United States
Department of
Agriculture

Forest
Service

R5-MB-287

July 2015

Final Environmental Impact Statement

Westside Fire Recovery Project
Volume I – Chapters 1, 2, 3, and 4

Happy Camp Oak Knoll and Salmon/Scott River Ranger Districts,
Klamath National Forest
Siskiyou County, California

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Westside Fire Recovery Project

Final Environmental Impact Statement

Siskiyou County, California

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Abstract:

The Westside Fire Recovery Project was developed in response to the 2014 wildfires on the Happy Camp/Oak Knoll and Salmon/Scott River Ranger Districts of the Klamath National Forest (Forest). The project will address the needs for 1) worker and public safety and access; 2) safe conditions for firefighters performing fire suppression for community protection; 3) an economically viable project, meeting project objectives and benefiting our local communities; and 4) restored and fire-resilient forested ecosystems.

Alternatives considered in detail are: 1) Alternative 1, no action; 2) Alternative 2, the refined proposed action; 3) Alternative 3, an alternative that emphasizes the development of future late successional forest habitat, habitat connectivity, northern spotted owl habitat and legacy components within the post fire landscape; 4) Alternative 4, an alternative that is designed to reduce watershed disturbance and impacts to water quality and fisheries, relative to the proposed action; 5) Alternative 5, that adds fuels treatments adjacent to private timber lands and removes treatment of salvage logging and site preparation from late successional reserves, riparian reserves, and inventoried roadless areas; 6) Alternative 2 Modified, developed during consultation with the U.S. Fish and Wildlife Service to further minimize impacts on northern spotted owl habitat; and 7) Alternative 3 Modified (the preferred alternative)which combined elements from all alternatives considered in detail (Alternatives 2, 3, 4, 5 and Alternative 2 modified) in addition to the alternative developed by the Karuk Tribe. Alternative 3 Modified is the preferred alternative. Eleven other alternatives were considered but eliminated from detailed study.

Comments received on the draft EIS were considered in developing this final EIS, which is available at: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=45579. The final EIS is available for a 30-day review period in accordance with 1506.10(2). There is no formal comment period on this final EIS prior to decision. An Emergency Situation Determination pursuant to 36 CFR 218.21 was granted for this project on May 13, 2015; therefore, under 36 CFR 218.21(d), a proposed action is not subject to the pre-decisional objection process as the Chief of the Forest Service determined that an emergency situation exists with respect to all or part of the proposed action or activity.

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Summary

The Forest Service prepared this final environmental impact statement (EIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. In response to issues raised by the public during scoping and consultation efforts with tribes and regulatory agencies, the Forest Service refined the proposed action and developed three additional action alternatives analyzed in detail. Comments received on the draft EIS were considered in developing this final EIS. After the draft EIS comment period the Forest Service developed two additional alternatives analyzed in detail by combining elements from all alternatives analyzed in detail in the draft EIS, including the Karuk Alternative. Consultation efforts with the Karuk Tribe, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, and public comments drove the development of these modified alternatives. This final EIS discloses the environmental impacts that would result from the Westside Fire Recovery project proposed action or its alternatives.

The final EIS is available for a 30-day review period in accordance with 1506.10(2). There is no formal comment period on this final EIS prior to decision. An Emergency Situation Determination pursuant to 36 CFR 218.21 was granted for this project on May 13, 2015; therefore, under 36 CFR 218.21(d), a proposed action is not subject to the pre-decisional objection process as the Chief of the Forest Service determined that an emergency situation exists with respect to all or part of the proposed action or activity.

Background

Severe drought and exceptionally dry fuel conditions made the 2014 fire season one of the most impacting in the history of the Klamath National Forest. Fires within the Happy Camp Complex were ignited by lightning near the town of Happy Camp, located on the middle portion of the Klamath River. Hot, dry and windy conditions caused three of the original 19 fires to escape containment, burn actively for several weeks, and eventually grow together spreading south along the Scott River and into the Marble Mountain Wilderness. The Beaver Fire located about 30 miles east of Happy Camp on the north side of the Klamath River, consumed approximately 32,400 acres. The July Complex was comprised of the Log and Whites Fires, which burned approximately 37,000 acres southeast of Fort Jones. The July Complex burned both private and National Forest land, ultimately spreading into the Marble Mountain Wilderness and into the drainage of the North Fork of the Salmon River. The 2014 fire season ultimately burned about 215,000 acres on the Forest, of which the Beaver Fire, the Happy Camp Complex, and the Whites Fire of the July Complex are a subset[1]. The Beaver Fire, Happy Camp Complex, and Whites Fire burned a total of about 183,500 acres, including 162,580 acres of National Forest System lands and 20,910 acres of private land (Table S- 1 below).

[1] The Beaver Fire, Happy Camp Complex, and Whites Fire were identified as requiring critical treatments due to post-fire conditions. Some other fires were also entirely within wilderness, preventing treatment. On the Goosenest Ranger District on the east side of the Klamath National Forest, the Forest is currently implementing the Little Deer project, which has much different conditions and no significant effects; the Environmental Assessment was finalized on February23, 2015 without an Emergency Situation Determination request and a decision notice/finding of no significance was signed on April 17, 2015. See project website for more information or documents about the Little Deer project: http://www.fs.usda.gov/project/?project=45313

Table S- 1: General Fire Information

Fire	Fire Start Date	Containment Date	Acres Burned: Forest Service	Acres Burned: Private	Total Acres Burned
Beaver Fire	July 30, 2014	August 30, 2014	14,630	17,870	32,500
Happy Camp Complex	August 12, 2014	October 29, 2014	115,050	2,150	117,200
Whites Fire	July 31, 2014	September 25, 2014	32,900	890	33,790
	Total of All Fires (acres)		162,580	20,910	183,500

Burned Area Emergency Response

Burned Area Emergency Response (BAER) actions, currently underway, aim to identify and manage imminent and unacceptable threats to human life, safety, property, and critical natural and cultural resources on National Forest System lands. BAER actions include repairing road drainages (grading, culvert cleaning, installation of rolling drainage dips, etc.), felling only imminent hazard trees along 650 miles of roads, and posting closure signs along roads and trails. Hazard trees felled during fire suppression and BAER activities were very limited in scope compared to the fire event and consisted of the most high-priority danger tree hazards[2] along only the most frequented of roadways. Due to the objectives of BAER activities and the scale of the event, the many recently fire-killed trees were considered to be structurally sound at the time and were left standing. As snags along the roadways in burned areas are exposed to winter rains, snow, and winds and subsequently deteriorate and decay, threats to human health and safety substantially increase. While BAER activities mitigate many of the immediate hazards, additional emergency actions are needed to address the remaining safety concerns and to move the affected areas towards recovery.

Purpose and Need

This project was developed in response to landscape-level changes to forested habitat resulting from the 2014 wildfires on the Klamath National Forest. Forest Service resource specialists began evaluating conditions in the project area immediately following the fires. The BAER analyses provided resource assessments on the fires' effects on soils, watersheds, vegetation, and wildlife. Post-fire inventories of the transportation system were conducted to obtain condition status. Field crews conducted surveys on forested stands to collect data on stand mortality and salvage viability. Soil burn severities and vegetation burn severities were mapped to determine the changed post-fire conditions. The initial post-fire assessments were completed by the fall of 2014. Resource specialists used this information to make recommendations to the Forest Supervisor, to develop the purpose and need. The purpose and need is described in detail in Chapter 1. Overall, the purpose and need of the project includes the following needs:

- A need for worker and public safety and access.
- A need for safe conditions for firefighters performing fire suppression for community protection.

[2] A high-priority danger tree hazard is defined as "a road or road segments where danger trees are determined to be highly likely to fail and where those failures would be highly likely to cause injuries" (FSH 7709.59 Section 40.5).

- A need for a project that is economically viable, meeting project objectives and benefiting our local communities.
- A need for restored and fire-resilient forested ecosystems.

Proposed Action

The project area comprises 218,600 total acres, including 187,100 acres of National Forest System land and 31,500 acres of private land. It is divided into three subparts: project area A (Beaver Fire), project area B (Happy Camp Complex), and project area C (Whites Fire of the July Complex). This project areas is larger than the fire foot print because the boundary was expanded beyond the fire perimeters. The project area was expanded near private property structures in order to incorporate hazardous fuel reduction treatments and fire breaks for community protection. See the vicinity map in Appendix A.

In order to accomplish these objectives, the Forest Service initially proposed:

- 11,700 acres of salvage harvest units[3] where fire-killed trees (snags) would be removed to reduce future fire risk and severity and to provide for public and forest worker safety;
- 650 miles of roadside hazard treatments (i.e., snag removal) along Forest system roads, state highways, and county roadways;
- 22,900 acres of hazardous fuels treatments (including strategic fuel breaks and treatments within ¼ mile of private property structures and other infrastructure); and
- 7,900 acres of reforestation (site preparation, planting, and release) to accelerate the restoration of forest habitat.

Public Engagement

See Chapter 1 for details. The Notice of Intent to prepare an EIS for the Westside Fire Recovery project was published in the Federal Register on October 15, 2014, beginning the 30-day public scoping period. The Forest used news releases, social media, and public open houses and presentations to inform broader audiences.

Results of Scoping

The Forest Service received 749 unique comments by means of 98 unique letters, and 1,556 form letters during the scoping period. In response to comments received, the Forest Service determined four issues to be relevant to alternative development. Other issues were also considered during the refinement of the proposed action (Chapter 2) or addressed in the disposition of scoping comments (Appendix B in the draft EIS).

Comment Period Notification

A Notice of Availability and legal notice were published in the Federal Register on March 13, 2015, beginning the 30-day comment period, as granted through alternative arrangements with the Council on Environmental Quality on March 6, 2015. On April 3, 2015 a notice of extension was published in the Federal Register and a legal notice was published in the Siskiyou Daily News, extending the comment period an additional 15 days in response to public requests for additional review and comment time. Comments

[3] Treatment in salvage harvest units is limited to moderate to high severity areas (greater than 50 percent mortality) outside of riparian reserves. An estimated 6,800 acres of fire-killed trees would actually be removed. See chapter 2 for a complete description of harvest units.

received by April 27, 2015, were considered timely for agency response. The Forest used news releases, and social media, and public open houses and presentations to inform broader audiences.

Results from Comment Period Comments

A total of 13,413 comment letters were received during the Westside Fire Recovery draft EIS comment period. The Forest received 265 unique letters, 21 master form letters, and 263 form plus letters (with slight modifications of the master form letters; the remainder of the letters were form letters identical to one of the 21 master form letters). A list of comments received and how the Forest responded are included in Appendix B.

Ongoing Consultation Efforts

The Forest has been actively consulting with regulatory agencies as well as local and national elected officials. The Forest Service has also remained engaged in government to government consultation with federally recognized local tribes and seeking input from non-federally recognized tribes. Pacific fisher is proposed for listing as "threatened" under the Endangered Species Act. The Forest Service would conference with the U.S. Fish and Wildlife Service if it is determined that the Westside Fire Recovery Project would threaten the continued existence of Pacific fisher. If Pacific fisher is listed under the Endangered Species Act, the Forest Service would initiate formal consultation under Section 7 of the Endangered Species Act.

Alternatives Considered in Detail

In response to relevant issues, the Forest Service developed three alternatives (Alternative 3, 4 and 5) to the proposed action and several alternatives considered but eliminated from detailed study. In response to comment period comments and consultation with local tribes and regulatory agencies, the Forest Service developed two additional alternatives (Alternative 2 Modified and Alternative 3 Modified). Alternatives are described in detail in Chapter 2.

- Alternative 1 (No Action) -There will be no treatment with this alternative. The no action alternative provides reviewers a baseline to compare the magnitude of environmental effects of the action alternatives. It also provides a picture of the results of allowing natural regeneration to take place across the project area.
- Alternative 2 (Refined Proposed Action) – This alternative is the proposed action as scoped, except refined in response to public scoping comments and the acquisition of field-verified information about the project area. The alternative was developed through interdisciplinary involvement and recommendations in order to meet the purpose and need of the project, while being consistent with the Forest Plan and other regulatory requirements. This was the preferred alternative for the draft EIS.
- Alternative 3 – This alternative was developed in response to relevant issues about the effects of the proposed action on spotted owl and fisher habitat, habitat connectivity, and legacy components (i.e. old growth trees) and concerns about treatments in late-successional reserves. Alternative 3 emphasizes the development of future late successional habitat, habitat connectivity, northern spotted owl habitat and legacy habitat components within the post fire landscape. Alternative 3 is designed to retain legacy components for future habitat development, reduce effects to northern spotted owl nests, and lessen the effects to connectivity while still meeting the purpose and need for action.

- Alternative 4 – This alternative was developed to reduced impacts to watershed, including to federally-listed Coho Salmon. This alternative was developed through consultation discussions between the Forest Service and the National Marine Fisheries Service (NMFS) and in response to relevant public issues about the effects of the proposed action on watershed conditions and recovery. Alternative 4 is designed to reduce watershed disturbance and impacts to water quality and fisheries, relative to the proposed action, while still meeting the purpose and need for action. This alternative reduces or eliminates temporary road actions, especially within key watersheds and sensitive watersheds, as identified by the interdisciplinary team.
- Alternative 5 – This alternative addresses disagreements about the effects of salvage logging and site preparation on late successional reserves, riparian reserves, and inventoried roadless areas. Alternative 5 also addresses disagreements about whether or not the proposed action sufficiently addresses the needs for fuels reduction adjacent to private timber lands in the Beaver Fire area. Salvage harvest, site preparation, planting, and release are only proposed within management areas considered as matrix lands. Additional hazardous fuels treatments are proposed adjoining private land treatments.
- Alternative 2 Modified –This alternative was developed as the agency continued further field verification efforts and early Endangered Species Act (ESA) consultation with U.S. Fish and Wildlife Service regarding the federally-listed northern spotted owl.
- Alternative 3 Modified (the preferred alternative for the final EIS) – This alternative was developed in response to comments received during the public comment period and continued consultation with local tribes and the U.S. Fish and Wildlife Service.

The agency considered a total of 18 alternatives for the final EIS. In addition to the 7 alternatives considered in detail and the 10 alternatives considered but eliminated from detailed study, the Forest Service received an alternative from the Karuk Tribe on March 5, 2015 at 4:30 p.m., the day before printing the draft EIS. This alternative was incorporated into Appendix G of the draft EIS and was made available for public review and comment. For the final EIS, the Forest Service developed Alternative 3 Modified and incorporated elements of the Karuk Alternative. Both Alternative 2 Modified and Alternative 3 Modified reflect ideas developed by the public during the comment period, collaborative efforts, and consultation. These additional alternatives are comprised of actions already proposed in the range of alternatives described in the draft EIS. Effects of these alternatives are within the scope of analysis already considered in the draft EIS and are disclosed in Chapter 3 of this document. For a full discussion of how the suggestions presented in the Karuk Alternative have been considered for this and future projects see Chapter 2 of the final EIS.

Emergency Situation Determination

In order to facilitate implementation of the project, the Forest requested and was granted an Emergency Situation Determination pursuant to 36 CFR 218.21 on May 13, 2015. Under 36 CFR 218.21(d), a proposed action is not subject to the pre-decisional objection process if the Chief or Associate Chief of the Forest Service determines that an emergency situation exists with respect to all or part of the proposed action or activity.

Alternative Arrangements

On March 6, 2015, the Council on Environmental Quality granted the Forest Service's request for Alternative Arrangements pursuant to 40 CFR 1506.11. As a result, he Forest Service shortened the comment period for the draft EIS from 45 to 30 days, shortening the 45-day comment period requirement for the draft EIS by 15 days, resulting in a 30-

day comment period (40 CFR 1506.10(c)). The Forest subsequently extended the comment period for 15 days in response to public requests for additional review and comment time.

The agency is not seeking any additional alternative arrangements for this project.

Decision Framework

As the Responsible Official, the Forest Supervisor may decide to: (1) select the proposed action; (2) select one of the alternatives; (3) select one of the alternatives after modifying the alternative with additional mitigating measures or a combination of activities from other alternatives; or, (4) select the no action alternative, choosing not to authorize the Westside Fire Recovery project.

In making this decision, the Forest Supervisor will consider:

- How well does the selected alternative meet the purpose and need described in this EIS?
- How well does the selected alternative move the project area toward the desired conditions established in the Forest Plan?
- Does the selected alternative mitigate potential adverse effects?

Chapter 1 Purpose of and Need for Action

Document Structure

The Forest has prepared this Environmental Impact Statement (EIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This EIS discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four chapters and appendices:

- ***Purpose of and Need for Action (Chapter 1):*** This chapter briefly describes the proposed action, the need for that action, and other purposes to be achieved by the proposal. This section also details how the Forest Service informed the public of the proposed action and how the public responded.
- ***Alternatives, Including the Refined Proposed Action (Chapter 2):*** This chapter provides a detailed description of the agency's proposed action as well as alternative actions that were developed in response to comments raised by the public during scoping. It describes the key management direction used in developing the project which comes from the Forest Plan's forest-wide standards and guidelines, and describes those specific to management areas found within the project area including Late Successional Reserves, which accounts for about 50 percent of the project area, and describes the role of salvage harvest for risk reduction in Late Successional Reserves. The end of the chapter includes summary tables comparing the proposed action and alternatives with respect to the activities proposed for each alternative, how each addresses the purpose and need of the project, how each addresses relevant issues, and their environmental impacts.
- ***Affected Environment and Environmental Consequences (Chapter 3):*** This chapter describes the affected environment and environmental impacts of the proposed action and alternatives on Forest resources and the overall response from the Forest to responsible opposing views.
- ***Consultation and Coordination (Chapter 4):*** This chapter provides a list of preparers and agencies consulted during the development of the EIS.
- ***Appendices:*** The appendices provide more detailed information to support the analyses presented in the EIS.

The EIS and supporting documents can be found at: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=45579.

Additional information is located within the project record located at the Forest headquarters office in Yreka, CA.

Modifications or Clarifications between Draft and Final Document

Chapter 1

- The Public Involvement section was updated based on open houses, field trips, and public comments received during the comment period after the draft EIS was published on March 13, 2015. This includes updates to the collaborative efforts, tribal consultation and regulatory consultation that were ongoing during the time of publication
- A section was added to this chapter describing the use of salvage of fire killed trees in Late Successional Reserves, described in detail in Appendix E.
- Language was updated throughout the final EIS to reflect current status of the project.

Chapter 2

- Language was added to clarify how each alternative was developed or how each is responsive to public comments or issues. Changes to the descriptions of alternatives are summarized below and detailed in chapter 2.
- Acres were adjusted for all alternatives based on new field verified information and treatment adjustments as a result of consultation and further interdisciplinary input. These numbers are reflected in the description of the alternatives and in the summary tables in this chapter.
- Two additional action alternatives (Alternative 2 Modified and Alternative 3 Modified) were added to this chapter. Both alternatives were developed based on existing alternatives analyzed in detail before publishing the draft EIS. Alternative 2 Modified was developed through consultation with the U.S. Fish and Wildlife Service. Through continuing consultation additional modifications were needed and captured in Alternative 3 Modified.
- The tables displaying alternatives by management area were moved to the end of Chapter 2 to improve readability and illustrate the differences between alternatives by management area.
- After consultation with the Karuk Tribe, the Forest incorporated some of their suggestions in Alternative 3 Modified. Elements of the Karuk Alternative were used to develop this alternative. The Karuk Alternative is now included in Chapter 2 of the final EIS as a discussion about how the Karuk Alternative was considered, including what elements were incorporated into Alternative 3 Modified, what elements will be considered for future actions, and how the Karuk Alternative compares to the preferred alternative.
- The Forest Service received public comments regarding the readability of the draft EIS, errors such as table references, and needs to clarify language. Changes were incorporated throughout the final EIS to address these public comments. A list of editorial comments is included in Appendix B and is addressed in the body of the final EIS.
- A description of the evolution of the project from scoping to selected alternatives was added to this section of the final EIS. This description of the evolution was developed to describe how the project has changed from the initial proposed action as scoped to Alternative 3 Modified. The evolution of the project shows how each alternative was designed to respond to public comment, discussion with collaborative groups, and consultation with the Karuk Tribe and other local tribes and discussions with other tribal groups and regulatory agencies helped shape Alternative 3 Modified.
- Language was clarified or modified between draft and final EIS to describe the action alternatives and project design features. These changes are summarized below.

Changes to all Action Alternatives

- Language was added to clarify the description of roadside hazard based on how the Forest intends to use the Regional Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (Angwin et al. 2012). Along forest roads, dead and fire - damaged trees with a 60 percent or greater probability of mortality are proposed for removal. After publication of the draft EIS, these rules were modified so that trees over 45 inches in diameter were required to have a 95 percent probability of mortality. This was done to ensure that legacy trees along road systems were retained. Project design was modified after publication of the draft, in consultation with the U.S. Fish and Wildlife Service to eliminate marking of green hazard trees that are not fire-damaged. This was done to reduce potential impacts to northern spotted owl habitat. Within proposed roadside hazard areas, the Forest Service is using a 60 percent probability of mortality as a threshold. No alternatives in this project propose the removal of green trees, defined as trees with a less than a 60 percent probability of mortality. All green trees will be retained. The only exceptions are green trees that pose an immediate hazard to roadways.
- Hazardous fuels treatment acres were updated to account for about 670 acres that were incorrectly mapped in the published draft EIS. These acres overlapped the Marble Mountain

Wilderness in the draft EIS, but were never intended to be treated. The 670 acres now removed from the prescribed burn treatment areas in the Whites fire.

- Language was added to clarify when proposed fuels treatments are projected to be implemented (see Chapter 2). The target implementation timeline for fuels treatments is one to ten years following a project decision. Fuels treatments that overlap roadside hazard removal or salvage harvest treatments are proposed to be implemented following the implementation of roadside hazard removal or salvage harvest. If new information or changed circumstances relating to the environmental impacts of a proposed action come to the attention of the responsible official after a decision has been made and prior to completion of the approved program or project, the responsible official may review the information carefully to determine its importance. Consideration should be given to whether or not the new information or changed circumstances are within the scope and range of effects considered in the original analysis. New or supplemental analysis may be completed as needed to address changes in condition prior to continued implementation of proposed activities (FSH1909.15, Section 18.1).
- Language was clarified for treatments within site preparation and planting units (see Chapter 2). The language was clarified to state that any tree with any remaining green limbs will be considered live and retained within site preparation and planting units. Site preparation units outside of salvage harvest units will not use the mortality guidelines to determine trees for removal. The Forest Service recognized that trees with green limbs may still have the capability of producing seeds regardless of the likelihood of mortality as defined by the "*Mortality Guidelines for Fire Injured Trees in California*" (Smith and Cluck, 2011). The objective of site-preparation and planting units is to retain any potential seed source for natural reforestation. By retaining trees with green limbs, regardless of their likelihood of mortality, remaining trees will provide potential habitat for connectivity for northern spotted owl and fisher.

Changes to Project Design Features

- Heritage-9 was added during the development of a project-specific programmatic agreement with the State Historic Preservation Office for compliance with the National Historic Preservation Act (see Tribal Consultation section below).
- Range-3 was modified to add clarifying language that no planting is proposed within site preparation and planting or salvage units that overlap historic wet or dry meadows (as defined in Range-3); these are now just site preparation units that are site-prepared to improve growth of meadow vegetation.
- Recreation and Scenery-4 and -5 were modified to add clarifying language and identify where applicable. Recreation and Scenery-6 through -12 were also added for recreation and scenery; these project design features are described in the project design feature table in Chapter 2.
- Watershed-4 was modified to include equipment exclusion from all riparian reserves associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits.
- Watershed-12 was modified to include leaving on site all hazard trees cut within 25 feet of a stream channel or spring. All hazard trees equal to or greater than 26 inches diameter at breast height within the first site tree (150-170 feet) distance from all streams (perennial and intermittent) will be left on site unless, after felling, leaving these trees continues to pose a threat to safety, infrastructure, forest road drainage system integrity or accessibility. Where hazard tree removal is proposed along roads that parallel fish-bearing streams, any hazard tree equal to or greater than 26 inches in diameter that is below the road, that would contact the stream channel if felled in that direction, will be retained on site.

- Watershed-34 was modified to add language responsive with continued ESA consultation with NMFS and public comments on the avoidance of drafting water in specific creeks and lower reaches of cold tributaries (Fish Biological Assessment, Appendix E).
- Language in all Wildlife project design features was modified based on clarification needed during consultation with the U.S. Fish and Wildlife Service.
- The original Wildlife-19 and Wildlife-20 were removed because the units described as part of these project design features were removed from treatment within the applicable alternative. Wildife-19 now clarifies that trees without fire damage will not be removed along roads unless they are an immediate hazard to maintain public and worker access. Wildife-20 clarifies that limited operating periods do not apply to roadside hazard treatments occurring along roads that are Maintenance Level 3, 4 or 5.

Chapter 3

- A section was added to this chapter to respond to comments that were submitted during the comment period on the draft EIS. This section directly responds to repeated themes in comments the agency received during comment periods on the original proposed action (scoping) and on the draft EIS. A list of Scoping comments is in Appendix B of the draft EIS; a list of comments submitted on the draft EIS is in Appendix B of the final EIS.
- Analysis of the effects of two additional alternatives (Alternative 2 Modified and Alternative 3 Modified) was completed since the draft EIS was published and is included in Chapter 3 of the final EIS. Any clarification or changes of methods is described for each resource, and analysis was also broken apart by fire area (Beaver, Happy Camp, and Whites) in Chapter 3. The history and description of all alternatives are found in Chapter 2.

Appendices

- Additional maps were added to Appendix A. These maps include a cumulative effects map, a map showing the evolution of salvage units, a map showing how Late Successional Reserve (LSR), Inventoried Roadless Area (IRA), matrix, and non-matrix lands overlap the project areas, and updated treatment maps for all alternatives (including maps for Alternative 2 Modified and Alternative 3 Modified).
- Appendix E contains the full text of the “Risk Reduction Salvage in Late Successional Reserves” document that was sent to the Regional Ecological Office as part of project review and the letter of concurrence from the Regional Ecological Office concluding that this Project is consistent with the Northwest Forest Plan.
- Appendix B: Response to Comments replaces Appendix B: Public Scoping Comments Disposition and Open House Record that was published in the draft EIS. This new Appendix B lists each comment the Forest received during the comment period on the draft EIS and how the Forest responded to each comment.
- Appendix H and I were added to the final EIS. Appendix H is the Wildlife Biological Assessment and Appendix I is the Fisheries Biological Assessment.

Background

On the west side of the Forest, the terrain is extremely rugged with total relief in excess of 7,500 feet and hillslopes commonly steeper than 65 percent. The Klamath Mountains, of which the west side of the Forest is a part, are also characterized by steep ecological gradients, high vegetation, wildlife, and fish diversity, with numerous species including the federally-listed northern spotted owl and Coho Salmon (under the Endangered Species Act (ESA)) and the Pacific fisher which is proposed for federal listing under ESA. Annual precipitation ranges from approximately ten inches in eastern valleys to

over 70 inches in the highest elevations. Climate is essentially Mediterranean, and watershed hydrology is characterized by dry summer and fall months followed by substantial winter precipitation. Morphology and function of the steep stream channels is influenced by large floods and associated landslides and debris flows.

Prior to the 2014 fires, vegetation types within the project area generally consisted of oak, brush, grass, and mixed conifers. Oaks, brush, and grasses are typically found on low-elevation sites on shallow, rocky soils located on the southerly and westerly aspects. These southerly and westerly aspects exhibit harsher conditions than the northerly and easterly aspects. As elevations increase, conifer species become more prevalent, primarily as a function of higher precipitation amounts at higher elevations. Deeper, more developed soils than those at low elevations support mixed conifer stands of Douglas-fir, ponderosa pine, incense cedar, and sugar pine. Higher elevation sites within the project area provide favorable conditions for red fir and white fir survival and growth, with white fir becoming a substantial component of the mixed conifer type. Hardwood species, including Pacific madrone, California black oak, canyon live oak, Oregon white oak, tanoak, and bigleaf maple are generally a minor component of mixed conifer stands.

Few forested regions have historically experienced fires as frequently and with such high variability in fire severity as the Klamath Mountains Bioregion (Skinner 2006). The fire regime of the forests of the Klamath Mountains differs from the more mesic old-growth Douglas-fir dominated forests of Oregon and Washington (described in Franklin et al. 1981) in fire frequency, fire severity and structural attributes such as the amount and persistence of snags and coarse woody debris (Taylor and Skinner 1997). The characteristic fire regime of the Klamath Mountains, before the current era of fire exclusion, was one of frequent low to moderate intensity fire with low to moderate severity effects (Skinner et al. 2006), not the “stand-replacement or mixed” regime that is typical in the Coast Range and western Oregon and Washington Cascades (Taylor and Skinner 1998, Wills and Stuart 1994, Fry and Stephens 2006). In a fire regime dominated by low to moderate severity effects, tree mortality with wildfire is generally low. In the Klamath Mountains, patches of moderate to high severity fire were more likely on upper slope positions and on south and west-facing aspects (Skinner 2006). Patches of high severity would produce a pulse of snags and, eventually, down logs until these were consumed by subsequent fires. Because frequent low to moderate severity fires consume wood, it is unlikely that coarse woody debris accumulated to levels seen in Oregon and Washington (Taylor and Skinner 1997); snags and logs were likely clustered in time and space with long intervals and large areas where dead wood was sparse (Skinner 2002). Under historical conditions an event with large patch size and geographic extent of high severity fire that occurred within the project area would have been highly unlikely to occur because there would have been substantially less surface fuel, less fuel continuity and lower stand density than existed in 2014. Fires were more likely to burn on the ground rather than in the tree canopy and a patchy stand structure would have been shaped by frequent low to moderate intensity fires that consumed most of the dead and down wood on upper slopes.

Even though fire exclusion has since altered the fire regime and produced an unnatural accumulation of surface fuels in many areas, fire in the Klamath Mountains still generally burns with predominately low to moderate severity effects today (Odion et al. 2004, Miller et al 2012). The current elevated fuels conditions sometimes lead to fires of higher

intensity and severity; combined with severe drought, wind and lighting strikes, these conditions led to about 31 percent of the 2014 wildfires burning with moderate to high severity effects in the project area.

Within the Klamath Mountains bioregion, lightning accounts for 74 percent of ignitions and 82 percent of burned areas, and median fire return intervals range from eight to 38 years (Taylor, Skinner, and Agee 2006). A great portion of the project area remained unburned from 20 to 100 years prior to the 2014 fires.

Emergency Triggering Event

Severe drought and exceptionally dry fuel conditions made the 2014 fire season one of the most impacting in the history of the Forest. The following outlines some of the difficult conditions that characterized the season:

- Three consecutive years of drought resulted in record low snowpack, rainfall, and stream flows;
- Live and dead fuel moistures were at record historic lows with numerous days setting new records for severe wildfire burning conditions;
- Over the course of the summer, five separate waves of lightning storms affected the Forest, setting a total of 127 wildfires (an additional 12 wildfires were human-caused);
- Twenty severe fire weather warnings ("Red Flag Warnings") were issued by the National Weather Service between July 29 and August 18, 2014, due to lightning and abundant dry fuels, strong winds, and low relative humidity;
- As a result of threatening wildfire activity, a total of 14 Mandatory Evacuations and 15 Evacuation Advisories were ordered by the Siskiyou County Sheriff's Office. These evacuations affected an estimated 800 residents. Extensive Forest road and area closures were also in effect for most of the fire season;
- Simultaneous wildfires burning in Oregon, Washington, and other parts of California resulted in limited firefighting resources (crews and aircraft) being readily available to the Forest during initial suppression efforts; and
- Rugged mountainous topography, heavy fuel loadings (jackstraw fallen snags and trees) and limited access made fire suppression efforts extremely challenging.

Forest-wide, the 2014 fire season ultimately burned about 215,000 acres. Restoration needs for all affected acres were identified. Some fires, or portions of fires, burned within wilderness areas where natural processes drive restoration. Restoration needs of the 5,500-acre Little Deer fire (located on the east side of the Forest) have been identified and analyzed through a stand-alone environmental analysis. The Westside Fire Recovery project is composed of the other large fires (or portions of fires) that burned during 2014 - the Beaver fire, Happy Camp Complex, and the Whites fire of the July Complex.

The Beaver, Happy Camp Complex, and Whites fires burned a total of about 183,500 acres, including 162,580 acres of National Forest System lands and 20,910 acres of private land. See Table 1-1 below.

Table 1-1: General fire information

Fire	Fire Start Date	Containment Date	Acres Burned: Forest Service	Acres Burned: Private	Total Acres Burned
Beaver Fire	July 30, 2014	August 30, 2014	14,630	17,870	32,500

Fire	Fire Start Date	Containment Date	Acres Burned: Forest Service	Acres Burned: Private	Total Acres Burned
Happy Camp Complex Fire	August 12, 2014	October 29, 2014	115,050	2,150	117,200
Whites Fire	July 31, 2014	September 25, 2014	32,900	890	33,790
Total of All Fires (acres)			162,580	20,910	183,500

Fires within the Happy Camp Complex were ignited by lightning near the town of Happy Camp which is located on the middle portion of the Klamath River. Nineteen fires were ignited in this storm and comprised the complex. Due to hot, dry and windy conditions, three of the original 19 fires could not be readily contained and eventually grew together and spread east to the Scott River and south into the Marble Mountain Wilderness over the course of several weeks. This combined fire burned about 133,000 acres, not all of which are included in the Happy Camp Complex as analyzed by this project. The Beaver fire occurred on the north side of the Klamath River about 30 miles east of Happy Camp, and eventually consumed approximately 32,000 acres. The July Complex was comprised of the Log and Whites fires; the complex fire burned approximately 37,000 acres southeast of Fort Jones, 33,800 acres of which are part of the Whites fire as analyzed in this project. The July Complex burned both private and National Forest land, ultimately spreading into the Marble Mountain Wilderness and into the North Fork drainage of the Salmon River.

Resources Affected

The fires burned extensive portions of the Klamath River, Scott River, and Salmon River 5th field watersheds on the western half of the Forest. Dozens of tributary drainages in these watersheds were affected. Large portions of late successional reserves and habitat burned with high-severity fire. In the wildfires that occurred in the 2014 Westside Fire Recovery project area (Beaver, Whites, and Happy Camp fires) over 7,000 acres of functioning nesting-roosting habitat and 9,600 acres of foraging habitat were lost to stand-replacement (i.e. high severity) fire. All the large fires of the 2014 season burned with mixed severity, meaning there was a mosaic of light, moderate, and severely burned forests within each fire area.

Table 1-2 below describes the percentage of vegetative canopy killed (basal area). See the Rapid Assessment of Vegetation Condition maps in Appendix A.

Table 1-2: Percentage of vegetative canopy killed (basal area)

Fire Severity	Percentage (%) of Vegetative Canopy Killed (basal area)	Beaver %	Happy Camp %	Whites %	Total %
Very Low	0-25	43	62	63	**59**
Low	25-50	10	8	6	**8**
Moderate	50-75	7	6	5	**6**
High	75-100	40	23	26	**27**

Of the approximately 183,500 acres that burned within the Westside project area, approximately 27 percent exhibits very high vegetation burn severity effects. Within high-severity areas, full consumption of duff, conifer and hardwood litter, saplings, and small and large dead material occurred. Full consumption of canopy foliage and small branches within the crown stratum has left standing dead trees that are storing a

tremendous amount of biomass available for future surface fuel accumulation. Areas of high severity burns experienced 75 percent or greater vegetation mortality, loss of canopy and understory cover, and loss of duff layers and large woody debris. The stands that burned at high severity ranged in species composition and structure, and included shrub/oak stands, single layered conifer plantations, multi-layered mixed conifer stands, and higher elevation stands dominated by true fir. Most trees within high severity burn areas are dead or expected to die in the next three to five years.

About six percent of the fire areas burned with moderate severity. Areas characterized by moderate-severity burns experienced 50 to 75 percent vegetation mortality, substantial reduction in canopy, understory cover, duff layers and large woody debris. Moderate-severity fire areas generally experienced consumption of surface fuels, leaving the canopy structure primarily intact; however, the conifer and hardwood canopies are generally brown needle foliage. Dead fuels contribute to surface fuel loads and will decay slowly. Small shade-tolerant trees fill in the mid-story canopy connecting to the upper canopy fuel (ladder-effect) of the larger fire-resilient trees on the landscape resulting in high-severity effects in many forested lands. A substantial portion of the trees within moderate-severity areas have either been killed by fire or are expected to experience high mortality due to fire injury, insects, and the effects of prolonged drought. Continued overall low levels of rainfall and particularly low snowfall amounts this winter are not alleviating drought conditions in northern California. These continuing relatively dry conditions will further decrease the survivability of fire-damaged trees, even in areas that burned at lower severity.

Areas characterized by low or very low severity burns experienced zero to 50 percent vegetation mortality and a reduction in fuel loading. In low-severity burn areas, most of the stand mortality occurred in understory trees less than 10 inches in diameter at breast height. Over time, these small trees will fall to the forest floor and contribute to future fuel loading, but in much smaller quantities than in the moderate- to high-severity burn areas.

Debris Flows in Post-Fire Environment

Over 50,000 acres of the Westside Fires burned with moderate to high severity, killing most of the trees. Because of the extreme fire conditions, ground vegetation, down woody debris and tree crowns were completely consumed in large areas of the fire. Lack of ground cover and crown interception exposes soils to raindrop impacts, and increases the amount of precipitation that reaches the ground. Moderate to high severity fires can also cause a loss of soil hydrologic function by sealing pores and degrading soil structure. Under high severity fire conditions, soils become resistant to water infiltration because burned organic material soaks into empty pore spaces in the soils, making the soil surface impervious to water, or “hydrophobic”. Also, silica in the soil can fuse at high temperatures contributing to hydrophobicity. Once soils become hydrophobic, surface runoff and erosion can increase dramatically because rainfall cannot infiltrate the soil. During mid-July, 2015 high intensity rainfall events over severely burned portions of the West Side Fire area caused surface erosion that triggered a number of debris flows. As much as 1.5 inches of rain fell in less than an hour in many parts of the fire area during these storms. The high-intensity rainfall event on hydrophobic soils that had been denuded of vegetation in the 2014 Westside Fires caused rapid delivery of water and sediment to stream channels by rills and small gullies. This slurry of water and debris is

what formed the debris flows. Water, rocks, mud and trees were swept downslope in the Music Creek, Beaver Creek, Grider Creek, and Walker Creek drainages. Debris flows in a post-fire environment is a common natural phenomenon especially where there are large areas of high severity burn such as the 2014 Westside Fires. These debris flows were surface erosion events related primarily to loss of ground vegetation, loss of forest canopy and hydrophobic soil conditions rather than landslides caused by loss of root strength.

Burned Area Emergency Response

Ongoing Burned Area Emergency Response (BAER) actions aim to identify and manage imminent, unacceptable threats to human life, safety, property, and critical natural and cultural resources on National Forest System lands. BAER actions include repairing road drainages (grading, culvert cleaning, installation of rolling drainage dips, etc.), felling only imminent-hazard trees along roads, and posting closure signs along roads and trails. Hazard trees felled during fire suppression and BAER activities were very limited in number and consisted of older dead, decomposed, and structurally unsound trees along only the most-frequented of roadways. Due to the objectives of BAER activities and the scale of the fire-impacted area, most of recently fire-killed trees (snags) were considered to be structurally sound at the time of BAER and were left standing. As snags along the roadways in burned areas are exposed to winter rains, snow, and winds, and subsequently deteriorate and decay, threats to human health and safety substantially increase. While BAER activities mitigate many of the immediate hazards, additional emergency actions are needed to address the remaining safety concerns and to move the affected areas towards recovery.

Westside Fire Recovery Project

The Westside Fire Recovery project was developed in response to landscape-level changes to forested habitat resulting from the 2014 wildfires on the Forest. Resource specialists began evaluating conditions in the project area immediately following the fires. The BAER analyses provided resource assessments on the fires' effects on soils, watersheds, vegetation, and wildlife. Post-fire inventories of the transportation system were conducted to obtain condition status. Field crews conducted surveys on forested stands to collect data on stand mortality and timber salvage viability. Soil-burn severities and vegetation-burn severities were mapped to determine the changed post-fire conditions. The initial post-fire assessments were completed by the fall of 2014. Resource specialists used this information to make recommendations to the responsible official, Forest Supervisor Patricia Grantham, for developing the proposed action.

The Forest has prepared this EIS to analyze and disclose the effects of proposed treatments included in the Westside Fire Recovery project. An EIS is required due to the scope of the proposed treatments and the potential for significant impacts, especially to the federally-listed northern spotted owl and Coho Salmon and their critical habitats.

The boundary was extended beyond the fire perimeters (Table 1-1) to incorporate hazardous fuel reduction treatments and fire breaks within one-quarter mile of structures on private property. The project area comprises 218,600 total acres, including 187,100 acres of National Forest System land and 31,500 acres of private land. It is divided into three subparts: project area A (Beaver fire), project area B (Happy Camp Complex), and

project area C (Whites fire of the July Complex). See the vicinity map (Map A-1 in Appendix A).

Table 1-3: Acres within the project area on private and National Forest System lands by fire area

Project Area	Fire	Forest Service Project Area (acres)	Private Lands within Project Area (acres)	Total Acres within Project Area
A	Beaver Fire	19,000	24,800	43,800
B	Happy Camp Complex	127,000	5,400	132,400
C	Whites Fire	41,100	1,300	42,400
Total Project Area (acres)		187,100	31,500	218,600

Table 1-4: General location by fire area within the project area

Project Area	Fire	Legal Location Township (T), Range (R), and Section (S)	Elevation Range (Feet)	Watershed (5th Field)
A	Beaver Fire	Mt.Diablo: T46N R8W S 2-7, 9-11; T46N R9W S1-13,18; T46N R10W S1-3,10-15;T47N R8W S4-10,15-22, 27-35; T47N R9W S1, 9-17, 20-36; T47N R10W S 25, 34-36	1,700-6,300	Beaver Creek, Horse Creek-Klamath River, Humbug Creek-Klamath River
B	Happy Camp Complex	Humboldt: T14N R8E S 5, 8,17, 20; T15N R7E S 1, 2,12,13, 24;T15N R8E S3-10,15-22, 27-28, 34; T16N R7E S1, 2,10-15, 23-25, 35, 36; T16N R8E S6-10,15-22, 27-34 Mt. Diablo: T43N R12W S2-11,14-20; T44N R10W S6; T44N R11W S1-11, 15-22, 28-30;T44N R12W S1-35; T45N R10W S5-9,16-21, 28-32; T45N R11W S1-36; T45N R12W S1-36; T46N R10W S31-32; T46N R11W S 16-22, 26-36; T46N R12W S 10-11,13-16, 20-36	1,100-7,400	Elk Creek[4], Horse Creek-Klamath River, Indian Creek,Lower Scott River, Seiad Creek-Klamath River[5], Thompson Creek-Klamath River, Ukonom Creek-Klamath River
C	Whites Fire	Mt.Diablo: T39N R10W S 1-11,17-18; T39N R11W S 1-3,10-15; T40N R8W S 6-7,18-19,30; T40N R10W S 2-36; T40N R11W S 1-4, 9-16, 21-28, 33-36; T41N R10W S 8-22, 27-35; T41N R11W S 24-25,33-36	2,200-8,000	French Creek-Scott River, North Fork Salmon River[6], South Fork Salmon River[7]

Management Direction

Direction for this project comes from the Klamath National Forest Land and Resource Management Plan (Forest Plan) of 1995, as amended. The Forest Plan incorporates direction from the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (Northwest Forest Plan). Other statutes, regulations, plans and policies that provide

[4] Key Watershed from the Forest Plan
[5] The Grider Creek 6th field portion of this 5th field watershed is identified as part of a Key Watershed in the Forest Plan
[6] Key Watershed from the Forest Plan
[7] Key Watershed from the Forest Plan

management direction for this project include, but are not limited to, the Endangered Species Act, the National Historic Preservation Act, the Clean Water Act, the Clean Air Act, Recovery Plans for northern spotted owls and Coho salmon, as well as Forest Service directives. The project is designed to be consistent with all applicable laws, policies and plans, and to consider information in guidance documents such as watershed analyses, the National Fire Plan, and Forest Fire Management Plan.

Key direction for this project comes from the Forest Plan's forest-wide standards and guidelines, and those specific to management areas that are found within the project area, as described in Table 1-5. This project includes design features listed on Table 2-42 in Chapter 2 that were developed to reduce potential negative impacts to resources and to meet the standards and guidelines of the Forest Plan. For further information pertaining to meeting the requirements of the Forest Plan, please see the Forest Plan consistency checklist, available in the project record and on the project website.

Much of the project lies within the wildland urban interface (WUI) community threat zone as described in the Forest Fire Management Plan. Within the project area, there is U.S. Fish and Wildlife Service-designated critical habitat for northern spotted owl (U.S. Fish and Wildlife Service 2012), and National Marine Fisheries Service-designated critical habitat for Coho Salmon (May 5, 1999, 64 FR 24049). The project is located within the North and South Fork Salmon River, Elk Creek, and the Grider section of the Seiad Creek-Klamath River key watersheds; management direction for key watersheds in the Forest Plan (pages 4-25 through 4-26) applies to activities in the project.

The 1995 Forest Plan includes standards and guidelines from the Northwest Forest Plan. The Forest Plan provides forest-wide and management area direction for project-level projects. Management areas within the project area are described in Table 1-5.

Table 1-5: Notable Forest Plan management area goals for management areas found within the project boundary[8]

Management Areas (MA)	Pages in Forest Plan	Notable Forest Plan Goals, Standards and Guidelines
MA1- Research Natural Area[9]	4-67 to 4-69	Not applicable; no activities are planned for this management area.
MA2- Wilderness	4-70 to 4-75	Not applicable; no activities are planned for this management area.
MA3- Recommend and Designated Wild River[10]	4-78 to 4-79	Not applicable; no activities are planned for this management area.
MA12- Recommended and Designated Scenic River	4-117 to 4-119	A wide range of silvicultural treatments may be used to meet Scenic River objectives. Salvage of trees killed by wildland fire, pest infestations or other natural processes is permitted consistent with area resource management goals. Salvage and reforestation efforts are a moderate priority. Minimize the loss of timber value where possible (page 4-119).
MA13- Recommended and Designated Recreational River	4-120 to 4-122	Lands may be managed for a full range of silvicultural uses, to the extent currently practiced. Timber harvesting would be allowed under standard restrictions to protect the immediate river environment, water quality, scenic, fish and wildlife and other values. Schedule moderate timber yields, compatible with area goals (page 4-122)
MA 5- Special Habitat: Late Successional Reserves (LSRs) Falcon and Eagle	4-82 to 4-89; 4-92 to 4-93; 4-90 to 4-92	Conditions of late-successional forest ecosystems are enhanced to serve as habitat for late-successional species. Continuous areas of multi-layered forests with high quality habitat characteristics and attributes are common (page 4-83). Vegetation removal to eliminate public hazards and salvage are permitted if it benefits habitat (pages 41 and 4-93). See discussion of salvage in LSRs and Appendix E for a complete assessment of compliance with MA-5.
MA7-Special Interest Area	4-97 to 4-100	Salvage of burned or pest-killed trees may be allowed to promote the management goals and objectives of the SIA. Reforestation of these areas to meet SIA objectives shall be a high priority (page 4-99).
MA10-Riparian Reserves[11]	4-106 to 4-114	Riparian Reserves (RRs) are portions of watersheds where riparian-dependent resources receive primary emphasis and where special standards and guidelines apply. Standards and guidelines prohibit and regulate activities in RRs that retard or prevent attainment of the Aquatic Conservation Strategy (ACS) objectives. Standards and guidelines applicable to this management area include the following: Fall roadside safety hazard trees; allow the removal of these trees where woody debris requirements are met (page 4-113). Design fuel treatment practices and activities to meet ACS objectives, and to minimize disturbance of riparian ground cover and vegetation. Restore RRs to meet ACS. Design prescriptions to re-establish stands that provide the desired vegetation characteristics (for example, species composition and age class structure).
MA 11- Retention Visual Quality Objective (VQO)	4-115 to 4-116	Salvage of trees killed by wildland fire, pest infestation or other natural processes is permitted consistent with area goals (page 4-116)
MA 15- Partial Retention VQO	4-126 to 4-127	An attractive, forested landscape is provided and is maintained for a sustained yield of wood products in areas capable, available, and suitable for timber production. Forested stands are resilient to wildland fire, insect, disease, and other damage (page 4-126).
MA 17- General Forest	4-131 to 4-132	A programmed flow of timber is provided, which is sustainable through time. Conifer stocking levels and high growth rates are maintained commensurate with the capability of the site to produce wood fiber. Forested stands are resilient to wildland fire, insect, disease, and other damage (page 4-131).

[8] See the Forest Plan consistency checklist in the project record for detailed information about project consistency by applicable standard and guideline.
[9] All of MA1 overlaps MA2.
[10] All of MA3 overlaps with MA2 with exception of about 40 acres.
[11] Riparian reserves overlap with most other management areas. No treatment is proposed within hydrologic (water-related) riparian reserves, except roadside hazard treatment and fuels treatments within one-quarter mile of private property structures.

Risk Reduction Salvage in Late Successional Reserves

About 81, 200 acres or 50 percent of the 162,580 acres of National Forest lands burned in the Beaver, Happy Camp, and Whites fire perimeters are within Late Successional Reserves. The 2014 fires created large patches of fire-killed trees. As the dead trees break or fall, adding to the surface fuels, future stands will contain high fuel loadings. Areas of continuous, high fuel loading have a high probability of burning with high severity (Chapter 3, Fuels). This condition conflicts with the Forest-wide goal for Fire Management which is to "reduce unacceptable fuel buildups and potential acreage of future high intensity wildfires." (Forest Plan, page 4-8)

The primary reason that salvage harvest is proposed within Late Successional Reserves is to reduce the risk of future stand-replacement fire from heavy fuel accumulations that will result from trees killed in the 2014 Westside Fires. This section addresses how the proposed salvage of fire-killed trees in the Westside Fire Recovery project would contribute to Forest Plan goals for fire management (Forest Plan, page 4-8) and be compatible with Forest Plan direction to protect and enhance late-successional ecosystems within Late Successional Reserves (Forest Plan, page 4-83).

Late Successional Reserves are described in the Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (also known as the Northwest Forest Plan (NWFP)) which is incorporated in the Forest Plan for the Klamath National Forest; Late Successional Reserves are part of Management Area (MA) 5 in the Forest Plan. The objective of Late Successional Reserves is to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl (NWFP Standards and Guidelines C-9; Forest Plan, page 4-83).

The Forest Plan provided specific guidelines for risk reduction in Late Successional Reserves (4-87) as follows:

- MA5-27 Certain risk management activities, if properly planned and implemented, may reduce the probability of major stand-replacing natural events such as fire.
- MA5-28 Silvicultural activities aimed at reducing risk shall focus on younger stands in Late Successional Reserves. The objective will be to accelerate development of late-successional conditions while making the future stand less susceptible to natural disturbances. Salvage activities should focus on the reduction of catastrophic insect, disease and fire threats. Treatments should be designed to provide effective fuel breaks wherever possible. (Emphasis added). However, the scale of salvage and other treatments should not generally result in degeneration of currently suitable owl habitat or other late-successional conditions.
- MA5-29 In some Late Successional Reserves in these provinces, management that goes beyond these guidelines may be considered. Levels of risk in those Late Successional Reserves are particularly high and may require additional measures. Consequently, management activities designed to reduce risk levels are encouraged in those Late Successional Reserves even if a portion of the activities must take place in currently late-successional habitat. While risk-reduction efforts should generally be focused on young stands, activities in older stands may be appropriate if:

    1) the proposed management activities will clearly result in greater assurance of long-term maintenance of habitat,
    2) the activities are clearly needed to reduce risks and

3) the activities will not prevent the Late Successional Reserves from playing an effective role in the objectives for which they were established.

Such activities in older stands may also be undertaken in Late Successional Reserves in other provinces if levels of fire risk are particularly high. Additional information is available in Chapter 3 and Appendix E.

Purpose and Need for Action

There is a need to close the gap between the existing and desired condition (Table 1-7), while protecting forest resources within the project area.

There is a need for worker and public safety and access.

Fire-killed trees (i.e. snags) are often unstable and at risk of falling or snapping off. As snags in burned areas are exposed to winter rains, snow, and winds and subsequently deteriorate and decay, risk to human health and safety substantially increase. Snags need to be addressed in order to minimize unnecessary safety hazards for the public who recreate in the area. Safety for forest workers also needs to be provided. Forest workers will work within the burned areas in the years to come, accomplishing reforestation, fuels reduction, and other resource management activities. Hazard trees also threaten public and worker access along miles of roads. It is also imperative that infrastructure, especially utility lines, roads, trailheads, campgrounds, fire lookouts, and bridges are maintained for safe use by the public and workers.

Proposed activities to address this component of the purpose and need include:

- Salvage harvest of fire-killed trees selected based on criteria described in the salvage section in Alternative 2 of Chapter 2.
- Salvage of fire-killed and other hazard trees along roadways and near infrastructure.
- Removal of roadside hazard treesto maintain current and future safe ingress and egress from the forest.

There is a need for safe conditions for firefighters performing fire suppression for community protection.

As snags continue to decay, break, and fall, surface fuel loading and the severity and intensity of future fires will increase. Increased fire intensities and fallen snags will inhibit the effective control of future fires and/or put fire suppression crews at increased risk. Fallen hazard trees will also impact road access along miles of roadways, impairing fire suppression efforts. Local communities and residential enclaves are nestled within and adjacent to forests in a fire-adapted ecosystem. Hazardous trees and fuels conditions need to be abated, where they exist within the wildland urban interface, especially within one-quarter mile of private property in burned areas and areas identified as strategic. Strategic areas are likely areas where fires can be successfully contained or controlled in order to have better conditions for suppressing future fires. The goal of these areas are to protect lives and properties of our local communities.

Proposed activities to address this component of the purpose and need include:

- Salvage harvest of fire-killed trees selected based on criteria described in the salvage section in Alternative 2 of Chapter 2.

- Felling and removal of fire-killed and other hazard trees along roadways to maintain current and future safe ingress and egress from the forest and near infrastructure;
- Creation of shaded fuel breaks on selected strategic ridgetops to facilitate future fire suppression efforts;
- Reduction of fuels by piling and burning, mastication, and underburning within the wildland urban interface and other strategic areas; and
- Planting in certain areas promoting forested conditions over brush-field conditions to improve future fire control.

There is a need for a project that is economically viable, meeting project objectives and benefiting our local communities.

The Forest Plan directs the Forest to harvest dead or dying trees to achieve a number of purposes including the production of wood products, as consistent with Forest-wide and management area goals. Dead timber loses significant commodity value (50 percent or more within two years) if left standing too long and is most profitable if harvested as soon as possible. Because of decay rates of trees which vary by species (Dale 1987 and Lowell et al. 1992 as cited in Kocher et al. 2009), it is important to offer timber sales while the wood is still marketable. Table 1-6 summarizes the decay rate by year after tree death for white fire, ponderosa pine, Jeffery pine, sugar pine, and Douglas-fir.

Table 1-6: Conifer decay rates after fire (Dale 1987 and Lowell et al. 1992 as cited in Kocher et al. 2009)

Years after tree death	White fir	Ponderosa Pine or Jeffery Pine	Sugar Pine	Douglas-fir
1	10-20% of volume decayed	25% of sapwood blue stained*	Extensive blue stain in sapwood	Minimal decay; some cracks in heartwood
2	50% of volume decayed	All wood blue stained; 50% of sapwood decayed	75% of sapwood decayed	25-50% of sapwood decayed
3	100% of volume decayed	All sapwood and some heartwood decayed	All sapwood and some heartwood decayed	All sapwood decayed; 1 inch of heartwood decayed
4	--	70% of volume decayed	50% of volume decayed	2 inches of heartwood decayed
5	--	90% of volume decayed	50% of volume decayed	3 inches of heartwood decayed

Source: Dale, J.W.Fire damage literature summary. Unpublished paper. Vallejo, CA: USDA, Forest Service, Pacific Southwest Region, State and Private Forestry, Forest Pest Management 1987. Lowell, E.C., S. A. Willits, and R. L. Krahmer. Deterioration of fire-killed and fire-damaged timber in the western United State. Gen. Tech. Rep. PNW-GTR-292. Portland, OR: USDA, Forest Service, Pacific Northwest Research Station, 1992.

*Blue stain is a discoloration of the sapwood of pines due to fungal infection; considered a visual defect that often reduces the value of the wood. Sapwood is the white or light-colored wood that encircles the pink heartwood.

Capturing the marketability of the fire-killed trees and hazard trees provides the agency a viable means of fully implementing the project and potentially funding restoration, including reforestation for future wildlife habitat and the improvement of watershed conditions for fish habitat. Otherwise, the Forest will need to use appropriated dollars to remove only the snags and hazard trees most critical for public and worker safety and access. Much of the proposed project will not happen if appropriated dollars are the only funding mechanism. Capturing the maximum economic value of the salvaged timber also benefits Siskiyou County and the surrounding communities by maintaining and/or

creating jobs in forest management and providing timber to the local mills which are major employers of these rural communities.

Proposed activities to address this component of the purpose and need include:

- Salvage harvest of fire-killed trees selected based on criteria described in the salvage section in Alternative 2 of Chapter 2; and
- Felling and removal of fire-killed and other hazard trees along roadways and near infrastructure.

There is a need for restored and fire-resilient forested ecosystems.

Although wildfires provide some benefits to forest ecosystems (such as snag and downed wood creation and short-term fuels reduction in areas of low intensity burns), intensely burned forested areas may be slow to recover and heavy fuel loads will result from fallen snags. Following a high-severity wildfire, heavy fuel loading predisposes an area to high-intensity and high-severity wildfires in the future. Such fires inhibit forest stand regeneration and result in stand type changes to brush or other non-forested vegetation types; this inhibits or delays reaching the desired conditions of the Forest Plan or providing for future forested wildlife habitat per Forest Plan goals and direction. High-severity fires also put remaining wildlife habitat at risk of future loss. There is a need to reduce the amount and continuity of fuels at the landscape scale to reduce the size and severity of future fires (Thompson et al. 2007). By reducing fuels created by the 2014 fires and replanting selected areas, the likelihood and speed by which burned, forested areas are restored is increased. This results in a more fire-resilient forested ecosystem for the benefit of wildlife habitat and watershed conditions.

Activities to address this need include:

- Salvage harvest of moderate- to high-severity fire-killed trees is proposed to reduce the risk of future stand-replacement fire from heavy fuel accumulations that will result from trees killed in the 2014 Westside Fires (see Risk Reduction Salvage in Late Successional Reserves section in this chapter and Appendix E). Areas selected for salvage harvest are based on the criteria described in Chapter 2 to prevent high fuel loads from fire-killed trees in the future;
- Reduction of fuels by piling and burning, mastication, and underburning within the wildland urban interface and other strategic areas as defined in Chapter 2;
- Replanting of burned areas with an appropriate species mix and spacing for the site; and
- Retention of clumps of snags within treatment areas to ensure that habitat for snag-dependent species is retained.

Table 1-7: Existing and Desired Conditions

Statement of Need	Existing Condition	Desired condition
Worker and public safety and access	Infrastructure, including utility lines, roads, bridges, trailheads, campgrounds, and fire lookouts within the project area, are surrounded by fire-killed and damaged trees and preexisting danger trees that pose a hazard to the public and Forest workers and restrict access. As snags in burned areas are exposed to winter rains, snow, and winds and subsequently deteriorate and decay, risk to human health and safety substantially increase.	Public and forest worker access to public lands along all roadways and trailheads are unimpeded to the extent possible. Hazards from falling danger trees are mitigated to the extent possible, especially nearby roadways and other infrastructure. Salvage harvest areas have reduced amounts of snags, providing for improved safety conditions for forest workers.
Safe conditions for firefighters performing fire suppression for community protection	Within the wildland urban interface, local communities and residential enclaves are nestled within and adjacent to forests in a fire-adapted ecosystem. As snags continue to decay, break, and fall, surface fuel loading and the severity and intensity of future fires will increase. Increased fire intensities and fallen snags inhibit the effective control of future fires and/or put fire suppression crews at increased risk. Progressively increasing fuel loadings where potential flame lengths are projected to exceed four feet. Flame lengths over four feet are resistant to fire suppression tactics. Fallen hazard trees impact road access along miles of roadways, impairing fire suppression efforts.	Hazardous trees and fuels conditions are abated within the wildland urban interface, especially within one-quarter mile of private property structures. Fuel loading is reduced within strategic areas. Fuel breaks are created and maintained for community protection. Probability of future high-intensity wildfires is reduced. Fuel loadings commensurate with surface flame lengths of less than four feet (should the area burn again). Hazards from falling snags are mitigated to the extent possible, improving access for fire suppression and community protection. Risk and effectiveness of fire suppression is improved due to fire breaks, reduced fuel loading, reduced snags, and unimpeded access.
A project that is economically viable	The estimated volume and economic value of the timber is not captured. The project is not implemented and the benefits of improved safety, access, fuels conditions for fire suppression and community protection, and restored and fire-resilient forested ecosystems have not been achieved. Jobs for the local community have not been created.	Dead or dying trees are harvested to produce wood products as consistent with Forest goals. (Forest Plan, pages 4-131 to 4-132 and 4-49). The timber sale and receipts are used to fund project implementation and restoration work, including fuels reduction, reforestation for future wildlife habitat, and the improvement of watershed conditions for fish habitat. Private industry jobs in the forest management sector of the county will be created and/or maintained.

Statement of Need	Existing Condition	Desired condition
Restored and fire-resilient forested ecosystems	Within the wildland urban interface, local communities and residential enclaves are nestled within and adjacent to forests in a fire-adapted ecosystem. Approximately 27% of the fire areas exhibit high vegetation burn severity (75-100% vegetative canopy killed) effects. Most trees within high severity burn areas are expected to die. Approximately 6% of the fire areas burned with moderate severity (50-75% vegetative canopy killed), and a substantial portion of those trees have been killed by fire, and surviving trees are expected to experience high mortality due to fire injury, insects, and the effects of prolonged drought. Progressively increasing fuel loads where potential flame lengths are projected to exceed four feet. Flame lengths over four feet are resistant to fire suppression tactics. Large portions of late successional reserves and habitat burned with high-severity fire are not likely to develop as late successional forests within the next 200 years or more.(Appendix E) Extensive portions of the Klamath River, Scott River and Salmon River watersheds burned. Tributary drainages in these watersheds were affected.	The long-term desired future condition for the project area is a healthy forested landscape with diverse ecosystem conditions reflective of historic vegetation and the ecological capability of the landscape. This includes some natural openings and native browse species vegetation within a largely continuous conifer-dominated landscape. To the extent possible, fire will play a natural role in the ecosystem. However, the desired condition will also include reduced risk of high intensity fire within the wildland urban interface. Fuel loadings commensurate with project surface flame lengths of less than four feet. Within late successional reserves, in the short term, clumps of leave snags will provide post-fire habitat components for a variety of wildlife species. In the long term, a conifer overstory with some understory vegetation components will provide forage and cover for wildlife species. The probability of the loss of remaining or future wildlife habitat from high severity wildfire is reduced. In the long term, fire-resilient forested ecosystems experience less high severity fires, lessening impacts to watershed conditions from future fires.

Proposed Action as Scoped

The project area was adjusted based on more accurate information following field review between scoping and publishing the draft EIS. The proposed action proposed treatment on about 63,883 acres. Based on refining the project area boundary since scoping the draft EIS considered about 62,400 acres for treatment with some overlap of treatments limiting the footprint of the project to about 50,900 acres. After scoping, the proposed action was refined to respond to public comments and internal concerns. A list of these changes were documented in Chapter 1 and were also incorporated into the description of Alternative 2 in Chapter 2 of the draft EIS. Additional clarification or changes needed between draft and final EIS are listed in Chapter 1 and are captured in the description of alternatives in Chapter 2 of this document. An evolution of the proposed action is included in Appendix A with a map that shows how the footprint of the project changed during each phase of the project (Appendix A)

The Westside Fire Recovery project, as described in the scoping notice for the project issued in September 2014, included four overlapping types of treatment: (1) salvage harvest; (2) roadside hazard treatments; (3) hazardous fuel treatments; and (4) site preparation, planting, and release. In addition to the above treatments, the proposed action, as scoped, included treatment along 506 miles of National Forest System roads and 172 miles of state and county roads.

See project website http://www.fs.fed.us/nepa/nepa_project_exp.php?project=45579 for a description of the proposed action as scoped.

Decision Framework

The responsible official for this project is the Forest Supervisor for the Klamath National Forest. This environmental impact statement is not a decision document; it discloses the environmental consequences of implementing the no action alternative or an action alternative. The environmental impact statement also aids the responsible official in determining whether the effects disclosed will have a significant effect on the environment. After analyzing and responding to public comment, the responsible official will make a decision and issue a Record of Decision.

As the Responsible Official, the Forest Supervisor may decide to: (1) select the proposed action; (2) select one of the alternatives; (3) select one of the alternatives after modifying the alternative with additional mitigating measures or a combination of activities from other alternatives; or, (4) select the no action alternative, choosing not to authorize the Westside Fire Recovery project. In making this decision, the Forest Supervisor will consider:

- How well does the selected alternative meet the purpose and need described in this EIS?
- How well does the selected alternative move the project area toward the desired conditions established in the Forest Plan?
- Does the selected alternative mitigate potential adverse effects?

The final decision will be based on the information in this document and the supporting information contained in the project record, consideration of public comments, how well the selected alternative meets the purpose and need for the project, and whether the

selected alternative complies with agency policy, applicable state and federal laws, and Forest Plan direction.

Emergency Situation Determination

In order to facilitate implementation of the project, the Forest requested and was granted an Emergency Situation Determination by Chief Tidwell pursuant to 36 CFR 218.21 on May 13, 2015. Under 36 CFR 218.21(d), a proposed action is not subject to the pre-decisional objection process if the Chief or Associate Chief of the Forest Service determines that an emergency situation exists with respect to all or part of the proposed action or activity. An emergency situation is defined as:

> *"A situation on National Forest System (NFS) lands for which immediate implementation of a decision is necessary to achieve one or more of the following: relief from hazards threatening human health and safety; mitigation of threats to natural resources on NFS or adjacent lands; avoiding a loss of commodity value sufficient to jeopardize the agency's ability to accomplish project objectives directly related to resource protection or restoration." (36 CFR 218.21(b), 2015)*

Excerpts from the May 13, 2015 approval letter by Chief Tidwell:

> *In 2014, the Pacific Southwest Region (Region 5) experienced 1,460 fires on Forest Service managed land, impacting 399,713 acres of national forests. Substantial impacts to human safety, recreation, wildlife habitat, watersheds, and general forest health were felt across the region. Many acres were left in a deforested condition. In response to these impacts, Region 5 received a great deal of interest from the public, counterparts within the Agency at the national level, and Congress asked how the region could work to restore these acres. Regional Forester Moore is requesting five ESDs to cover specific actions within fire areas that cover 285,346 acres.*
>
> *According to Regional Forester Moore's cover letter requesting the ESDs, while the project areas that would be covered by these emergency processes only cover a fraction of the acres affected by the fires experienced in the Pacific Southwest Region in 2014, the acres selected were carefully chosen based on an effort to reduce threats to human safety, wildlife, watersheds, soils, and to promote restoration and reforestation. The projects treat areas that are frequently used for recreation, by agency employees conducting administrative duties, or that are critical to fuels management objectives. While it is critical that the agency restore national forest land and mitigate harmful impacts as much as possible, it is also important that these decisions not unduly impact the remaining resources. We have attempted to strike that balance in the development of these projects. We recognize the importance of the public involvement process/or these projects and are aware that these expedited emergency processes impact the structure of that process. Recognizing that impact, we have made efforts to find ways to involve the public throughout the planning process and to ensure that public concerns are heard, considered, and that the responsible official is factoring that input into the final decision. Increased opportunity for public involvement has been a particularly important part of the two EIS projects, King and Westside, as we balance the need to move quickly while the importance of engaging and responding to the public.*

Alternative Arrangements

On March 6, 2015, the Council on Environmental Quality granted the Forest Service's request for Alternative Arrangements pursuant to 40 CFR 1506.11. As a result, he Forest Service shortened the comment period for the draft EIS from 45 to 30 days, shortening the 45-day comment period requirement for the draft EIS by 15 days, resulting in a 30-day comment period (40 CFR 1506.10(c)). The Forest subsequently extended the comment period for 15 days in response to public requests for additional review and comment time.

The agency is not seeking any additional alternative arrangements for this project.

Public Involvement

Pre-Scoping

The Forest Service conducted robust public engagement throughout the summer while the fires were active and during suppression repair and burned area emergency response (BAER) activities. During the summer, members of the community expressed interest in suppression and related repair activity and in the next steps of fire recovery proposed. The agency's public engagement efforts that began this summer during the fires were used as a platform to continue public engagement efforts and interest related to Westside Fire Recovery project. Prior to scoping for the project, the Forest Service:

- Conducted 34 public meetings during fire operations to explain operations, extent, and impacts of wildland fires on the forest;
- Delivered 200 press releases in local and internet media to give updates and conditions on fire and suppression activity, also conducting multiple radio and television interviews during fire suppression activities; and
- Posted to social media (i.e., Facebook) throughout suppression activities, reaching about 50,000 unique users at the height of activity.

Following the fires, the Forest conducted eight BAER meetings in the affected communities. In mid-November, the Forest conducted eight community-based after-action reviews. These meeting were either hosted by the Forest or in coordination with other agency and community cooperatives, to gather public feedback on the fire suppression efforts.

Scoping

The project was first published to the Schedule of Proposed Actions and the Forest website on October 1, 2014. On October 8, 2014, scoping letters were sent to interested and affected parties, including other public agencies, tribes, adjacent property owners, and interested groups and individuals.

A Notice of Intent to prepare an Environmental Impact Statement for the Westside Fire Recovery project was published in the Federal Register on October 15, 2014. The notice asked that comments on the proposed action be received within 30 days following publication in the Federal Register. On October 14, 2014 a legal notice of scoping was published in the Siskiyou Daily News, beginning the formal scoping process that guides the development of the draft EIS. Comments received by November 14, 2014, were considered in identifying issues and project development.

The Forest used news releases and social media to inform broader audiences. The Forest has created a project website[12] to provide a source for information and avenue for soliciting and providing comments, as well as the standard legal notices and public notifications to meet the requirements of the NEPA. Field trips and public open house meetings were held in the local communities of Yreka, Fort Jones, Scott Bar, Sawyers Bar, Happy Camp, Klamath River, and Seiad Valley to inform, consult, and involve

[12] http://www.fs.fed.us/nepa/nepa_project_exp.php?project=45579

interested parties in an interactive, in-person manner. These efforts also helped the Forest gauge public understanding and perception of the project. At the request of the timber industry, the Forest met with timber industry representatives who provided feedback on industry interest and capacity for salvage harvest using commercial timber sales. The Forest briefed the Siskiyou County Board of Supervisors on October 21, 2014 to present the Westside Fire Recovery proposal.

The comments received as a result of public scoping are summarized in Appendix B of the draft EIS. The interdisciplinary team met and reviewed the scoping responses the week of December 15, 2014 to formulate issues concerning the proposed action. These were sorted by relevant issues and other issues. Criteria on how these were sorted are described in more detail at the end of this chapter. Relevant issues, described later in Chapter 1, were used in the development of all action alternatives analyzed in detail. Other issues were considered and eliminated from detail study. Alternatives eliminated from detail study are described in Chapter 2.

Two local collaborative groups were formed in response to the Westside Fire Recovery proposal, including:

- Citizens' Advisory Committee, which was approved by the Siskiyou County Board of Supervisors and charged with developing consensus recommendations to federal and state agencies on a variety of topics, including the Westside Fire Recovery project.
- The locally-based National Institute for the Elimination of Catastrophic Wildfire has formed "The Westside Klamath Steering Committee" which is comprised of Siskiyou County residents and represents a wide range of interests that reflect the social and economic diversity within the affected area.

See Appendix B for Forest Service responses to recommendations provided during the comment period on the draft EIS.

Public Open Houses and Presentations Prior to Comment Period

It was the intent of the Forest that these preliminary open houses and presentations provide information for the public so that when the draft EIS was published, interested parties were prepared to make informed comments on the proposed action and alternatives within the compressed time frame provided by alternative arrangements.

The Forest Service offered open houses prior to the release of the draft EIS as follows:

- January 30, 2015- Klamath National Forest Headquarters, Yreka, CA
- January 31, 2015 - Fort Jones Community Center, Ft. Jones, CA
- February 3, 2015 - Klamath River Community Center, Klamath River, CA
- February 4, 2015 - Karuk Senior Nutrition Center, Happy Camp, CA
- February 6, 2015 - Salmon River Restoration Building, Sawyers Bar, CA
- February 13, 2015 - Seiad Valley Volunteer Fire Department, Seiad Valley, CA

Presentations of preliminary information to interested parties or local governmental entities prior to the release of the draft EIS were as follows:

- November 18, 2014 – Meeting with Bruce Courtright, Ray Haupt, Larry Alexander
- November 25, 2014 – Meeting with Fire Safe Council of Siskiyou County, Advisory Board
- December 17, 2014 – Meeting with Siskiyou Fire Safe Council
- January 8, 2015 – Meeting with Backcountry Horsemen
- January 13, 2015 - Siskiyou County Board of Supervisors, Yreka, CA;

- January 21, 2015 – Meeting with Fire Safe Council
- January 26, 2015 - Timber Industry Field Trip, Happy Camp Complex area;
- February 5, 2015 – Presentation at Etna Rotary Monthly Meeting
- February 7, 2015 – Meeting at Siskiyou County Fire Chiefs Association
- February 11, 2015 –Meeting at CAL FIRE
- February 18, 2015 – Meeting at Fire Safe Council in Yreka
- February 23, 2015 – Meeting with The Westside Klamath Steering Committee, associated with the National Institute for the Elimination of Catastrophic Wildfire, Northern California Resource Center, Fort Jones, CA;
- February 25, 2015 - Happy Camp Fire Safe Council; and
- March 7, 2015 - Siskiyou County Fire Chiefs Association, Yreka, CA.

The Forest Service offered to provide presentations to other groups, as requested.

Preliminary maps of the proposed action and alternatives were provided to the Karuk Tribe and were also available for review by the public at the Salmon/Scott River and the Happy Camp – Oak Knoll Ranger Districts and on the Klamath National Forest website. Preliminary maps of the proposed action were also provided to interested publics who wished to review the project area in the field in advance of publication of the draft EIS.

Notification of the open houses was shared through the Forest's Facebook page, public website page notifications, and emailing more than 700 contacts including more than 30 media outlets (newspapers, broadcast and internet news sites) with the listing of venues and their respective dates and times. Meetings with local interest groups such as the Siskiyou County Fire Chiefs Association were scheduled with those groups at their request.

While less formal than public meetings, the open houses allowed for small group discussions, which provided the Forest with perspectives and insights into the opinions, local knowledge and values of the communities. At each open house, line officers, principle forest staff and members of the interdisciplinary team were available to answer questions and provide information. Maps and descriptions of the preliminary proposed action and alternatives were also provided. Members of the public were encouraged to provide comments for the record on provided flip charts. These comments were transcribed as closely to verbatim as possible and appear in Appendix B. Attendance ranged from four to five people at Klamath River to more than twenty people at Sawyers Bar.

The open houses provided the opportunity for members of the public to interact with team members and decision makers as they craft this project. Interested participants took the opportunity to ask more in-depth questions regarding policy, procedure, timelines, and opportunities to comment on the draft EIS. Many members of the public were extremely knowledgeable and well informed on fire recovery and the potential effects of various parts of the preliminary proposed action and alternatives. At each open house there were a number of thoughtful and well-rounded discussions of strategic fuel breaks, fuels reduction strategies, restoration actions and other important questions.

There is broad consensus on post-fire work on:

- roadside safety along main and important travel ways;
- defensible space around private property;
- strategic ridgetop fuel breaks; and

- fuels reduction (so that fire can be reintroduced on the Forest, and that future fires are less intense and less impacting on local communities and national forest resources).

The question of salvage of fire-killed trees generated widely diverse views including:

- Salvage as a means of fuels reduction had strong support from some parties, but less so from others.
- A common theme from supporters of salvage as a means to reduce fuels and recover economic value was to maximize the amount salvaged. Several residents of affected communities felt that an even more aggressive approach needed to be taken with the removal of the burned timber to reduce future fuel loads. The need to address the fuel loading that will increase over the next five to seven years in the post-fire area was a major topic of concern especially in and around the wildland urban interface communities. This particular subject area was an urgent theme in areas that had been evacuated in the past or during the 2014 fire season.
- Many local attendees stressed that recovery of economic value was important, particularly if it paid for future restoration, and that economic recovery should be maximized.
- Some parties felt that fire-killed trees should only be salvaged if they presented a safety hazard along main roads or posed a fuels risk to local communities, and that burned areas should otherwise not be salvaged.
- Reforestation of fire damaged sites also raised many opinions and concerns:
- Nearly all commenters on this topic wanted to make sure that species selection for reforestation was appropriate for the site in question, and that a mix of species should be planted. Several commenters noted that hot, dry south slopes and rocky sites that would not support coniferous forests should not be replanted with conifers.
- Several commenters noted that any replanting needed to be widely spaced rather than densely stocked plantations. Some commenters felt that planting trees was a poor investment in many cases, and that most sites should be allowed to re-vegetate naturally.

Comment Period on the Draft EIS

On March 6, 2015, the draft EIS and supporting documents were posted to the project's webpage. Email notifications and letters of the draft EIS comment period were sent to interested and affected parties, including other public agencies, tribes, adjacent property owners, and interested groups and individuals. On March 6, 2015, the Council on Environmental Quality granted the Forest Service alternative arrangements, shortening the required comment period on the draft EIS by 15 days or from 45 to 30 days. On March 13, 2015, a Notice of Availability was published in the Federal Register and a legal notice was published in the Siskiyou Daily News, beginning the 30-day comment period. On April 3, 2015 a notice of extension of the draft EIS comment period was published in the Federal Register and the Siskiyou Daily News. The comment period was extended an additional 15 days in response to public requests for addition review and comment time. Comments received by April 27, 2015, were considered timely and addressed in response to comments (Appendix B).

Public Open Houses and Presentations before and during Comment Period on the draft EIS

During the comment period additional field trips and public open house meetings were held in the local communities of Yreka, Fort Jones, Scott Bar, Sawyers Bar, Happy Camp, Klamath River, and Seiad. In addition to hosting field trips and public open house

meetings locally, Forest Service representatives also traveled to neighboring communities of Eureka and Redding, California and to Medford, Oregon.

The Forest Service offered open houses after the release of the draft EIS and prior to the release of the final EIS included:

- March 7, 2015 – Open House with Siskiyou County Fire Chiefs Association
- March 26, 2015 – Open House at Salmon/Scott River District Office
- March 27, 2015 – Open House at Scott Bar Community Hall
- March 31, 2015 – Open House in Happy Camp
- April 2, 2015 – Open House at Klamath River Community Center
- April 4, 2015 – Open House at Klamath HQ
- April 7, 2015 – Open House in Eureka, CA
- April 14, 2015 – Open House in Seiad Valley
- April 17, 2015 – Open House in Redding
- April 21, 2015 – Open House in Medford, OR

These open houses were similar to those hosted by the Forest between scoping and the release of the draft EIS. They provided an opportunity to share with the public information about how each alternative was developed and how they changed based on public comments received during the scoping period. It also gave the public an opportunity to voice their concerns on the effects the project may have on the community, future fuels concerns, and habitat issues for different wildlife species. These open houses also provided the opportunity to speak with people who had helped write the draft EIS. Maps were provided to members of the public showing updated maps and description of alternatives as they were being developed. This also included information about the Karuk Alternative. Handouts were provided to attendees which consisted of information about each action alternative, the timeline for the project, a link to the project website with detailed instructions on how to comment on the project.

Presentations of preliminary information to interested parties or local governmental entities after the release of the draft EIS and prior to the release of the final EIS included:

- March 14-15, 2015 – Information Booth at Sportsman's Expo
- March 20, 2015 – Meeting with the Westside Klamath Steering Committee.
- March 24, 2015 – Radio Broadcast on Jefferson Exchange Radio
- March 25, 2015 – Radio Broadcast on KSYC
- April 3, 2015 – Meeting in Seiad Valley
- April 20, 2015 – TV Interview KDRV
- April 24, 2015 – Public Tour with Klamath River FSC

Results of the Draft EIS Comment Period

A total of 13,413 comment letters were received during the Westside Fire Recovery draft EIS comment period. The agency received 265 unique letters, 21 master form letters, and 263 form plus letters (with slight modifications of the master form letters; the remainder of the letters were form letters identical to one of the 21 master form letters). A large portion of these letters were hand-delivered to the Forest Service at the Medford, Oregon open house on April 21, 2015. Other form letters were emailed to the Forest Service and included a mixture of opposition and support for the project. A large portion of the comments also expressed opinions or preferences for or against different alternatives; see Appendix B for a summary table of this review.

Many commenters expressed concerns regarding:

- Impacts to wildlife and wildlife habitat;
- Impacts to watersheds and fisheries resources;
- Procedures related to public comment and review opportunities (i.e. emergency situation determination and/or alternative arrangements) and/or decision and implementation timelines;
- Value of harvested timber;
- Fuels conditions post-fire and/or post-salvage, especially near communities and in the Wildland Urban Interface; and
- Forest Plan consistency or other legal requirements.

A table of comments received and how the Forest responded is included in Appendix B (Response to Comments).

Tribal Consultation

Tribal consultation was initiated via letters dated October 8, 2014 with the Confederated Tribes of the Grand Ronde, Confederated Tribes of the Siletz, Karuk Tribe, Klamath Tribes, and the Quartz Valley Indian Reservation. Consultation under NEPA and Section 106 continues through correspondence, meetings, government-to-government meetings, emails, telephone calls and field trips. The Shasta Nation, Inc. and the Shasta Indian Nation tribes are also involved in the processes.

The Forest is conducting consultations to solicit input from the tribal governments regarding their assessment of effects on resources traditionally used by tribes and cultural values related to those resources within the area where project activities are proposed.

Formal government-to-government meetings were held with the Karuk Tribe on November 12, 2014, February 19, 2015 and May 11, 2015; tribal council members have also been present at informal government-to-government meetings as well as staff-to-staff meetings, including weekly conference calls and in-person meetings. Formal project comments were received from the Karuk in response to scoping (November 14, 2014) and after the publication of the draft EIS. Late on March 5, 2015, the day prior to publishing the draft EIS, the Karuk submitted a project alternative. This alternative was incorporated into the draft EIS as Appendix G and was available for public comment. Because a large portion of the project area is within Karuk aboriginal territory and with the receipt of a Karuk project alternative, tribal consultation with the Karuk has been robust and is captured in the project record.

A government-to-government meeting was held with the Quartz Valley Indian Reservation on November 20, 2014 and formal project comments received on December 22, 2014. On April 2, 2015 a field trip was conducted with the Quartz Valley Indian Reservation chair and staff. Comments from the tribe were incorporated into project alternatives. Consultation and information exchange with all local tribes is ongoing.

The Forest is seeking information from Indian tribes and Native American organizations on the Westside Fire Recovery Programmatic Agreement, which specifically addresses the Section 106 of the National Historic Preservation Act process for this project. Consultation with the tribes on this agreement was initiated via letter dated February 18, 2015. The Karuk Tribal Historic Preservation Officer requested that the Advisory Council on Historic Preservation participate in the development of the programmatic agreement; the Advisory Council on Historic Preservation notified the Forest via letter

dated June 15, 2015 that they will participate. Consultation on this agreement with tribes, Native American organizations, Advisory Council on Historic Preservation and the California State Office of Historic Preservation are on-going.

Ongoing Regulatory Consultation

The Forest has been actively consulting with regulatory agencies as well as local and national elected officials. The Forest is developing a project-specific programmatic agreement with the State Historic Preservation Office for compliance with the National Historic Preservation Act (see Tribal Consultation section above). Regarding the Endangered Species Act (ESA), the Forest is consulting with the U.S. Fish and Wildlife Service about the effects of the project on the federally-listed northern spotted owl. Pacific fisher is proposed for listing as "threatened" under the ESA. The Forest Service would conference with the U. S. Fish and Wildlife Service if it is determined that the Westside Fire Recovery Project would threaten the continued existence of Pacific fisher. If Pacific fisher is listed under the ESA, the Forest Service would initiate formal consultation under Section 7 of the ESA. The Forest is also consulting with National Oceanic and Atmospheric Administration, National Marine Fisheries Service about the effects of the project on the ESA-listed Coho Salmon. The Forest is also working up-front with the North Coast Regional Water Quality Control Board regarding compliance with the Clean Water Act. The Forest will continue consultation efforts with all parties to ensure the Westside Fire Recovery Project is in full compliance with federal laws and regulations.

Issues

Scoping comments from the public, other agencies, and tribes were used to formulate issues concerning the proposed action. The Forest Service separated the issues into two groups: relevant issues and other issues. Relevant issues were defined as those directly or indirectly caused by implementing the proposed action. Other issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality NEPA regulations explains this delineation in Sec. 1501.7: "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…"

The Forest Service received 749 unique comments by means of 98 unique letters, and 1,556 form letters during the scoping period. Scoping comments are summarized in Appendix B. Four issues were determined to be relevant to alternative development or modification and are described in Table 1-8.

Table 1-8: Relevant issues and how they were addressed in project design

Relevant Issue #1.	**There is a disagreement about effects of salvage logging on wildlife habitat (e.g. northern spotted owl, Pacific fisher, and snag-associated species) and general wildlife habitat fragmentation and connectivity.**

Relevant Issue #1.	**There is a disagreement about effects of salvage logging on wildlife habitat (e.g. northern spotted owl, Pacific fisher, and snag-associated species) and general wildlife habitat fragmentation and connectivity.**
	Alternative 2 responds to this issue. Following scoping the proposed action was refined to remove treatment in northern spotted owl cores classified as high potential for reproduction. Units that intersected these cores were removed from salvage harvest treatment. Criteria was clarified to include only areas of moderate to high severity vegetation mortality with more than ten contiguous acres of medium to high severity vegetation mortality and less than 40 percent crown closure to avoid habitat fragmentation and address concerns about connectivity. Alternative 3 responds to this issue by removing treatment in salvage harvest units classified as moderate potential for northern spotted owl reproduction. Moderate ranked core areas were identified at an owl home range scale. Salvage harvest units were also removed from treatment if they were less than 20 acres in size to avoid habitat fragmentation and address concerns about connectivity. This alternative also removes salvage treatments in units located in the Beaver project area in order to retain fisher connectivity in Beaver Creek. Fisher habitat will be protected by not removing large decadent hardwoods with cavities, selecting Douglas-fir and ponderosa pine snags over true fir snags where possible, and retaining snags within or adjacent to unique landscape features such as rock outcroppings, seeps, and springs. The following project design features were developed or modified following scoping to address this issue: Wildlife-11, 12, 18, 19, 20, 21
Relevant Issue #2.	**There is a disagreement about the effects of salvage logging and required infrastructure on watershed health (e.g. beneficial uses, Coho Salmon habitat, and soil productivity).**
	Alternative 4 responds to this issue by identifying key watersheds and proposing to treat these watersheds differently to account for the specific conditions, water quality and fish habitat impairments, and recovery potential of each. Alternative 4 would reduce the ground disturbance-related impacts in these areas by eliminating temporary road actions (except for less than 250 feet stretches of temporary road on ridgetops). This alternative also includes restorative actions within riparian reserves where they occur within salvage harvest units, eliminates hazard tree removal on Maintenance Level 1 roads that are not used by the project, and allows for no landing construction within riparian reserves. The following project design feature was developed or modified following scoping to address this issue: Watershed-5
Relevant Issue #3.	**There is a disagreement about the effects of salvage logging and site preparation on late successional reserves and riparian reserves.**
	Alternative 2 responds to this issue following scoping by clarifying that salvage harvest treatments are not proposed in any riparian reserves associated with stream channels or in hydrologic riparian reserves. Site preparation was modified after scoping to include hand treatment only in riparian reserves within plantation site preparation and planting units. Treatment will include hand-work only (no ground-based equipment) and lop-and-scatter or other fuels reduction will be implemented if fuel loading is above seven tons per acre; fuels may be hand-piled or windrowed and burned. Alternatives 3 and 4 respond to this issue (see description of how these alternatives address relevant issues #1 and #2. Alternative 5 responds to this issue because it proposes only treatment in units within matrix lands and removes salvage harvest and site preparation from all riparian reserves and late successional reserve management areas.
Relevant Issue #4.	**There is a disagreement about whether or not the proposed action sufficiently reduces fuels adjacent to private timber lands in the Beaver Fire area.**
	Alternative 5 responds to this issue by including treatments on an additional 1,200 acres adjoining private land to increase fuel breaks along ridge and road systems within the Beaver Fire area. Units were identified based on proximity to private timberlands and the concept of connecting fuel treatments utilizing an “all-lands” approach. These additional hazardous fuels treatments in coordination with salvage harvest will reduce high densities of snags and surface fuels adjacent to private timberlands. .

Other Issues

Other issues were raised by the public that are being addressed by Alternative 1 (no action), Alternative 2 (the refined proposed action), alternatives considered but eliminated by detailed study, and/or are being handled through responses to public comment.

Other Issue #1.	**There is a disagreement about:** • **where salvage logging should be proposed (in low to moderate fire severity, where fires were ignited from below);** • **what trees will be identified for removal;** • **what the effects will be on natural growth of plants and natural fire regimes (including risks of high intensity wildfire, and culturally-important plants) and roadless area characteristics; and** • **what the cumulative effects of the project will be added to the effects of other projects.**
Other Issue #2.	There is a disagreement about the economic effects of the project: • whether enough trees will be salvage logged to provide economic benefits; • how limited operating periods will limit economic opportunities; and • whether the true environmental economic costs will be analyzed.
Other Issue #3.	There is a disagreement about the effects on safety and the environment from the number and criteria for choosing trees to be removed through roadside hazard treatments: • how many trees need be removed to provide safe travel along roads; and • how removing hazard trees, especially below roads, affects safety.
Other Issue #4.	There is a disagreement about the species and density of trees proposed for planting and the costs and benefits of reforestation through planting.
Other Issue #5	There is a disagreement about the environmental costs and benefits of the project to: • air quality; • climate change; • cultural resources; • economics; • forest health; • fire and fuels; • invasive species (noxious weeds); and • recreation and scenery; • soils, geology, and watershed protection; • vegetation, especially the timber resource; and • wildlife species and habitat (especially snag-associated species).

Chapter 2 Alternatives, Including the Refined Proposed Action

Introduction

This chapter describes and compares the alternatives considered for the Westside Fire Recovery project. It describes the seven different alternatives considered in detail, an alternative developed by the Karuk Tribe during tribal consultation, and ten alternatives considered but eliminated from detailed study. The chapter also displays, in tabular format, the alternatives considered in detail so that the alternatives and their environmental impacts can be quickly and easily compared.

Best Available Information and Data Quality

The draft and final EIS were prepared using a combination of remote sensing analysis tools such as the Rapid Assessment of Vegetation Condition after Wildfire (RAVG), soil burn severity assessments, standard Geographic Information System (GIS) spatial data, forest vegetation and transportation databases, and field verification of on-the-ground conditions. Areas proposed for treatment were field verified by resource specialists. These areas were visited by resource specialists in order to make the final EIS as accurate as possible. Mapping of proposed salvage units and site preparation and planting units is based on RAVG assessments of fire severity, Forest GIS databases, and field verification. Unit boundaries, treatment acres, and analysis of effects changed between draft and final EIS based on updated surveys and additional field reconnaissance.

Changes in Field Data between Publication of the Draft EIS and the Final

Changes in Estimated Mortality in Units:

Mortality in fire-damaged trees after a large fire is common. Trees that appear to have survived the fire (i.e. have green needles) show up as live trees in the RAVG data but later die from damage to the cambium or roots of the trees, or from secondary factors such as drought stress or insect attack. Proposed risk-reduction salvage units were located in the most severely burned areas where any surviving trees had been exposed to higher intensity fire than those in less severely burned areas. RAVG data that estimated fire-caused mortality used in publication of the draft EIS was taken from remote sensing imagery acquired in October 2014. At the time the RAVG data were acquired, many of the proposed salvage units had islands of trees that had less than 50 percent mortality. Areas with less than 50 percent mortality were shown in the DEIS as islands within salvage units that would be retained; however, fire severity in those areas had not been field verified at that time. The winter of 2014-2015 was drier and warmer than normal so fire-damaged trees likely experienced more stress than would have normally occurred. Between publication of the draft and final EIS, extensive secondary mortality from drought and insect attack has occurred in all RAVG classes. With warmer and drier weather in the spring of 2015, field crews reported many of the areas reported as having very low to low fire severity (RAVG Classes 1 and 2) in proposed treatment units were now showing additional mortality from fire damage, drought and insect attack. Most patches of less than 75 percent mortality in the RAVG data (Classes 1, 2 and 3) have advanced at least one class, or are now totally dead. Essentially all of the pockets of moderate fire severity (RAVG Class 3) in proposed salvage units are now greater than 75

percent dead. An estimated 75 percent of the RAVG Class 2 (25 to 50 percent mortality) in salvage units have become RAVG Class 3 or 4 stands (greater than 50 percent mortality). An estimated 50 percent of the very low severity (RAVG Class 1) stands within salvage units have become RAVG Class 3 or 4 stands (greater than 50 percent mortality).

In the draft EIS, in Alternatives 2 through 5, salvage treatment areas avoided hydrologic Riparian Reserves and areas where less than 50 percent mortality occurred; this is also the case for Alternative 2 Modified in the final EIS. Since receiving information about the increased mortality that has occurred since October 2014, acre estimates for proposed salvage harvest and graphs of salvage harvest and retention areas in each of these alternatives have been modified to reflect the additional mortality that had occurred by the time the final EIS was completed. Salvage harvest treatment acres are estimated acres within units where more than 50 percent mortality occurred and where salvage activity is proposed. Units are larger than potential treatment areas because they include salvage harvest acres plus areas where no harvest will occur. These include hydrologic riparian reserves, areas with less than 50 percent mortality within unit boundaries, and additional snag retention areas.

In Alternative 3 Modified, remaining areas of lower mortality were flagged out of units, or designated as snag retention areas which are marked on the ground. As a result, Alternative 3 Modified shows no islands of RAVG 1 or 2 areas because there are none within unit boundaries. In all stands within proposed salvage units, individual trees with greater than 70 percent probability of mortality have been marked for retention.

Changes in Riparian Reserves:

Riparian Reserve boundaries in Alternatives 2, 3, 4, 5 and Alternative 2 Modified are based on the Forest GIS layer. This is a map product derived from remote sensing and topographic data. In Alternative 3 Modified, Riparian Reserves have been field verified and marked on the ground.

Alternatives Considered in Detail

In the draft EIS the Forest originally developed 14 action alternatives to the proposed action, four of which were designed to achieve were studied in detail because they fully met the purpose and need of the project. These alternatives were developed based on the issues identified through public comment during the scoping process. Project design features were developed and incorporated into the alternatives considered in detail to minimize or eliminate negative effects of the project, and protect and promote late successional habitat, consistent with the Forest Plan. The final EIS added language to clarify existing alternatives and project design features described in the draft EIS based on comments received during the comment period and though consultation with regulatory agencies and local tribes. These modifications are listed in Chapter 1 of this document.

For this final EIS, a total of 18 alternatives were considered, 7 alternatives in detail and the 10 alternatives considered but eliminated from detailed study. In addition to the 14 action alternatives developed for the draft EIS the Forest Service received an alternative from the Karuk Tribe on March 5, 2015, the day before printing of the draft EIS. The Karuk alternative was incorporated into Appendix G of the draft EIS and was available

for public review and comment during the draft EIS comment period. Lastly, the Forest Service developed two additional alternatives between the draft and final EIS that are analyzed in detail in the final EIS and will be considered in the decision. These latter alternatives are reflective of ideas raised during the public comment period on the draft EIS, collaborative efforts, and consultation with regulatory agencies and federally-recognized tribes. Alternative 2 Modified and Alternative 3 Modified are a combination of actions already proposed in the alternatives presented for public comment in the draft EIS. These two additional alternatives are within the range of actions already proposed and their effects are within the scope of analysis already considered in the draft EIS. The no action alternative, proposed action, and other alternatives studied in detail are described below. The agency also considered and analyzed the no action alternative in detail. Maps showing areas considered for treatment for each action alternative studied in detail are found in Appendix A.

Alternative 1

Alternative 1 is the no action alternative and proposes no treatment within the project area as part of the implementation of this project. Other projects and activities within the project area will be implemented as analyzed and planned by other analyses and subsequent decisions. The no action alternative provides reviewers a baseline to compare the magnitude of environmental effects of the action alternatives for this project. It also provides a picture of the results if natural regeneration were to take place across the entire project area.

Alternative 2

Alternative 2 was originally scoped as the proposed action which was developed in response to landscape-level changes to forested habitat resulting from the 2014 wildfires on the Forest. Alternative 2 was originally designed with the intention of meeting the purpose and need of the project, while being consistent with Forest Plan direction and law, regulation, and policy. After initial evaluation, the Forest Service resource specialists identified areas that would meet the purpose and need of the project on a landscape scale. Alternative 2 was later refined following scoping and the comment period on the draft EIS, and after the Forest identified areas where resources may be negatively impacted by implementation of Alternative 2. The description of Alternative 2 and acres of treatment proposed in this alternative were adjusted based on site-specific information collected after field verification and as needed to meet Forest Plan direction and applicable, law regulation, and policy. See Appendix A for a detailed map and description of the evolution of the project.

Acres by treatment type are described in detail below and do not account for the overlap in treatment types. This project includes the following five types of treatments: (1) salvage harvest; (2) roadside hazard treatments; (3) hazardous fuel treatments (including wildland urban interface, fuels management zones, roadside fuels treatments, and prescribed burning) (4) site preparation, reforestation, and release; and (5) hand treatment in Riparian Reserves. Hand treatment in Riparian Reserves was originally discussed as part of the site preparation treatment but was removed from that description to clarify that the proposed treatment does not always include planting and to be easily comparable to the other alternatives with similar treatments. All five of these treatments were developed to provide fire managers improved options for effectively managing potential future

wildfires. Criteria used to identify areas for treatment are described below as part of each treatment type.

Connected actions are also described as part of Alternative 2. Included in this description of connected actions are existing legacy sediment sites that were identified and will be scheduled for treatment in compliance with the Clean Water Act as a condition of the North Coast Regional Water Quality Control Board waiver of waste discharge requirements (Order No. R1-2010-0029). Some legacy site work is covered under previous NEPA documents and will not be discussed as part of Alternative 2.

Timing of treatments

Salvage harvest and roadside hazard treatments will begin immediately following the decision and will be completed as soon as possible, likely within a year or less. Site preparation, planting, and the majority of fuels treatments will also begin immediately where possible (with some following salvage harvest and roadside hazard treatments, as needed). The majority of site preparation, planting, and fuels treatments will be completed within three years of the decision. Five years after the fire, conditions will be ripe for underburning. Our target for completion of all project treatments is within seven to eight years of the decision.

Salvage Harvest (about 7,940 treatment acres within 11,090 acres of units)

The intended purpose of salvage of fire-killed trees is to reduce the amount and continuity of fuels that would be created when those trees break or fall to the ground and become surface fuel. Risk reduction salvage units have been proposed because of their location relative to private lands, communities at risk, important access / ingress / egress roads and proposed ridgetop fuel breaks. These actions compliment proposed fuel reduction and strategic fuel management zones as part of a landscape scale strategy to reduce the size and severity of future fires. Creating large blocks where fuel loads have been reduced in concert with ridgetop fuel breaks also provides control points for fire suppression, and increases the likelihood that large fires could be contained along watershed boundaries. Reducing the size and severity of future fires serves to reduce risk to wildlife habitat and improves the likelihood of firefighting success. Salvage harvest would also promote ecosystem sustainability by increasing the likelihood and speed by which burned forested areas are reforested by opening areas for safe planting.

- Areas proposed for salvage harvest treatment include:
    1. Areas with more than ten contiguous acres of moderate- to high-severity vegetation mortality and less than 40 percent crown closure;
    2. Areas determined to be feasible in terms of logging systems, accessibility, and economics; and
    3. Units outside of northern spotted owl core areas where there is less than 50 percent of effective nesting, roosting or foraging habitat remaining within the core area.

Between the draft EIS and final EIS additional treatment units were dropped, removing about 610 acres from proposed salvage harvest due to economic viability of units, public comment, and/or consultation. Overall salvage harvest treatment is proposed in about 7,940 acres within the larger unit boundaries, using the acreage refinements based on increased mortality between October 2014 and July 2015. Unit acres total about 11,090

acres and are larger than potential treatment areas because they include areas where no harvest will occur such as hydrologic riparian reserves and areas with less than 50 percent mortality that are within unit boundaries as well as salvage harvest acres (Table 2-1).

Standing dead trees 14 inches in diameter at breast height or greater will be considered for salvage using the guidelines in Report #RO-11-01 "*Marking Guidelines for Fire-Injured Trees in California*" (Smith & Cluck, 2011). These guidelines were developed using peer-reviewed scientific literature to evaluate tree species for mortality in northern California. These guidelines provide a sliding scale of the probability of mortality in different tree species based on the percentage of volume of the tree burned or length of crown scorched by fire. Fire affected trees with a 70 percent or greater chance of dying within the next three to five years will be considered for salvage harvest.

Recommendations identified in the Forest-wide Late Successional Reserve Assessment (USDA 1999) follow Forest Plan direction focusing on long-range objectives and direct management actions following a stand-replacing event to be designed to accelerate or not impede the development of late-successional characteristics. Management direction for salvage in Late Successional Reserves (Forest Plan, pages 4-87 through 4-88) will be followed throughout the project. Project design features are incorporated into the project design to ensure this, as described in Table 2-42.

Salvage logging treatments will be accomplished by a combination of ground-based, skyline, and helicopter logging systems (Table 2-1). All salvage units will be reforested (see reforestation section below) with the need for site preparation evaluated per criteria outlined in site-preparation section below.

No salvage harvest is proposed within wilderness, backcountry, research natural areas, designated or recommended wild rivers, inventoried roadless areas, riparian reserves associated with stream channels (hydrologic riparian reserves) or high ranked northern spotted owl cores as described in Alternative 3 in the project area.[13]

The Westside Fire Recovery project seeks to meet the objective of retaining large material (including snags and coarse woody debris) until the next stand is capable of producing such material by:

- Retaining large "legacy" green trees wherever they occur. By virtue of their location and/or inherent resistance to fire, large green trees are most likely to persist until the next stand can develop large structures.
- Retaining snags in Riparian Reserves. This has the effect of retaining the larger trees, on average, on the landscape in locations that historically burned with less intensity. Large snags are more likely to persist than small snags.
- Designating additional snag retention areas in association with Riparian Reserves or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity.
- Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity-fuel treatment. By reducing the amount and continuity of surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Figure 7 of Appendix E).

[13] This refers to hydrologic not geologic riparian reserves. Salvage harvest is proposed in geologic riparian reserves. Hydrologic riparian reserves will likely need to be crossed to access certain harvest stands.

- Treating small fuels in Riparian Reserves by broadcast burning at the time that activity fuels are treated. This reduces the small surface fuels that readily ignite and carry fire but is unlikely to harm most of the larger snags because they will not yet have developed the surface that is receptive to embers.

Table 2-1: Acres of salvage harvest treatment within Alternative 2 units by logging system

Logging System	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
	Acres of Treatment[a] (within Unit)[b]			
Ground-based	420 (660)	410 (670)	20 (40)	850 (1,370)
Skyline	170 (200)	3,380 (4,670)	180 (270)	3,680 (5,140)
Helicopter	0	3,000 (4,050)	360 (540)	3,410 (4,580)
Total Treatment Acres (Unit)	**590 (860)**	**6,790 (9,390)**	**560 (850)**	**7,940 (11,090)**

[a] Treatments are estimated acres within units where more than 50 percent mortality occurred and where salvage activity is proposed. Treatment areas avoid hydrologic riparian reserves and areas where less than 50 percent mortality occurred.

[b] Units are larger than treatment areas because they include areas where no harvest will occur such as hydrologic riparian reserves and areas with less than 50 percent mortality that are within unit boundaries as well as salvage harvest acres.

Both acres of treatment and acres within units are estimates based on GIS and field data. Values are rounded to the nearest ten acres.

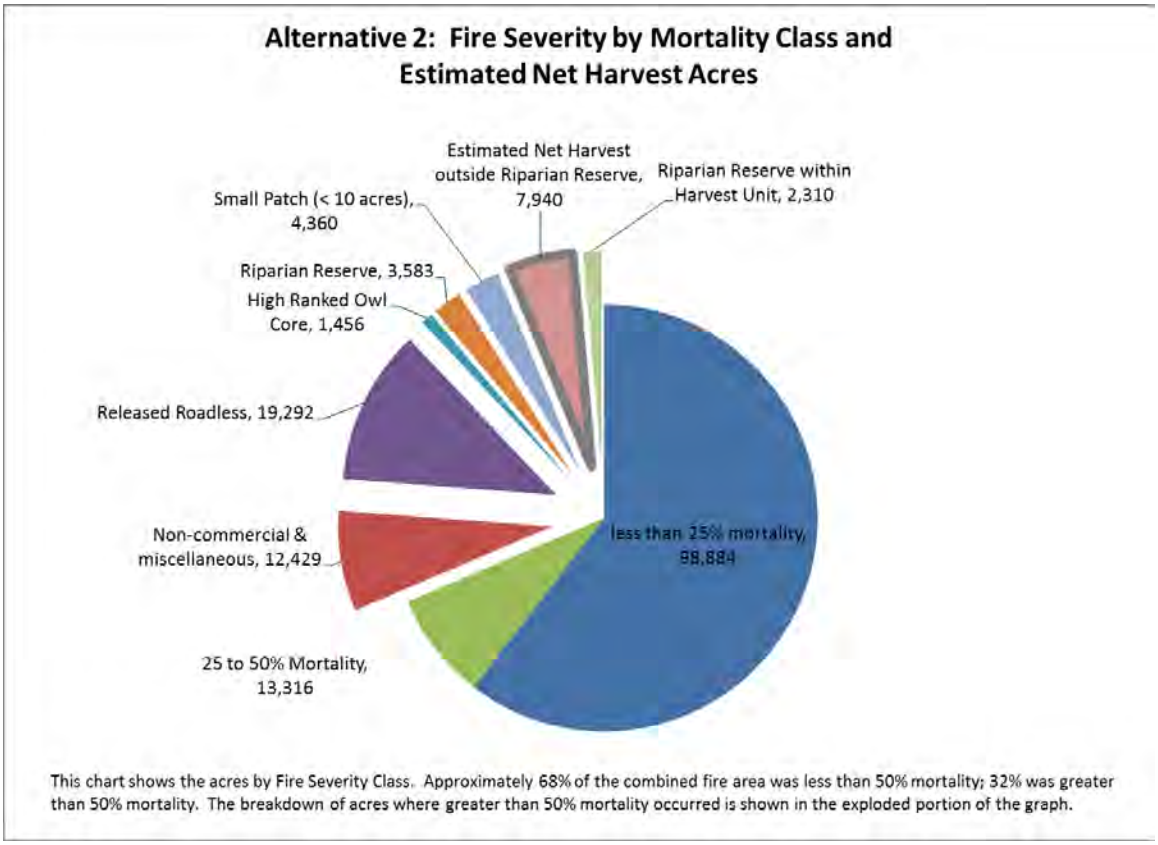

Figure 2-1: Fire Severity by Mortality Class and Estimated Net Harvest Acres in Alternative 2

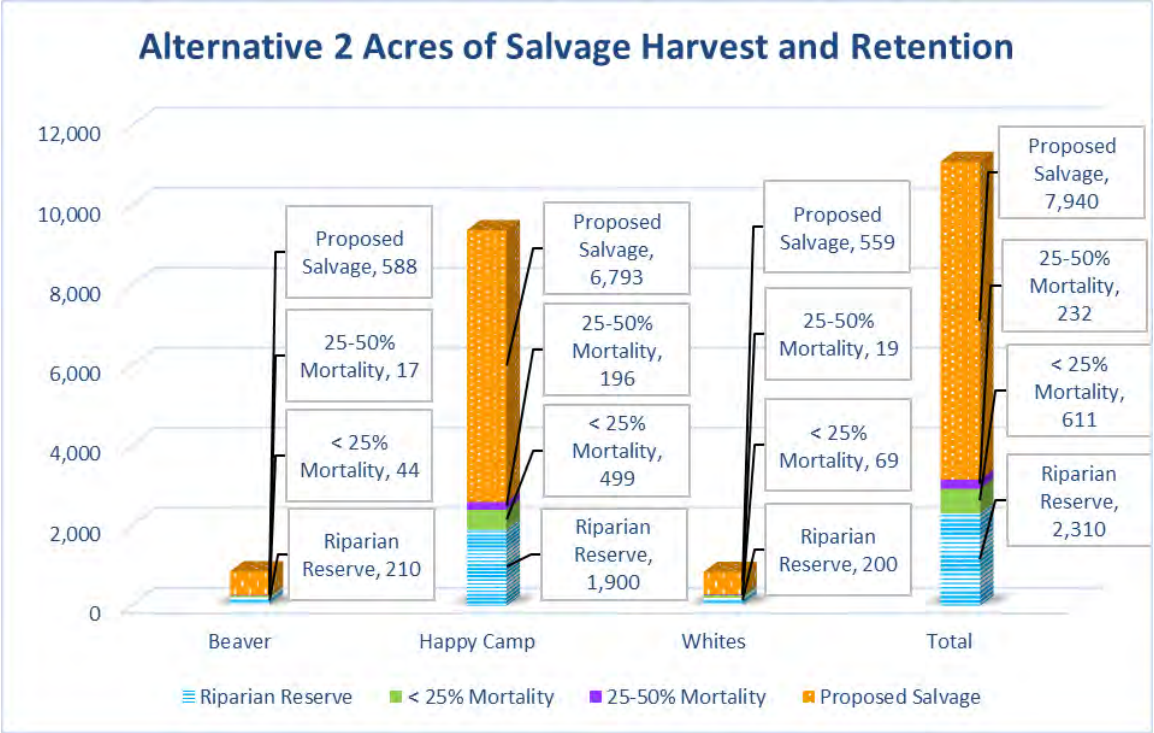

Figure 2-2: Acres of Salvage Harvest and Retention within Treatment Units in Alternative 2

Roadside Hazard Treatments (640 miles of roadways being evaluated; 5,080 acres of estimated treatment)

Roadside hazard treatment was developed to provide for both public and Forest worker safety and future fire suppression efforts. Roads classified in all maintenance levels (described in Table 2-2) will be considered for roadside hazard treatments. A hazard (or danger) tree is defined as a standing tree that presents a hazard to people due to conditions such as deterioration of or damage to the root system, trunk, stem, or limbs or the direction or lean of the tree (29 CFR 1910.266(c); FSH 6709.11, glossary). Only hazard trees identified by this definition will be removed. Where no hazard trees are present, there will be no hazard tree removal.

The Forest will evaluate 640 miles of Forest System roads, county roads, and state highways for roadside hazard trees. Within the evaluated areas, hazard trees will be identified to be cut and possibly removed as it meets the criteria described below. Trees along all Forest System roads within the project boundary will be evaluated for the potential of a hazard tree to hit the road using the guidelines of "assessing targets" in the Regional Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (Angwin et al. 2012, page 8). Roadside hazard reduction is proposed within 250 feet on either side of these roads to address hazards. This includes Maintenance Level 1 (see Table 2-2) roads used by Forest Service employees and contractors for administrative purposes. Because of slope, a few fire-killed trees farther than 250 feet from a road may still present a hazard to the road and thus need to be removed. However, the majority of hazard trees will be within the 250-foot buffer of a road.

Two different assessments will be made using the Hazard Tree Guidelines in identifying roadside hazard trees along the Forest System roads. First, to identify fire-injured or fire-killed trees burned in the 2014 fires along Forest Service system roads within the project area that have a 60 percent or greater chance of dying within three to five years, definitions in Report #RO-11-01 "Marking Guidelines for Fire-Injured Trees in California" (Smith & Cluck, 2011) were used. These trees will be removed if they are a potential threat to the roadway.

Second, for trees that do not have a 60 percent or greater chance of dying within three to five years due to fire-injury, the Hazard Tree Guidelines will be used to identify if these trees are a moderate or high potential hazard to the roadway (Angwin et al. 2012, page 20). Moderate hazards are those hazards that can be monitored or mitigated to abate hazard. Live trees or trees that are still green but have defects that may classify them as potential hazards according to the Hazard Tree Guidelines will not be cut immediately but will be monitored and evaluated for possible future removal if they are classified as having moderate hazard potential. Trees identified as having high hazard potential will be removed promptly. All dead trees, standing trees 4.5 feet or taller without a green point of growth, that are defined as hazards will be removed.

Merchantable trees will be removed when consistent with applicable project design features (Botany-3, Recreation/Scenery-11, Watershed-12, 13, and 14, and Wildlife-19, as described in Table 2-42. Removal of merchantable roadside hazard trees will include the use of ground-based, skyline, and helicopter logging systems. Non-merchantable trees will be piled and burned where the treatment is along a strategic road for hazardous fuels treatments, described below. Non-merchantable trees will be cut and left when they are not along a road defined as strategic for fire and needing fuels treatment. Per agency policy already in place, the public may obtain a permit to remove felled trees for firewood in accordance with permit requirements. The agency anticipates the local public will remove firewood along roadways, especially near communities.

Where there is overlap with salvage treatment units, both hazard trees and those trees fitting the salvage harvest prescriptions will be cut and removed in accordance with project design features.

Fire severity and vegetation type data were used estimate the acres proposed for roadside hazard treatment. The vast majority of the trees proposed for harvest are found within the "concentrated areas" located within forested areas of high or moderate severity with generally larger blocks of tree mortality. Approximate acres of concentrated treatments were determined by including only forested areas (greater than 10 inches in diameter at breast height) of moderate or high fire severity outside of salvage harvest units and plantations. Approximate acres of scattered treatments were determined by including only forested areas (greater than 10 inches in diameter at breast height) of low or very low fire severity inside or outside of salvage harvest units. Within the 640 miles of roadways being evaluated, it is estimated that logging within roadside hazard treatments is proposed within a total of 5,080 acres, including 1,422 acres of "concentrated" treatment and 3,658 acres of "scattered" treatment.

Miles by maintenance level considered for roadside hazard treatments are described in Table 2-2. Maps showing areas considered for roadside hazard treatment are found in Appendix A.

Table 2-2: Miles of Roadside Hazard Treatments by National Forest Transportation System Maintenance Level

Road Type by Maintenance Level	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Level 1 (basic custodial care, closed to public)	17	49	3	69
Level 2 (high clearance vehicles)	66	183	31	280
Level 3 (suitable for passenger cars)	30	67	15	112
Level 4 (moderate degree of user comfort)	2	7	0	9
Level 5 (high degree of user comfort)	2	0	0	2
County Roads and State Highways	49	96	27	172
Grand Total (miles)	166	402	76	644

Hazardous Fuels Treatments (about 22,220 acres)

In addition to salvage harvest, roadside hazard treatments, and site preparation treatments described in this alternative, hazardous fuel treatments will further reduce the dangers associated with heavy fuel loading, especially within the wildland urban interface. The total acres proposed for hazardous fuels treatments were reduced from 22,890 acres to 22,220 acres between draft and final EIS[14]. Hazardous fuels treatments are not within Wilderness, research natural area, or wild river land allocations. Hazardous fuels treatments may occur in both hydrologic and geologic Riparian Reserves.

Fuels treatments were developed using the criteria listed below and include: lop and scattering, chipping, mastication, broadcast burning, jackpot burning, and pile burning.

The following criteria were used to identify areas, strategic roads and ridgelines needing hazardous fuels treatments:

- One-quarter mile buffer from private property structures in burned areas or within areas that underwent fire suppression-related activity;
- 500 feet from infrastructure (e.g. utility lines, communication sites, campgrounds, lookouts, bridges, etc.);
- 250 feet on either side of Forest roads and ridgelines, used historically for fire suppression purposes; and
- Areas determined to be feasible in terms of slope, accessibility, existing fuels conditions, and logical holding features such as roads, streams, and ridges.

Table 2-3: Acres of hazardous fuels treatment by treatment type

Fuels Treatment Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Wildland Urban Interface	610	1,200	410	2,220
Fuels Management Zones	870	3,020	920	4,810
Roadside Fuels Treatments	610	3,010	810	4,420
Prescribed Burn	0	1,560	9,210	10,770
Grand Total (acres)	2,090	8,790	11,350	22,220

Information on how each fuels treatment will be implemented is described in detail below. These descriptions are categorized based on type of treatment or their location

[14] This change of about 670 acres is due to removal of acres of prescribed fire in the Whites fire area that were incorrectly mapped in the Marble Mountain Wilderness.

within the project area. Description of treatments within the wildland urban interface, fuel management zones, roadsides, and in areas proposed for prescribed burning are provided below.

Wildland Urban Interface (about 2,220 acres)

A combination of mechanical, mastication, and hand work is planned. Areas identified for treatment with mechanical equipment will include a combination of cutting trees and other understory vegetation. After mechanical or mastication treatments, activity-generated slash will be piled and burned. Areas treated only by hand thinning will remove dead vegetation or trees under 12 inches in diameter and will be disposed of by chipping, piling with follow-up burning, or lopping and scattering of fuels. Live understory vegetation (less than 12 inches in diameter) will be removed to reduce flame length, intensity, and the potential for crown fire activity. The objective is to have an area with a reduced fuel load and minimized ladder fuels to create a more defensible wildland urban interface during future fire events.

Fuels Management Zones (about 4,810 acres)

The primary locations of fuels management zones are strategic ridge systems used to contain the 2014 fires as well as historic fire lines from previous large fires within the project area. Treatments in these zones aim to maintain existing control lines by removing all dead vegetation and live brush greater than two feet tall, and by thinning live conifer trees less than 12 inches in diameter at breast height to approximately 20-foot spacing. Hardwoods would be retained. Retained conifers will be pruned up to seven feet above the ground within these zones to increase canopy base height, and reduce ladder fuels and the potential for crown fire initiation. Activity-generated fuels will be treated by a variety of methods. Where hand thinning is proposed, lopping and scattering of fuels, piling and burning, and/or chipping will be used to reduce fuels. Mechanical or mastication equipment may be used to pile activity fuels within these areas in addition to, or in lieu of, hand work.

Roadside Fuels Treatments (about 4,420 acres)

Roadside treatments along roads identified as strategic for firefighting will help to hold a planned or unplanned fire within the project area. Roadside treatments outside of identified strategic road systems will include removal of activity-generated fuels to provide access for fire suppression resources responding to future unplanned ignitions. Activities similar to those described above within fuels management zones will be used to treat roadside fuels.

Prescribed Burn (about 10,770 acres)

Prescribed burning is proposed under weather conditions which promote low-intensity fires. A mosaic post-burn condition will result from prescribed burning with isolated pockets of tree mortality, and burned and unburned understory vegetation. A mosaic burn is anticipated where some areas fully consume surface fuels and other areas are partially burned or unburned.

Second-entry burns in units identified for prescribed burning will be used to maintain surface fuel loading and increase heterogeneity of forest structure and vegetation by consuming surface fuels and small understory vegetation. Many of the prescribed burning

locations will use existing control lines established in recent large fires within the project area. Firelines will be constructed around the perimeter of the prescribed burn and will include using dozers to re-scrape control lines to mineral soil. Natural barriers to fire like rock outcrops or talus would be used where they exist around. In areas where control lines are not accessible by equipment, hand-line construction to mineral soil will occur. Removal of understory vegetation along control lines will include cutting brush and conifer trees less than 12 inches in diameter to facilitate holding operations during prescribed fire implementation.

Site Preparation, Reforestation and Release

Site-preparation, reforestation, and release treatments are designed to increase the likelihood and speed by which burned forested areas are reforested following fires. More rapid and successful reforestation is accomplished by reducing fuel loading and creating openings for safe planting. Careful evaluations were made to prioritize treatment units likely to support successful reforestation. Units within the project area are highly variable; therefore, criteria differ slightly for determining site-preparation needs within natural units versus existing plantations.

For the purposes of this project, reforestation needs were stratified into three categories for field evaluation: 1) burned conifer plantations (plantations); 2) conifer units not proposed for salvage harvest for which there is a need to reforest with conifer species (natural stands); and 3) conifer units where salvage harvest is implemented (net salvage harvest acres).

- *Plantations:* Site-preparation in plantations includes plantations that existed prior to the 2014 fires where most of the unit was lost due to the 2014 wildfires. Based on the criteria listed below, these plantations were also identified as unable to naturally recover. Most plantations planned for treatment consist of dead trees less than 16 inches in diameter at breast height. In some areas trees larger than 16 inches will be treated to reduce hazards to workers and the public, and to reduce fuel loading to achieve flame lengths of less than four feet over the next 20 years.
- *Natural Units (Non-salvage Harvested):* Natural units are units not scheduled for salvage harvest that were burned during the 2014 fires where trees are generally less than 20 inches diameter at breast height. These units were assessed for reforestation using the criteria listed below. These units will only be treated where mitigation of the snag hazards can be completed prior to planting.
- *Salvage Harvest Acres:* Site-preparation for reforestation within acres that are salvage harvested will follow harvest activities. Site preparation will only be done where fuel loading after harvest is greater than seven tons per acre (including standing dead fuels or one-hour, ten-hour, or 100-hour fuels as defined in the glossary). Otherwise, these units will be planted without site preparation.

Areas were considered for site preparation, planting and release if they:

- Were identified as areas determined to have been historically dominated by conifers, as determined by the 1945 Wieslander Vegetation mapping (Kelly, M.B. et. al 2005) in addition to visual cues based upon Forest Service professional judgment;
- Had successful vegetation growth prior to the 2014 fires;
- Had evidence that, prior to the fire, conifers were successfully re-establishing, and competing vegetation (brush and hardwoods) were not dominating the site;
- Had little availability of natural seed source within seed distribution distances;

- Had favorable site class, aspect, slope position, and elevation for artificial regeneration; and,
- Had favorable regeneration potential by prioritizing areas based on site quality and moisture availability and avoiding areas with a history of repetitive high severity burns if likely to re-burn before stand reaches level of fire resilience.

Site Preparation (about 15,800 acres)

Site preparation reduces fuel loads so that future fire severity is reduced and to create Site preparation reduces fuel loads so that future fire severity is reduced and to create areas for planting. Site preparation consists of cutting non-merchantable material and disposing of it by piling and burning, by leaving the material in place and remove by prescribed underburning, or masticating vegetation. Reduced fuel loads after site preparation treatments would increase the probability that trees, snags and coarse woody debris will persist on the landscape even with the historic fire frequencies experienced in the project area. Fuels treatments are described in more detail in the hazardous fuels treatment section above. Site preparation in units where planting is proposed is designed to maintain desired conditions of surface, canopy and ladder fuels.

Site preparation treatment acres were added and published incorrectly in the draft EIS. The correct number of acres proposed for treatment in the draft EIS was originally 14,184 acres which was subsequently corrected following field verification. Site preparation is proposed on 15,800 acres using the refined net acres of salvage harvest based on increased mortality between October 2014 and July 2015 (see the Changes in Field Data section at the beginning of this chapter). Follow-up maintenance will focus on strategic ridge- and road-systems intersect units proposed for site preparation and planting. Depending on site location, site preparation will include the following treatments (see Appendix A for maps of treatment locations):

- Fuels maintenance will involve thinning or cutting of understory vegetation and piling and burning of surface fuels to maintain desired fuel conditions. Conifer trees up to 12 inches in diameter at breast height may be cut and the retained trees pruned to increase canopy base heights in order to decrease fire behavior at the surface and transition to over-story fuels (see the description of site preparation above).
- Manual site preparation will fall standing dead conifers, hardwoods, and brush less than ten inches diameter at breast height with a chainsaw or other cutting implement on slopes greater than 35 percent. Felled material in excess of that needed for coarse woody debris or ground cover may be piled, or windrowed by hand, and burned or felled and left in place and underburned to complete site preparation activities. Material greater than ten inches in diameter will be cut and left or skyline yarded on steep slopes because of concerns about safety and effectiveness of treating large, heavy material by hand on steep ground. Manual site preparation may also be used on slopes less than 35 percent where it is cost-efficient to do so, or where resource concerns limit the use of mechanical site-preparation methods.
- Skyline yarding will be used on slopes greater than 35 percent with high densities of dead trees. Trees generally less than 16 inches in diameter will be skyline yarded, decked or piled on roadside landings. Piled material may be made available to the public for firewood cutting. Pile burning will complete site preparation activities.
- Mastication will be used to shred dead trees, hardwoods and brush less than 12 inches in diameter into pieces less than three inches diameter distributing them across the unit on slopes less than 35 percent.
- Mechanical yarding and slash piling of dead trees generally less than 16 inches in diameter will be used on slopes less than 35 percent. Material in excess of that needed for coarse woody debris and effective ground cover will be cut and piled using ground-based equipment

or cut and skidded to a landing where the material will be burned. Piled material of preferred firewood species may be made available to the public for firewood cutting following project activities. Materials less than 16 inches in diameter at breast height may also be felled, left in place and prescribe burned.

- Following mechanical site preparation activities, units will be identified (Watershed-25 and Watershed-26, Table 2-42of Chapter 2) as areas where sub-soiling or deep tillage will be used to help break up the dense soil and improve infiltration, aeration, and tree growth. Ripping may also be considered to help mechanically break up soils by raking across unit contours. No sub-soiling, deep tillage or ripping is proposed in hydrologic Riparian Reserves.

Reforestation

Reforestation prescriptions, including planting conifers or encouraging the growth of hardwoods, are designed to reflect projected unit composition based on historic condition information for both hardwoods and conifers. Units identified for proposed planting include areas where no suitable green trees exist or the number of remaining green trees can't provide a seed source for natural regeneration. Planting is proposed in areas where residual green trees were assessed during site visits for immediate seed-cone potential and were found to be inadequate for providing a reliable seed source. Remaining green trees will contribute to overall post-fire stocking levels but cannot be relied upon solely for overall re-seeding needs. Planting is not proposed in areas that are identified as wet or dry meadows.

Planting prescriptions are based on historic unit conditions, projected unit composition, and the likelihood of long-term survivability of project units within a fire ecosystem. Overall, species considered for planting in the project area include Douglas-fir, sugar pine, ponderosa pine, incense cedar, white fir, and red fir. A mosaic distribution will be achieved over time due to the spatial variability achieved by micro-site selection for planting. Conifers will not be planted next to green hardwoods; when determining if trees meet the average spacing for the stand, hardwoods will be included. Seedlings will be widely spaced on poorer sites including southerly aspects and/or rocky soils. Trees will be planted in clusters to achieve groups of conifers throughout the landscape to mimic natural units. Seedling survival rates and competition from brush species will create a natural mosaic of species and stocking densities. In order to effectively reforest these units, an average of 130 to 300 trees per acre will be planted to achieve a target stocking level of 75 to 225 variably spaced trees per acre, depending on the site conditions described below. There is no intention to create densely stocked plantations of continuous fuels. Initial recommendations for the spacing of conifer seedlings considered Forest Plan land management objectives for projected stocking needs, and the likelihood of achieving those objectives, for each unit evaluated for reforestation.

Tree planting will be by hand methods, using either bare root or container stock. Hand planting will increase the likelihood for survival and provide for the desired spatial variability within treatment units and across the project area. The tree species planted will roughly correspond with historical unit composition, varying by forest type from unit to unit. In general, mostly pines will be planted on droughty south-facing slopes and ridges. South-facing slopes and ridges will be planted at lower densities compared to other areas within the project. Douglas-fir will be planted at higher densities as the primary species on lower sheltered slopes and northern aspects. True fir will be re-established at the higher elevations at the highest density to reflect how these units would have naturally

established. Hardwoods will not be planted, due to their ability to naturally regenerate following fire either by epimoric sprouting, belowground sprouting, or by natural re-establishment as seedlings from seed caches found within the stand. Epicormic sprouting refers to the shoots that grow from buds on stems or branches of hardwoods, often in response to stress. Growth of existing hardwoods will be encouraged; hardwoods will be included in the target stocking for units in areas where they exist.

Additional planting establishment techniques may be used to increase survival of planted trees. These techniques include, but are not limited to, animal protection devices for browse reduction; shade blocks for improved microsite conditions; and hand grubbing to remove competing vegetation around seedlings for survival.

Release

The release treatment will follow planting or natural regeneration to increase the establishment of seedlings. Release treatments include manually removing competing plants or water uptake from competing plant roots by "grubbing" around conifer seedlings or natural hardwood seedlings. Grubbing consists of removing all vegetation within a minimum of a five-foot radius from planted or natural regenerated seedlings.

Table 2-4: Site preparation, Reforestation, and Release by unit type

Site Preparation, Reforestation and Release Unit Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Plantations	1,160	5,040	610	6,810
Within Natural Units (Non-salvage Harvested)	620	400	30	1,050
Within Salvage Harvest Units	590	6,790	560	7,940
Total Site Preparation Acres	2,370	12,230	1,200	15,800

Hand Treatment in Riparian Reserves (about 370 acres[15])

In Riparian Reserves within the plantation site-preparation and planting units, dead trees less than 16 inches in diameter at breast height may be cut and felled if necessary for long-term fuels reduction or reestablishment of riparian vegetation. Treatments are proposed to achieve ground cover and allow for natural regeneration of vegetation. Treatments are proposed only in areas of high and moderate vegetation mortality and where the overhead hazards can be mitigated without equipment entry into the Riparian Reserves. Follow-up slash treatment will include hand-work only (no ground-based equipment) and would be implemented only if fuel load (one-hour, ten-hour, or 100-hour fuels) is above seven tons per acre; fuels may be hand-piled, lopped and scattered, broadcast burned or windrowed and burned.

Connected Actions

Road Access

Project access will require the use of about 562 miles of National Forest Transportation System (Forest System), county, and state roads. Forest System roads will be maintained

[15] Estimated acres were calculated using GIS and omitted RAVG class 1 and 2 (or areas with less than 50% mortality).

as needed for project implementation as displayed in Table 2-5. There will be no roads added to the Forest System as a result of this project. About five miles of new temporary roads will be constructed. About nine miles of temporary roads on existing roadbeds and another nine miles of temporary road on previously decommissioned roads will be used for project access. Where temporary road actions occur on roadbeds that have existing legacy sediment sources, these legacy sediment sites would be treated and the roadbed appropriately hydrologically stabilized as part of the project. All temporary roads, including those previously decommissioned, will be closed and hydrologically stabilized after completion of the project according to the project design features (Watershed-5 and Watershed-24) found in Table 2-42.

Table 2-5: Miles of road access by Forest System maintenance level and temporary road access

Type of Road Access	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Forest System, County, and State	146	353	63	562
New Temporary Road	0	3.5	0.1	3.6
Temporary Road on Existing Roadbed	2.8	5.8	0.7	9.3
Temporary Road on Re-opened Decommissioned Road	0	9.0	0	9.0
Grand Total	148.8	371.3	63.8	583.9

Landings

Existing landings will be used where possible. Landing size will be commensurate with operational safety. Helicopter landings will be two acres in size or less. Skyline landings will use roads wherever possible. New skyline landings off the road system and ground-based landings will average one acre in size but will not exceed 1.5 acres in size. Both new and existing landings will be hydrologically stabilized after use, according to the project design features (Watershed-5 and Watershed-24) found in Table 2-42.

Legacy Sediment Sites (Elk Creek Watershed)

The portion of Elk Creek watershed within the Happy Camp Complex project area contains about 150 sites within 33 miles of road. Most of the legacy sites are located on or adjacent to the Forest System roads. The other legacy sites are located on existing landings or roadbeds (historic routes, abandoned temporary roads, or decommissioned roads). Legacy site treatments are shown in Appendix A and will include the treatments shown in Table 2-6.

Road storm-proofing treatments between individual sites will occur on about 33 miles of Forest System roads (15N02, 15N75, 16N05, 16N39 and 45N19). Treatments between legacy sites may include the following: where possible, reconstruct road prism to an out-sloped configuration, otherwise reduce inboard ditch length by adding additional relief culverts or dips; reduce road prism width; remove berms; place rip-rap below outlets of ditch relief culverts; recondition road subgrade and travel surface by applying crushed aggregate; add rolling dips where needed to control road surface runoff; or stabilize road prism slumps with retaining walls or rock buttresses.

Table 2-6: Description of treatment, number of sites, and actions needed for legacy site treatment

Treatment	Number of Sites	Description of Action Needed:

Treatment	Number of Sites	Description of Action Needed:
Culvert Upgrades	About 45	Replace culverts to accommodate the 100-year peak flow.
Diversion Prevention	About 51 sites (17 included in culvert upgrade)	Construct armored rolling dips to prevent streams from diverting down roadways should the culvert plug or fail.
Aquatic Organism Passage	3 sites	Replace existing stream crossing with bottomless arch culvert to improve or restore aquatic organism passage.
Retaining Wall	About 7 sites	Construct retaining wall, rock buttress, reinforced embankment, or equivalent. Where road prism has slumped or failed.
Fill Reduction	About 16 sites	Remove excess fill materials from the top of stream crossings to reduce the amount of fill available for discharge should the culvert plug or fail; add riprap to armor fill slopes.
Fill Removal	About 27 sites	Remove all fill materials from stream channels, swales, road shoulders and sliver fills; these treatments would occur on closed Forest roads and existing roadbeds.
Repair/Maintain Existing Infrastructure	About 16 sites	Clean culvert inlets, ditches, etc., repair damaged culvert inlets, shorten “shotgun” culvert outlets, place riprap below culvert outlets to reduce hill slope erosion, remove cut slope slide materials

Alternative 3

Alternative 3 was developed in response to relevant issues one and three and public comments raised about the effects of the Alternative 2 on spotted owl and fisher habitat, habitat connectivity, and legacy components. Legacy components are those habitat features that take a long time to develop (e.g. large old-growth trees, legacy trees, and large downed logs). Alternative 3 emphasizes the development of future late successional habitat, habitat connectivity, northern spotted owl habitat and retention of legacy components within the post-fire landscape.

Spotted owl activity centers within the project area were evaluated and prioritized in order to identify sites with the highest likelihood of post-fire owl occupancy. In order to more fully respond to recommendations described in Recovery Action 10 of the 2012 Revised Recovery Plan, known spotted owl activity centers in the project area were evaluated based on the amount of suitable habitat remaining after the 2014 fires within the 0.5-mile core areas (500-acre areas centered on clusters of best available locations such as known nest and roost sites). Activity centers containing at least 50 percent (250 acres) suitable nesting, roosting and/or foraging habitat within the core area and an additional 1,086 acres nesting/roosting and/or foraging habitat in the outer home range (0.5 to 1.3 miles) were classified as having “high potential” for the owls associated with that site to remain on site, continue to reproduce, and therefore contribute to the demographics of the spotted owl population in the area.

Activity centers containing less than 50 percent suitable nesting/roosting and/or foraging habitat within the core area were evaluated at the 1.3-mile home range scale. Home ranges containing more than 20 percent suitable nesting/roosting and/or foraging habitat were classified as having “moderate potential” for the owls associated with that site to remain on site, reproduce, and contribute to the demographics of the population in the area. The Level One consultation team (consisting of biologists from the Forest and the Yreka Office of the U.S. Fish and Wildlife Service) acknowledged uncertainty in site location but assumed that shifts in locations could occur in response to the modifications

and/or loss of habitat caused by high- and moderate-severity fire. Those with "moderate potential" may shift away from their original core use area, but remain within their home range, in areas where adequate suitable habitat exists post-fire.

Low-potential sites were defined as having less than 20 percent suitable habitat remaining within the 1.3-mile home range. These sites were assumed highly unlikely to persist or contribute to the demographics of the northern spotted owl population.

Occupied sites, where owls are thought to have *not* been displaced by the 2014 fires, would potentially be at a higher risk of impacts from post-fire activities; sites where owls were likely displaced due to habitat loss from the highest severity fire and are no longer present in the immediate area would potentially be at a lower risk from post-fire activities.

Changes from the Alternative 2:

- No salvage harvest in units (see list of units in project design features, Table 2-42) within "moderate potential" northern spotted owl core areas except for specifically designated core areas, as described above.
- No salvage harvest in units less than 20 acres in size
- No salvage harvest in the Beaver fire area.

Alternative 3 is also designed to retain legacy components for future habitat development, reduce effects to northern spotted owl habitat, and lessen the effects to connectivity while still meeting the purpose and need for action. Table 2-7 describes in detail how each concern was addressed.

Table 2-7: Concerns addressed by the development of Alternative 3

Concern About:	Addressed by:
The effects of salvage logging on the long term development of the affected stand for future late-successional habitat, as described by the Regional Ecosystem Office/LSR working group, interdisciplinary team internal review, and as raised by the public	Retaining important habitat elements such as large trees, snags, and coarse woody debris while avoiding treatment in mixed-severity fire-affected forested areas. Many northern spotted owl activity centers were affected by the fire and this alternative is designed to reduce the effects of treatments on sites likely to persist in the future while balancing the need to reduce the potential of future high-severity fire affecting additional habitat. Large trees and snags provide valuable wildlife habitat for many species and this alternative will retain more of these legacy features to provide structure for the development of late-successional habitat. This alternative will benefit the federally-listed northern spotted owl, proposed-for-federally-listing Pacific fisher, survey and manage species, management indicator species and Forest Service Sensitive species by minimizing the impacts from fuels treatments.

Concern About:	Addressed by:
Habitat Connectivity	Habitat connectivity was affected by the 2014 fires and this alternative modifies proposed treatments in order to address connectivity in areas that may provide wildlife with the opportunity to move from one patch of habitat to another.
Post-fire natural stand development[16] and habitat requirements of post fire or snag associated species	Integrating recent science on post-fire natural stand development. This will be addressed with the MIS and Forest Service sensitive species analysis, as well as the snag and legacy tree pdfs. In addition, areas outside of units and mixed severity patches within the project area will provide habitat for a variety of wildlife species. Retaining snags and legacy features on the landscape will provide future structure for wildlife species. Salvage units and burned plantations will be replanted. As these stands develop, retained snag and legacy features will provide structure found in a more mature forest. In the short term species will also benefit from the pulse of dead and dying trees, grasses and forbs found within the project area.
The short term impacts to northern spotted owl that may occupy fire-affected forested areas, as well as long-term use of small pockets of mixed burn severity within active northern spotted owl activity centers	Nesting, roosting and foraging habitat and mixed burn severity inclusions (RAVG grid code 1 or 2) within treatment units will not be salvage harvested. Removing fuels within treatment units has the potential to create short-term impacts to spotted owl foraging and prey habitat. This will be balanced with fuels treatments and replanting the salvaged treatment units. The long-term goals are to reduce fire risk, protect remaining northern spotted owl nesting, roosting and foraging habitat, and replant treatment units. Replanting treatment units will move the project area toward late seral conditions more quickly than without treatment.
Large woody debris retention	Conserving an irreplaceable resource (Forest Plan, page 4-4), retention of large woody debris would slowly improve soil organic matter, and would be especially beneficial where organic matter has been lost to high soil burn severity. Retention of large woody debris is valuable to many wildlife species. Down wood provides sites for denning, resting and escape cover. Improved soil organic matter will improve tree growth over the long term that would aid in habitat development.

Treatments proposed in Alternative 3 are the same as Alternative 2 with the following exceptions:

Salvage Harvest (about 6,590 treatment acres within 9,040 acres of units)

Alternative 3 proposes salvage harvest on approximately 6,590 acres, using the acreage refinements based on increased mortality between October 2014 and July 2015, within about 9,040 acres of salvage units on Forest lands, reducing the number of acres of proposed salvage by 1,350 acres as compared to Alternative 2. This alternative proposes no salvage treatment within core areas classified as having either “high potential” or “moderate potential,” with the exception of four “moderate potential” core areas (KL1265, KL4133, KLNew3A, and KL1202) displayed on in Appendix A. These four sites experienced significant amounts of high-severity fire that removed virtually all suitable habitat within the 0.5-mile core areas but sufficient habitat remained in the home ranges. The Level One consultation team assumed this adjacent habitat would allow for the northern spotted owls to potentially shift their core area to use existing suitable habitat adjacent to the severely burned, previously occupied core areas.

In addition to the project design features (Wildlife-11, -12, and -13) designed to minimize effects to connectivity and fisher habitat, Alternative 3 removed all proposed salvage units within the Beaver project area. These units were removed to retain northern spotted

[16] e.g. *Fire Science Brief* 2009, Wagenbrenner 2015, Hanson et al 2013, PSW GTR-247, Bond et al 2013, Hutto 2006

owl connectivity, retain post-fire foraging habitat, and to respond to the need for protecting fisher habitat characteristics.

Between the draft and final EIS additional units were dropped from this alternative due to economic viability of units, public comment, or consultation. This alternative removed 560 acres from proposed salvage harvest between draft and final EIS.

Retention of large material (including snags and coarse woody debris) will be accomplished as described in Alternative 2.

Table 2-8: Acres of salvage harvest proposed in Alternative 3 by logging system

Logging System	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
	Acres of Treatment[a] (within Unit)[b]			
Ground-based	0 (0)	340 (550)	20 (40)	370 (590)
Skyline	0 (0)	3,060 (4,170)	150 (220)	3,210 (4,400)
Helicopter	0 (0)	2,730 (3,640)	290 (420)	3,010 (4,050)
Total Treatment Acres (Unit)	**0 (0)**	**6,130 (8,360)**	**460 (680)**	**6,590 (9,040)**

[a] Treatments are estimated acres within units where more than 50 percent mortality occurred and where salvage activity is proposed. Treatment areas avoid hydrologic riparian reserves and areas where less than 50 percent mortality occurred.

[b] Units are larger than treatment areas because they include areas where no harvest will occur such as hydrologic riparian reserves and areas with less than 50 percent mortality that are within unit boundaries as well as salvage harvest acres.

Both acres of treatment and acres within units are estimates based on GIS and field data. Values are rounded to the nearest ten acres.

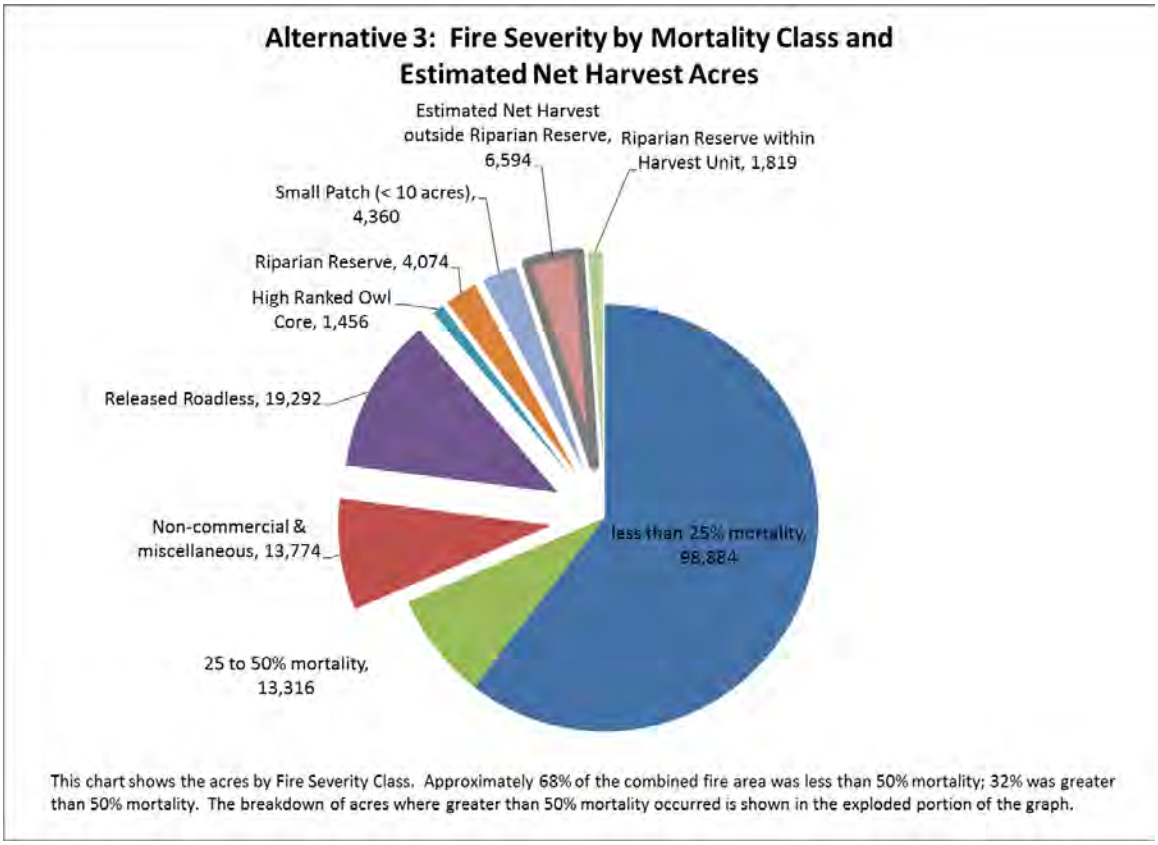

Figure 2-3: Fire Severity by Mortality Class and Estimated Net Harvest Acres in Alternative 3

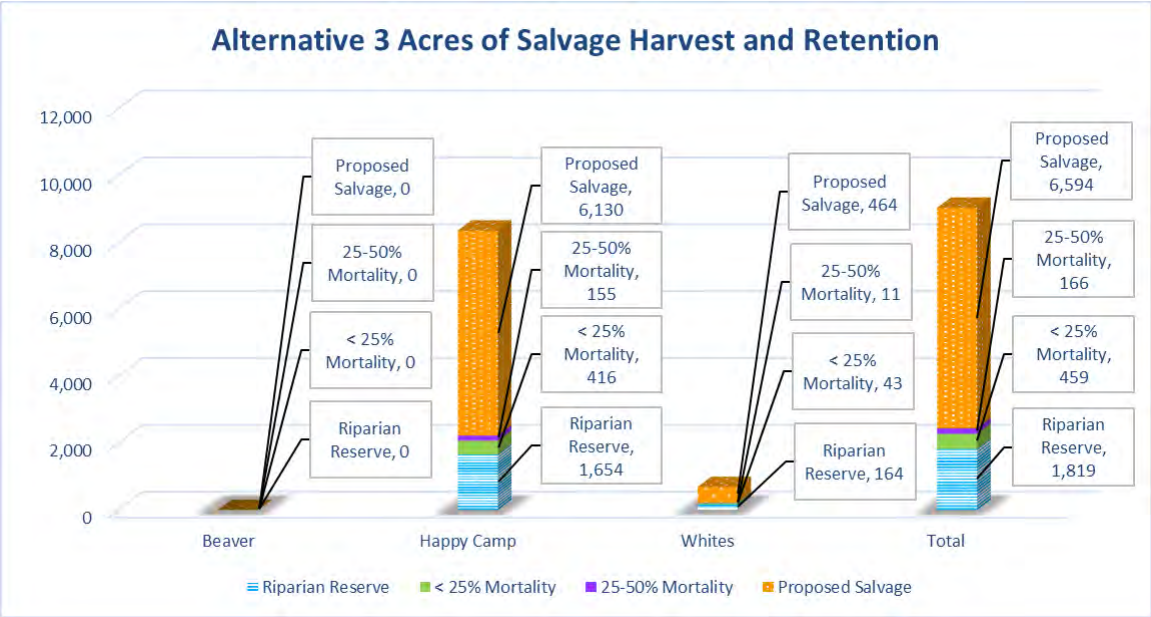

Figure 2-4: Acres of Salvage Harvest and Retention within Treatment Units in Alternative 3

Roadside Hazard Treatment (640 miles of roadways being evaluated; 5,080 acres of estimated treatment)

Roadside hazard treatments are as described in Alternative 2. Changes made between draft and final EIS to acres and the description of the Alternative 2 are also applicable to this alternative. Acres associated with these treatments are listed in Table 2-2.

Hazardous Fuel Treatment (about 22,220 acres)

Hazardous fuels treatments and proposed units are as described in Alternative 2. Changes made between draft and final EIS to acres and the description of the Alternative 2 are also applicable to this alternative. Acres associated with these treatments are listed in Table 2-3.

Site Preparation, Reforestation, and Release

Site preparation, reforestation, and release as described in Alternative 2 will be implemented on about 7,860 acres of plantations and natural units (non-salvage harvest units), and in 6,590 acres of salvage harvest using the refined acreage based on mortality increases from October 2014 to July 2015. Acres were adjusted based on the amount of salvage harvest acres removed from treatment for this alternative. Based on the removal of salvage harvest treatment acres within core areas classified as having either ‘high potential’ or ‘moderate potential,’ and the removal of salvage treatment in the Beaver project, site preparation, reforestation, and release acres decreased from Alternative 2.

Table 2-9: Acres of site preparation, reforestation, and release in Alternative 3 by unit treatment type

Site Preparation, Reforestation and Release Unit Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Plantations	1,160	5,040	610	6,810

Site Preparation, Reforestation and Release Unit Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Natural Units (Non-salvage Harvested)	620	400	30	1,050
Salvage Harvest Units	0	6,130	460	6,590
Total Acres	1,780	11,570	1,100	14,450

Hand Treatment in Riparian Reserves (0 acres)

No hand treatment in Riparian Reserves is proposed in this alternative.

Connected Actions

Road Access

Project access for this alternative is the same as Alternative 2. Implementation of this alternative will require the use of Forest System roads, State, and County Roads as displayed in Table 2-10. Access is similar to that of Alternative 2, but small sections of roads used for temporary access on existing roadbeds and re-opened decommissioned roads were removed because units associated with these sections of roads were removed. System roads will be maintained as needed for Alternative 3 implementation.

Table 2-10: Miles of road access for Alternative 3 by Forest Transportation System maintenance level and temporary road access

Type of Road Access	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Forest System, County, and State	146	353	63	562
New Temporary	0	3.4	0.1	3.5
Temporary Road on Existing Roadbed	1.5	4.6	0.7	6.8
Temporary Road on Re-opened Decommissioned Road	0	8.6	0	8.6
Grand Total	147.5	370.6	63.8	580.9

Landings and Legacy Sites

Both landings and legacy site actions are as described in Alternative 2. Alternative 3 is the same as Alternative 2 with the exception that fewer landings will be needed to implement this alternative because access to dropped units will no longer be needed.

Alternative 4

Alternative 4 was developed to reduce impacts to watersheds, including those containing federally-listed Coho Salmon. Alternative 4 was developed through consultation discussions between the Forest Service and National Marine Fisheries Service and in response to relevant issues #2 and #3 (see Chapter 1) raised about the effects of the proposed action on watershed conditions and recovery. Soils and riparian areas were impacted to varying degrees across the project area due to the 2014 wildfires and, in some areas, the effects were severe and likely to result in downstream impacts to water quality and fisheries habitat. Riparian and aquatic resources in general across the project area are negatively affected by the current post-fire conditions due to changes in natural processes such as hillslope erosion and stream sedimentation, and changed conditions such as effective stream shade and flow regime. Considering the impacted current

condition, the concern is that further ground disturbance, especially in the most impacted and/or sensitive watershed areas, may result in additional negative effects to aquatic resources including habitat for federally-listed (under the Endangered Species Act) Coho Salmon.

Alternative 4 was designed to reduce watershed disturbance and impacts to water quality and fisheries, relative to Alternative 2, while still meeting the purpose and need for action. Alternative 4 reduces or eliminates temporary road actions, especially within Key Watersheds (Forest Plan, pages 4-25 to 4-26). The interdisciplinary team has identified the areas (7th field watersheds) that are most sensitive to further ground disturbance, based on existing watershed condition and distribution of federally-listed fish. The criteria used to identify the most sensitive 7th field watersheds included the following:

1. Existing watershed disturbance—measured by analysis of fire impacts (vegetation and soil burn severity) and Cumulative Watershed Effects model values (Appendix B in the Hydrology Amendment on the project website) for existing condition (which includes BAER work);
2. Unstable slopes and landslide potential—quantitatively reflected in Cumulative Watershed Effects values, and further evaluated based on field review and information on past site-specific disturbance and recovery;
3. Stream monitoring data—Forest-level water quality monitoring (sediment and temperature) of reference and managed streams, mostly pre- 2014 fires;
4. Federally-listed (under the Endangered Species Act) Coho Salmon—proximity/probability and magnitude/duration of likely impacts to Coho Salmon and their habitat;
5. Key Watersheds—within the project area the key watersheds identified in the Forest Plan: Salmon River, and Elk and Grider creeks; and
6. Professional judgment—informed by field visits, literature review, and site-specific knowledge.

The following viewsheds were identified as the most sensitive 7th field watersheds (drainages):

- Three drainages along Beaver Creek including: Buckhorn Gul-Beaver, Dutch, and Lower West Fork Beaver;
- Walker Creek;
- Doggett Creek;
- Caroline Creek along the Klamath River;
- Kohl Creek;
- Music Creek;
- O'Neil Creek;
- Three drainages along Elk Creek including: Lower East Fork Elk, Upper East Fork Elk, and Upper Elk;
- China Creek;
- Four drainages along Grider Creek including: Cliff Valley, Lower Grider, Upper Grider, and Rancheria Creek;
- Tompkins Creek; and
- Whites Gulch

Alternative 4 proposes to treat these watersheds differently to account for the specific conditions, water quality and fish habitat impairments, and recovery potential of each.

Alternative 4 would reduce the impacts related to ground disturbance in these areas by eliminating temporary road actions (except for less than 250-foot stretches of temporary road on ridgetops). This alternative also includes restorative actions within Riparian Reserves where they occur within salvage harvest units, eliminates hazard tree removal on Maintenance Level 1 roads that are not used by the project, and allows for no landing construction within riparian reserves (several exceptions to no landings in Riparian Reserves apply with Alternative 2; these exceptions do not apply with Alternative 4).

Changes from the Alternative 2

Within the identified 7th field watersheds, along with all project design features, the following additional restrictions/mitigations are proposed:

- As in Alternative 2, hand treatments are proposed in Riparian Reserves within site preparation and planting units. Alternative 4 adds this same treatment to Riparian Reserve within salvage units;
- No use of temporary roads on existing roadbeds, or on reopened previously decommissioned roads, with the following exception:
    1. Use of temporary roads on existing roadbeds will be limited to segments along ridgetops and those not hydrologically connected to the drainage network (no stream crossings or temporary roads adjacent to streams).
    2. In Key Watersheds, all temporary roads will be less than 250 feet in length, on ridgetops and not hydrologically connected to the drainage network (no stream crossings or temporary roads adjacent to streams);
- No use of Maintenance Level 1 roads if stream-crossing reconstruction is needed; and
- Maintenance Level 1 roads that are not needed to implement actions in this project will not have hazard trees removed.

Treatments proposed in Alternative 4 are the same as Alternative 2 with the following exceptions:

Salvage Harvest (about 6,910 treatment acres within 9,700 acres of units)

Alternative 4 proposes salvage logging treatments on approximately 6,910 acres, using the acreage refinements based on increased mortality between October 2014 and July 2015, within about 9,700 acres of salvage units on Forest lands, thereby reducing the number of acres of proposed salvage by about 1,030 acres as compared to Alternative 2. Acres for salvage harvest were adjusted based on accessibility following the removal of temporary roads on existing roadbeds, including temporary roads on previously decommissioned roads, and removing Maintenance Level 1 roads where stream-crossing reconstruction is needed. Retention of large material (including snags and coarse woody debris) will be accomplished as described in Alternative 2.

Table 2-11: Acres of salvage harvest in Alternative 4 by logging system

Logging System	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
	Acres of Treatment[a] (within Unit)[b]			
Ground-based	380 (600)	380 (600)	20 (40)	760 (1,240)
Skyline	140 (160)	2,400 (3,330)	180 (270)	2,670 (3,750)
Helicopter	0 (0)	3,070 (4,170)	360 (540)	3,480 (4,710)

Logging System	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Total Treatment Acres (Unit)	**520 (750)**	**5,830 (8,100)**	**560 (850)**	**6,910 (9,700)**

[a] Treatments are estimated acres within units where more than 50 percent mortality occurred and where salvage activity is proposed. Treatment areas avoid hydrologic riparian reserves and areas where less than 50 percent mortality occurred.

[b] Units are larger than treatment areas because they include areas where no harvest will occur such as hydrologic riparian reserves and areas with less than 50 percent mortality that are within unit boundaries as well as salvage harvest acres.

Both acres of treatment and acres within units are estimates based on GIS and field data. Values are rounded to the nearest ten acres.

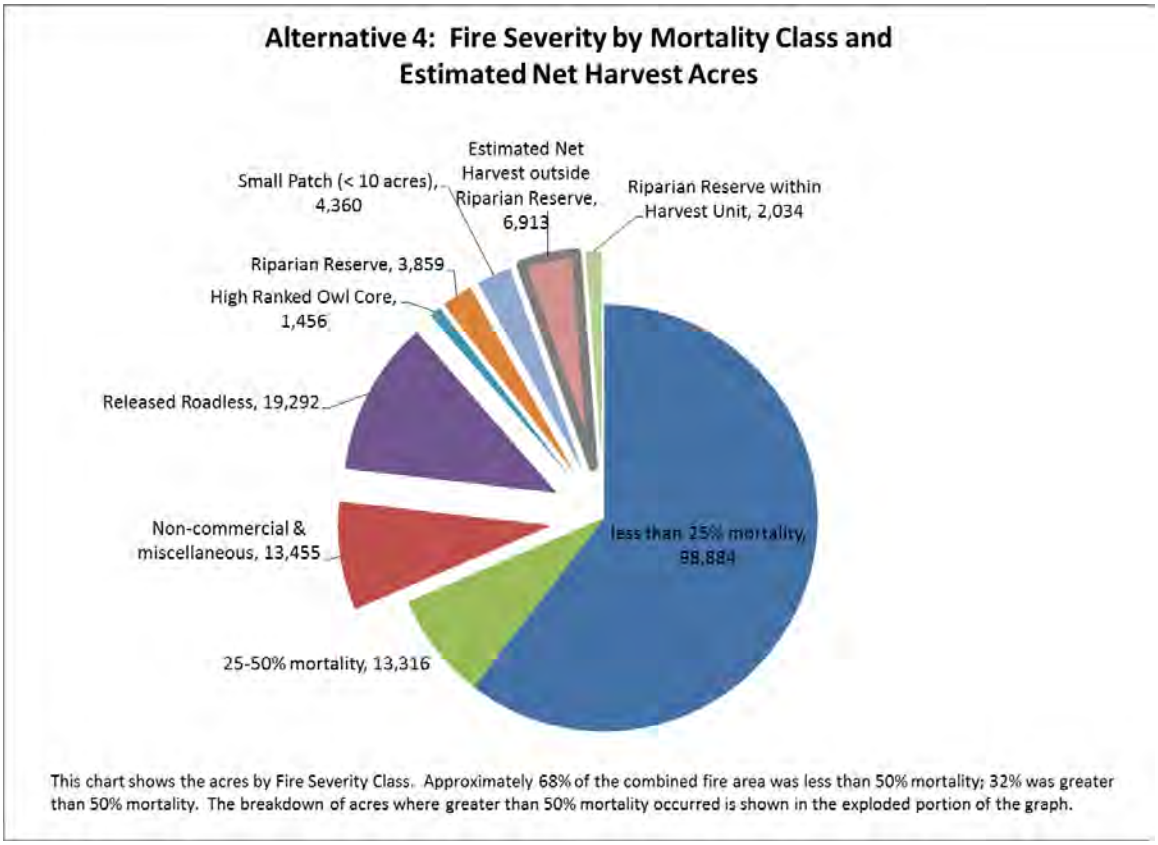

Figure 2-5: Fire Severity by Mortality Class and Estimated Net Harvest Acres in Alternative 4

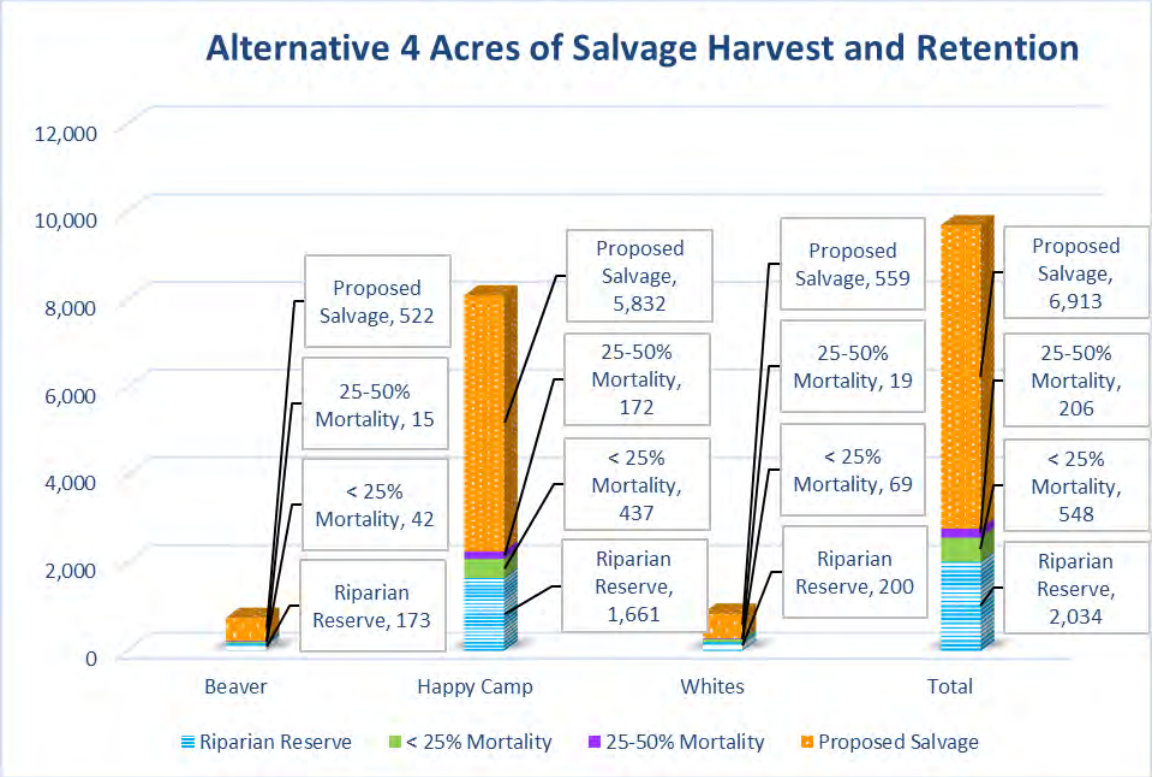

Figure 2-6: Acres of Salvage Harvest and Retention within Treatment Units in Alternative 4

Roadside Hazard Treatments (620 miles of roadways being evaluated; 4,920 acres of estimated treatment)

Alternative 4 proposes treatment along about 620 miles of roads or a maximum of about 19,580 acres of roadside hazard treatment. Roadside hazard treatment and criteria used to identify hazard or danger trees are as described in Alternative 2. Miles of roads and acres for roadside hazard treatment were adjusted based on the removal of treatment along Maintenance Level 1 roads which were removed from this alternative because they were not needed to implement actions for Alternative 4.

Hazardous Fuel Treatments (about 22,220 acres)

Hazardous fuels treatments and proposed units are as described in Alternative 2. Changes made between draft and final EIS to acres and the description of the Alternative 2 are also applicable to this alternative. Acres associated with these treatments are listed in Table 2-3.

Site Preparation, Reforestation, and Release (about 14,770 acres)

Site preparation, reforestation, and release as described in Alternative 2 will be implemented in 7,860 acres of plantations and natural units (non-salvage harvest units), and on 6,910 acres of salvage harvest acres, using the acreage refinements based on increased mortality between October 2014 and July 2015. No planting is proposed in the portions of salvage harvest units that overlap Riparian Reserves. Acres were adjusted based on the amount of salvage harvest acres removed from treatment based on changes in road use and access.

Table 2-12: Acres of site preparation, planting, and release in Alternative 4 by treatment type

Treatment Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Plantations	1,160	5,040	610	6,810
Within Natural Units (Non-salvage Harvested)	620	400	30	1,050
Within Salvage Harvest Units	520	5,830	560	6,910
Total Site Preparation	2,300	11,270	1,200	14,770

Hand Treatments in Riparian Reserves (about 1,830 acres[17])

This alternative expands hand treatments in all Riparian Reserves within salvage harvest units and in site preparation and planting treatments within Riparian Reserves; like Alternative 2, this treatment is proposed in Happy Camp and Whites fire areas only. Manual or hand treatment will fall standing dead conifers, up to 16 inches in diameter at breast height, with a chainsaw or other cutting implement, then cut and scattered throughout the riparian area to achieve 70 percent soil cover in Riparian Reserves within salvage harvest units. On slopes greater than 35 percent, manual felling of standing dead conifers, hardwoods, and brush will be limited to material less than ten inches diameter at breast height, due to concerns about safety and effectiveness of treating large, heavy material by hand on steep ground. The goal of hand treatment in Riparian Reserves is to promote more rapid soil recovery and natural regeneration without additional planting in these units. After treatment, if one-hour, ten-hour, or 100-hour fuels exceed seven tons per acre (and/or greater than 70 percent soil cover), excess fuels can be piled and burned or broadcast burned. One-hour, ten-hour, or 100-hour fuels are defined in the Glossary of this document.

Connected Actions

Road Access

Project access will require the use of Forest System roads, State and County Roads. Forest System roads will be maintained as needed for Alternative 4 implementation, as displayed in Table 2-13. There will be no roads added to the Forest System as a result of this project, however about two miles of new temporary roads will be constructed. This alternative limits the mileage of temporary roads on existing roadbeds, including temporary roads on reopened previously decommissioned roads, with the following exceptions: (1) new temporary roads in key watersheds will be less than 250 feet in length; and (2) all temporary roads will be limited to segments on ridgetops and not hydrologically connected to the drainage network (no stream crossings or temporary roads adjacent to streams). These two exceptions account for about five miles of temporary roads on existing roadbeds being used for project access in this alternative. One mile of temporary road, is proposed on reopened previously decommissioned roads. All temporary roads, including the previously decommissioned roads, will be closed and hydrologically stabilized, according the project design features, after completion of the project.

[17] Estimated acres were calculated using GIS and omitted RAVG class 1 and 2 (or areas with less than 50% mortality).

Table 2-13: Miles of road access for Alternative 4

Type of Road Access	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Forest System, County, and State	146	353	63	562
New Temporary	0	1.1	0.1	1.2
Temporary Road on Existing Roadbed	0.3	1.3	0.6	2.2
Temporary Road on Re-opened Decommissioned Road	0	0.4	0	0.4
Grand Total	146.3	355.8	63.7	565.8

Landings and Legacy Sites

Both landings and legacy site actions are as described in Alternative 2. Alternative 4 is the same as Alternative 2 with the exception that fewer landing will be required to implement Alternative 4.

Alternative 5

Alternative 5 is responsive to relevant issue #3 (Chapter 1) and addresses disagreements about the effects of salvage logging and site preparation on late successional reserves, riparian reserves, and inventoried roadless areas by removing all units that overlap these areas. Alternative 5 is also responsive to relevant issue #4, by addressing disagreements about whether or not the proposed action sufficiently addresses the needs for fuels reduction adjacent to private timber lands in the Beaver fire area. Alternative 5 addresses these needs by proposing an additional 1,200 acres of hazardous fuels treatments with adjoining private land treatments to increase fuel breaks along ridge and road systems within the Beaver Fire area.

Treatments in Alternative 5 are identical to the Alternative 2 with the following exceptions:

Salvage Harvest (about 2,360 treatment acres within 3,340 acres of units)

Alternative 5 proposes salvage harvest on approximately 2,360 acres, using the acreage refinements based on increased mortality between October 2014 and July 2015within about 3,340 acres of salvage units on Forest lands, thereby reducing the amount of acres of proposed salvage by 5,580 acres as compared to Alternative 2. Salvage harvest (as described in Alternative 2) is only proposed within management areas (MA) considered as matrix lands that exist within the project area, including Retention (MA 11), Scenic Rivers (MA 12), Recreation Rivers (MA 13), Partial Retention (MA 15), and General Forest (MA 17) management areas (matrix lands are defined on the 1994 Forest Plan EIS, Preferred Alternative Land Allocations Map). Compared to Alternative 2, Alternative 5 does not propose salvage harvest within special habitat (MA 5) which includes Late Successional Reserves and special habitat for bald eagle or falcon; neither Alternative 2 nor Alternative 5 propose salvage harvest in special interest areas (MA 7), hydrologic Riparian Reserves (MA-10), or in inventoried roadless areas. Retention of large material (including snags and coarse woody debris) will be accomplished as described in Alternative 2.

Table 2-14: Acres of treatment proposed in Alternative 5 by logging systems.

Logging System	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total

	Acres of Treatment[a] (within Unit)[b]			
Ground-based	420 (660)	140 (230)	0 (20)	560 (910)
Skyline	160 (170)	570 (800)	0 (0)	690 (970)
Helicopter	0 (0)	1,040 (1,410)	30 (60)	1,110 (1,470)
Total Treatment Acres (Unit)	580 (830)	1,750 (2,440)	30 (60)	2,360 (3,340)

[a] Treatments are estimated acres within units where more than 50 percent mortality occurred and where salvage activity is proposed. Treatment areas avoid hydrologic riparian reserves and areas where less than 50 percent mortality occurred.

[b] Units are larger than treatment areas because they include areas where no harvest will occur such as hydrologic riparian reserves and areas with less than 50 percent mortality that are within unit boundaries as well as salvage harvest acres.

Both acres of treatment and acres within units are estimates based on GIS and field data. Values are rounded to the nearest ten acres.

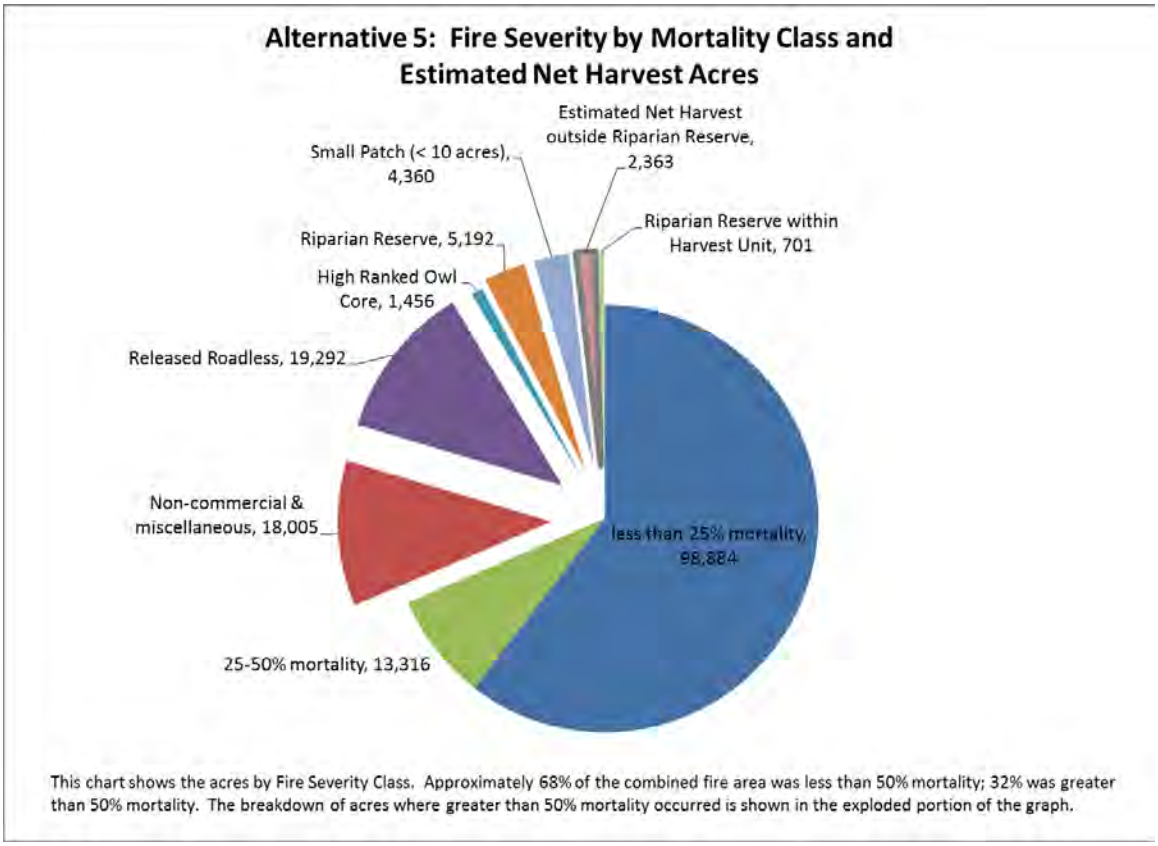

Figure 2-7: Fire Severity by Mortality Class and Estimated Net Harvest Acres in Alternative 5

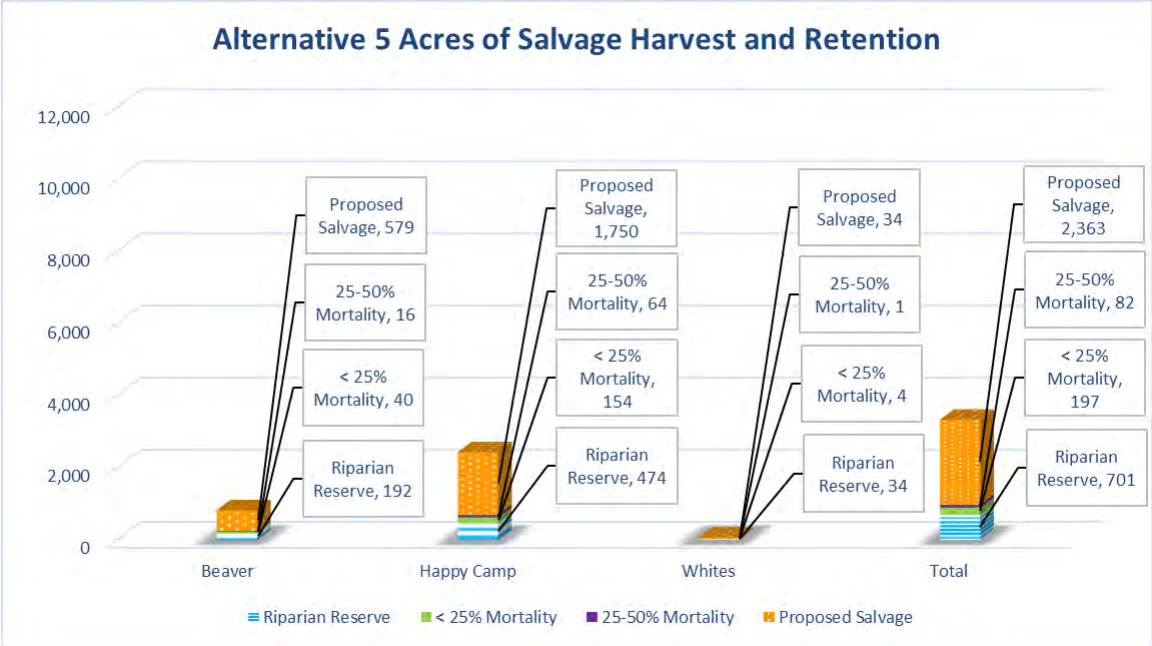

Figure 2-8: Acres of Salvage Harvest and Retention within Treatment Units in Alternative 5

Roadside Hazard Treatments (640 miles of roadways being evaluated; 5,080 acres of estimated treatment)

Roadside hazard treatments are as described in Alternative 2. Changes made between draft and final EIS to acres, and the description of the Alternative 2, are also applicable to this alternative. Acres associated with these treatments are listed in Table 2-2.

Hazardous Fuels Treatments (about 23,430 acres)

Hazardous fuels treatments are proposed on an additional 1,200 acres adjoining private land treatments to increase fuel breaks along ridgelines and road systems within the Beaver fire area. Units were identified based on proximity to private timberlands. These additional hazardous fuels treatments, in coordination with salvage harvest, will reduce high densities of snags and surface fuels adjacent to private timberlands.

Table 2-15: Alternative 5 fuels treatment acres by treatment type.

Fuels Treatment Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Wildland Urban Interface	610	1,200	410	2,220
Fuels Management Zones	2,080	3,020	920	6,020
Roadside Fuels Treatments	610	3,010	810	4,420
Prescribed Burn	0	1,560	9,210	10,770
Grand Total	3,300	8,790	11,350	23,430

Site Preparation, Reforestation, and Release (about 6,210 acres)

Site preparation, reforestation, and release are proposed only within management areas considered as matrix lands, as identified in the description of salvage harvest in this alternative. Compared to Alternative 2, Alternative 5 does not propose site preparation,

planting, and release in salvage harvest units that are within special habitat (MA 5) which includes Late Successional Reserves and habitat for eagle and falcon, special interest areas (MA 7), hydrologic riparian reserves (MA 10), and inventoried roadless areas (not defined as a management area in the Forest Plan).

Table 2-16: Acres of proposed site preparation, reforestation, and release for Alternative 5 by treatment type

Treatment Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Plantations	1,150	1,960	0	3,120
Natural Units (Non-salvage Harvested)	620	120	0	1,050
Salvage Harvest Acres	580	1,750	30	2,360
Total	2,350	3,830	30	6,210

Hand Treatment in Riparian Reserves (0 acres)

No hand treatment in Riparian Reserves is proposed.

Connected Actions

Road Access

Project access will require the use of Forest System roads, State and county roads. There will be no roads added to the Forest System as a result of this project. Almost one mile of new temporary road will be constructed, about four miles of temporary roads on existing roadbeds will be used, and less than two miles of temporary road on reopened decommissioned roads will be used for project access. All temporary roads, including those on previously decommissioned roads, will be closed and hydrologically stabilized according the project design features, after completion of the project.

Table 2-17: Miles of road access for Alternative 5 by type of road

Type of Road Access	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Forest System, County, and State	146	353	63	562
New Temporary	0	0.8	0	0.8
Temporary Road on Existing Roadbed	2.8	1.7	0	4.5
Temporary Road on Re-opened Decommissioned Road	0	1.5	0	1.5
Grand Total	148.5	357.0	63	568.8

Landings and Legacy Sites

Both landings and legacy site actions are as described in Alternative 2. Alternative 5 is the same as Alternative 2 with the exception that fewer landing will be needed to implement this alternative.

Alternative 2 Modified

Alternative 2 Modified was developed during early consultation with U.S. Fish and Wildlife Service to minimize the impacts of salvage harvest on the northern spotted owl. Treatments for Alternative 2 Modified are similar to Alternative 2; each treatment was

adjusted slightly after meeting with representatives from the U.S. Fish and Wildlife Service. Modifications to the descriptions of treatment are described below.

Salvage Harvest (about 7,070 treatment acres within 9,720 acres of units)

Alternative 2 Modified proposes salvage harvest treatment is only proposed in about 7,070net acres, using the acreage refinements based on increased mortality between October 2014 and July 2015, within the larger unit boundaries. The gross unit acres total about 9,720 acres, this is larger than potential treatments areas (net acres) because they include areas where no harvest will occur such as hydrologic riparian reserves and areas with less than 50 percent mortality that are within unit boundaries as well as salvage harvest acres.

Areas proposed for treatment in Alternative 2 Modified were adjusted after units were dropped within each fire-related project area. Salvage units were dropped in the Happy Camp and the Whites project areas during consultation with the U.S. Fish and Wildlife Service. These units were removed from proposed salvage treatment if they were within northern spotted owl core areas classified as having moderate potential for owls to remain on site, reproduce, and contribute to the demographics of the population of the area. See Alternative 3 for a complete description how owl cores were classified as high, moderate, or low. Salvage harvest units in T47N, R2W, Section 32 and T46N, R2W, Section 4 were also removed from the Beaver project area to retain fisher habitat connectivity, or if units were within owl cores classified as moderate as in the Happy Camp and Whites fire-related project areas. Units were also removed from treatment if treatments were no longer economically feasible to implement. Retention of large material (including snags and coarse woody debris) will be accomplished as described in Alternative 2.

Table 2-18: Acres of salvage proposed in Alternative 2 Modified by logging systems.

Logging System	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
	Acres of Treatment[a] (within Unit)[b]			
Ground-based	140 (230)	370 (600)	20 (40)	530 (870)
Skyline	80 (110)	3,090 (4,220)	160 (260)	3,320 (4,560)
Helicopter	0 (0)	2,880 (3,840)	320 (460)	3,220 (4,300)
Total Treatment Acres (Unit)	**220 (340)**	**6,340 (8,650)**	**500 (740)**	**7,070 (9,720)**

[a] Treatments are estimated acres within units where more than 50 percent mortality occurred and where salvage activity is proposed. Treatment areas avoid hydrologic riparian reserves and areas where less than 50 percent mortality occurred.

[b] Units are larger than treatment areas because they include areas where no harvest will occur such as hydrologic riparian reserves and areas with less than 50 percent mortality that are within unit boundaries as well as salvage harvest acres.

Both acres of treatment and acres within units are estimates based on GIS and field data. Values are rounded to the nearest ten acres.

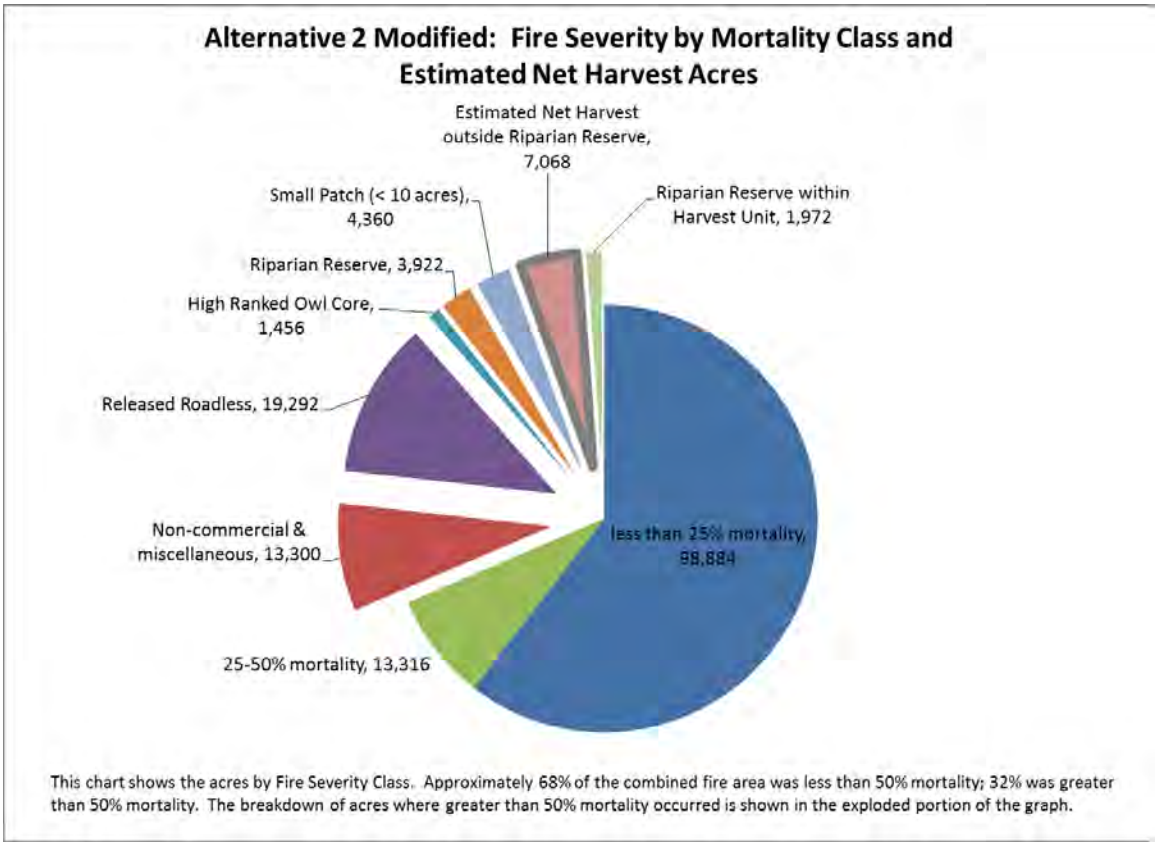

Figure 2-9: Fire Severity by Mortality Class and Estimated Net Harvest Acres in Alternative 2 Modified

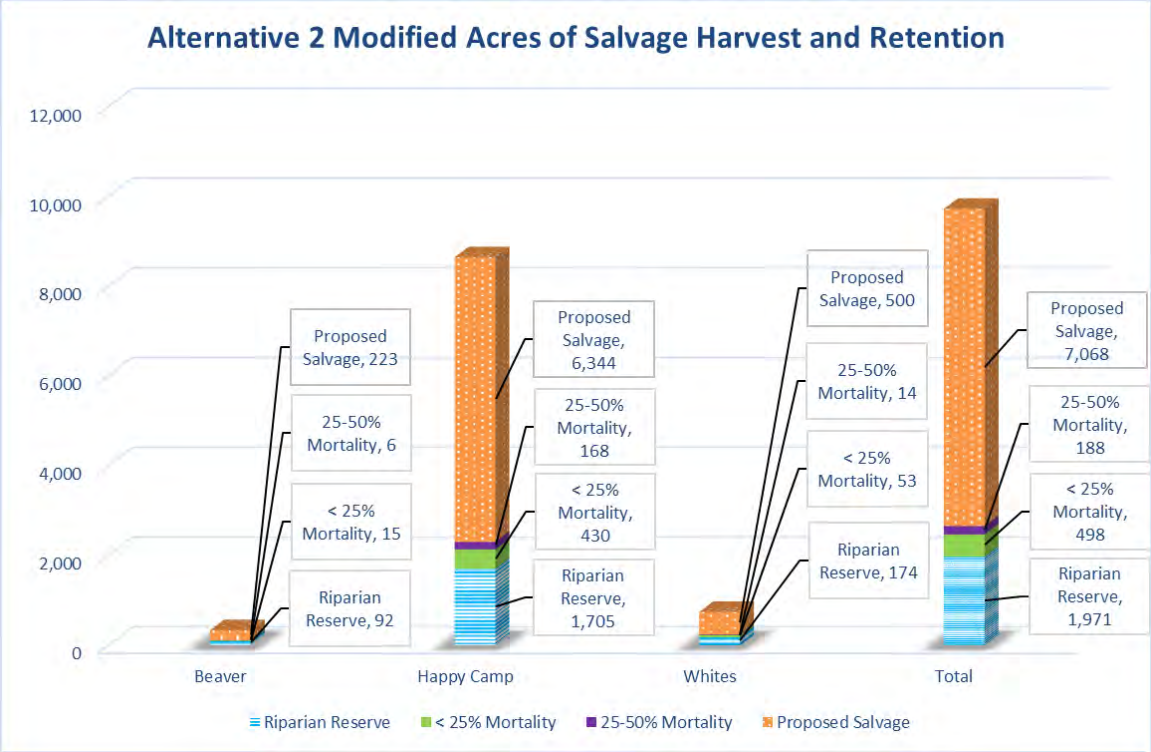

Figure 2-10: Acres of Salvage Harvest and Retention within Treatment Units in Alternative 2 Modified

Roadside Hazard Treatments (640 miles of roadways being evaluated; 4,226 acres of estimated treatment)

In Alternative 2 Modified, marking guidelines were adjusted to respond to public comment and adjusted based on consultation with U.S. Fish and Wildlife Service. Acres associated with roadside hazard treatments are listed in Table 2-2. Alternative 2 Modified adjusts the percentage of mortality for fire-injured trees as follows: all trees less than 45 inches in diameter that were burned in the 2014 fires along Forest System roads within the project area will be considered for removal if they are dead or have a 60 percent or greater chance of dying within three to five years; and trees burned in the 2014 fires, that are greater than 45 inches in diameter, will be considered for removal only if they are dead or have a 90 percent or greater chance of dying within three to five years as defined by Report #RO-11-01 "Marking Guidelines for Fire-Injured Trees in California" (Smith & Cluck, 2011).

The actual area where harvest will occur will not be known until on-the-ground hazard tree evaluations are completed. Mileages of treatment proposed are a maximum and the numbers are merely representative of the entire length and area being evaluated for hazard tree identification and removal. Acres used for analysis were calculated using all fire severity classes with a 200-foot buffer on either side of affected roads. GIS was used to narrow down the amount of acres of roadside hazard considered for hazard tree removal. As a result, the area actually treated by roadside hazard removal will likely be smaller than the estimated 16,005 acres. Fire severity and vegetation type data were used estimate the acres proposed for roadside hazard treatment. The vast majority of the trees proposed for harvest are found within the "concentrated areas" located within forested

areas of high or moderate severity with generally larger blocks of tree mortality. Approximate acres of concentrated treatments were determined by including only forested areas (greater than 10 inches in diameter) of moderate or high fire severity outside of salvage harvest units and plantations. Approximate acres of scattered treatments were determined by including only forested areas (greater than 10 inches in diameter) of low or very low fire severity inside or outside of salvage harvest units. Within the 640 miles of roadways being evaluated, it is estimated that logging within roadside hazard treatments is proposed within a total of 4,226 acres, including 1,293 acres of "concentrated" treatment and 2,933 acres of "scattered" treatment.

Hazardous Fuels Treatments

The wildland urban interface (WUI) and roadside fuels treatments (roadside fuels) are discussed together for Alternative 2 Modified. In Alternative 2 Modified, the prescription of these two treatments was changed to minimize the impact to fisher habitat connectivity and to address fuels concerns in areas with high solar radiation based on slope and aspect. Treatments will include a combination of mechanical, mastication, and hand work to cut dead and dying trees between eight and 14 inches in diameter. Other understory vegetation, including conifers and hardwoods two feet or taller and less than eight inches in diameter, will be thinned, and brush greater than two feet tall will be removed.

After treatment, activity-generated slash and brush will be piled and burned. Retained conifers and hardwoods will be pruned up to seven feet above the ground on the uphill side of trees to increase canopy base height, and reduce ladder fuels and the potential for crown fire initiation. Hanging branches will be removed if they hang below seven feet above ground level. Areas identified as WUI or roadside fuels will be treated differently based on solar radiation exposure, slope, and aspect. Hot Slope and Cool Slope treatments are described below:

- "Hot Slope" (complete understory treatments) are proposed in areas of higher solar radiation, including upper slope positions and westerly and southerly aspects. Treatment spacing will average 20 to 25 feet between leave trees. Leave trees will contain a mixture of hardwood and conifer species; those with good color and vigor will be retained.
- "Cool Slope" (modified understory treatments) are proposed in areas with important wildlife habitat elements and on areas of low solar radiation, northerly and easterly slopes, and on lower slopes in all aspects. Leave tree spacing will average 15 feet. Leave trees will be retained in mosaic pattern, incorporating clumps of at least ¼ acre in size which will be interspersed throughout areas proposed for modified understory WUI and roadside fuels treatments; leave trees will cover 10 to 20 percent of the areas. Preference for retention will be hardwoods located away from areas identified as strategic for fuels reduction (e.g. future locations to hold fireline for planned or unplanned fire within the project area).

Table 2-19: Alternative 2 Modified fuels treatment acres by treatment type.

Fuels Treatment Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Wildland Urban Interface	610	1,200	410	2,220
Fuels Management Zones	950	3,020	920	4,890
Roadside Fuels Treatments	610	3,010	810	4,420
Prescribed Burn	0	1,560	9,210	10,770
Grand Total (acres)	2,170	8,790	11,350	22,300

Site Preparation, Reforestation, and Release

Site preparation, reforestation, and release as described in Alternative 2 will be implemented on 7,860 acres of plantations and natural units (units that will not be salvage harvested), and in 7,070 acres of salvage harvest using refined acreage based on mortality between October 2014 and July 2015. Only the areas actually salvage harvested will be site prepared and planted, not the entire units. Total acres to be site prepared and planted were adjusted based on the amount of salvage harvest acres removed from treatment for this alternative. Where salvage acres were dropped, site preparation and planting is no longer proposed. For mastication and mechanical yarding units, with the exception of treatment on granitic and schist soil types (project design feature Watershed-9 in Table 2-42) the treatment has been modified to include slopes of up to 45 percent in Alternative 2 Modified.

Table 2-20: Acres of proposed site preparation, reforestation, and release for Alternative 2 Modified by treatment type

Site Preparation, Reforestation and Release Unit Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Plantations	1,160	5,040	610	6,810
Natural Units (Non-salvage Harvested)	620	400	30	1,050
Salvage Harvest Units	220	6,340	500	7,070
Total Acres	2,000	11,780	1,140	14,930

Hand Treatment in Riparian Reserves (about 60 acres[18])

Like Alternative 4, Alternative 2 Modified proposes hand treatment where Riparian Reserves overlap salvage units and existing plantations proposed for site preparation and planting in only the Happy Camp and Whites project areas. This alternative limits hand treatment within these units to the upper one-third of slopes of Riparian Reserves where they overlap site preparation and salvage units to achieve ground cover requirements and to allow for regeneration of vegetation. Within Riparian Reserves, the upper limit of dead tree removal was reduced from 16 to ten inches diameter at breast height. No planting is proposed in Riparian Reserves in this alternative.

Connected Actions

Road Access

Project access will require the use of Forest System roads, State and County Roads. Forest System roads will be maintained as needed for Alternative 2 Modified implementation as displayed in Table 2-21. There will be no roads added to the Forest System as a result of this project. About three miles of new temporary roads will be constructed. Alternative 2 Modified reduces the number of miles of temporary road on existing roadbeds to about seven miles, and the miles of temporary road on reopened decommissioned roads to less than six miles. All temporary roads, including those previously decommissioned, will be closed and hydrologically stabilized according the project design features at the completion of the project.

[18] Estimated acres were calculated using GIS and omitted RAVG class 1 and 2 (or areas with less than 50% mortality).

Table 2-21: Miles of road access for Alternative 2 Modified by type of road

Type of Road Access	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Forest System, County, and State	146	353	63	562
New Temporary	0	3.3	0.1	3.4
Temporary Road on Existing Roadbed	1.1	5.5	0.7	7.3
Temporary Road on Re-opened Decommissioned Road	0	5.6	0	5.6
Grand Total	147.1	367.5	63.8	578.3

Landings and Legacy Sites

Both landings and legacy site actions are as described in Alternative 2. Alternative 2 Modified is the same as Alternative 2 with the exception that fewer landing will be needed to implement this alternative.

Alternative 3 Modified

Alternative 3 Modified was developed during additional consultation with regulatory agencies, including U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Water Board, local tribes, and in response to comments. This alternative combined elements for action alternatives proposed in the draft EIS. Many of the actions proposed in the draft EIS benefited multiple resources; however, during the comment period members of the public stated that Alternatives 3 and 4 divided wildlife and watershed concerns when they could have been addressed in the same alternative. Alternative 3 Modified responds to these comments. It emphasizes the development of future late-successional habitat (see Appendix E), habitat connectivity, northern spotted owl habitat, additional snag retention areas, and retention of legacy components, while minimizing potential negative effects of treatment to watershed conditions.

Alternative 3 Modified was also developed by incorporating elements of both Alternative 5 and the Karuk Alternative to help restore fire to the landscape. This alternative proposes additional fuels treatments.

Salvage Harvest (about 5,760 treatment acres within 6,890 acres of units)

Alternative 3 Modified proposes salvage logging treatments on approximately 5,760 net acres, using the refined acreage based on mortality from October 2014 to July 2015, within about 6,890 gross acres of salvage units on Forest lands. Alternative 3 Modified was developed based on Alternative 3; both alternatives remove all salvage harvest acres from the Beaver project area. In addition to units dropped as part of Alternative 3, 830 of additional salvage units were dropped in the Happy Camp and the Whites project areas in Alternative 3 Modified. These changes were based on additional modifications identified during consultation with the U.S. Fish and Wildlife Service. Units were dropped as described in Alternative 3 and Alternative 2 Modified; additional units were dropped if they were no longer economically viable or to address public comments, as well as to address wildlife concerns identified during streamlined consultation with the U.S. Fish and Wildlife Service. These additional units were reevaluated by the Forest and removed from treatment if they did not contribute to the overall fuels strategy and if they were within northern spotted owl core areas classified as having high or moderate potential for owls to remain on site, reproduce, and contribute to the demographics of the population of the area. High or moderate owl cores are defined in the description of Alternative 3 in

this chapter. Acres within treatment areas were adjusted after units were dropped within each fire-related project area and additional corridors were added for habitat connectivity. Retention of large material (including snags and coarse woody debris) will be accomplished as described in Alternative 2.

Table 2-22: Acres of salvage harvest proposed in Alternative 3 Modified by logging systems.

Logging System	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
	Acres of Treatment[a] (within Unit)[b]			
Ground-based	0 (0)	480 (490)	40 (40)	520 (530)
Skyline	0 (0)	2,800 (3,200)	170 (210)	2,970 (3,410)
Helicopter	0 (0)	1,930 (2,520)	340 (440)	2,270 (2,960)
Total Treatment Acres (Unit)	**0 (0)**	**5,200 (6,210)**	**550 (680)**	**5,760 (6,890)**

[a] Treatments are estimated acres within units where more than 50 percent mortality occurred and where salvage activity is proposed. Treatment areas avoid hydrologic riparian reserves and areas where less than 50 percent mortality occurred.

[b] Units are larger than treatment areas because they include areas where no harvest will occur such as hydrologic riparian reserves and areas with less than 50 percent mortality that are within unit boundaries as well as salvage harvest acres.

Both acres of treatment and acres within units are estimates based on GIS and field data. Values are rounded to the nearest ten acres.

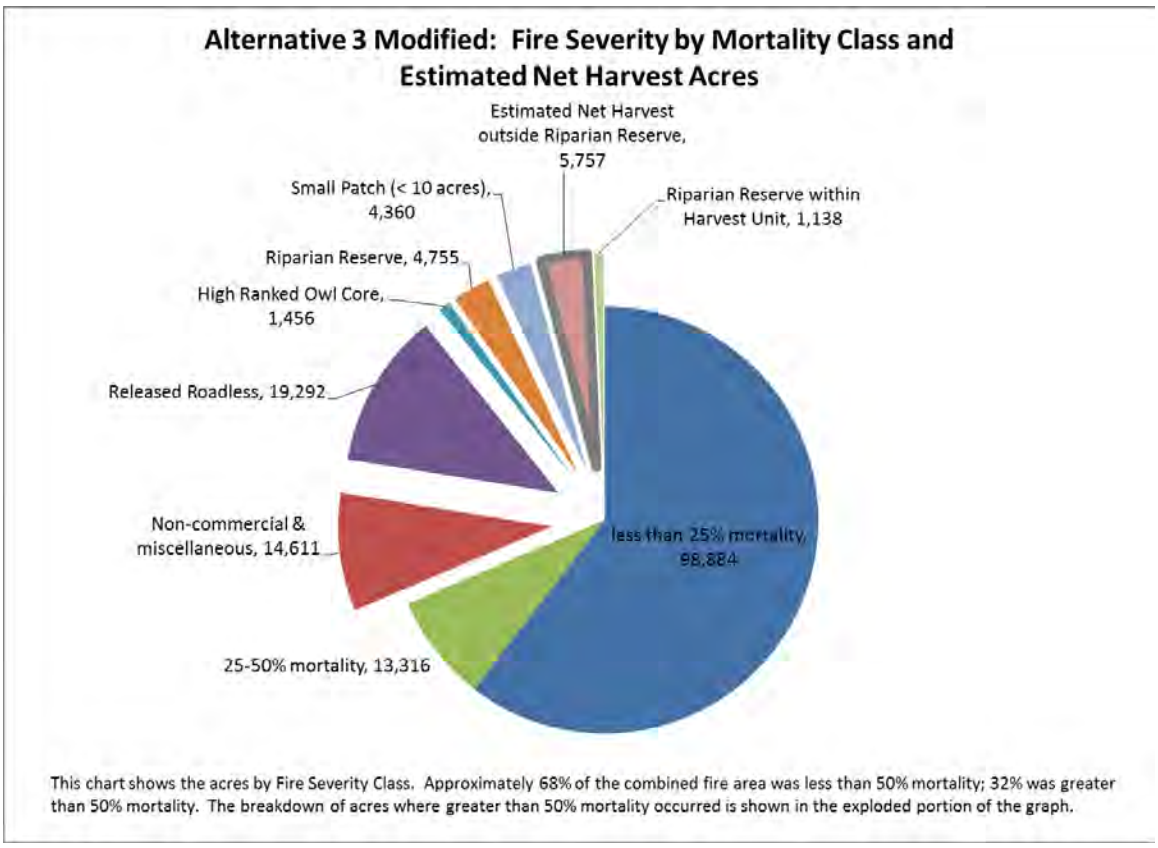

Figure 2-11: Fire Severity by Mortality Class and Estimated Net Harvest Alternative 3 Modified

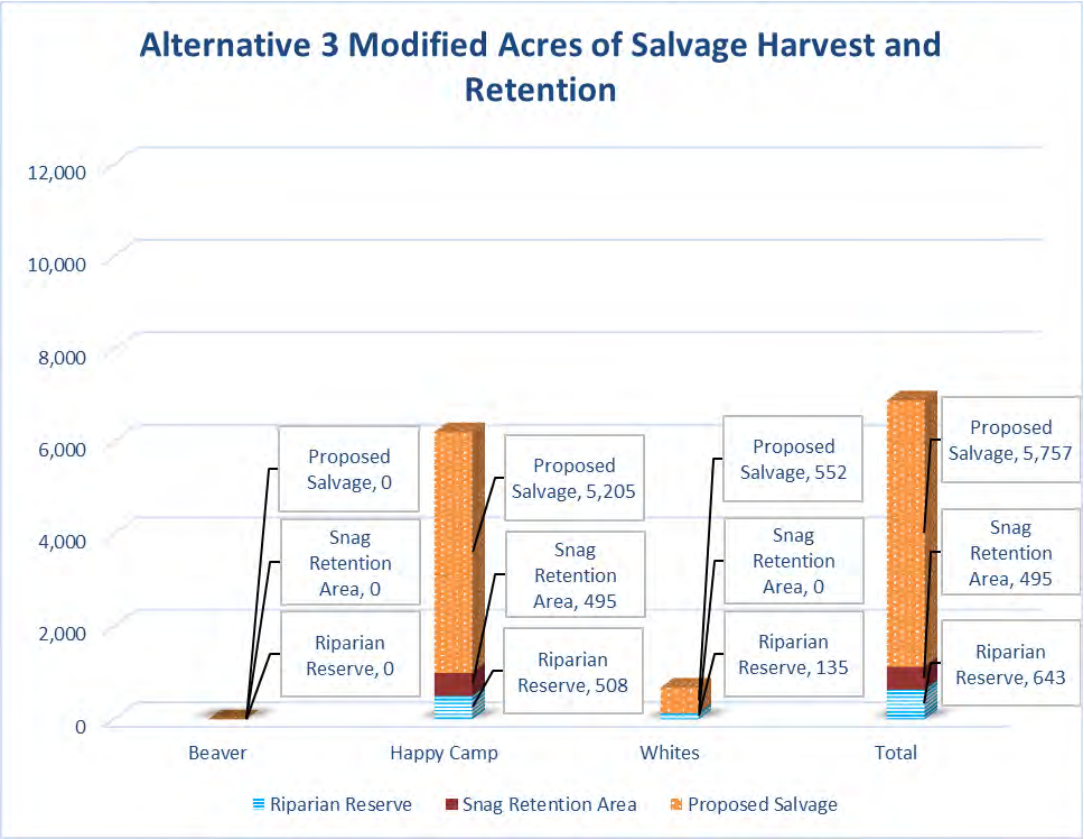

Figure 2-12: Acres of Salvage Harvest and Retention within Treatment Units in Alternative 3 Modified

Roadside Hazard Treatments (about 320 miles of roadways being evaluated; 4,168 acres of estimated treatment)

Same as Alternative 2 Modified, except additional field reconnaissance provided better information on where fire-killed roadside hazard trees would be removed. A total of about 320 miles of roads were removed from consideration for roadside hazard as compared to Alternative 2. The Forest deleted from roadside hazard removal any areas that were not directly affected by the 2014 fires, and no hazard tree removal is proposed adjacent to roads in need of substantial work to again be drivable. Hazard trees (also known as danger trees) outside fire affected areas will be removed if they are determined to be an imminent hazard.

Table 2-23: Miles of road by maintenance level along which roadside hazard will be treated in Alternative 3 Modified

Road Type by Maintenance Level	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Level 1 (basic custodial care, closed to public)	8.5	24.4	1.5	34.4
Level 2 (high clearance vehicles)	32.6	124.2	24.3	181.1
Level 3 (suitable for passenger cars)	3.8	60.5	16.6	80.9
Level 4 (moderate degree of user comfort)	0.1	0	0	0.1
Level 5 (high degree of user comfort)	0.6	0	0	0.6
County Roads and State Highways	2.5	5.4	12.2	20.0

Road Type by Maintenance Level	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Grand Total (miles)	48.0	214.6		317.2

The actual area where harvest will occur will not be known until on-the-ground hazard tree evaluations are completed. Mileages of treatment proposed are a maximum and the numbers are merely representative of the entire length and area being evaluated for hazard tree identification and removal. Acres used for analysis were calculated using all fire severity classes with a 200-foot buffer on either side of affected roads. GIS was used to narrow down the amount of acres of roadside hazard considered for hazard tree removal. As a result, the area actually treated by roadside hazard removal will likely be smaller than the estimated 14,322 acres. Fire severity and vegetation type data were used estimate the acres proposed for roadside hazard treatment. The vast majority of the trees proposed for harvest are found within the "concentrated areas" located within forested areas of high or moderate severity with generally larger blocks of tree mortality. Approximate acres of concentrated treatments were determined by including only forested areas (>10" in DBH) of moderate or high fire severity outside of salvage harvest units and plantations. Approximate acres of scattered treatments were determined by including only forested areas (>10" in DBH) of low or very low fire severity inside or outside of salvage harvest units. Within the 320 miles of roadways being evaluated, it is estimated that logging within roadside hazard treatments is proposed within a total of 4,168 acres, including 1,330 acres of "concentrated" treatment and 2,838 acres of "scattered" treatment.

Hazardous Fuels Treatments (about 24,450 acres)

In addition to modifying wildland urban interface (WUI) and roadside fuels treatments (roadside fuels) to "hot slope" or "cool slope" treatments as describe in Alternative 2 Modified, prescribed burns adjacent to private timberlands from Alternative 5 were incorporated into Alternative 3 Modified. Fuels treatments were also added on the south and west sides of section 32 in T47N R2W in the Beaver fire area. Since salvage harvest units 1129 and 1140 were dropped, fuels treatments were added in this section of the Beaver fire along private property boundaries. In addition to the additional fuel breaks in the Happy Camp and Whites fire areas, wildland urban interface, and roadside fuels treatments were added to this alternative based on some of the recommendations in the Karuk Alternative.

Table 2-24: Alternative 3 Modified fuels treatment acres by treatment type.

Fuels Treatment Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Wildland Urban Interface	630	1,460	550	2,630
Fuels Management Zones	1,530	2,620	780	4,930
Roadside Fuels Treatments	700	4,120	890	5,710
Prescribed Burn	450	1,540	9,190	11,180
Grand Total (acres)	3,310	9,740	11,410	24,450

Site Preparation, Reforestation, and Release (about 12,890 acres)

Site preparation and planting units were removed from Alternative 3 Modified to address public comments, economic feasibility, and wildlife concerns identified during consultation with the U.S. Fish and Wildlife Service. Units were removed (P199, P200,

P201, P341, P342, P343) where site preparation and planting boundaries overlapped existing or historic meadows; if meadows are identified during implementation in overlapping site preparation or salvage units, planting will not be implemented (project design feature Range-3 on Table 2-42). No skyline yarding will be used for treatment in plantation units proposed for site preparation and planting. Proposed treatment for units P087 and P091 are now proposed for site preparation by hand cutting and piling. Units still proposed for site preparation, reforestation, and release will be implemented as described in Alternative 2 within other plantations and natural units (units that are not salvage harvested), and on all salvage harvest acres.

In addition to the areas dropped from site preparation and planting, the total number of site preparation, reforestation, and release acres were also adjusted based on the number of salvage harvest acres proposed for treatment for this alternative. For mastication and mechanical yarding units, with the exception of treatment on granitic and schist soil types (project design feature Watershed-9 on Table 2-42) the treatment has been modified to include slopes of up to 45 percent in this alternative. Mastication and mechanical units will exclude equipment on granitic and schist soil types on slopes greater than 35 percent.

Table 2-25: Acres of proposed site preparation, reforestation, and release for Alternative 3 Modified by treatment type

Site Preparation, Reforestation and Release Unit Type	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Plantations	1,130	4,610	560	6,290
Natural Units (Non-salvage Harvested)	530	310	0	840
Salvage Harvest Units	0	5,200	550	5,760
Total Acres	1,660	10,120	1,110	12,890

Hand Treatment in Riparian Reserves (about 590 acres[19])

Like Alternative 2, this alternative proposes hand treatment only where Riparian Reserves overlap site preparation and planting in areas identified as plantations. Alternative 3 Modified proposes hand treatment in all fire areas, including the Beaver Fire area, where Riparian Reserves overlap site preparation units. Within Riparian Reserves, the upper limit of dead tree removal was reduced from 16 to ten inches diameter at breast height. After hand treatment (as described in Alternative 2) is complete, the need for planting will be evaluated and planting would occur only where necessary to re-establish conifers as a component of the Riparian Reserve. Live hardwoods would count towards stocking levels. Follow-up hand treatments are proposed to help facilitate growth of natural regeneration of hardwoods and conifer seedlings.

Connected Actions

Road Access

Project access will require the use of Forest System roads, State and County Roads. Forest System roads will be maintained as needed for Alternative 3 Modified

[19] Estimated acres were calculated using GIS and omitted RAVG class 1 and 2 (or areas with less than 50% mortality).

implementation as displayed in Table 2-13. There will be no roads added to the Forest System as a result of this project; about three miles of new temporary roads will be constructed. This alternative reduces the mileage of temporary roads on existing roadbeds that will be used for project access to less than five miles. All temporary roads associated with salvage in the Beaver project area were dropped due to dropping the associated salvage units. In the Beaver project area, there are no new temporary roads and no temporary road actions that involve stream crossings. About five miles of temporary roads on re-opened decommissioned roads are proposed for use. The decommissioned section of Forest Road 46N62 (also referred to as the "Caroline Creek Road") will remain closed. Sections of decommissioned road associated with dropped salvage units were also dropped; these include decommissioned sections of 45N56YA, 46N42Y, and 46N78 which will remain closed. All temporary roads, including those on previously decommissioned roads, will be closed and hydrologically stabilized according the project design features.

Table 2-26: Miles of road access for Alternative 3 Modified by Forest Transportation System maintenance level and temporary road access

Type of Road Access	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Forest System, County, and State	48	210	55	317
New Temporary	0	3.3	0	3.3
Temporary Road on Existing Roadbed	0	3.9	0.7	4.6
Temporary Road on Re-opened Decommissioned Road	0	4.8	0	4.8
Grand Total	48	222.0	55.7	329.7

Landings and Legacy Sites

Both landings and legacy site actions are as described in Alternative 2. Alternative 3 Modified is the same as Alternative 2 with the exception that fewer landing will be needed to implement this alternative.

Monitoring

As project actions are implemented, they are monitored by Forest Service personnel as part of normal operating procedures. Forest Service employees monitor timber marking of harvest units to ensure that prescriptions and marking guides are being followed. Forest Service sale administrators monitor the harvest to assure that Forest Plan standards and guidelines, best management practices, and project design features are being implemented. Seedling growth and quality are monitored and inspected in the nursery prior to planting trees. Contract inspectors will work with planting crews to ensure that planting prescriptions are followed and release methods are suitable for enhancing survival of seedlings. Subsequent surveys will be conducted to document seedling survival, stocking densities and species diversity within treatment areas. Areas that are planted will also be assessed for overall vigor, growth, amount (and species) of competing vegetation, and seedling damage.

As fuels treatments are implemented, projects are monitored as part of normal operating procedures. Prior to prescribed burning, burn plans are developed. Burn plans for prescribed fire require monitoring of the burning to ensure that project objectives are being achieved.

Project design features identified for wildlife species within the analysis will be monitored for effectiveness during implementation and assumptions made pertaining to effects to species will be verified. The U.S. Fish and Wildlife Service will continue involvement through the life of the project as part of the consultation process by providing recommendations for minimizing effects if new information becomes available through northern spotted owl monitoring and the application of protection measures. The U.S. Fish and Wildlife may have terms and conditions associated with the Biological Opinion that may require additional monitoring. Pre-implementation surveys for northern goshawk, peregrine falcon, and bald eagles have been completed and nests identified will be monitored throughout project implementation.

The Forest Noxious Weed Detection and Treatment Program will continue to monitor for new infestations of invasive plant species that may be introduced or spread throughout the project area and Forest lands. Project implementation monitoring will be conducted for both invasive species and Sensitive botanical species, where effectiveness of project design features, as implemented on the ground will be noted. The viability of Sensitive botanical populations will be assessed as part of this process. Results will be documented in the Forest annual monitoring reports.

Best Management Practices Evaluation Program monitoring will occur on a sample of the BMPs appropriate for this project which are listed in Appendix D. Because many project treatments do not occur within the same year, these treatments will be included in Best Management Practices Evaluation Program monitoring pools for up to a decade as needed. The Forest Sediment Monitoring Plan (USDA Forest Service 2013c) and Shade Monitoring Plan (USDA Forest Service 2011a) will be implemented for Total Maximum Daily Load compliance as displayed in the North Coast Region Basin Plan (North Coast Region Water Quality Control Board 2011). As described in the Fisheries Biological Assessment and Addendum, project hazard tree marking near streams that contain Coho salmon Critical Habitat has, and will continue to be, monitored by fisheries biologists from the Forest Service, National Marine Fisheries Service, and the Karuk Tribe. This monitoring will ensure that hazard trees in these near stream areas are marked according to EIS descriptions and project design features. As described in project design features, Forest Service fisheries biologists will be involved in decisions about where water drafting will occur. Information about where project water drafting is occurring, especially during June-September, will be shared and these activities may be monitored by Forest Service, National Marine Fisheries Service, or Karuk Tribe fisheries biologists.

Monitoring of at-risk historic properties and/or cultural resources during implementation may be conducted to ensure the effectiveness of resource protection measures pursuant to the Regional Programmatic Agreement and/or the Westside Fire Recovery Programmatic Agreement.

Monitoring to assess the implementation and effectiveness of project design features to meet soil Standard and Guidelines in the Forest Plan may occur in the Westside project. Field investigations of soil cover, soil compaction, and impacts to soil organic matter will occur on a minimum of five percent of activity areas forest-wide, as described in Chapter 5 of the Forest Plan. Units will be selected randomly from all activity areas across the Forest where soil disturbing activities take place; the Westside project will be included in the sampling pool for soil monitoring. Results will be documented in the Forest annual monitoring reports.

Comparison of Alternatives

Comparison Tables of Miles of Roads and Acres of Treatment

Table 2-27, Table 2-28, and Table 2-29 provide brief summaries of activities for each fire area by treatment acres proposed for each alternative analyzed in detail. Table 2-30 provided a summary of the activities for the project as a whole. See treatment maps in Appendix A for maps of each alternative. Comparison Tables of Effects Related to Purpose and Need

Table 2-31 shows a comparison of the effects related to economic aspect of the purpose and need for the entire project area. Table 2-32, Table 2-33, and Table 2-34 compare alternatives on how they address the purpose and need for each fire-related project area, and Table 2-37 compare alternatives in response to relevant issues. Comparison Tables of Effects by Resource

Table 2-38, Table 2-39, and Table 2-40 display a comparison of the environmental effects by fire area of each action alternative by resource. Table 2-41displays alternatives by treatments within various land allocations.

Comparison Tables of Miles of Roads and Acres of Treatment

Table 2-27: Comparison of miles of roads and acres of treatment in the Beaver Fire Area

Treatments in Beaver Fire Area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Net Salvage Acres[20]	**0**	**590**	**0**	**520**	**580**	**220**	**0**
Ground-based	0	420	0	380	420	140	0
Skyline	0	170	0	140	160	80	0
Helicopter	0	0	0	0	0	0	0
Gross Acres in Units[21]	**0**	**860**	**0**	**750**	**830**	**340**	**0**
Ground-based	0	660	0	600	660	230	0
Skyline	0	200	0	160	170	110	0
Helicopter	0	0	0	0	0	0	0
Roadside Hazard Treatments (miles/acres) Evaluated	**0**	**170 miles / maximum of 5,800 acres**	**170 miles / maximum of 5,800 acres**	**160 miles / maximum of 5,600 acres**	**170 miles / maximum of 5,800 acres**	**170 miles / maximum of 5,800 acres**	**50 miles / maximum of 2,190 acres**
Hazardous Fuel Treatments (acres)	**0**	**2,090**	**2,090**	**2,090**	**3,300**	**2,170**	**3,300**
Wildland Urban Interface	0	610	610	610	610	610	630
Fuels Management Zones	0	870	870	870	2,080	950	1,530
Roadside Fuels	0	610	610	610	610	610	700
Prescribed Burn	0	0	0	0	0	0	450
Site Preparation, Reforestation and Release Treatments (acres)	**0**	**Not including salvage=1,780 Including=2,370**	**Not including salvage=1,780 Including=1,780**	**Not including salvage=1,780 Including=2,300**	**Not including salvage=1,770 Including=2,350**	**Not including salvage=1,780 Including=2,000**	**Not including salvage=1,660 Including=1,660**
Site Prepare/reforest	0	2,370	1,780	2,300	2,350	2,000	1,660
Plantations	0	1,160	1,160	1,160	1,150	1,160	1,130
Natural Units	0	620	620	620	620	620	530
Within salvage harvest	0	590	0	520	580	220	0

[20] Net acres do not include acreage in stream-course Riparian Reserves or in areas that burned with less than 50% mortality of vegetation. Between draft EIS and final EIS, it was determined that mortality increased so these figures reflect increased mortality.

[21] Gross acres include all acres within the unit boundaries whether they will be harvested or not.

Treatments in Beaver Fire Area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Riparian Reserves Hand Treatment	**0**	**0**	**0**	**0**	**0**	**0**	**90**
Road Access (miles)	**0**	**149**	**148**	**146**	**149**	**147**	**48**
Forest System Roads, County Roads and State Highways	0	146	146	146	146	146	48
New Temporary Roads	0	0	0	0	0	0	0
Temporary Roads on Existing Roadbeds	0	2.8	1.5	0.3	2.8	1.1	0
Temporary Roads on Reopened Decommissioned Roads	0	0	0	0	0	0	0

Table 2-28: Comparison of miles of roads and acres of treatment in the Happy Camp Fire Area

Treatments in Happy Camp Fire Area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Net Salvage Acres[22]	**0**	**6,790**	**6,130**	**5,830**	**1,750**	**6,340**	**5,200**
Ground-based	0	410	340	360	140	370	480
Skyline	0	3,380	3,060	2,400	570	3,090	2,800
Helicopter	0	3,000	2,730	3,070	1,040	2,880	1,930
Gross Acres in Units[23]	**0**	**9,390**	**8,360**	**8,100**	**2,440**	**8,650**	**6,210**
Ground-based	0	670	550	600	230	600	490
Skyline	0	4,670	4,170	3,330	800	4,220	3,200
Helicopter	0	4,050	3,640	4,170	1,410	3,840	2,520
Roadside Hazard Treatments (miles/acres) Evaluated	**0**	**400 miles / maximum of 14,000 acres**	**400 miles / maximum of 14,000 acres**	**390 miles / maximum of 13,600 acres**	**400 miles / maximum of 14,000 acres**	**400 miles / maximum of 14,000 acres**	**215 miles / maximum of 9,730 acres**
Hazardous Fuel Treatments (acres)	**0**	**8,790**	**8,790**	**8,790**	**8,790**	**8,790**	**9,740**
Wildland Urban Interface	0	1,200	1,200	1,200	1,200	1,200	1,460

[22] Net acres do not include acreage in stream-course Riparian Reserves or in areas that burned with less than 50% mortality of vegetation. Between draft EIS and final EIS, it was determined that mortality increased so these figures reflect increased mortality.

[23] Gross acres include all acres within the unit boundaries whether they will be harvested or not.

Treatments in Happy Camp Fire Area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Fuels Management Zones	0	3,020	3,020	3,020	3,020	3,020	2,620
Roadside Fuels Treatments	0	3,010	3,010	3,010	3,010	3,010	4,120
Prescribed Burn	0	1,560	1,560	1,560	1,560	1,560	1,540
Site Preparation, Reforestation and Release Treatments (acres)	**0**	**Not including salvage=5,440 Including=12,230**	**Not including salvage=5,440 Including=11,570**	**Not including salvage=5,440 Including=11,270**	**Not including salvage=2,080 Including=3,830**	**Not including salvage=5,440 Including=11,780**	**Not including salvage=4,920 Including=10,120**
Site Prepare/reforest	0	12,230	11,570	11,270	3,830	11,780	10,120
Plantations	0	5,040	5,040	5,040	1,960	5,040	4,610
Within natural units	0	400	400	400	120	400	310
Within salvage units	0	6,790	6,130	5,830	1,750	6,340	5,200
Riparian Reserve Hand Treatment	**0**	**320**	**0**	**1,770**	**0**	**50**	**480**
Road Access (miles)	**0**	**371**	**370**	**356**	**357**	**367**	**226**
Forest System Roads, County Roads and State Highways	0	353	353	353	353	353	210
New Temporary Roads	0	3.5	3.4	1.1	0.8	3.3	3.3
Temporary Roads on Existing Roadbeds	0	5.8	4.6	1.3	1.7	5.5	3.9
Temporary Roads on Reopened Decommissioned Roads	0	9.0	8.6	0.4	1.5	5.6	4.8

Table 2-29: Comparison of miles of roads and acres of treatment in the Whites Fire Area

Treatments in Whites Fire Area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Net Salvage Acres[24]	**0**	**560**	**460**	**560**	**30**	**500**	**550**
Ground-based	0	20	20	20	0	20	40
Skyline	0	180	150	180	0	160	170

[24] Net acres do not include acreage in stream-course Riparian Reserves or in areas that burned with less than 50% mortality of vegetation. Between draft EIS and final EIS, it was determined that mortality increased so these figures reflect increased mortality.

Treatments in Whites Fire Area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Helicopter	0	360	290	360	30	320	340
Gross Acres in Units[25]	**0**	**850**	**680**	**850**	**70**	**740**	**680**
Ground-based	0	40	40	40	20	40	40
Skyline	0	270	220	270	0	240	210
Helicopter	0	540	420	540	60	460	440
Roadside Hazard Treatments (miles/acres) Evaluated	**0**	**80 miles / maximum of 2,700 acres**	**80 miles / maximum of 2,700 acres**	**70 miles / maximum of 2,500 acres**	**80 miles / maximum of 2,700 acres**	**80 miles / maximum of 2,700 acres**	**55 miles / maximum of 2,400 acres**
Hazardous Fuel Treatments (acres)	0	11,350	11,350	11,350	11,350	11,350	11,400
Wildland Urban Interface	0	410	410	410	410	410	550
Fuels Management Zones	0	920	920	920	920	920	780
Roadside Fuels	0	810	810	810	810	810	890
Prescribed Burn	0	9,210	9,210	9,210	9,210	9,210	9,190
Site Preparation, Reforestation and Release Treatments (acres)	**0**	**Not including salvage=640 Including=1,200**	**Not including salvage=640 Including=1,100**	**Not including salvage=640 Including=1,200**	**Not including salvage=0 Including=30**	**Not including salvage=640 Including=1,140**	**Not including salvage=560 Including=1,110**
Site Prepare/reforest		1,200	1,100	1,200	30	1,140	1,110
Plantations	0	610	610	610	0	610	560
Natural Units	0	30	30	30	0	30	0
Salvage Harvest	0	560	460	560	30	500	550
Riparian Reserve Hand Treatment	**0**	**50**	**0**	**60**	**0**	**10**	**20**
Road Access (miles)	**0**	**64**	**64**	**64**	**63**	**64**	**55**
Forest System Roads, County Roads and State Highways	0	63	63	63	63	63	55
New Temporary Roads	0	0.1	0.1	0.1	0	0.1	0
Temporary Roads on Existing Roadbeds	0	0.7	0.7	0.6	0	0.7	0.7

[25] Gross acres include all acres within the unit boundaries whether they will be harvested or not.

Treatments in Whites Fire Area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Temporary Roads on Reopened Decommissioned Roads	0	0	0	0	0	0	0

Table 2-30: Comparison of total miles of roads and acres of treatment in all Westside Fire Recovery Project Areas

Treatments in the Westside project area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Net Salvage Acres[26]	**0**	**7,940**	**6,590**	**6,910**	**2,360**	**7,070**	**5,760**
Ground-based	0	850	370	760	560	530	520
Skyline	0	3,680	3,210	2,670	690	3,320	2,970
Helicopter	0	3,410	3,010	3,480	1,110	3,220	2,270
Gross Acres in Units[27]	**0**	**11,090**	**9,040**	**9,700**	**3,340**	**9,720**	**6,890**
Ground-based	0	1,370	590	1,240	910	870	530
Skyline	0	5,140	4,400	3,750	970	4,560	3,410
Helicopter	0	4,580	4,050	4,710	1,470	4,300	2,960
Roadside Hazard Treatments (miles/acres) Evaluated	**0**	**640 miles / maximum of 20,500 acres**	**640 miles / maximum of 20,500 acres**	**620 miles / maximum of 19,580 acres**	**640 miles/ maximum of 20,500 acres**	**640 miles/ maximum of 20,500 acres**	**320 miles / maximum of 14,320 acres**
Hazardous Fuel Treatments (acres)	0	22,220	22,220	22,220	23,430	22,300	24,450
Wildland Urban Interface	0	2,220	2,220	2,220	2,220	2,220	2,630
Fuels Management Zones	0	4,810	4,810	4,810	6,020	4,890	4,930
Roadside Fuels	0	4,420	4,420	4,420	4,420	4,420	5,710
Prescribed Burn	0	10,770	10,770	10,770	10,770	10,770	11,180
Site Preparation, Reforestation and Release Treatments (acres)	**0**	**Not including salvage=7,860 Including=15,800**	**Not including salvage=7,860 Including=14,450**	**Not including salvage=7,860 Including=14,770**	**Not including salvage=3,850 Including=6,210**	**Not including salvage=7,860 Including=14,930**	**Not including salvage=7,130 Including=12,890**

[26] Net acres do not include acreage in stream-course Riparian Reserves or in areas that burned with less than 50% mortality of vegetation. Between draft EIS and final EIS, it was determined that mortality increased so these figures reflect increased mortality.
[27] Gross acres include all acres within the unit boundaries whether they will be harvested or not.

Treatments in the Westside project area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Site Prepare/reforest		15,800	14,450	14,770	6,210	14,930	12,891
Plantations	0	6,810	6,810	6,810	3,110	6,810	6,290
Natural Units	0	1,050	1,050	1,050	740	1,050	840
Within salvage acres		7,940	6,590	6,910	2,360	7,070	5,760
Riparian Reserve Hand Treatment	**0**	**370**	**0**	**1,830**	**0**	**60**	**590**
Road Access (miles)	**0**	**584**	**582**	**565**	**569**	**578**	**330**
Forest System Roads, County Roads and State Highways	0	562	562	562	562	562	317
New Temporary Roads	0	3.6	3.5	1.2	0.8	3.4	3.3
Temporary Roads on Existing Roadbeds	0	9.3	6.8	2.2	4.4	7.3	4.6
Temporary Roads on Reopened Decommissioned Roads	0	9.0	8.6	0.4	1.5	5.6	4.8

Comparison Tables of Effects Related to Purpose and Need

Table 2-31: Comparison of alternative effects related to economic aspect of the purpose and need for the entire project area.

Meeting Purpose and Need	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Capture the economic value of snags and hazard trees for a viable project and benefit to local communities	Timber sale income (in millions of dollars)	$0	$210	$185	$189	$84	$179	$153
	Labor income (in millions of dollars)	$0	$53	$47	$47	$22	$46	$38
	Employment (jobs)	0	1,236	1,067	1,074	549	1,076	887

Table 2-32: Comparison of alternative effects related to the public safety, fire suppression and fire-resilient ecosystem aspects of purpose and need of the project for Beaver Fire area.

Meeting Purpose and Need	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified

Meeting Purpose and Need	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Provide for worker and public safety and access	Miles and acres of roadside hazard treatment	0 0	170 miles 5,800 acres	170 miles 5,800 acres	160 miles 5,600 acres	170 miles 5,800 acres	170 miles 5,800 acres	48 miles 2,190 acres
	Acres of fuels reduction treatment within WUI	0	610 acres	610 acres	610 acres	610 acres	610 acres	630 acres
	Acres where snags are removed by salvage and site preparation	0	590 acres salvage 1,780 acres of site preparation	0 acres salvage 1,780 acres of site preparation	520 acres salvage 1,780 acres of site preparation	580 acres salvage 1,770 acres of site preparation	220 acres of salvage 1,780 acres of site preparation	0 acres of salvage 1,660 acres of site preparation
Improve fire suppression conditions for firefighters and community protection	Acres of resistance to control improved (large fuels removed)	0	2,965 acres	2,105 acres	2,855 acres	4,135 acres	2,535 acres	2,930 acres
	Acres of fuel breaks, prescribed burning and other fuels treatments	0	2,090 acres	2,090 acres	2,090 acres	3,300 acres	2,170 acres	3,300 acres
Provide for restored and fire-resilient forested ecosystems	Acres treated to promote regeneration through salvage harvest	0	590 acres	0	520 acres	580 acres	220 acres	0
	Years to reach a mature stand in areas of salvage harvest	100+ years	40-60 years	40-60 years	40-60 years	40-60 years in matrix land; 100+ in non-matrix	40-60 years	40-60 years
	Type of vegetation regenerated in salvage harvest areas Short-term/ Long-term	Grass, forbs, brush. Brush, hardwoods, isolated parches of conifers	Brush, hardwoods, young conifers/ Mature mixed conifer stands	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2 within matrix lands; isolated conifers elsewhere	Same as Alternative 2	Same as Alternative 2
	Total acres where fuels are reduced by salvage, and fuels treatments	0	590 acres salvage 2,090 acres fuels treatments	0 acres salvage 2,090 acres fuels treatments	520 acres salvage 2,090 acres fuels treatment	580 acres salvage 3,300 acres fuels treatments	220 acres salvage 2,170 acres fuels treatments	0 acres salvage 3,300 acres fuels treatments

Table 2-33: Comparison of alternative effects related to the public safety, fire suppression and fire-resilient ecosystem aspects of the purpose and need of the project for Happy Camp Fire area.

Meeting Purpose and Need	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified

Meeting Purpose and Need	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Provide for worker and public safety and access	Miles and acres of roadside hazard treatment	0 0	400 miles 14,000 acres	400 miles 14,000 acres	390 miles 13,600 acres	400 miles 14,000 acres	400 miles 14,000 acres	215 miles 9,730 acres
	Acres of fuels reduction treatment within WUI	0	1,200 acres	1,200 acres	1,200 acres	1,200 acres	1,200 acres	1,460 acres
	Acres where snags are removed by salvage and site preparation	0	6,790 acres salvage 5,440 acres of site preparation	6,130 acres salvage 5,440 acres of site preparation	5,830 acres salvage 5,440 acres of site preparation	1,750 acres salvage 2,080 acres of site preparation	6,340 acres salvage 5,440 acres of site preparation	5,200 acres salvage 4,920 acres of site preparation
Improve fire suppression conditions for firefighters and community protection	Acres of resistance to control improved (large fuels removed)	0	16,715 acres	15,685 acres	15,425 acres	6,405 acres	15,975 acres	13,975 acres
	Acres of fuel breaks, prescribed burning and other fuels treatments	0	8,790 acres	8,790 acres	8,790 acres	8,790 acres	8,790 acres	9,740 acres
Provide for restored and fire-resilient forested ecosystems	Acres treated to promote regeneration through salvage harvest	0 acres	6,790 acres	6,130 acres	5,830 acres	1,750 acres	6,340 acres	5,200 acres
	Years to reach a mature stand in areas of salvage harvest	100+ years	40-60 years	40-60 years	40-60 years	40-60 years in matrix land; 100+ in non-matrix	40-60 years	40-60 years
	Type of vegetation regenerated in salvage harvest areas Short-term/ Long-term	Grass, forbs, brush. Brush, hardwoods, isolated parches of conifers	Brush, hardwoods, young conifers/ Mature mixed conifer stands	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2 within matrix lands; isolated conifers elsewhere	Same as Alternative 2	Same as Alternative 2
	Total acres where fuels are reduced by salvage, and fuels treatments	0	6,790acres salvage 8,790 acres fuels treatments	6,130 acres salvage 8,790 acres fuels treatments	5,830 acres salvage 8,790 acres fuels treatment	1,750 acres salvage 8,790 acres fuels treatments	6,340 acres salvage 8,790 acres fuels treatments	5,200 acres salvage 9,740 acres fuels treatments

Table 2-34: Comparison of alternative effects related to the public safety, fire suppression and fire-resilient ecosystem aspects of the purpose and need of the project for the Whites Fire area.

Meeting Purpose and Need	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified

Meeting Purpose and Need	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Provide for worker and public safety and access	Miles and acres of roadside hazard treatment	0 0	80 miles 2,700 acres	80 miles 2,700 acres	70 miles 2,500 acres	80 miles 2,700 acres	80 miles 2,700 acres	55 miles 2,400 acres
	Acres of fuels reduction treatment within WUI	0	410 acres	410 acres	410 acres	410 acres	410 acres	550 acres
	Acres where snags are removed by salvage and site preparation	0	560 acres salvage 640 acres site preparation	640 acres salvage 640 acres site preparation	640 acres salvage 640 acres site preparation	30 acres salvage 0 acres site preparation	500 acres salvage 640 acres site preparation	550 acres salvage 560 acres site preparation
Improve fire suppression conditions for firefighters and community protection	Acres of resistance to control improved (large fuels removed)	0	9,090 acres	8,930 acres	9,090 acres	7,680 acres	8,980 acres	8,905 acres
	Acres of fuel breaks, prescribed burning and other fuels treatments	0	11,350 acres	11,350 acres	11,350 acres	11,350 acres	11,350 acres	11,340 acres
Provide for restored and fire-resilient forested ecosystems	Acres treated to promote regeneration through salvage harvest	0	560 acres	460 acres	560 acres	30 acres	500 acres	550 acres
	Years to reach a mature stand in areas of salvage harvest	100+ years	40-60 years	40-60 years	40-60 years	40-60 years in matrix land; 100+ in non-matrix	40-60 years	40-60 years
	Type of vegetation regenerated in salvage harvest areas Short-term/ Long-term	Grass, forbs, brush. Brush, hardwoods, isolated parches of conifers	Brush, hardwoods, young conifers. Mature mixed conifer stands	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2 within matrix lands; isolated conifers elsewhere	Same as Alternative 2	Same as Alternative 2
	Total acres where fuels are reduced by salvage, and fuels treatments	0	560 acres salvage, 11,350 acres fuels treatments	460 acres salvage 11,350 acres fuels treatments	560 acres salvage, 11,350 acres fuels treatment	30 acres salvage 11,350 acres fuels treatments	500 acres salvage 11,350 acres fuels treatments	550 acres salvage 11,400 acres fuels treatments

Comparison Tables of Alternative Indicators by Relevant Issue

Table 2-35: Comparison of alternative indicators by relevant issue for the Beaver Fire area.

Issue	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Relevant Issue 1: Effects of salvage logging on wildlife habitat	Acres of salvage logging on terrestrial indicators in Chapter 3, Wildlife	0	See Comparison Tables of Effects by Resource Table 2-38	See Comparison Tables of Effects by Resource Table 2-38	See Comparison Tables of Effects by Resource Table 2-38	See Comparison Tables of Effects by Resource Table 2-38	See Comparison Tables of Effects by Resource Table 2-38	See Comparison Tables of Effects by Resource Table 2-38
Relevant Issue 2: Effects of salvage logging and required infrastructure on watershed health	Analysis indicators for watersheds in Chapter 3, Hydrology	0	See Comparison Tables of Effects by Resource Table 2-38	See Comparison Tables of Effects by Resource Table 2-38	See Comparison Tables of Effects by Resource Table 2-38	See Comparison Tables of Effects by Resource Table 2-38	See Comparison Tables of Effects by Resource Table 2-38	See Comparison Tables of Effects by Resource Table 2-38
Relevant Issue 3: Effects of salvage logging and site preparation on late successional reserves (LSRs), riparian reserves (RRs) and inventoried roadless areas (IRAs)	Acres of salvage logging in LSRs	0	20	0	20	0	20	0
	Acres of site preparation in LSRs	0	20	20	20	0	20	20
	Acres of salvage logging in hydrologic Riparian Reserves	0	0	0	0	0	0	0
	Acres of site preparation in hydrologic Riparian Reserves	0	0	0	0	0	0	0
	Acres of salvage logging in IRAs	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)
	Acres of site preparation in parts of IRAs that retain roadless character	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)	N/A (no IRAs in Beaver)
Relevant Issue 4: Adequate fuels treatments adjacent to private timberlands in the Beaver Fire area	Acres of fuels treatments adjacent to private timberlands in the Beaver Fire area	0	870	870	870	2,080	870	2,080

Table 2-36: Comparison of alternative indicators by relevant issue for the Happy Camp Fire area.

Issue	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Relevant Issue 1: Effects of salvage logging on wildlife habitat	Acres of salvage logging on terrestrial indicators in Chapter.3, Wildlife	0	See Table 2-39	See Table 2-39	See Table 2-39	See Table 2-39	See Table 2-39	See Table 2-39
Relevant Issue 2: Effects of salvage logging and required infrastructure on watershed health	Analysis indicators for watersheds in Chapter 3, Hydrology	0	See Table 2-39	See Table 2-39	See Table 2-39	See Table 2-39	See Table 2-39	See Table 2-39
Relevant Issue 3: Effects of salvage logging and site preparation on late successional reserves (LSRs), riparian reserves (RRs) and inventoried roadless areas (IRAs)	Acres of salvage logging in LSRs	0	4,880	4,470	4,070	0	4,590	3,370
	Acres of site preparation in LSRs	0	3,200	3,200	3,200	0	3,200	2,920
	Acres of salvage logging in hydrologic RRs	0	0	0	0	0	0	0
	Acres of site preparation in hydrologic RRs	0	330	0	1,770	0	50	480
	Acres of salvage logging in IRAs	0	0	0	0	0	0	0
	Acres of site preparation in parts of IRAs that retain roadless character	0	120	120	120	0	120	120

Table 2-37: Comparison of alternative indicators by relevant issue for the Whites Fire area

Issue	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alt 2 Mod	Alt 3 Mod
Relevant Issue 1: Effects of salvage logging on wildlife habitat	Acres of salvage logging on terrestrial indicators in Chapter 3, Wildlife	0	See Table 2-40	See Table 2-40	See Table 2-40	See Table 2-40	See Table 2-40	See Table 2-40
Relevant Issue 2: Effects of salvage logging and required infrastructure on watershed health	Analysis indicators for watersheds in Chapter 3, Hydrology	0	See Table 2-40	See Table 2-40	See Table 2-40	See Table 2-40	See Table 2-40	See Table 2-40
Relevant Issue 3: Effects of salvage	Acres of salvage logging in LSRs	0	490	430	490	0	450	500

Issue	Measurement Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alt 2 Mod	Alt 3 Mod
logging and site preparation on late successional reserves (LSRs), riparian reserves (RRs) and inventoried roadless areas (IRAs)	Acres of site preparation in LSRs	0	640	640	640	0	640	560
	Acres of salvage logging in hydrologic RRs	0	0	0	0	0	0	0
	Acres of site preparation in hydrologic RRs	0	20	0	160	0	0	20
	Acres of salvage logging in IRAs	0	0	0	0	0	0	0
	Acres of site preparation in parts of IRAs that retain roadless character	0	40	40	40	0	40	40

Comparison Tables of Effects by Resource

Table 2-38: Comparison of effects of all alternatives by resource for the Beaver Fire area.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Vegetation	Natural regeneration on 7,050 acres of moderate- to high- severity vegetation burn. Regenerates as brush, hardwoods and isolated patches of conifers in the long term; meets the National Forest Management Act (NFMA) requirement by meeting Forest Plan standards.	Natural regeneration on about 4,680 acres of moderate- to high-severity vegetation burn; 2,370 acres (34%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards.	Natural regeneration on about 5,270 acres of moderate- to high-severity vegetation burn; 1,780 acres (25%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 4,750 acres of moderate- to high-severity vegetation burn; 2,300 acres (33%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 4,700 acres of moderate- to high-severity vegetation burn; 2,350 acres (33%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 5,050 acres of moderate- to high-severity vegetation burn; 2,000 acres (28%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 5,390 acres of moderate- to high-severity vegetation burn; 1,660 acres (24%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards
Fuels	There will be 1,765 acres meeting desired condition for fire and fuels resources.	There will be 4,730 acres meeting desired condition for fire and fuels resources.	There will be 3,870 acres meeting desired condition for fire and fuels resources.	There will be 4,620 acres meeting desired condition for fire and fuels resources.	There will be 5,900 acres meeting desired condition for fire and fuels resources.	There will be 4,300 acres meeting desired condition for fire and fuels resources.	There will be 4,695 acres meeting desired condition for fire and fuels resources.
Wildlife: Northern Spotted Owl	There are six, eight, seven activity centers that have low, moderate and high risk to reproduction. 59% and 78% of the critical habitat subunits KLE6 and KLE7 in the project area respectively contain suitable habitat.	The effects on the activity center's risk to reproduction are not changed from Alternative 1. 58% and 78% of the critical habitat subunits KLE6 and KLE7 in the project area respectively contain suitable habitat.	The effects on the activity center's risk to reproduction are not changed from Alternative 1. 59% and 78% of the critical habitat subunits KLE6 and KLE7 in the project area respectively contain suitable habitat.	The effects to activity center's risk to reproduction and changes to critical habitat are the same as for Alternative 2.	The effects to activity center's risk to reproduction and changes to critical habitat are the same as for Alternative 2.	The effects to activity center's risk to reproduction and changes to critical habitat are the same as for Alternative 2.	The effects to activity center's risk to reproduction and changes to critical habitat are the same as for Alternative 2.
Wildlife: Bald Eagle	There is one Bald Eagle nest and it has a low risk to disturbance and risk to potential nest trees.	The risk of disturbance will be low for all three nest sites as a result of project design features. The risk to potential nest trees remains low.	The effects are the same as Alternative 2.	The effects are the same as Alternative 2	The effects are the same as Alternative 2	The effects are the same as Alternative 2	The effects are the same as Alternative 2
Wildlife: Northern Goshawk	There are three potentially occupied territories. Two have a high risk to reproduction and one has a moderate risk to reproduction.	The level of disturbance is low as a result of project design features. The risk to reproduction is the same as for Alternative 1.	Level of disturbance is the same as Alternative 2.	Level of disturbance is the same as Alternative 2.	Level of disturbance is the same as Alternative 2.	Level of disturbance is the same as Alternative 2.	Level of disturbance is the same as Alternative 2.
Wildlife: Fisher, Marten and Wolverine	There are seven, five and one watersheds with moderate, low and very low connectivity respectively. Four of the thirteen watersheds meet the home range potential criteria.	There will be four, six, and three watersheds with moderate, low and very low connectivity. The watersheds meeting the home range potential criteria are the same as for Alternative 1.	The effects are the same as for Alternative 2.	The effects are the same as Alternative 2	The effects are the same as Alternative 2	The effects are the same as Alternative 2	The effects are the same as Alternative 2
Wildlife: Pallid Bat, Townsend Big-eared Bat, Fringed myotis, Willow Flycatcher, Siskiyou Salamander, Tehama Chaparral Snail and Western Bumble Bee (Sensitive Species)	There are no potential hibernacula/ maternities that will be affected. There is no Siskiyou Mountain Salamander habitat in the fire area. There will be no Tehama Chaparral Snail habitat affected. There will be no Western Bumble Bee habitat affected.	There are seven and five potential hibernacula that have a moderate and high risk of disturbance respectively. Nine watersheds will have a low level of willow flycatcher habitat alteration. The likelihood of dispersal for the Tehama Chaparral Snail is high. One watershed will have a high level of disturbance to Western Bumble Bee habitat.	The effects for all of the species are the same as for Alternative 2.	The effects for all of the species are the same as for Alternative 2.	The effects for all of the species are the same as for Alternative 2.	The effects for all of the species are the same as for Alternative 2.	The effects for all of the species are the same as for Alternative 2.
Wildlife: Management Indicator Species	There are 23,400 acres of snag habitat and 4,250 acres of hardwood habitat in the fire area.	There will be about 9% of the snag habitat affected and 5% of the hardwood habitat affected.	There will be about 8% of the snag habitat affected and 5% of the hardwood habitat affected.	There will be about 8% of the snag habitat affected and 4% of the hardwood habitat affected.	The effects are the same as for Alternative 4.	The effects are the same as for Alternative 4.	There will be about 5% of the snag habitat affected and 2% of the hardwood habitat affected.
Range	There would be no effect on the availability of forage and a neutral effect on rangeland condition.	The availability of forage would increase; there will be a neutral effect on rangeland condition.	Same as Alternative 2.	Same as Alternative 2.	The availability of forage would increase less than with other action alternatives; there will be a neutral effect on rangeland condition.	There would be a small increase in the availability of forage; there will be a neutral effect on rangeland condition.	There would be a small increase in the availability of forage; there will be a neutral effect on rangeland condition.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Botany: Threatened, Endangered, and Proposed or Candidate Species	No likelihood of jeopardizing continued existence	No likelihood of jeopardizing continued existence	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Botany: Forest Service Sensitive Species	Static trend, no known populations present	Static trend, no known populations present	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Botany: Survey and Manage Species	Compliant	Compliant following implementation of PDF's	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Botany: Non-native Invasive Species	High	High	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Fish and other Aquatic Species : Indirect Effects- Sediment		Includes temporary road actions in Doggett Creek and Beaver Creek resulting in temporary site-scale impacts and long term benefits from fixing sediment sources. Over-all, discountable negative effects (due to dispersed disturbance, replanting and PDFs).	Near stream temporary road actions, and effects would be the same as for Alternative 2. Discountable negative effects.	No near stream temporary road actions proposed. Negative short term impacts (and long term benefits from addressing existing legacy sediment sites) in Doggett and Buckhorn-Beaver creeks would not occur. Discountable negative effects reduced.	Near stream temporary road actions and effects would be the same as for Alt. 2. Discountable negative effects.	1.7 miles of temp road dropped (includes all near-stream temp roads and temp roads w/ crossings), 3 landings dropped. No benefits from addressing existing legacy sediment sites on temp roads. Discountable negative effects reduced.	All temp roads and landings dropped. RR hand treatments in site prep units added; these actions would have neutral short term effects and beneficial long term effects to watershed condition.
Fish and other Aquatic Species : Indirect Effects- Temperature		Shade in RRs protected by PDFs which minimize effects of roadside hazard, temp road and landing, and fuels treatments resulting in discountable negative effects. Sedimentation can affect temps – see above for sediment impacts.	Same as Alternative 2	Slightly less potential effect of roadside hazard removal where it is reduced in extent.	Near stream temporary road actions and effects would be the same as for Alt. 2. Discountable negative effects.	Same as Alternative 2	Reduced effects from roadside hazard removal where it is reduced in extent. Also, effects are reduced because live hazard trees will not be felled.
Fish and other Aquatic Species : Indirect Effects – Large Wood		Project design features ensure retention of large wood within near stream areas for hazard tree removal and temp road actions. Discountable negative effects.	Effects would be the same as Alt. 2.	Slightly less potential effect of roadside hazard removal where it is reduced in extent, and where temp road actions are dropped (Doggett Cr and face drain to Beaver Cr).	Effects would be the same as Alt. 2.	Effects would be the same as Alt. 2.	Less potential effect of hazard tree removal where it is reduced in extent.
Fish and other Aquatic Species : Direct effects to Salmon and Steelhead		Direct effects will be minimized through designation of acceptable sites (PDF watershed-34) and use of NMFS (2001) water drafting specifications. Direct effects would be discountable and minor to anadromous fish.	Effects would be the same as Alt. 2.	Effects would be the same as Alt. 2.	Discountable negative effects would be reduced due to substantially reduced ground disturbing actions and therefore need for water drafting.	Effects would be the same as Alt. 2.	Because all salvage, temporary roads and landings have been dropped there will be less need for water drafting therefore potential effects to aquatic resources are reduced.
Fish and other Aquatic Species : Direct effects to Resident Trout		Direct effects will be minimized through designation of acceptable sites and use of PDFs and BMPs for water drafting. Direct effects would be discountable and minor to trout.	Effects would be the same as Alt. 2.	Effects would be the same as Alt. 2.	Effects would be the same as Alt. 2.	Effects would be the same as Alt. 2.	Because all salvage, temporary roads and landings have been dropped there will be less need for water drafting therefore potential effects to aquatic resources are reduced.
Fish and other Aquatic Species : Direct effects to Other Aquatic Species		Direct effects will be minimized through designation of acceptable sites (PDF watershed-34) and implementation of BMPs for water drafting. Direct effects would be discountable and minor to aquatic species.	Effects would be the same as Alt. 2.	Discountable negative effects would be reduced where near stream temporary road and crossing work are dropped (Doggett Cr and face drain to Beaver Cr).	Effects would be the same as Alt. 2.	Effects would be the same as Alt. 4.	Because all salvage, temporary roads and landings have been dropped there will be less need for water drafting therefore potential effects to aquatic resources are reduced.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Soils	The erosion hazard ratings remain high on 30 acres in the analysis area which does not meet desired condition for soil stability. There is a high volume of standing dead that will contribute to large woody debris and all acres meet desired condition. Soil organic matter has been affected by the 2014 wildfires on 5 acres. Past timber harvests have resulted in 269 acres not meeting desired condition for soil structure.	Soil stability would be affected on about 2,049 acres, surface organic matter on 674 acres, soil organic matter on 383 acres and soil structure on 250 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 1,134 acres, surface organic matter on 143 acres, soil organic matter on 211 acres and soil structure on 109 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 1,366 acres, surface organic matter on 619 acres, soil organic matter on 374 acres and soil structure on 237 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 1,406 acres, surface organic matter on 673 acres, soil organic matter on 435 acres and soil structure on 260 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 1,219 acres, surface organic matter on 413 acres, soil organic matter on 247 acres and soil structure on 432 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 905 acres, surface organic matter on zero acres, soil organic matter on 333 acres and soil structure on 123 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.
Geology	There is no effect to landslide risk from the alternative. There are 13 watersheds in the project area with duration of elevated landslide risk of greater than 80 years. There will be no effect to cave resources or unique geologic features. There will be no disturbance of ultramafic bedrock.	There is no effect to landslide risk from this alternative. There will be 13 watersheds in the project area with duration of elevated risk of greater than 80 years. There are zero acres of new temporary road on ultramafic rock. There is a very low likelihood of effecting cave resources. There is no effect to unique geologic features.	The effects of the alternative are the same as for Alternative 2.	The effects of the alternative are the same as for Alternative 2.	The effects of the alternative are the same as for Alternative 2.	The effects of the alternative are the same as for Alternative 2.	The effects of the alternative are the same as for Alternative 2.
Air	There will be no nitrogen oxides, carbon dioxide or fugitive dust emissions.	There will be 5.4 tons per year of nitrogen oxide emission, 2,396 metric tons per year carbon dioxide equivalent emissions and 2 tons per year of fugitive dust from this alternative.	There will be 5.3 tons per year of nitrogen oxide emission, 2,106 metric tons per year carbon dioxide equivalent emissions and 2 tons per year of fugitive dust from this alternative.	There will be 5.4 tons per year of nitrogen oxide emission, 2,276 metric tons per year carbon dioxide equivalent emissions and 2 tons per year of fugitive dust from this alternative.	There will be 1.9 tons per year of nitrogen oxide emission, 2,158 metric tons per year carbon dioxide equivalent emissions and 1 tons per year of fugitive dust from this alternative.	There will be 5.4 tons per year of nitrogen oxide emission, 2,343 metric tons per year carbon dioxide equivalent emissions and 2 tons per year of fugitive dust from this alternative.	There will be 5.6 tons per year of nitrogen oxide emission, 3,746 metric tons per year carbon dioxide equivalent emissions and 2 tons per year of fugitive dust from this alternative.
Recreation	There would be no short-term adverse effects associated with project implementation. Increased short-term use of burn areas for firewood cutting and deer hunting. Direct long-term adverse effect to dispersed camping and hiking opportunities in burn areas from loss of shade. Increased short-term and long-term safety concerns from fallen snags. Increased maintenance costs for Forest infrastructure. No adverse effects to recreation settings from project implementation.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in one location.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in one location.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in one location.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in one location.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in one location.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in zero locations.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Scenery	There is no effect to Visual Quality Objectives. Long term adverse effect with permanent vegetation change away from a conifer-dominated vegetation type towards a shrub-dominated ecosystem. Achievement of the desired condition would be set back 50 plus years or more.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in one location. Although Visual Quality Objectives would not be met for some roadside hazard treatments in Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels Eight of the nine viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in one location. Although Visual Quality Objectives would not be met for some roadside hazard treatments in Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels Eight of the nine viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in one location. Although Visual Quality Objectives would not be met for some roadside hazard treatments in Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels Eight of the nine viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in one location. Although Visual Quality Objectives would not be met for some roadside hazard treatments in Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels Eight of the nine viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in one location. Although Visual Quality Objectives would not be met for some roadside hazard treatments in Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels. Eight of the nine viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. No indirect long term adverse effects from project activities. Visual Quality Objectives would be met for all viewsheds. Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels for all nine viewsheds.
Wild and Scenic Rivers	No effect to Wild and Scenic Rivers or their corridors because no action is taken.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Cultural Resources	There will be no direct effects to historic properties. Short-term indirect effects from no action will be negligible, but long-term will be moderate to major. No direct effects to cultural resources will occur but fire-adapted plants that are important to tribal interests will not be enhanced in the long term without prescribed burning. Long-term indirect effects would be moderate to major.	There will be no direct effects to historic properties or identified cultural resources due to the implementation of project design features and standard resource protection measures under the forthcoming project specific programmatic agreement with the State Historic Preservation Office and Advisory Council on Historic Preservation. Removal of dead and dying trees from within or adjacent to historic properties and identified cultural resources as well as reducing adjacent fuels results in direct and indirect beneficial effects that are moderate to major in both the short and long term. The protection measures that minimize the effects of fuels reduction treatments on historic properties may lead to indirect effects that increase likelihood of damage from future fires and direct public attention to heritage sites. These effects are minor in the short term but moderate to major in the long term. The exclusion of fire on certain fire-adapted cultural resources may also lead to indirect effects that reduce the viability or usability of these resources. These effects are minor in the short term but moderate to major in the long term.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Socio-Economics	Since no actions will occur in this alternative, an unsafe condition will continue to exist in the short term and get worse in the long term unless actions are taken outside this project to improve safety. This alternative is not consistent with the Siskiyou County Land and Resource Management Plan that encourages resource use of the Forest. No economic benefits come from this alternative.	Safer conditions would prevail in the short term with removal of roadside hazard trees along a maximum of 170 miles of roads. In the long term, safer conditions would be provided through 2,090 acres of hazardous fuels treatments. Economic returns from the entire project would include a potential $3 million return to Siskiyou County, labor income of $53 million and 1,236 jobs. This alternative is consistent with local county objectives for resource use of the Forest.	Similar to Alternative 2 except economic returns from the entire project would include a potential $2.5 million with labor income of $46 million and 1,067 jobs.	Similar to Alternative 2 except roadside hazard s would be treated along a maximum of 160 miles and economic returns from the entire project would include a potential $2.4 million with labor income of $47 million and 1,074 jobs.	Similar to Alternative 2 except hazardous fuels would be treated on 3,300 acres and economic returns from the entire project would include a potential $1.6 million with labor income of $22 million and 549 jobs.	Similar to Alternative 2 except hazardous fuels would be treated on 2,170 acres and economic returns from the entire project would include a potential $2.7 million with labor income of $46 million and 1,076 jobs.	Similar to Alternative 2 except roadside hazards would be removed along 48 miles of road, 3,300 acres of fuels would be treated, and economic returns from the entire project would include a potential $2.5 million with labor income of $38 million and 887 jobs.
Inventoried Roadless Areas	No effect because there are no inventoried roadless areas in the Beaver project area.	No effect because there are no inventoried roadless areas in the Beaver project area.	No effect because there are no inventoried roadless areas in the Beaver project area.	No effect because there are no inventoried roadless areas in the Beaver project area.	No effect because there are no inventoried roadless areas in the Beaver project area.	No effect because there are no inventoried roadless areas in the Beaver project area.	No effect because there are no inventoried roadless areas in the Beaver project area.

Table 2-39: Comparison of effects of alternative by resource for the Happy Camp Fire area.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Vegetation	Natural regeneration on 34,060 acres of moderate- to high-severity vegetation burn. Regenerates as brush, hardwoods and isolated patches of conifers in the long term; meets the National Forest Management Act (NFMA) requirement by meeting Forest Plan standards	Natural regeneration on about 21,830 acres of moderate- to high-severity vegetation burn; 12,230 acres (36%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 22,490 acres of moderate- to high-severity vegetation burn; 11,570 acres (34%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 22,790 acres of moderate- to high-severity vegetation burn; 11,270 acres (33%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 30,230 acres of moderate- to high-severity vegetation burn; 3,830 acres (11%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas (within matrix lands) regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 22,280 acres of moderate- to high-severity vegetation burn; 11,780 acres (35%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 23,940 acres of moderate- to high-severity vegetation burn; 10,120 acres (30%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Fuels	There will be 6,895 acres meeting desired condition for fire and fuels resources.	There will be 23,610 acres meeting desired condition for fire and fuels resources.	There will be 22,580 acres meeting desired condition for fire and fuels resources.	There will be 22,320 acres meeting desired condition for fire and fuels resources.	There will be 13,300 acres meeting desired condition for fire and fuels resources.	There will be 22,870 acres meeting desired condition for fire and fuels resources.	There will be 20,870 acres meeting desired condition for fire and fuels resources.
Wildlife: Northern Spotted Owl	There are two, eleven, thirty-nine and five activity centers with very low, low, moderate and high risk to reproduction. 71%, 52%, and 60% of the critical habitat subunits KLE6, KLE7 and KLW7 in the project area respectively contain suitable habitat.	There are two, seven, forty-two and six activity centers with very low, low, moderate and high risk to reproduction. The percent of project area with suitable habitat is the same as for Alternative 1. .	There are two, nine, forty-one and five activity centers with very low, low, moderate and high risk to reproduction. The percent of project area with suitable habitat is the same as for Alternative 2.	There are two, seven, forty-two and six activity centers with very low, low, moderate and high risk to reproduction. The percent of project area with suitable habitat is the same as for Alternative 2.	There are two, eleven, thirty-nine and five activity centers with a very low, low, moderate, and high risk to reproduction. The percent of project area with suitable habitat is the same as for Alternative 2.	The effects are the same as Alternative 2.	There are two, nine, forty-one and five activity centers with very low, low, moderate and high risk to reproduction respectively. The percent of project area with suitable habitat is the same as for Alternative 2.
Wildlife: Bald Eagle	There is no risk of disturbance in this alternative. All three of the nest sites have a low risk to future nest trees.	The risk of disturbance will be low for all three nest sites as a result of project design features. The risk to future potential nest trees is low for two nests and moderate for the third.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.	The risk of disturbance is the same as for Alternative 2. All of the nest sites will have a low risk to future potential nest trees.	The effects are the same as for Alternative 2.	The percent of project area with suitable habitat is the same as for Alternative 2.
Wildlife: Northern Goshawk	There are nine potentially occupied territories. Six have a high risk to reproduction and three have a moderate risk to reproduction.	The level of disturbance is low as a result of project design features. The risk to reproduction is the same as for Alternative 1.	Level of disturbance is the same as Alternative 2.	Level of disturbance is the same as Alternative 2.	Level of disturbance is the same as Alternative 2.	Level of disturbance is the same as Alternative 2.	Level of disturbance is the same as Alternative 2.
Wildlife: Fisher, Marten and Wolverine	There are twenty-six and ten watersheds with moderate and low connectivity respectively. Eighteen of the thirty-six watersheds meet the home range potential criteria.	There will be thirteen, eighteen and five watersheds with moderate, low and very low connectivity. Eleven of the thirty-six watersheds meet the home range potential criteria.	The effects for connectivity and the home range potential are the same as for Alternative 2.	There are seventeen, fourteen and five watersheds with moderate, low and very low connectivity. The effects to the home range potential are the same as for Alternative 2.	There are twenty, twelve, and four watersheds with moderate, low and very low connectivity. The effects to the home range potential are the same as for Alternative 2.	There will be fourteen, seventeen and five watersheds with moderate, low and very low connectivity. The effects to the home range potential are the same as for Alternative 2.	There is twenty, fifteen and one watershed(s) with moderate, low and very low connectivity. The effects to the home range potential are the same as for Alternative 2.
Wildlife: Pallid Bat, Townsend Big-eared Bat, Fringed myotis, Willow Flycatcher, Siskiyou Salamander, Tehama Chaparral Snail and Western Bumble Bee (Sensitive Species)	There are no potential hibernacula/ maternities that will be affected. There will be no Siskiyou Mountain Salamander habitat affected. There will be no Tehama Chaparral Snail habitat affected. There will be no Western Bumble Bee habitat affected.	There eighteen, five and five potential hibernacula that have a low, moderate and high risk of disturbance respectively. Twenty-six watersheds will have a low level of willow flycatcher habitat alteration. The likelihood of dispersal for the Tehama Chaparral Snail is high. The risk of habitat disturbance is low for the Siskiyou Mountain Salamander. Four watersheds will have a high level of disturbance to Western Bumble Bee habitat.	The effects for all species are the same as for Alternative 2.	There nineteen, five and four potential hibernacula that have a low, moderate and high risk of disturbance respectively. The effects to Willow Flycatcher, Siskiyou Mountain Salamander, Tehama Chaparral Snail and Western Bumble Bee are the same as for Alternative 2.	The effects to Pallid Bat, Townsend Big-eared Bat, Fringed myotis, Willow Flycatcher, Siskiyou Mountain Salamander, Tehama Chaparral Snail and Western Bumble Bee are the same as for Alternative 2. Three watersheds will have a high level of habitat disturbance for the Western Bumble Bee.	The effects for all species are the same as for Alternative 2.	The effects for all species are the same as for Alternative 2.
Wildlife: Management Indicator Species	There are 146,700 acres of snag habitat and 4,070 acres of hardwood habitat in the fire area.	There will be about 14% of the snag habitat affected and 11% of the hardwood habitat affected.	There will be about 13% of the snag habitat affected and 11% of the hardwood habitat affected.	The effects are the same as for Alternative 3.	The effects are the same as for Alternative 3.	The effects are the same as Alternative 2.	There will be about 9% of the snag habitat affected and 6% of the hardwood habitat affected.
Survey and Manage	There will be no known sites affected by this alternative.	There will be no effect to known survey and manage sites as a result of project design features.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.
Range	There would be no effect on the availability of forage and a neutral effect on rangeland condition.	The availability of forage would increase; there will be a neutral effect on rangeland condition.	Same as Alternative 2.	Same as Alternative 2.	The availability of forage would increase less than with other action alternatives; there will be a neutral effect on rangeland condition.	There would be a small increase in the availability of forage; there will be a neutral effect on rangeland condition.	There would be a small increase in the availability of forage; there will be a neutral effect on rangeland condition.
Botany: Threatened, Endangered, and Proposed or Candidate Species	No likelihood of jeopardizing continued existence	No likelihood of jeopardizing continued existence	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Botany: Forest Service Sensitive Species	*Eriogonum hirtellum*: Static trend in population viability *Erythronium hirtellum*: Declining trend in population viability *Thermopsis robusta:* Declining trend in population viability	*Eriogonum hirtellum:* Static trend in population viability *Erythronium hirtellum:* Increasing trend in population viability *Thermopsis robusta*: Short term increasing trend in population viability	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Botany: Survey and Manage Species	Compliant	Compliant following implementation of PDF's	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Botany: Non-native Invasive Species	High	High	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Fish and other Aquatic Species : Indirect Effects- Sediment		Several temporary road actions within RRs, six new landings in RR, reopen of 9 miles decomm roads resulting in short term negative effects that may be adverse. Areas of road impacts: Caroline Creek (46N62), Lower Grider Creek (46N41YA), Cliff Valley Creek (46N77), and China Creek (46N78). Existing sediment sites in Grider, Kuntz, and O'Neil drainages fixed.	Near stream temporary road actions, and effects would be the same as for Alternative 2. Potential adverse effects from reopening 46N62 remain.	Temp roads with crossings dropped: Grider, Gard, Caroline, Cliff Valley and China creeks. Negative short term impacts avoided. No long term benefits from addressing existing legacy sediment sites in O'Neill Creek. Potential adverse effects from reopening 46N62 avoided. Overall, discountable short term negative effects.	Temp road actions and effects the same as Alt 4 except reopening 46N62 remains therefore potential adverse effects remain. No long term benefits from addressing existing legacy sediment sites in O'Neill Creek.	Reopening of 46N62 dropped therefore potential adverse effects are avoided. Overall, discountable negative short term effects.	Reopening of 46N62 dropped therefore potential adverse effects are avoided. Overall, discountable negative short term effects.
Fish and other Aquatic Species : Indirect Effects- Temperature		Shade in RRs protected by avoiding salvage in RRs and PDFs minimize effects of roadside and fuels treatments resulting in discountable negative effects. Sedimentation can affect temps – see above for sediment impacts.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Fish and other Aquatic Species : Indirect Effects – Large Wood		PDFs ensure retention of large wood near all stream channels. Discountable negative effects.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Less potential effect of hazard tree removal where it is reduced in extent.
Fish and other Aquatic Species : Direct effects to Salmon and Steelhead		Direct effects will be minimized through designation of acceptable sites that avoid impacts to thermal refugia and compliance with PDFs including use of NMFS (2001) water drafting specifications in Coho CH. Direct effects would be due to disturbance and likely to be discountable and minor.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Fish and other Aquatic Species : Direct effects to Resident Trout		Direct effects will be minimized through designation of acceptable sites that avoid impacts to thermal refugia and compliance with FS BMPs. Direct effects would be due to disturbance and likely to be discountable and minor.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Fish and other Aquatic Species : Direct effects to Other Aquatic Species		Direct effects will be minimized through designation of acceptable sites that avoid impacts to thermal refugia and compliance with FS BMPs. Direct effects would be due to disturbance and likely to be discountable and minor.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Soils	The erosion hazard ratings remain high on 26,824 acres in the analysis area which does not meet desired condition for soil stability. There is a high volume of standing dead that will contribute to large woody debris and all acres meet desired condition. Soil organic matter has been affected by the 2014 wildfires on 633 acres. Past timber harvests have resulted in 383 acres not meeting desired condition for soil structure.	Soil stability would be affected on about 2,001 acres, surface organic matter on534 acres, soil organic matter on2,106 acres and soil structure on 1,346 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 1,957 acres, surface organic matter on 438 acres, soil organic matter on 2,055 acres and soil structure on 1,322 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 1,838acres, surface organic matter on 481 acres, soil organic matter on 1,999 acres and soil structure on 1,251 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 1,240 acres, surface organic matter on 182 acres, soil organic matter on 1,529 acres and soil structure on 926 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 2,001 acres, surface organic matter on 476 acres, soil organic matter on 2,098 acres and soil structure on 1,337 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 1,565 acres, surface organic matter on 299 acres, soil organic matter on 1,675 acres and soil structure on 875 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.
Geology	There is no effect to landslide risk from the alternative. There are 36 watersheds in the project area with duration of elevated landslide risk of greater than 80 years. There will be no effect to cave resources or unique geologic features. There will be no disturbance of ultramafic bedrock.	There is no effect to landslide risk from this alternative. There will be 24 watersheds in the project area with duration of elevated risk of greater than 80 years and 12 watersheds with a reduction of duration of less than 30 years. There are zero acres of new temporary road on ultramafic rock. There is a very low likelihood of effecting cave resources. There is no effect to unique geologic features.	There will be 25 watersheds with a duration of elevated risk of greater than 80 years and 11 watersheds with a duration of elevated risk of less than 30 years. The other effects of the alternative are the same as for Alternative 2.	There will be 27 watersheds with a duration of elevated risk of greater than 80 years and 9 watersheds with a duration of elevated risk of less than 30 years. The other effects of the alternative are the same as for Alternative 2.	There will be 34 watersheds with a duration of elevated risk of greater than 80 years and 2 watersheds with a duration of elevated risk of less than 30 years. The other effects of the alternative are the same as for Alternative 2.	There will be 25 watersheds with a duration of elevated risk of greater than 80 years and 11 watersheds with a duration of elevated risk of less than 30 years. The other effects of the alternative are the same as for Alternative 2.	There will be 26 watersheds with a duration of elevated risk of greater than 80 years and 10 watersheds with a duration of elevated risk of less than 30 years. The other effects of the alternative are the same as for Alternative 2.
Air	There will be no nitrogen oxides, carbon dioxide or fugitive dust emissions.	There will be 19 tons per year of nitrogen oxide emission, 16,578 metric tons per year carbon dioxide equivalent emissions and 35 tons per year of fugitive dust from this alternative.	There will be 19 tons per year of nitrogen oxide emission, 16,352 metric tons per year carbon dioxide equivalent emissions and 35 tons per year of fugitive dust from this alternative.	There will be 19 tons per year of nitrogen oxide emission, 15,860 metric tons per year carbon dioxide equivalent emissions and 35 tons per year of fugitive dust from this alternative.	There will be 6.7 tons per year of nitrogen oxide emission, 10,694 metric tons per year carbon dioxide equivalent emissions and 10 tons per year of fugitive dust from this alternative.	There will be 18.8 tons per year of nitrogen oxide emission, 16,572 metric tons per year carbon dioxide equivalent emissions and 35 tons per year of fugitive dust from this alternative.	There will be 19 tons per year of nitrogen oxide emission, 16,646 metric tons per year carbon dioxide equivalent emissions and 35 tons per year of fugitive dust from this alternative.
Recreation	There would be no short-term adverse effects associated with project implementation. Increased short-term use of burn areas for firewood cutting and deer hunting. Direct long-term adverse effect to dispersed camping and hiking opportunities in burn areas from loss of shade. Increased short-term and long-term safety concerns from fallen snags. Increased maintenance costs for Forest infrastructure. No adverse effects to recreation settings from project implementation.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in nine locations.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in nine locations.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in nine locations.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in nine locations.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in seven locations.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. Indirect long-term adverse effects to recreation settings from project activities in five locations.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Scenery	There is no effect to Visual Quality Objectives. Long term adverse effect with permanent vegetation change away from a conifer-dominated vegetation type towards a shrub-dominated ecosystem. Achievement of the desired condition would be set back 50 plus years or more.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in nine locations. Although Visual Quality Objectives would not be met for some salvage harvest and roadside hazard treatments in Retention or Partial Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). “Greening up” for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels Twenty-five of the thirty-four viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in nine locations. Although Visual Quality Objectives would not be met for some salvage harvest and roadside hazard treatments in Retention or Partial Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). “Greening up” for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels Twenty-five of the thirty-four viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in nine locations. Although Visual Quality Objectives would not be met for some salvage harvest and roadside hazard treatments in Retention or Partial Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). “Greening up” for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels Twenty-five of the thirty-four viewsheds Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in nine locations. Although Visual Quality Objectives would not be met for some salvage harvest and roadside hazard treatments in Retention or Partial Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). “Greening up” for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels Twenty-five of the thirty-four viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in seven locations Although Visual Quality Objectives would not be met for some salvage harvest and roadside hazard treatments in Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). “Greening up” for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels Twenty-seven of the thirty-four viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. Indirect long-term adverse effects to viewsheds from project activities in five locations. Although Visual Quality Objectives would not be met for some salvage harvest and roadside hazard treatments in Retention Visual Quality Objectives areas, Forest Plan consistency will be met (Forest Plan S&G 11-7). “ Greening up” for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels Twenty-nine of the thirty-four viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.
Wild and Scenic Rivers	No effect to Wild and Scenic Rivers or their corridors because no action is taken.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.
Cultural Resources	There will be no direct effects to historic properties. Short-term indirect effects from no action will be negligible, but long-term will be moderate to major. No direct effects to cultural resources will occur but fire-adapted plants that are important to tribal interests will not be enhanced in the long term without prescribed burning. Long-term indirect effects would be moderate to major.	The effects on historic properties and identified cultural resources are the same as those described for Beaver, with the exception of planting in Karuk aboriginal territory. The Karuk state that planting has direct and indirect effects on their cultural resources in both the short and long-term. These effects are mitigated under the forthcoming project specific programmatic agreement. If these affects cannot be mitigated, the resolution process in the forthcoming programmatic agreement will be followed.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Socio-Economics	Since no actions will occur in this alternative, an unsafe condition will continue to exist in the short term and get worse in the long term unless actions are taken outside this project to improve safety. This alternative is not consistent with the Siskiyou County Land and Resource Management Plan that encourages resource use of the Forest. No economic benefits come from this alternative.	Safer conditions would prevail in the short term with removal of roadside hazard trees along a maximum of 400 miles of roads. In the long term, safer conditions would be provided through 8,790 acres of hazardous fuels treatments. Economic returns from the entire project would include a potential $3 million return to Siskiyou County, labor income of $53 million and 1,236 jobs. This alternative is consistent with local county objectives for resource use of the Forest.	Similar to Alternative 2 except economic returns from the entire project would include a potential $2.5 million with labor income of $46 million and 1,067 jobs.	Similar to Alternative 2 except roadside hazard s would be treated along a maximum of 390 miles and economic returns from the entire project would include a potential $2.4 million with labor income of $47 million and 1,074 jobs.	Similar to Alternative 2 except economic returns from the entire project would include a potential $1.6 million with labor income of $22 million and 549 jobs.	Similar to Alternative 2 except economic returns from the entire project would include a potential $2.7 million with labor income of $46 million and 1,076 jobs.	Similar to Alternative 2 except roadside hazards would be removed along 215 miles of road, 9,740 acres of fuels would be treated, and economic returns from the entire project would include a potential $2.5 million with labor income of $38 million and 887 jobs.
Inventoried Roadless Areas	No effect to the roadless character of inventoried roadless areas because no treatments occur within these areas.	Roadless character will not be negatively affected by 74 acres of roadside hazard treatment, 121 acres of site preparation and reforestation, or 207 acres of hazardous fuels treatments.	Roadless character will not be negatively affected by 74 acres of roadside hazard treatment, 121 acres of site preparation and reforestation, or 207 acres of hazardous fuels treatments.	Roadless character will not be negatively affected by 74 acres of roadside hazard treatment, 121 acres of site preparation and reforestation, or 207 acres of hazardous fuels treatments.	Roadless character will not be negatively affected by 74 acres of roadside hazard treatment, 0 acres of site preparation and reforestation, or 207 acres of hazardous fuels treatments.	Roadless character will not be negatively affected by 74 acres of roadside hazard treatment, 121 acres of site preparation and reforestation, or 207 acres of hazardous fuels treatments.	Roadless character will not be negatively affected by 31 acres of roadside hazard treatment, 120 acres of site preparation and reforestation, or 288 acres of hazardous fuels treatments.

Table 2-40: Comparison of effect of alternative by resources for the Whites Fire area.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Vegetation	Natural regeneration on 10,260 acres of moderate- to high-severity vegetation burn. Regenerates as brush, hardwoods and isolated patches of conifers in the long term; meets the National Forest Management Act (NFMA) requirement by meeting Forest Plan standards	Natural regeneration on about 9,060 acres of moderate- to high-severity vegetation burn; 1,200 acres (12%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 9,160 acres of moderate- to high-severity vegetation burn; 1,100 acres (11%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 9,060 acres of moderate- to high-severity vegetation burn; 1,200 acres (12%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 10,230 acres of moderate- to high-severity vegetation burn; 30 acres (<1%) of moderate- to high-severity on which conifer regeneration will be accelerated. Most of the area regenerates with brush, hardwoods, and isolated conifers in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 9,120 acres of moderate- to high-severity vegetation burn; 1,140 acres (11%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards	Natural regeneration on about 9,150 acres of moderate- to high-severity vegetation burn; 1,100 acres (11%) of moderate- to high-severity on which conifer regeneration will be accelerated. Treated areas regenerate with mature, mixed conifer stands in long term; meets NFMA and Forest Plan standards
Fuels	There will be 3,740 acres meeting desired condition for fire and fuels resources.	There will be 12,830 acres meeting desired condition for fire and fuels resources.	There will be 12,670 acres meeting desired condition for fire and fuels resources.	There will be 12,830 acres meeting desired condition for fire and fuels resources.	There will be 11,420 acres meeting desired condition for fire and fuels resources.	There will be 12,720 acres meeting desired condition for fire and fuels resources.	There will be 12,645 acres meeting desired condition for fire and fuels resources.
Wildlife: Northern Spotted Owl	There are eleven and four activity centers that have low and moderate risk to reproduction. 68% of the critical habitat subunit KLW8 in the project area contains suitable habitat.	There are nine and six activity centers with low and moderate risk to reproduction. 68% of the critical habitat subunit KLW8 in the project area contains suitable habitat	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.	There are ten and five activity centers with low and moderate risk to reproduction. The percent of suitable habitat in the critical habitat subunit is the same as for Alternative 2.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.
Wildlife: Bald Eagle	There are no known Bald Eagle nest sites in this fire area.	NA	NA	NA	NA	NA	NA
Wildlife: Northern Goshawk	There are three potentially occupied territories. One has a high risk to reproduction and two have a moderate risk to reproduction.	The level of disturbance is low as a result of project design features. The risk to reproduction is the same as for Alternative 1.	Level of disturbance is the same as Alternative 2. The risk to reproduction is the same as for Alternative 1.	Level of disturbance is the same as Alternative 2. The risk to reproduction is the same as for Alternative 1.	Level of disturbance is the same as Alternative 2. The risk to reproduction is the same as for Alternative 1.	Level of disturbance is the same as Alternative 2. The risk to reproduction is the same as for Alternative 1.	Level of disturbance is the same as Alternative 2. The risk to reproduction is the same as for Alternative 1.
Wildlife: Fisher, Marten and Wolverine	There are six, eight and four watersheds with moderate, low and very low connectivity respectively. Fourteen of the twenty-one watersheds meet the home range potential criteria.	There will be six, seven and five watersheds with moderate, low and very low connectivity. Nine of the eighteen watersheds meet the home range potential criteria.	The effects are the same as Alternative 2 for both connectivity and home range potential.	The effects are the same as Alternative 2 for both connectivity and home range potential.	There will be seven, six and five watersheds with moderate, low and very low connectivity. Home range potential is the same as Alternative 2.	The effects are the same as Alternative 2 for both connectivity and home range potential.	The effects are the same as Alternative 2 for both connectivity and home range potential.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Wildlife: Pallid Bat, Townsend Big-eared Bat, Fringed myotis, Willow Flycatcher, Siskiyou Salamander, Tehama Chaparral Snail and Western Bumble Bee (Sensitive Species)	There are no potential hibernacula/ maternities that will be affected. There is no Siskiyou Mountain Salamander habitat in the fire area. There will be no Tehama Chaparral Snail habitat affected. There will be no Western Bumble Bee habitat affected.	There seven, three and three potential hibernacula that have a low, moderate and high risk of disturbance respectively. Twelve watersheds will have a low level of willow flycatcher habitat alteration. The likelihood of dispersal for the Tehama Chaparral Snail is high. One watershed will have a moderate level of disturbance to Western Bumble Bee habitat.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.	There eight, two and three potential hibernacula that have a low, moderate and high risk of disturbance respectively. The effects to Willow Flycatcher, Tehama Chaparral Snail and Western Bumble Bee are the same as for Alternative 2.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.
Wildlife: Management Indicator Species	There are 42,200 acres of snag habitat and 700 acres of hardwood habitat in the fire area.	There will be about 9% of the snag habitat affected and 3% of the hardwood habitat affected.	There will be about 8% of the snag habitat affected and 3% of the hardwood habitat affected.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 2.	The effects are the same as for Alternative 3.
Range	There would be no effect on the availability of forage and a neutral effect on rangeland condition.	The availability of forage would increase; there will be a neutral effect on rangeland condition.	Same as Alternative 2.	Same as Alternative 2.	The availability of forage would increase less than with other action alternatives; there will be a neutral effect on rangeland condition.	There would be a small increase in the availability of forage; there will be a neutral effect on rangeland condition.	There would be a small increase in the availability of forage; there will be a neutral effect on rangeland condition.
Botany: Threatened, Endangered, and Proposed or Candidate Species	No likelihood of jeopardizing continued existence	No likelihood of jeopardizing continued existence	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Botany: Forest Service Sensitive Species	Static trend, no known populations present	Static trend, no known populations present	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Botany: Survey and Manage Species	Compliant	Compliant following implementation of PDF's	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Botany: Non-native Invasive Species	High	High	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Fish and other Aquatic Species : Indirect Effects- Sediment		There are no near stream temporary road actions in the Whites Fire area under any alternative. Discountable negative effects.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Fish and other Aquatic Species : Indirect Effects- Temperature		Shade in RRs protected by avoiding salvage in RRs and PDFs minimize effects of roadside and fuels treatments resulting in discountable negative effects. Sedimentation can affect temps – see above for sediment impacts.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Fish and other Aquatic Species : Indirect Effects – Large Wood		Salvage excludes RRs. Project design features ensure retention of large wood within near stream areas for fuels, hazard tree removal and landings. Discountable negative effects.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Less potential effect of hazard tree removal where it is reduced in extent.
Fish and other Aquatic Species : Direct effects to Salmon and Steelhead		Direct effects will be minimized through designation of acceptable sites that avoid impacts to thermal refugia and compliance with PDFs including use of NMFS (2001) water drafting specifications in Coho CH. Direct effects would be due to disturbance and likely to be discountable and minor.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Fish and other Aquatic Species : Direct effects to Resident Trout		Direct effects will be minimized through designation of acceptable sites that avoid impacts to thermal refugia and compliance with FS BMPs. Direct effects would be due to disturbance and likely to be discountable and minor.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Fish and other Aquatic Species : Direct effects to Other Aquatic Species		Direct effects will be minimized through designation of acceptable sites that avoid impacts to thermal refugia and compliance with FS BMPs. Direct effects would be due to disturbance and likely to be discountable and minor.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Soils	The erosion hazard ratings remain high on 280 acres in the analysis area which does not meet desired condition for soil stability. There is a high volume of standing dead that will contribute to large woody debris and all acres meet desired condition. Soil organic matter has been affected by the 2014 wildfires on 280 acres. Past timber harvests have resulted in 50 acres not meeting desired condition for soil structure.	Soil stability would be affected on about 519 acres, surface organic matter on12 acres, soil organic matter on376 acres and soil structure on 298 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 514 acres, surface organic matter on 12 acres, soil organic matter on 376 acres and soil structure on 298 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 520 acres, surface organic matter on 12 acres, soil organic matter on 389 acres and soil structure on 305 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 464 acres, surface organic matter on 12 acres, soil organic matter on 326 acres and soil structure on 268 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 519 acres, surface organic matter on 12 acres, soil organic matter on 385 acres and soil structure on 301 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.	Soil stability would be affected on about 443 acres, surface organic matter on 12 acres, soil organic matter on 169 acres and soil structure on 285 acres. Legacy site treatment will improve soil stability over the long term. Project design features will minimize the effects to soil resources and the Forest Plan standards are met.
Geology	There is no effect to landslide risk from the alternative. There are 8 watersheds in the project area with duration of elevated landslide risk of greater than 80 years. There will be no effect to cave resources or unique geologic features. There will be no disturbance of ultramafic bedrock.	There is no effect to landslide risk from this alternative. There will be 8 watersheds in the project area with duration of elevated risk of greater than 80 years. There are zero acres of new temporary road on ultramafic rock. There is a very low likelihood of effecting cave resources. There is no effect to unique geologic features.	The effects of the alternative are the same as for Alternative 2.	The effects of the alternative are the same as for Alternative 2.	The effects of the alternative are the same as for Alternative 2.	The effects of the alternative are the same as for Alternative 2.	The effects of the alternative are the same as for Alternative 2.
Air	There will be no nitrogen oxides, carbon dioxide or fugitive dust emissions.	There will be 10 tons per year of nitrogen oxide emission, 27,281 metric tons per year carbon dioxide equivalent emissions and 7 tons per year of fugitive dust from this alternative.	There will be 10 tons per year of nitrogen oxide emission, 27,248 metric tons per year carbon dioxide equivalent emissions and 7 tons per year of fugitive dust from this alternative.	There will be 10 tons per year of nitrogen oxide emission, 27,095 metric tons per year carbon dioxide equivalent emissions and 7 tons per year of fugitive dust from this alternative.	There will be 6.4 tons per year of nitrogen oxide emission, 26,438 metric tons per year carbon dioxide equivalent emissions and 2 tons per year of fugitive dust from this alternative.	There will be 10 tons per year of nitrogen oxide emission, 27,281 metric tons per year carbon dioxide equivalent emissions and 7 tons per year of fugitive dust from this alternative.	There will be 10 tons per year of nitrogen oxide emission, 27,617 metric tons per year carbon dioxide equivalent emissions and 7 tons per year of fugitive dust from this alternative.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Recreation	There would be no short-term adverse effects associated with project implementation. Increased short-term use of burn areas for firewood cutting and deer hunting. Direct long-term adverse effect to dispersed camping and hiking opportunities in burn areas from loss of shade. Increased short-term and long-term safety concerns from fallen snags. Increased maintenance costs for Forest infrastructure. No adverse effects to recreation settings from project implementation.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. No adverse effects to recreation settings from project implementation.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. No adverse effects to recreation settings from project implementation.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. No adverse effects to recreation settings from project implementation.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. No adverse effects to recreation settings from project implementation.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. No adverse effects to recreation settings from project implementation.	Recreational use is not expected to increase or decrease. Direct short-term adverse effect from smoke, road closures, or increased traffic during project implementation. Indirect short and long-term beneficial effect to big game hunting opportunities from prescribed fire and replanting. Indirect long-term beneficial effect to developed recreation facilities and dispersed campsites from fuels and roadside hazard treatments. These treatments would protect Forest Service infrastructure and/or increase safety at these sites. No adverse effects to recreation settings from project implementation.
Scenery	There is no effect to Visual Quality Objectives. Long term adverse effect with permanent vegetation change away from a conifer-dominated vegetation type towards a shrub-dominated ecosystem. Achievement of the desired condition would be set back 50 plus years or more.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. "Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels. All 19 viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. "Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels. All 19 viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. "Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels. All 19 viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. "Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels. All 19 viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. "Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels. All 19 viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.	Minor localized short-term direct adverse effects to Visual Quality Objectives from management treatments during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation. "Greening up" for three years after project completion would reduce visual evidence of fuels, harvest, roadside hazard, and site prep/plant activities to acceptable levels. All 19 viewsheds will meet Visual Quality Objectives. Indirect long-term beneficial effect to scenic character from management treatments would be speeding up recovery of the burn areas to a conifer-dominated character that is more consistent with historic scenery conditions and Desired Scenic Character.
Wild and Scenic Rivers	No effect to Wild and Scenic Rivers or their corridors because no action is taken.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.	No effect or a low risk to Wild and Scenic Rivers because none of the activities would negatively affect the outstandingly remarkable values (ORVs) of these rivers or their corridors. All ORVs would be protected.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Cultural Resources	There will be no direct effects to historic properties. Short-term indirect effects from no action will be negligible, but long-term will be moderate to major. No direct effects to cultural resources will occur but fire-adapted plants that are important to tribal interests will not be enhanced in the long term without prescribed burning. Long-term indirect effects would be moderate to major.	The effects on historic properties and identified cultural resources are the same as those described for the Happy Camp Complex.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Socio-Economics	Since no actions will occur in this alternative, an unsafe condition will continue to exist in the short term and get worse in the long term unless actions are taken outside this project to improve safety. This alternative is not consistent with the Siskiyou County Land and Resource Management Plan that encourages resource use of the Forest. No economic benefits come from this alternative.	Safer conditions would prevail in the short term with removal of roadside hazard trees along a maximum of 80 miles of roads. In the long term, safer conditions would be provided through 11,350 acres of hazardous fuels treatments. Economic returns from the entire project would include a potential $3 million return to Siskiyou County, labor income of $53 million and 1,236 jobs. This alternative is consistent with local county objectives for resource use of the Forest.	Similar to Alternative 2 except economic returns from the entire project would include a potential $2.5 million with labor income of $46 million and 1,067 jobs.	Similar to Alternative 2 except roadside hazard s would be treated along a maximum of 70 miles and economic returns from the entire project would include a potential $2.4 million with labor income of $47 million and 1,074 jobs.	Similar to Alternative 2 except economic returns from the entire project would include a potential $1.6 million with labor income of $22 million and 549 jobs.	Similar to Alternative 2 except economic returns from the entire project would include a potential $2.7 million with labor income of $46 million and 1,076 jobs.	Similar to Alternative 2 except roadside hazards would be removed along 55 miles of road, 11,400 acres of fuels would be treated, and economic returns from the entire project would include a potential $2.5 million with labor income of $38 million and 887 jobs.
Inventoried Roadless Areas	No effect to the roadless character of inventoried roadless areas because no treatments occur within these areas.	Roadless character will not be negatively affected by 36 acres of roadside hazard treatment, 39 acres of site preparation and reforestation, or 5,240 acres of hazardous fuels treatments.	Roadless character will not be negatively affected by 36 acres of roadside hazard treatment, 39 acres of site preparation and reforestation, or 5,240 acres of hazardous fuels treatments.	Roadless character will not be negatively affected by 36 acres of roadside hazard treatment, 39 acres of site preparation and reforestation, or 5,240 acres of hazardous fuels treatments.	Roadless character will not be negatively affected by 36 acres of roadside hazard treatment, 0 acres of site preparation and reforestation, or 5,240 acres of hazardous fuels treatments.	Roadless character will not be negatively affected by 36 acres of roadside hazard treatment, 39 acres of site preparation and reforestation, or 5,240 acres of hazardous fuels treatments.	Roadless character will not be negatively affected by 34 acres of roadside hazard treatment, 39 acres of site preparation and reforestation, or 5,240 acres of hazardous fuels treatments.

Comparison Table of Treatments by Land Allocation

Table 2-41displays the acres of various treatments in each alternative by category of land allocation.

Table 2-41: Comparison treatments by alternative within various land allocations[28]

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Beaver Fire							
Late Successional Reserves	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=0 Fuels Treatment=0	Salvage acres=20 Site Prepare and Reforest=20 Roadside Hazard=130 Fuels Treatment=30	Salvage acres=0 Site Prepare and Reforest=20 Roadside Hazard=130 Fuels Treatment=30	Salvage acres=10 Site Prepare and Reforest=20 Roadside Hazard=120 Fuels Treatment=30	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=130 Fuels Treatment=30	Salvage acres=20 Site Prepare and Reforest=20 Roadside Hazard=130 Fuels Treatment=30	Salvage acres=0 Site Prepare and Reforest=20 Roadside Hazard=100 Fuels Treatment=40
Administratively Designated[29]	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=0 Fuels Treatment=0	Salvage acres=0 Site Prepare and Reforest=380 Roadside Hazard=1,020 Fuels Treatment=470	Salvage acres=0 Site Prepare and Reforest=380 Roadside Hazard=1,020 Fuels Treatment=470	Salvage acres=0 Site Prepare and Reforest=380 Roadside Hazard=930 Fuels Treatment=470	Salvage acres=0 Site Prepare and Reforest=380 Roadside Hazard=1,020 Fuels Treatment=470	Salvage acres=0 Site Prepare and Reforest=380 Roadside Hazard=1,020 Fuels Treatment=480	Salvage acres=0 Site Prepare and Reforest=330 Roadside Hazard=620 Fuels Treatment=650

[28] No treatments will take place in congressionally designated areas (wilderness).
[29] Within the Westside project area, these include special habitat for eagle and falcon; the North Russian Landslide Dam Special Interest area (see the geology section of Chapter 3 for more information), designated or recommended “Wild” rivers for Wild and Scenic River Act designation; and mapped hydrologic Riparian Reserves. Inventoried roadless areas are not included; for more information about treatments in these areas, see the inventoried roadless area section of Chapter 3.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 2 Modified	Alternative 3 Modified
Matrix[30]	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=0 Fuels Treatment=0	Salvage acres=570 Site Prepare and Reforest=1,380 Roadside Hazard=4,650 Fuels Treatment=1,590	Salvage acres=0 Site Prepare and Reforest=1,380 Roadside Hazard=4,650 Fuels Treatment=1,590	Salvage acres=510 Site Prepare and Reforest=1,380 Roadside Hazard=4,550 Fuels Treatment=1,590	Salvage acres=0 Site Prepare and Reforest=1,390 Roadside Hazard=4.650 Fuels Treatment=2,800	Salvage acres=200 Site Prepare and Reforest=1,380 Roadside Hazard=4,650 Fuels Treatment=1,660	Salvage acres=0 Site Prepare and Reforest=1310 Roadside Hazard=1,470 Fuels Treatment=2,610
Happy Camp Complex							
Late Successional Reserves	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=0 Fuels Treatment=0	Salvage acres=4,880 Site Prepare and Reforest=3,200 Roadside Hazard=7,060 Fuels Treatment=3,570	Salvage acres=4,470 Site Prepare and Reforest=3,200 Roadside Hazard=7,060 Fuels Treatment=3,570	Salvage acres=4,070 Site Prepare and Reforest=3,200 Roadside Hazard=7,010 Fuels Treatment=3,570	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=7,060 Fuels Treatment=3,570	Salvage acres=4,590 Site Prepare and Reforest=3,200 Roadside Hazard=8,090 Fuels Treatment=3,310	Salvage acres=3,370 Site Prepare and Reforest=2,920 Roadside Hazard=6,830 Fuels Treatment=3,860
Administratively Designated	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=0 Fuels Treatment=0	Salvage acres=280 Site Prepare and Reforest=420 Roadside Hazard=950 Fuels Treatment=1,920	Salvage acres=270 Site Prepare and Reforest=420 Roadside Hazard=950 Fuels Treatment=1,920	Salvage acres=200 Site Prepare and Reforest=420 Roadside Hazard=920 Fuels Treatment=1,920	Salvage acres=20 Site Prepare and Reforest=0 Roadside Hazard=950 Fuels Treatment=1,920	Salvage acres=280 Site Prepare and Reforest=420 Roadside Hazard=950 Fuels Treatment=1,920	Salvage acres=420 Site Prepare and Reforest=390 Roadside Hazard=820 Fuels Treatment=2,080
Matrix	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=0 Fuels Treatment=0	Salvage acres=1,630 Site Prepare and Reforest=1,820 Roadside Hazard=5,990 Fuels Treatment=3,300	Salvage acres=1,390 Site Prepare and Reforest=1,820 Roadside Hazard=5,990 Fuels Treatment=3,300	Salvage acres=1,560 Site Prepare and Reforest=1,820 Roadside Hazard=5,670 Fuels Treatment=3,300	Salvage acres=1,730 Site Prepare and Reforest=2,080 Roadside Hazard=5,670 Fuels Treatment=3,300	Salvage acres=1,470 Site Prepare and Reforest=1,820 Roadside Hazard=4,960 Fuels Treatment=3,300	Salvage acres=1,410 Site Prepare and Reforest=1,610 Roadside Hazard=2,080 Fuels Treatment=3,800
Whites Fire							
Late Successional Reserves	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=0 Fuels Treatment=0	Salvage acres=490 Site Prepare and Reforest=640 Roadside Hazard=2,220 Fuels Treatment=6,860	Salvage acres=430 Site Prepare and Reforest=640 Roadside Hazard=2,220 Fuels Treatment=6,860	Salvage acres=490 Site Prepare and Reforest=640 Roadside Hazard=2,190 Fuels Treatment=6,860	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=2,220 Fuels Treatment=6,840	Salvage acres=450 Site Prepare and Reforest=640 Roadside Hazard=2,410 Fuels Treatment=6,860	Salvage acres=500 Site Prepare and Reforest=560 Roadside Hazard=2,160 Fuels Treatment=6,920
Administratively Designated	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=0 Fuels Treatment=0	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=230 Fuels Treatment=1,530	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=230 Fuels Treatment=1,530	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=230 Fuels Treatment=1,530	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=230 Fuels Treatment=1,520	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=230 Fuels Treatment=1,530	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=10 Fuels Treatment=10
Matrix	Salvage acres=0 Site Prepare and Reforest=0 Roadside Hazard=0 Fuels Treatment=0	Salvage acres=70 Site Prepare and Reforest=0 Roadside Hazard=250 Fuels Treatment=2,960	Salvage acres=30 Site Prepare and Reforest=0 Roadside Hazard=250 Fuels Treatment=2,960	Salvage acres=70 Site Prepare and Reforest=0 Roadside Hazard=80 Fuels Treatment=2,960	Salvage acres=30 Site Prepare and Reforest=0 Roadside Hazard=250 Fuels Treatment=2,990	Salvage acres=50 Site Prepare and Reforest=0 Roadside Hazard=60 Fuels Treatment=2,960	Salvage acres=50 Site Prepare and Reforest=0 Roadside Hazard=230 Fuels Treatment=4,470

[30] Within the Westside project area, these include General Forest; designated or recommended "Scenic" or "Recreational" river corridors; Retention; and Partial Retention management areas; for more information on the rivers, and Retention and Partial Retention visual quality, see the Wild and Scenic River and Scenery sections of Chapter 3.

Project Design Features

The Forest developed the following project design features to address project objectives, to minimize resource impacts, and to ensure compliance with the Forest Plan and applicable laws and regulations. Table 2-42 displays the design features developed for this project, along with the applicable units. Project design features will be implemented in all action alternatives unless otherwise designated.

Table 2-42: Westside Fire Recovery Project Design Features and applicable stands and/or alternatives

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
Botany - 1	Forest Service botanist will flag for avoidance appropriate populations of federally Threatened and Endangered and Forest Service Sensitive species. Yellow and black striped flagging will be used to delineate population boundaries. Some specific areas may also require a limited operating period (LOP) to minimize impacts to plants.	508-1, F071, F025, F025-1, F026, F106, F106-1, F106-3, P065 LOP: F025, F025-1, F026, F106, F106-1, F106-3	S&G 6-7, 7-4
Botany - 2	Populations protected under Survey and Manage guidelines will be flagged for avoidance. Yellow and black striped flagging will be used to delineate population boundaries.	F078, F162, F032, F068-1, F030, F030-2, F043-5, F146, F027-1, F146-1, F034, F034-1, F035, F035-1, F035-2, F035-3, F077, F077-1, F160-2, F019, F157, F157-2, F020, F091, F044-1, F044-2, F160, F160-2, F109, F151, F078-7	S&G 6-17
Botany - 3	Hazard trees adjacent to flagged populations of Threatened, Endangered, and Sensitive (TES) and Survey and Manage species will be directionally felled away from the flagged area to avoid disturbing the population. Directionally felled trees may only be removed if it causes no ground disturbance within the flagged area. Yellow and black striped flagging will be used to delineate population boundaries.	R136, R045, R101, R131, R127-11, R140, R140-1, R042, R115, R151, R127-4, R119, R128, R040, R093	S&G 6-7, 6-17, 7-4
Botany - 4	Hazard trees located within the flagged population boundary for TES or Survey and Manage species may be felled, but must be left on-site to avoid ground disturbance. Yellow and black striped flagging will be used to delineate population boundaries.	R136, R045, R101, R131, R127-11, R140, R140-1, R042, R115, R151, R127-4, R119, R128, R040, R093	S&G 6-7, 6-17, 7-4
Botany - 5	A Forest Botanist will be consulted prior to conducting Fuels treatments within the Lake Mountain Special Interest Area	F070, F071, F072	S&G 6-7, 7-4
Botany - 6	Cultural botanical resources (fern beds in riparian zones) will be flagged for avoidance. Yellow and black striped flagging will be used to delineate population boundaries.	228, 228-1, 226-1, 226-2, P322, P319 *Units subject to field verification	S&G 6-13, 21-47, 24-24
Botany - 7	Equipment and vehicle travel and/or staging shall be restricted to established road surfaces.	F084-1	S&G 6-7

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
NNIS – 1	Equipment and vehicles that leave established road surfaces will be cleaned of soil, seeds, vegetative matter, and other debris that could contain noxious weed seeds prior to entering and before leaving the project area. Areas appropriate for cleaning equipment prior to leaving the project area will be designated as appropriate.	All equipment where applicable	Mandatory C-Provision 6.25
NNIS - 2	Equipment and vehicles will avoid working within flagged noxious weed sites. Orange/black flagging labeled with *INVASIVE SPECIES* will be used to delineate population boundaries.	1151, 1155, 508-5, 508-4, 506, 501, 500, 411, 410407, 62, 23, 005-3, F008, F075, F076, F159, F022, F013, F155, F077, F160, F015, F016, F087, F088, F084, F090, F050, F051, F053, F080, F038, F036, F044, F045, F113, F028, F152, F109, F029, F026, F037, F034, F035, F043, F078, F157, F002, F086, F081, F162, F151, F184, F030, F127, F129, F146, F121, F033, F133, F068, F069, F116, F008, F072, F071, F013, F016, F018, F022, F075, F076, F156, F159, F074, F078, F021, F017, F019, P026, P089, P099, P102, P105, P106, P107, P072, P073, P075, P113, P160, P139, P057, P058, P059, P061, P063, P065, P028, R128, R082, R127-11, R100, R136, R140, R131, R020, R024, R015, R041, R017, R132, R130, R118, R109, R102, R111, R132, R106, R082, R096, R094, R032, R017, R103, R116, R079, R137, R132	FSM 2900, EO 13112
NNIS - 3	If potential landings sites are infested with noxious weeds, consult a Botanist about appropriate methods for containing and/or managing the infestation. Methods may include blading infested soil away from activity zone and covering this soil; or adding a barrier to the landing so seed banks cannot be transported.	All landings where applicable: info to date indicates the following locations: L174, L176, L177, L203, L219, L220, L223, L224, L225, L002, L005, L013, L0134, DZ03, DZ04, DZ17, L006, L007, L044, L261, L269, L048, L064, L066	FSM 2900, EO 13112
NNIS - 4	Any straw or seed placed within the project area must be documented as California certified weed free. Other materials where State inspection protocol does not exist (gravel, wood chips) used as mulch in the project area, should be inspected by a Forest Service representative to determine the potential for spread of noxious weeds.	All materials where applicable	FSM 2900, EO 13112
NNIS - 5	Any facility that provides material such as rock, gravel, or boulders to	All facilities where applicable	FSM 2900, EO 13112

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	be used in the project area should be inspected and determined to have limited potential for the spread of noxious weeds from stored material. Material stockpiles must be noxious weed free.		
Fuels - 1	Site specific burn plan prior to implementation would be completed to identify desired fire behavior and weather conditions to meet prescribed fire and resource objectives along with protection measures to reduce impacts to both cultural and natural resources within the burn area.	All salvage harvest units	This is a requirement prior to implementing prescribed fire.
Fuels - 2	All burning activities would adhere to pertinent air quality regulations. Smoke emissions would be minimized by following Best Available Control Measures (BACM). A smoke permit administered by the local County Air Resource Agency would accompany burn plans.	All units where applicable	This is a requirement prior to implementing prescribed fire.
Fuels - 3	In preparation of prescribed fire activities, perimeter control lines will be constructed to mineral soil. As needed, brush and conifer trees < 12" dbh may be cut along control lines to facilitate holding activities.	All units where applicable	This PDF is in place to describe fireline activities associated with prescribed fire activities in order to disclose potential effects.
Fuels - 4	All fire lines would follow the established guidelines for water bar construction as outlined in the Best Management Practices. Upon completion of burning, the visible character of the firelines would be disguised by spreading pine needles, brush, etc where they intersect roads or trails in order to reduce the likelihood of the firelines becoming unwanted trails.	All units where applicable	This PDF is to mitigate visual and resource effects of fireline.
Fuels - 5	Piles will be covered to keep piles dry for ignition and consumption during wet periods.	All units where applicable	This PDF is to keep piles dry to allow piles with fuel to consume better and reduce smoke emissions.
Fuels - 6	Prior to planting, the project silviculturist will coordinate with the fuels specialist to review planting activities within identified hazardous fuels treatments. Planting utilizing a clumping pattern with variable spacing to minimize surface fuel loadings and break the continuity of the fuel beds to maintain desired low fire hazard conditions.	All units where applicable	This PDF is in place to ensure planting specifications during implementation meet the intended need for both silviculture and fuels resources.
Fuels - 7	Areas proposed for a combination of planting and follow up prescribed fire would be assessed prior to implementation by the silviculturist and fuels specialist to assess fuel conditions and potential mortality of planted trees as a result of planned	Units with ground-based logging system only	This PDF is to reduce mortality of planted trees during prescribed fire implementation.

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	prescribed fire. Should high mortality rates of planted trees be predicted, handline or other control methods would be employed to exclude fire from these areas.		
Heritage - 1	Conduct heritage resource surveys to determine presence of resources within the area of potential effects following the provisions outlined in the Regional and Westside Recovery Programmatic Agreements (PAs).	All units where applicable Alternatives 2-5, Alt 2 Modified, Alt 3 Modified.	Required under Section 106 of the National Historic Preservation Act (NHPA); S&G 24-4; Consistent with requirements set forth in the Regional PA and Westside Fire Recovery (WFR) PA.
Heritage - 2	Complete the Section 106 process, consulting with the State Historic Preservation Officer on potential adverse effects to sites from project activities that cannot be mitigated using Standard Resource Protection Measures (SRPM). If adverse effects cannot be avoided, a Historic Properties Treatment Plan will be developed.	All units where applicable; Alternatives 2-5, Alt 2 Modified, Alt 3 Modified.	Required under Section 106 of the National Historic Preservation Act (NHPA); S&G 24-8; Consistent with requirements set forth in the Regional PA and WFR PA.
Heritage - 3	All sites within the area of potential effects will be clearly delineated prior to implementation. This includes but is not limited to flagging site boundaries.	All units where applicable; Alternatives 2-5, Alt 2 Modified, Alt 3 Modified.	Mitigation to prevent adverse effects to heritage resources pursuant to the Regional PA and the WFR PA.
Heritage - 4	Any project activities within site boundaries will follow approved SRPMs established by PAs and will be approved by the heritage program manager.	All units where applicable; Alternatives 2-5, Alt 2 Modified, Alt 3 Modified.	Mitigation to prevent adverse effects to heritage resources pursuant to the Regional PA and the WFR PA.
Heritage - 5	No skid roads, road improvements, landings or burn pile areas will occur within archeological sites without approval from the district archaeologist and/or heritage program manager.	All units where applicable; Alternatives 2-5, Alt 2 Modified, Alt 3 Modified.	Mitigation to prevent adverse effects to heritage resources pursuant to the Regional PA and the WFR PA.
Heritage - 6	In the event that new heritage resources are discovered during project implementation, the district archaeologist and/or heritage program manager must be notified and all activities in the vicinity (150 feet) of the resource shall cease until consultations are completed.	All units where applicable; Alternatives 2-5, Alt 2 Modified, Alt 3 Modified.	Required under Section 106 of the National Historic Preservation Act (NHPA); Conforms to discovery stipulations set forth in the Regional PA and WFR PA.
Heritage - 7	Heritage personnel will conduct implementation and post-implementation monitoring of project activities within site boundaries.	All units where applicable; Alternatives 2-5, Alt 2 Modified, Alt 3 Modified.	FSM 2360; S&G 24-17; Monitoring requirements pursuant to the Regional PA and the WFR PA.
Heritage-8	Reforestation efforts along the Historic Barton Ditch (and any other historic ditch identified within a reforestation unit) will be implemented	Units P102 & P104; Alternatives 2-5, Alt 2 Modified, Alt 3 Modified. Other locations where	Mitigation to prevent adverse effects to heritage resources pursuant to the

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	with the following conditions: the historic feature will be flagged and avoided by all equipment during site prep and planting activities; no planting will occur within 20 feet on either side of the ditch.	applicable..	Regional PA and the WFR PA.
Heritage-9	Monitoring of at-risk historic properties and/or cultural resources during implementation may be conducted to ensure the effectiveness of resource protection measures pursuant to the Regional PA and/or Westside Fire Recovery PA.		Monitoring requirements pursuant to the Regional PA and the WFR PA
Inventoried Roadless Area - 1	Site preparation and planting within Inventoried Roadless Areas will be by hand and not include ground-based mechanical equipment.	All site preparation and planting units in IRAs	Consistency with the 2001 Roadless Area Conservation Rule.
Range-1	All structural rangeland improvements, such as corrals, cattle guards, and spring developments, will be mapped and protected from disturbance. If damage occurs, improvements will be repaired or replaced in a timely manner.	All units within allotments	
Range-2	Timing of logging operations will be made known to the Rangeland Management Specialist in order to decrease conflicts between cattle and heavy equipment.	All Units within allotments	
Range - 3	Meadows (dry or wet) shall not be used for landings, staging areas, or contractor camping. No planting is proposed in site preparation and planting or salvage units that overlap meadows (dry or wet). Meadows are defined as a non-forested, herbaceous opening, ¼ acre or larger with at least 50 percent herbaceous groundcover and/or riparian shrubs of alder and willow. Openings covered in ferns (*Pteridium spp.*), corn lily (*Veratrum spp.*), marlahan mustard (*Isatis tinctoria*) or other weedy species are exempt. Openings characterized by greater than 50 percent barren ground are also exempt.	1108, 1128, 1128-1, 1137, 1142, F046, F046-2, F047, F047-1, F047-2, F047-3, F048, F048-1, F048-2, F049-1, F050-1, F053, F054, F055, F056, F057, F060, F062, F082, F083, F084, F084-1, F084-3 F085, F085-1, F085-2, F085-3, F086, F087, F087-1, F089, F089-1, F089-2, F090, F095, F095-1, F095-2, F095-3, F096, F096-1, F096-2, F161, F163-1, F169, F175, F176, F178, F180, F182, P073, P083, P084, P085, P087, P088, P090, P092, P093, P094, P098, P100, P103, P110, P111, P113, P115, R001, R002, R005, R006, R007, R010, R011, R013, R015, R017, R019, R023, R025, R026, R027, R028, R030, R033, R034, R039, R040, R041, R045, R049, R050, R051, R054-1, R057, R058, R072, 022, 031, 032, 034, 508_1_1, 508-1, 508-2, 508-4, 508-4-1, 508-5, 508-6, 508-9, 515-1, 518, 528, 528-1-1, 530, 545, 546, F008, F010, F026, F063-4, F063-5, F070, F071, F072, F109, F118, F120, P036, P038, P039, P041, P042,	

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
		P044, P049, P050 P052, P056, P058, P059, P060, P062, P064, P065, P066, P067, P068, P069, P070, P071, R079, R082, R111, R118, R119, R127-11, R127-9, R128, 426, F073-1, F076-6, F077-1, L019, L024, L001, L003, L013, L266, DZ21	
Recreation and Scenery-1	Protect and maintain recreational features and recreational settings along roads, trails, and trailheads identified as visually sensitive.	All Alternatives: All units where applicable	To minimize resource impacts, and to ensure compliance with the Forest Plan and applicable laws and regulations.
Recreation and Scenery-2	Repair or replace recreational signing or other facilities and trail settings if damaged during project implementation.	All Alternatives: All units where applicable	Ensure compliance with the Forest Plan S & G 12-3.
Recreation and Scenery-3	Provide visitor information about area/road/trail closures, or other recreation setting changes, in news releases, on-site, and on the Forest website.	All Alternatives: All units where applicable	Ensure compliance with the Forest Plan S & G 12-3.
Recreation and Scenery-4	Minimize scenery contrasts within foreground distances (50 feet) such as stumps, landings, skid patterns, temporary roads, and burn piles in sensitive trailside and roadside to meet assigned VQOs.	All Alternatives: Bear Creek Trail - Roadside hazard for road 15N06, Lake Mt Trail – roadside hazard for road 45N65, Units 508-1, 508-1-1, 508-4-1, 508-5, 508-6-1, F071	To minimize resource impacts, and to ensure compliance with the Forest Plan S & G 15-1.
Recreation and Scenery-5	No visible tree mark paint on trees after implementation in Retention VQO areas as seen from high sensitivity viewpoints.	All Alternatives: All units visible from: Cold Spring Trailhead, Pacific Crest Trail, Grider Creek Campground, Grider Creek Road, Klamath Wild and Scenic River, Highway 96, Scott River Road, Tyler Meadows Trailhead	To minimize resource impacts, and to ensure compliance with the Forest Plan and applicable laws and regulations
Recreation and Scenery-6	Provide safety signing along trails, rivers, or roads or temporary road or trail closures in active project areas to provide for public safety.	Modified Alternatives 2 & 3: 058, 058-1,058-3, 058-6, 058-7, 61, 62, 62-1, 224, 228-3, 508-1, 508-1-1, 508-4-1, 508-5, 508-6-1, F071	Response to public comment, and to ensure compliance with applicable laws and regulations.
Recreation and Scenery-7	Cut stumps 6” or lower within 100 feet of dispersed campsites listed below and displayed on Motor Vehicle Use Map (in addition campsite on road 45N72X). 51D015, 51D018, 51D019, 51D020, 51D021, 51D022, 52D013, 52D015, 52D016, 52D017, 54D001, 54D011, 55D001, 55D002C, 55D003, 55D004, 55D005, 55D006, 55D007, 55D008, 55D009, 55D010	Modified Alternatives 2 & 3: All units, fuels, and roadside hazard treatments where applicable	To minimize resource impacts.
Recreation and Scenery-8	Cut stumps 6” or lower if possible away and angle-cut stumps away from Pacific Crest, Bear Creek, and Lake Mountain Trails up to 50 feet each side of trail.	Modified Alternatives 2 & 3: Units 224, 228-3, P321, 508-1, roadside hazard on Forest roads 45N72X, 45N78, 45N78A	Response to public comment, to minimize resource impacts.

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
Recreation and Scenery-9	Hand piling of purchaser created slash to be piled at least 30 feet from Pacific Crest, Bear Creek, and Lake Mountain Trails.	Modified Alternatives 2 & 3: Units 224, 228-3, P321, 508-1	Response to public comment, to minimize resource impacts.
Recreation and Scenery-10	Protect trail tread from log skidding and machine access. The Cold Springs Trailhead parking area (north of road #45N78) will not be used for log storage, equipment storage, truck turnaround, or crew vehicle parking.	Modified Alternatives 2 & 3:	Response to public comment, to minimize resource impacts.
Recreation/Scenery – 11	No hazard tree removal within 15 feet of the PCT except tail hold trees needed for unit 224. Tail hold trees will be flush cut upon project completion.	Modified Alternatives 2 & 3: Roadside Hazard for road 45N78A at Cold Springs Trailhead	Response to public comment, to minimize resource impacts.
Recreation/Scenery – 12	No salvage harvest within 50 feet of the PCT.	Modified Alternatives 2 & 3: Unit 224, 229-2	Response to public comment, to minimize resource impacts.
Roads - 1	Forest Road 12 will be signed from the intersection with Highway 96 to 3/8 mile past Walker Bridge; the sign will request log truck drivers to not use their “Jake Brakes” along this section of road.	Forest Road 12	
Soils-1	For any tractor harvest unit that do not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met.	All ground based units	Meet table 4-2 of Forest Plan S&G 3-2
Watershed - 1	All ground disturbing activities within or outside of the normal operating season (NOS) between May 1 to October 31 will be implemented according to the Forest’s Wet Weather Operation Standards (Klamath National Forest, 2002). Wet weather operations in riparian reserves outside of the NOS will be limited to landings, existing roads, fuels units, roadside hazard units, and site prep and planting.	All units where applicable	BMP 1.5
Watershed - 2	Areas where soil has been disturbed by project activities within Riparian Reserves must be stabilized prior to the end of the normal operating season, prior to sunset if the National Weather Service forecast is a “chance” (30%) of rain within the next 24 hours, or at the conclusion of the operations, whichever is sooner. This includes skid trails that cross swales (i.e. linear depressions perpendicular to the slope contour that do not meet definition for designation as a Riparian Reserve). Restoration generally consists of removing excess sediment, reshaping and waterbarring former approaches, and spreading slash on the former crossing.	All units where applicable	Waiver of Waste Discharge Requirements for Non-point source Discharges Related to Certain Federal Land Management Activities on National Forest Lands (Water Board Waiver) Order No. R1-2010-0029.

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
Watershed - 3	Project Riparian Reserves are established in the following manner per the Forest Plan (site tree for Salmon and Happy Camp districts is 170 feet, site tree for Scott and Oak Knoll districts is 150 feet): For fish-bearing streams, it is the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream), whichever is greatest. For Salmon and Happy Camp ranger districts, this will be 340 feet (680 feet total). For permanently flowing non-fish-bearing streams, it is the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream), whichever is greatest. For Salmon and Happy Camp ranger districts, this will be 170 feet (340 feet total) and 150 feet for the Oak Knoll and Scott River Ranger District. For intermittent streams, the stream channel and extending to the top of the inner gorge, or extension from the edges of the stream channel to a distance equal to the height of one site potential tree, or 100 feet slope distance, whichever is greatest. For unstable lands, it is the extent of unstable and potentially unstable areas. Consistent with Forest Plan direction, riparian reserves for wetlands and springs will be defined by the edge of the feature out to a distance equal to 1 site potential tree. These riparian reserves will be flagged and avoided during salvage harvest.	All units where applicable	S&G MA10-2
Watershed - 4	Tractors and mechanical harvesters will be excluded from all riparian reserves associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits. In Roadside hazard tree units the equipment will be restricted to the road surface. Equipment will be excluded from wetlands or wet meadows (excluding small springs and seeps). To limit slope disturbance, inner gorge terrain (> 65% slope) that	All units where applicable	Unstable Lands: S&G MA10-7, BMP 1.6, BMP 1.18 and BMP 1.19

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	extends beyond riparian reserves will be buffered by 20-foot slope distance and excluded from mechanical equipment activities. In areas where treatments may conflict, a hydrologist will be consulted.		
Watershed - 5	New temporary roads or landings will not be constructed in any riparian reserve associated with stream channels, on toe zones of landslides, active landslides or inner gorges. Exceptions for this project design feature: Landings # DZ03, DZ10, DZ23, L043, L044, and L090. New landings in stream-course Riparian Reserves will not involve removing stream shade over perennial stream channels. For the six new landings in Riparian Reserve approved for use in this project, Forest Service watershed specialists will be involved in site specific decisions related to vegetation removal, drainage and erosion control, and hydrologic stabilization.	All units where applicable	Restriction on unstable lands is intended to not prevent attainment of ACS objectives and to meet BMP 1.6.
Watershed - 6	There will be no salvage logging on active landslides except for units 5, 23, 32, 39, 55, 56, 57, 59, 64, 226, 268, 406, 520, 524, 525, and 530 which have been field reviewed by the Forest Geologist (see Geology amendment for details on criteria for exceptions).	1128, 228, 3, 65, 225, 500, 532,	S&G MA10-7 and BMP 1.6 Exceptions are intended to meet S&G 2-1 (manage vegetation on unstable lands to maintain or enhance slope stability).
Watershed - 7	Limit equipment disturbance within 20 feet on either side of swales by minimizing equipment crossings and avoiding running trails up the axis of swales, except at designated crossings.	All units where applicable	
Watershed - 8	In salvage units and subsequent site preparation, skidding equipment will be restricted to slopes less than 35 percent. Skid trails that connect benches in dormant landslide terrain can have minor portions of the skid trails on slopes greater than 35 percent. Ground-based equipment can travel up to 100 feet on slopes 35 to 45 percent.	All salvage units.	Soil types with granitic or schist parent material are most susceptible to rutting and displacement of soil organic matter. See S&G 3-3.
Watershed-9	In site preparation units (where no salvage will occur) skidding equipment will be restricted to slopes less than 35% on granitic and schist soil types, and up to 45% on all other soil types. Site preparation treatments in Riparian Reserves will be by hand only.	The following site prep and planting units have granitic or schist soil and slopes greater than 35 percent: P031_1, P039, P051, P051-1, P160, P172, P180, P189, P191, P194, and P201.	Soil types with granitic or schist parent material are most susceptible to rutting and displacement of soil organic matter. See S&G 3-3.
Watershed - 10	During site preparation, material greater than 8'' inches in diameter would not be removed unless needed to reduce 1,000 hour fuel loading to seven tons per acre, retain as close to	All units where applicable	S&G 3-6

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	seven tons per acre as possible.		
Watershed - 11	Site preparation treatments would be designed to meet soils management direction in the Forest Plan. Site preparation will be used to reduce fuels where the sum of one-hour, ten-hour, and 100-hour fuels exceeds 7 tons per acre.	All units where applicable	
Watershed - 12	All hazard trees cut within 25 feet of a stream channel or spring will be left on site unless it continues to pose a threat to safety or accessibility (see watershed-4 for equipment exclusion restrictions). Along all stream channels (perennial and intermittent), all hazard trees 26 inches in diameter at breast height and greater within the first site tree (150-170 feet) will be left on site unless after felling, it continues to pose a threat to safety, infrastructure, forest road drainage system integrity or accessibility. Any hazard tree (equal or greater than 26 inches) below a road that would contact a fish bearing stream channel if felled that direction will be retained on site.	All units where applicable	S&G MA10-56, MA10-58, MA10-53.
Watershed - 13	Live trees directly rooted into the banks or otherwise integral to the stability of the channel bank will not be felled unless they pose an overhead hazard and, if felled, will be left on site unless this poses a hazard on the ground per Forest Service safety requirements.	All units where applicable	S&G MA10-58, MA10-55, MA-10-56.
Watershed - 14	Directional felling will be used to protect streambanks where hazard trees need to be mitigated for public or employee safety.	All units where applicable	S&G MA10-61, MA10-59.
Watershed - 15	Improvements to existing system roads in the project area will avoid over-steepened road cuts where possible, minimize sidecasting, and maintain ditches, cross drains, and any outsloped road segments.	All units where applicable	S&G MA10-42, MA10-45, MA10-48.
Watershed - 16	Roads will be watered as appropriate to maintain road fines on site. Other materials may be used for dust abatement as approved by the Forest Service.	All units where applicable	S&G MA10-45, MA10-48.
Watershed - 17	Upgrades or improvements to stream crossings will be built to Forest Plan standards.	All units where applicable	S&G MA10-44.
Watershed - 18	Activities which require culvert replacement or removal will occur during the least critical periods for water and aquatic resources: when streams are dry or during low-water conditions; and in compliance with spawning and breeding season	All units where applicable	S&G MA10-44.

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	restrictions.		
Watershed - 19	Legacy sediment site treatments within or adjacent to streams will have erosion-prevention techniques applied such as silt fences, straw waddles, or mulch to minimize the risk of discharge.	All units where applicable	S&G MA10-42, MA10-45, MA10-48.
Watershed - 20	All project-related temporary structures, materials and project-related debris will not be stored for any length of time on active landslides and will be removed from riparian areas and stream channels prior to winter shutdown.	All units where applicable	BMP 1.6
Watershed - 21	For legacy sediment site repairs, fill materials generated will be reincorporated back into subgrade to the extent possible; all excess fill materials will be spoiled at a site reviewed and approved by Forest Service botanist, watershed, and heritage specialists.	All legacy site repair where applicable	S&G MA10-42, MA10-45, MA10-48.
Watershed - 22	Following harvest activities achieve at least 50 percent effective soil cover on new temporary roads (if it's available on site). Achieve 80% soil cover on hydrologically connected temporary roads and re-opened decommissioned roads within riparian reserves at the end of season of use. Block temporary roads after the harvest season (prior to the first winter after use). Depending on soil texture and slope, new temporary roads will also be sub-soiled, tilled (or tilled, or roughed up) after use. All temporary roads (new, existing or re-opened decommissioned roads) will have the takeoffs from system road obliterated or blocked to avoid unauthorized use. All temporary roads will be hydrologically stabilized including removal of culverts and fills at stream crossings, out-sloping of road surfaces, and proper construction of water bars. Erosion and sedimentation control structures (water bars) will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.	All new temp roads	S&G 3-4, BMP 2.1
Watershed - 23	Existing landings will be used to the extent possible. Existing landings in stream-course riparian reserves will not be expanded towards stream channels, or on to active landslides, or where vegetation that provides shade to a stream would need to be cut. Existing landings in riparian reserves will be shaped and treated for erosion control at the end of each season of use, and hydrologically restored at project completion	All units where applicable	S&G MA10-42, MA10-51.

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	(including subsoiling and covering with slash/mulch as needed). Reused landings in riparian reserves will have site specific erosion control measures to reduce risk of sediment delivery into streams. During opening or construction of any landings, material will not be sidecast into intermittent or perennial stream channels. At project conclusion, landings will be configured for long-term drainage and stability by reestablishing natural runoff patterns. All landings within riparian reserves will be covered with at least 80 percent effective soil cover at the end of season use. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient.		
Watershed - 24	Refueling will not take place within Riparian Reserves except at designated landings in locations where most disconnected from water resources. A spill containment kit will be in place where refueling and servicing take place. Helicopter refueling will not occur within Riparian Reserves. Equipment used for refueling will not exceed 150 gallons.	All units where applicable	BMP 2.11
Watershed - 25	Skid trail erosion control work will be kept current during implementation. Erosion control and drainage of skid trails will be complete prior to shutting down operations due to wet weather or at project completion.	All units where applicable	BMP 1.17
Watershed - 26	Use existing skid trails instead of building new skid trails unless using existing skid trails will have greater negative effects. Space skid trails at least 75 feet apart, except near landings and where trails converge. Use no skid trails in areas in which ground-based mechanical equipment is excluded. Designation of new skid trails will be approved by a Timber Sale Administrator. Erosion and sedimentation control structure will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.	All units where applicable	BMP 1.17
Watershed - 27	No full bench skid trails will be constructed. Full bench skid trails have the entire skid trail cut into the hillslope.	All units where applicable	BMP 2.2
Watershed - 28	Locations where skid trails intersect roads will be obliterated or effectively blocked to vehicle access.	All units where applicable	
Watershed - 29	Skyline corridors will be placed on the landscape as to minimize disturbance to active landslides, inner gorges and	All units where applicable	For Unstable Lands: BMP 1.6

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	toe zones of dormant landslide deposits. All skyline and ground-based yarding will require one-end suspension in corridors and on skid trails. Corridors for skyline yarding that are parallel to the stream channel will be placed outside of the riparian reserve. The corridor may cross the stream channel with full suspension of logs within 30 feet from the stream bank. Apply erosion control measures as necessary in skyline corridors to control erosion and runoff. This could include hand construction of water bars and /or spreading slash from adjacent areas.		
Watershed - 30	Where skidding occurs through units with less than 50 percent soil cover, mulch skid trails of greater than 15 percent slope, to achieve at least 50 percent effective soil cover on skid trails (approximately 40 acres across the project area may require this). Effective soil cover could include plant litter, woody material in contact with the soil, living vegetation, and rock fragments with a diameter of ½ to 3 inches. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient.	Based on soil burn severity data, these units are most likely to require this: 225, 264, 402, 525, 528, 540, 1109, 1129, 1136, 1140, 1142, 1151, and 1155.260.1, 521, 408.41, 262, 517, 508.9, 580.4, 263, 20, 33, and 213	S&G 3-4
Watershed - 31	Prescribed fire effects in riparian reserves will mimic a low intensity backing fire, except for handpiles where higher intensity may occur to consume pile material. Ignition of underburns will generally not occur in riparian reserves. Approval by the District Fish Biologist is needed for underburn riparian reserve ignitions.	All units where applicable	MA10-65, MA10-68.
Watershed - 32	Handpiles and windrows in riparian reserves will be placed in a checkerboard pattern whenever possible (not piled directly above another). Handpiles will be less than six feet in diameter. Hand piles will be more than 30 feet away from intermittent streams and 70 feet away from perennial streams except in wildland urban interface areas where piles shall be more than 30 feet from perennial streams. No more than 30 percent or any riparian reserve acre, or other contiguous riparian reserve area which is less than one acre, can have burn scars at any time which do not have organic mulch or vegetative recovery (i.e. not invasive weeds). Consider raking burn scars to restore ground cover and facilitate vegetative recovery as soon as the burn is completely extinguished.	All units where applicable	MA10-65, MA10-68.

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
Watershed - 33	For underburning, hand-line construction in riparian vegetation shall be avoided and in general should be farther than 25 feet from stream channels. Handlines will be mitigated (waterbarred and covered with organic material) immediately following prescribed burning, when safe to do so.	All units where applicable	MA10-65, MA10-68.
Watershed - 34	Draft water only at sites designated by the Forest Service. Decisions related to where water drafting occurs will be coordinated with a Forest Service fisheries biologist so that potential impacts to anadromous fish, and the thermal refugia they rely upon, are sufficiently minimized. Sites that are not likely to have rearing Coho salmon present will be prioritized for use, such as mainstem sites on the Klamath, Scott, and Salmon rivers. Priority will also be given to sites that involve drafting relatively warmer waters in mainstem rivers; drafting from tributaries and colder water sources, especially in their lower reaches, will be avoided particularly during late summer and early fall (when fish survival is dependent upon thermal refugia). Water storage facilities such as foldable tanks are encouraged and will be assessed for sites with moderate flows that simultaneously support rearing SONCC coho salmon, and may be subject to high drafting use (e. g., Walker Creek). Project-related water drafting will be monitored, and shifted away from streams if their baseflows will no longer sustain drafting-related water withdrawal consistent with PDFs. The following creeks will be avoided, due to their small size, small summer base flows, and consistent presence of rearing SONCC Coho salmon - Tom Martin Cr, O'Neil Cr, Little Horse Cr, and China Cr. When drafting from waters designated as coho salmon Critical Habitat: NOAA Fisheries Water Drafting Specifications (2001) apply 1. Intakes will be screened with 3/32" mesh for rounded or square openings, or 1/16" mesh for slotted openings. When in habitat potentially occupied by steelhead trout, intakes will be screened with 1/8" mesh size. Wetted surface area of the screen or fish-exclusion device shall be proportional to the pump rate to ensure that water velocity at the screen surface does not exceed 0.33 feet/second.	All units where applicable	Designed to prevent adverse effects to ESA-listed fish, and consistent with BMP 2.5.

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	a. Use of a NOAA approved fish screen will ensure the above specifications are met. 2. Fish screen will be placed parallel to flow. 3. Pumping rate will not exceed 350 gallons-per-minute or 10% of the flow of the anadromous stream drafted from. 4. Pumping will be terminated when tank is full. Additional applicable specifications: • There will be no modification/improvement of drafting sites in Coho Critical Habitat. Water drafting by more than one truck shall not occur simultaneously. When drafting from waters that are not Coho Salmon critical habitat: Forest Service Best Management Practices (BMP) Handbook direction applies (BMP 2.5) 1. For fish-bearing streams, the water drafting rate should not exceed 350 gallons per minute for streamflow greater than or equal to 4.0 cubic feet per second (cfs). 2. Below 4.0 cfs, drafting rates should not exceed 20 percent of surface flows. 3. Water drafting should cease when bypass surface flows drop below 1.5 cfs. 4. Intakes, for trucks and tanks, shall be placed parallel to the flow of water and screened, with opening size consistent with the protection of aquatic species of interest. 5.Fish-bearing streams that are temporarily dammed to create a drafting pool shall provide fish passage for all life stages of fish. When drafting from non-fish-bearing waters: Forest Service BMP Handbook direction applies (BMP 2.5) • Drafting rate should not exceed 350 gallons per minute for stream flow greater than or equal to 2.0 cubic feet/second. • Drafting rate should not exceed 50 percent of surface flow. • Drafting should cease when bypass surface flow drops below ten gallons per minute. • Drafting by more than one truck shall not occur simultaneously.		
Watershed - 35	Rock and gravel will be applied to drafting sites if it is needed to prevent stream sedimentation.	All units where applicable	BMP 2.5

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	Water drafting sites located outside of Coho salmon Critical Habitat only may include minor instream modification, such as fine sediment removal and building of board/plastic dams. All boards and plastic will be removed after use.		
Watershed - 36	Maintain 5 to 20 pieces of CWD per acre with a target size of 20 inches in diameter (or larger) and about 40 cubic feet in volume when they are available. The minimum piece size to count toward these objectives is > 15 inches diameter and 10 feet long. On upper slopes and south and west aspects, ~5 pieces > 15 inches diameter and 10 feet long would be retained. On north and east aspects and on lower slopes, up to 20 pieces >15 inches diameter and 10 feet long will be retained. Individual snags, clumps of snags, existing logs on the ground and green trees within units may count towards these targets. All Alternatives/All Treatments	All units where applicable	Forest-wide S&G 6-16
Wildlife – 1	A survey strategy has been developed in coordination with Fish and Wildlife Service for northern spotted owl (NSO) surveys. Three NSO surveys will be completed each year prior to project implementation, except for roads identified as major ingress/egress access roads that do not occur within occupied core areas (see Ingress/Egress roads discussion below). If surveys result in a positive detection of NSO, then: No treatment will occur within occupied core areas from February 1 to July 9 unless nesting is confirmed or suspected, then no treatment within the core area until after September 15. No treatment will occur within 0.25 miles of unsurveyed suitable NSO nesting/roosting or foraging habitat (as identified by the project biologist and FWS consultation) prior to July 9, except for the following areas: Units 005-9-1, 22, 23, 23-15, 23-16, 23-17, 23-18, 23-19, 23-30, 51, 52, 56-1-1, 56-2, 58, 059, 520, 523, 524, 525-1, and 525-2 INGRESS/EGRESS ROADS with Roadside Hazard Treatment: Limited Operating Periods will <u>not</u> apply to ingress/egress roadside hazard treatments occurring <u>*outside*</u> occupied core areas (as determined by the most recent surveys). Limited Operating Periods will apply to ingress/egress roadside hazard treatments occurring <u>*within*</u> occupied core areas (as determined by the	All Alternatives All units where applicable	Resulted from consultation with FWS.

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	most recent surveys); so treatments will not occur until after July 9. Unless nesting is suspected or confirmed then treatments will not occur within the occupied core area until after Sept. 15. Six NSO surveys will be completed along ingress/egress roads, though 3 surveys may or may not be completed prior to implementation.		
Wildlife – 2	No more than 50 percent of the suitable nesting/roosting, and foraging habitat within an occupied NSO core area and no more than 50 percent of the nesting/roosting, and foraging suitable habitat within an occupied NSO home range will be underburned annually. Underburning will not occur within occupied core areas between February 1 to September15.	All Alternatives All units where applicable	Resulted from consultation with FWS.
Wildlife – 3	No prescribed fire (e.g. underburning and pile burning) within 0.5 mile of an eagle nest from January 1 to August 31. No prescribed fire (e.g. underburning and pile burning) will be implemented within bald eagle winter roost areas from November 1 to March 31. If a survey determines that a winter roost or nest site is not active, no seasonal restrictions are required for the year.	ALL ALTERNATIVES All units where applicable	Bald and Golden eagle Protection Act; Bald eagle Management Guidelines and LRMP Standards and Guidelines..
Wildlife – 4	No helicopter activity within 0.5 mile of a bald eagle roost or nest or within all of Caroline Creek (7th field watershed) from January 1 to August 31. If surveys determine that a roost or nest is not active, no seasonal restrictions are required for the year. Landings L259 and L270 (in Caroline Creek) are not subject to this LOP.	All Alternatives All units where applicable Landings DZ03, DZ04, DZ05, DZ10, L040 Units 037, 038, and 039	Bald and Golden eagle Protection Act; Bald eagle Management Guidelines and LRMP Standards and Guidelines.
Wildlife – 5	No project activities creating noise above ambient levels (including mechanical thinning, yarding, chainsaw use, and hauling) or habitat modification within 0.25 mile of a bald eagle roost or nest from January 1 to August 31. If surveys determine that a roost or nest is not active, no seasonal restrictions are required for the year.	All Alternatives Units: F147, F152, F149, F152-1, F147-2, F098, F098-1, R126, R129, R132, and R102.	Bald and Golden eagle Protection Act; Bald eagle Management Guidelines and LRMP Standards and Guidelines.
Wildlife – 6	Goshawk surveys will be conducted prior to project implementation. If survey results locate a nesting pair, project activities will not occur within .25 miles of this site location from (March 1- August 31). If pre-implementation surveys determine no nesting activity, then seasonal restrictions may be lifted for the year.	All Alternatives All units where applicable	LRMP
Wildlife – 7	No roadside treatment between March 1 and June 15 to avoid	All Alternatives	Resulted from

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
	disturbance of denning fisher.	ML1 roads	consultation with FWS.
Wildlife – 8	No treatment, salvage harvest, or ground disturbing activity during any time of the year in areas within units that are flagged for avoidance; as these areas contain either known sites, occupied talus habitat, or potentially occupied talus habitat for the Scott Bar Salamander and Siskiyou Mountain Salamander. Sites will be flagged on the ground by the project wildlife biologist.	All Alternatives Applies to all or parts of units 517, 518, 508-8, 508-4, 508-4-1, 508-9, 508, 508-3, 508-2, 508-1, 501, 503, 506, 505, 515-1, 515-1-2, 516, 523-1, 523, and 528.	Survey and Manage Rules
Wildlife – 9	Do not place skyline corridors on known sites, occupied talus habitat, or potentially occupied talus habitat for the Scott Bar Salamander and Siskiyou Mt Salamander during anytime of the year. This will apply to skyline units within the range of the Scott Bar and Siskiyou Mt Salamander that have talus habitat.	All Alternatives Applies to units 508, 508-3, 508-2, 508-1, 501, 503, 506, 505, 515-1, 515-1-2, 516, 523-1, 523, and 528.	Survey and Manage Rules
Wildlife – 10	Avoid ground disturbance to known Survey and Manage mollusk and salamander sites during roadside hazard tree removal activities.	All Alternatives – All roadside hazard units where applicable	Survey and Manage Rules
Wildlife – 11	Legacy Components Retention for Late Successional Habitat Retain legacy component trees and snags in treatment units. These legacy components will be identified using physical characteristics. Legacy trees or snag size will vary depending on site condition, but are usually disproportionately large diameter trees that are often remnants of the previous stand on a given site. They are old standing trees that have persisted on the landscape after man-made and natural disturbances. For example, large trees containing one or more of the following characteristics: split or broken tops, heavy decadent branching, large mistletoe brooms, otherwise damaged to the degree that a cavity may form such as basal fire or lightning scars, or other features that indicate decay or defect. If the legacy component tree or snag must be felled for safety reasons, retain the log whole in the unit.	All Alternatives All units where applicable	Northwest Forest Plan Standards and Guidelines; LRMP; and NSO Recovery Plan Recovery Action 12.
Wildlife – 12	Snags or dying trees that contain cat faces, broken or forked tops, hollows or cavities, burned out cavities, or those that are otherwise damaged to the degree that a cavity may form will be favored for retention. Retain all large hardwood snags or live trees where practicable, particularly those with cavities, broken or split tops, or large broken branches.	All Alternatives All units where applicable	MIS habitat management recommendations and future stand development.

Project Design Feature	Description	Applicable Alternatives and Units	Rationale OR Applicable Standard and Guideline
Wildlife – 13	Retain pre-existing (existing prior to the wildfire) conifer and hardwood snags (greater than 14 inches in diameter at breast height) and pre-existing coarse woody debris in the salvage units. If any pre-existing snags must be felled for safety reasons, these pre-existing snags will be left on landscape whole as coarse wood.	All Alternatives All units where applicable	Resulted from consultation with FWS.; MIS habitat management recommendations; LRMP
Wildlife – 14	Avoid placing skyline corridors through retention patches or any actions that would potentially damage retention areas whenever possible.	All ALTERNATIVES	Resulted from consultation with FWS and interdisciplinary coordination
Wildlife – 15	Leave cull trees (greater than or equal to 20inches in diameter) in roadside units where possible . Leave as whole logs where practicable.	ALL ALTERNATIVES All units where applicable	LRMP
Wildlife - 16	Avoid all salvage harvest within delineated retention patches.	ALL ALTERNATIVES All units where applicable	Resulted from consultation with FWS and interdisciplinary coordination
Wildlife – 17	No management activities will occur within at least 0.25 mile (up to 1.0 mile) of peregrine falcon nest location from March 1 to August 31 if the nest is active. If a survey determines that a nest site is not active, no seasonal restrictions are required for the year.	ALL ALTERNATIVES Units:213 and F038,	LRMP
Wildlife – 18	No helicopter flight paths within 0.5 mile (up to 1 mile) from a peregrine falcon nest location from March 1 to August 31. If a survey determines that a nest site is not active, no seasonal restrictions are required.	ALL ALTERNATIVES Units:214 and L237	LRMP
Wildlife—19	Green Trees without fire damage will not be removed from within roadside hazard tree units unless they are an immediate hazard.	All Alternatives	Resulted from consultation with FWS.

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Alternative Developed as a Result of Tribal Consultation with the Karuk Tribe (Karuk Alternative)[31]

As a result of government-to-government consultation between the Karuk Tribe and the Forest, the Karuk Tribe provided an alternative that is responsive to the Tribe's management vision of restoring fire to its rightful place on the landscape where it will serve to protect river communities and cultural resources. Using the Karuk Tribe Department of Natural Resources Eco-Cultural Resources Management Plan, and concepts of the Western Klamath Restoration Partnership for which the Karuk serve as co-lead, specific treatments are proposed in areas of the Happy Camp Complex and Whites fires. The Karuk Tribe does not agree that salvage harvest as proposed in the existing alternatives of the Westside Fire Recovery Project is in the best interest of communities. The Karuk Tribe's management vision, as outlined in the Eco-Cultural Resource Management Plan, supports some level of salvage harvest based on what is best for resources and not driven by economics but the level of salvage proposed in the Westside Project is contrary to the Karuk Tribe's management vision. Therefore, an alternative without the level of salvage harvest in the alternatives presented in the draft EIS is proposed.

The Karuk Alternative focuses on getting fire back on the landscape and on the cost savings of doing this gained by reduced fire suppression expenditures over time. By creating fuelbreaks around communities and implementing strategic prescribed burns in the Wildland Urban Interface, wildfires burning late in the fire season can be allowed to burn and achieve resource benefits while reducing fire suppression costs. The Karuk Alternative still provides a substantial portion of merchantable timber for area mills (roughly 35 percent of the preferred alternative from the draft EIS), while minimizing the impacts of these harvest activities by concentrating them along key access routes and ridgetop fuelbreaks.

The Karuk Alternative allows for roadside hazard treatments along maintenance level 3, 4 and 5 roads that are well-traveled and serve as important access/egress routes, particularly in an emergency, and those maintenance level 1 and 2 roads that are needed for strategic fuels reduction projects to be used in the reintroduction of fire on the landscape. No site preparation and planting units are proposed. Several fuels units are added to those proposed in other alternatives; some are linear treatments for protection of private property, some are additional ridgetop treatments for reintroduction of landscape-scale fire, and others are larger underburn treatment units to allow for managing wildfire for resource benefits where it poses little threat to communities. This alternative was received in time for inclusion in Appendix G of the draft EIS with a request for public comment but not in time for detailed study before the draft EIS was published. The following is a numerical description of this alternative as provided by initial analysis of the maps that display proposed treatments and data made available by the Karuk Tribe.

Salvage Harvest (about 2,930 acres of salvage harvest within about 3,410 acres of units):

[31] The Karuk Tribe is a federally-recognized Indian Tribe (73 Fed. Reg. 18,535, 18, 544 (April 4, 2008)); the Tribe's aboriginal land is along the middle course of the Klamath and Salmon Rivers in Northern California. The Tribe's mapped Aboriginal Territory, an estimated 1.38 million acres within the Klamath River Basin, includes 85,800 acres of the Happy Camp Complex fire-related area (almost 75 percent) and 9,080 acres of the Whites fire area (27 percent). Some areas on the aboriginal territory map are also considered as part of the ancestral territory of other tribes.

This alternative proposes salvage logging treatments on about 2,930 acres within 3,410 acres of salvage units on Forest lands in the Happy Camp and Whites fire areas. This difference between acres of salvage units and harvested acres is a result of subtracting out the riparian reserve acres within each unit.

Table 2-43: Acres of treatment proposed in the Karuk Alternative by logging systems

Logging System	Happy Camp Complex Treatment Acres (and acres within salvage units)	Whites Fire Treatment Acres (and acres within salvage units)	Grand Total Salvage Treatment Acres (and acres within salvage harvest units)
Ground-based	170 (285)	9 (15)	179 (299)
Skyline	1,095 (1,825)	102 (170)	1,197 (1,995)
Helicopter	727 (1,211)	34 (57)	761 (1,268)
Total Treatment Acres (and acres within units)	2,756 (3,165)	173 (242)	2,930 (3,407)

Roadside Hazard Treatments (along about 221 miles within the Happy Camp fire area and 44 miles within the Whites fire area):

This alternative includes roadside hazard treatments, especially on maintenance level 3, 4 and 5 roads but also on some maintenance level 1 and 2 roads within the Happy Camp complex and Whites fire-identified project areas. Acres evaluated for these treatments are estimated to be a maximum of 11,683 acres (9,728 acres in the Happy Camp complex area and 1,955 acres in the Whites fire area).

Hazardous Fuels Treatments: (about 41,660 acres)

Project-related hazardous fuels treatments will take place on about 23,580 acres in the Happy Camp fire area and 18,080 acres in the Whites fire area for a total of 41,660 acres of treatments in the Karuk Alternative. Underburning (understory prescribed fire) acres in this alternative include about 29,220 acres (13,330 acres in the Happy Camp fire area and 15,890 acres in the Whites fire area). Fuel management zones include about 4,250 acres in the Happy Camp Complex fire area and 920 acres in the Whites fire area for a total of about 5,170 acres. In the Happy Camp Complex area, fuels will be treated on the roadsides on about 4,700 acres and on about 810 acres in the Whites fire area for a total of 5,510 acres. About 1,300 acres in the Happy Camp fire area and 470 acres in the Whites fire area will be treated in the Wildland Urban Interface (WUI) for a total of 1,770 acres of fuel reduction in WUI. In addition to project-related fuel reduction treatments, the Karuk Alternative proposes that future wildfires shall be managed for resource benefits on about 132,830 acres in the Happy Camp complex and 32,880 acres in the Whites fire area for a total of 165,700 acres.

Table 2-44: Karuk Alternative fuel treatment acres by treatment type

Treatment Type	Happy Camp Complex	Whites Fire	Grand Total
Wildland Urban Interface	1,300	470	1,770
Fuels Management Zones	4,250	920	5,160
Roadside Fuels Treatments	4,700	810	5,510
Prescribed Burn (underburn)	13,330	15,890	29,220
Grand Total	23,580	18,080	41,660

Site Preparation, Planting, and Release:

No site preparation, planting or release is proposed for Happy Camp and Whites fire areas in this alternative.

Connected Actions

Road Access

As with other alternatives, project access will require the use of Forest System roads and county roads. There will be no roads proposed to be added to the Forest System as a result of this project in the Karuk Alternative. No new temporary roads are proposed to be constructed, and no miles of temporary roads on existing roadbeds or on reopened decommissioned roads are proposed to be used for project access.

Table 2-45: Miles of road access for the Karuk Alternative

Type of Road Access in Miles	Happy Camp Complex	Whites Fire	Grand Total
Forest System, County, and State	353	63	416
New Temporary	0	0	0
Temporary Roads on Existing Roadbeds or Routes	0	0	0
Temporary Road on Existing Roadbeds	0	0	0
Temporary Roads on Re-opened Decommissioned Roads	0	0	0
Grand Total	353	63	416

Landings

Eighty-seven landings are proposed in the Karuk Alternative, 79 in the Happy Camp Complex and eight in the Whites fire area, to facilitate implementation of treatments. Thirty-two of these are existing landings, 30 in the Happy Camp Complex and two in the Whites fire area; 55 are new landings (49 for Happy Camp Complex area and six for the Whites fire area). Of the existing landings, 12 are to facilitate ground-based yarding (all in the Happy Camp Complex area) and 20 are for helicopters (18 in the Happy Camp Complex area and two for the Whites fire area). Of the new landings, six are for ground-based yarding (five in the Happy Camp Complex area and one in the Whites fire area). Twenty-nine new landings (all in the Happy Camp Complex area) are for helicopters. Twenty new landings are for skyline yarding; 15 of these are in the Happy Camp Complex area and five are in the Whites fire area.

In response to recommendations in the Karuk Alternative, the Forest included a number of treatments into the Happy Camp and Whites fire areas in Alternative 3 Modified as displayed in Table 2-46.

Table 2-46: Karuk Alternative Comparison to Alternative 3 Modified

Happy Camp and Whites Project Areas (acres of treatment)	Karuk Alternative	Alternative 3 Modified	Acres of Karuk Alternative in Alternative 3 Modified	Percent of Karuk Actions in Alternative 3 Modified
Risk Reduction Salvage Harvest Units (gross)	3,410	6,890	2,310	68
Risk Reduction Salvage Proposed[1]	2,930	5,750	1,995	68

Happy Camp and Whites Project Areas (acres of treatment)	Karuk Alternative	Alternative 3 Modified	Acres of Karuk Alternative in Alternative 3 Modified	Percent of Karuk Actions in Alternative 3 Modified
Roadside Hazard Evaluated	11,680	12,130	8,759	75
Estimated Roadside Hazard Treatments [2]	781	974	539	69
Fuels				
Fuels Management Zone (Ridgetop Fuel Breaks)	5,165	3,300	3470	67
Roadside Fuels Treatments	5,509	4,010	3,986	72
Understory Prescribed Fire [3]	29,221	10,730	10,738	37
WUI Fuel Reduction	1,768	2,010	1,682	95
Total Fuels Acres	**41,662**	**21,140**	**19,876**	**48**
Wildland Fire Use [4]	165,704	165,704	165,704	100
Site Preparation And Planting (Plantations and Natural Stands)	0	5,480	0	0

[1] Net acreage reduction is due to excluding riparian reserves and snag retention areas from the gross acreage.

[2] Estimated roadside hazard treatments include areas which burned at moderate and high severity where trees greater than ten inches in diameter occur, outside of salvage units.

[3] Estimated roadside hazard treatments include areas which burned at moderate and high severity where trees greater than ten inches in diameter occur, outside of salvage units.

[4] The Klamath National Forest Land and Resource Management Plan allows for wildland fire use on the entire Forest.

All action alternatives proposed by the Forest in this final EIS also strive to minimize the negative effects of harvest activities while providing merchantable timber. When and where possible, these activities are concentrated along key access routes and ridgetop fuelbreaks, taking into account effects of these actions on other resources.

The Forest supports the use of unplanned wildfire to achieve resource benefits as directed by the Forest Plan and national guidance for implementation of federal wildland fire management policy. None of the actions proposed by the Forest in the Westside Fire Recovery Project will limit the ability of the Forest to use this guidance to use unplanned wildlife to achieve resource benefits.

Alternative 3 Modified (the preferred alternative in the final EIS) emphasizes roadside hazard treatments along well-traveled roads that provide access and egress and those roads that are needed for fuel reduction. In the final EIS, the number of acres on which roadside hazards will be treated has been clarified as noted in Table 2-30 of this chapter. In Alternative 3 Modified, a total of 12,130 acres were evaluated along 270 miles of road in the Happy Camp Complex and Whites fire areas; on about 970 acres, hazard trees greater than10 inches in diameter that burned at moderate or high severity will be removed.

The effects of no site preparation and planting, as recommended in the Karuk Alternative, are analyzed in the effects of Alternative 1 in which no site preparation and planting will occur. As noted in the vegetation section of Chapter 3 of the final EIS, site preparation and planting have been included in action alternatives because they are important activities in accelerating regeneration of the Forest. Planting conifers in strategic locations that are unlikely to provide seed sources and conditions for conifer regeneration

help foster long-term habitat for wildlife species that depend on late-successional forests and to stabilize soils that are likely to landslide without tree roots. Planting, as proposed, is needed to meet the purpose and need of this project. Unlike in the past, planting will not result in row-crop plantations. Hardwood regeneration will be fostered in areas where hardwoods are present. Prescribed burning will not be halted or hindered by the presence of planted conifers. As noted in the vegetation section of Chapter 3 of the final EIS, in the preferred alternative (Alternative 3 modified) about 75 percent of the area that burned at moderate or high severity (about 70 percent of the Happy Camp fire area and almost 90 percent of the Whites fire area that burned at moderate or high severity) will regenerate naturally. About 25 percent of the area that burned at high or moderate severity (about 30 percent of the Happy Camp fire area and about 11 percent of the Whites fire area that burned at moderate or high severity) will be treated to accelerate regeneration.

Opportunities for increased underburning treatments that are recommended by the Karuk Tribe were analyzed. Some of the locations of suggested underburning were already included in projects that are either currently being analyzed or for which decisions were made before the 2014 fires (see Footnote 3 of Table 2-46). Other proposed locations for underburning in the Karuk Alternative burned severely in the 2014 fires and are not likely to be ready for prescribed burning within the eight years anticipated for the implementation of the Westside Fire Recovery Project. These underburns proposed by the Karuk Tribe will be analyzed when they are ready for potential treatment.

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the proposed action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of the need for the proposal, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but eliminated from detailed consideration for reasons summarized below.

Alternative A

This alternative was developed in response to a report that offers “a scientific framework of principles and practices that are provided to guide development of federal policy concerning wildfire and salvage logging and other post-fire treatments” (Beschta 1995) and includes recommendations on post-fire practices. The recommendations and how they are addressed are displayed in Table 2-47.

Table 2-47: Recommendations of the 1995 Beschta report and how each is addressed by alternatives in the Westside Fire Recovery project

Recommendations:		Addressed by:
Prohibiting salvage logging in sensitive areas (as defined by (a) through (f)	a) severely burned areas (soil burn severity)	Alternative 1 will not salvage in severely burned areas. Action alternatives (2 through 5) minimize negative effects of salvage through implementation of watershed project design features. See also response to relevant issue #1. Alternative 4 responds to this issue.

Recommendations:		Addressed by:
	b) erosive soils and any site where accelerated erosion is possible (soils with very high erosion hazard ratings)	Alternative 1 will not salvage on erosive soils or sites where accelerated erosion is possible. Action alternatives (2 through 5) minimize negative effects of salvage through implementation of watershed project design features. See also response to relevant issue #1. Alternative 4 responds to this issue.
	c) fragile soils (those that have physical, chemical, or biological limitations that reduce ability to recover after disturbance: schist, granitic, and serpentine)	Alternative 1 will not salvage on fragile soils. Action alternatives (2 through 5) minimize negative effects of salvage through implementation of watershed project design features. See also response to relevant issue #1. Alternative 4 responds to this issue.
	d) roadless areas	None of the alternatives propose salvage harvest within inventoried roadless areas so all alternatives meet the Beschta recommendations. See also response to relevant issue #3. Alternative 5 responds specifically to this issue.
	e) riparian areas	No salvage harvest is proposed for hydrologic (stream-side) riparian areas (reserves) as delineated in watershed project design features. No salvage is proposed for geologic riparian reserves in Alternative 1. Action alternatives (2 through 5) minimize negative effects of salvage through implementation of watershed project design features. See also response to relevant issues #1 and #3. Alternatives 4 and 5 respond to these issues as does the refined Alternative 2.
	f) steep slopes	Alternative 1 will not salvage on steep slopes. Action alternatives (2 through 5) minimize negative effects of salvage through implementation of watershed project design features that limit the slopes on which salvage will occur. See also response to relevant issue #1. Alternative 4 responds to this issue.
Limitations aimed at maintaining species and natural recovery processes should apply to areas suitable for salvage	Leave at least 50 percent of standing dead trees in each diameter class leave all trees greater than 20 inches diameter at breast height or older than 150 years Generally, leave all live trees	Alternative 1 maintains natural recovery process in 100 percent of the project area. Action alternatives (2 through 5) maintain natural recovery on from 88 percent of the project areas (Alternative 2) and 89 percent (Alternatives 3 and 4) to 96 percent (Alternative 5). Action alternatives generally retain all live trees (with 70 percent or greater chance of living) in salvage units. Removal of snags is governed by project design features; all action alternatives minimize negative effects of salvage on maintaining species through implementation of wildlife project design features. See also response to relevant issue #2. Alternative 3 responds to this issue.
Prohibit new road building in the burned landscape.		Alternative 1 does not propose building any new roads. Action alternatives (2 through 5) do not build any new National Forest Transportation System (permanent) roads. New temporary roads are proposed from 23 miles (Alternative 2) to 4 miles (Alternative 4) Alternative 4 limits new temporary roads. All action alternatives minimize negative effects of new temporary roads through implementation of project design features. See also response to relevant issue #1. Alternative 4 responds to this issue.

Recommendations:	Addressed by:
Limit active reseeding and planting.	None of the alternatives include active reseeding of grasses or use of pesticides, herbicides or fertilizers. Alternative 1 proposes no planting. Action alternatives (2 through 5) propose planting of native tree seedlings where viable seed sources are lacking on from 12 percent of the project areas (Alternative 2) to 4 percent (Alternative 5). All action alternatives minimize negative effects of planting through planting specifics (diversity of species to be planted, spacing, trees per acre, etc.) and by implementation of project design features. See also response to relevant issue #2. Alternative 3 responds specifically to this issue. Alternative 5 addresses this recommendation by limiting planting to matrix lands.
Discourage structural post-fire restoration	None of the alternatives include “hard” structures such as sediment traps, fish habitat alterations or bank stabilization. Alternative 1 proposes only natural post-fire restoration. Action alternatives (2 through 5) include repair of legacy sites such as too small culverts in areas agreed-upon with the State of California Water Board. Project design features for action alternatives include provision of large woody debris. All action alternatives minimize negative effects through implementation of project design features.
Support research efforts needed to address ecological and operational issues	This recommendation is beyond the scope of this project. The effects of both fine and large fuels on the probability of re-burn, and relevant scientific literature concerning this topic, are addressed for all action alternatives in Chapter 3 and the related Fire and Fuels resource report.
Educate the public regarding natural fires and post-burn landscapes	This recommendation is beyond the scope of this project. Chapter 3 compares the effects of allowing natural regeneration of the project area (Alternative 1) to the effects of active regeneration alternatives (2 through 5) and makes this comparison available to the public.

The comment letter on which this alternative is based seeks an alternative that includes all of the above recommendations.

Specifically prohibiting salvage logging in all areas defined by Beschta as sensitive will limit the Forest Service’s ability to meet the purpose and need for action. Other alternatives respond to the exclusion of salvage in one or more sensitive areas. The refined proposed action (Alternative 2) and alternatives to the proposed action respond to recommendations 2 through 8 that are within the scope of the project. All action alternatives include implementation of project design features to minimize negative impacts, making it redundant to analyze this alternative in detail so it was eliminated from detailed study.

Alternative B

This alternative was developed to respond to a request for specific treatments, and limitation on other treatments, and additional or modified project design features to minimize or eliminate negative effects as noted and addressed in Table 2-48.

Table 2-48: Recommendations on specific treatments and how each is addressed by alternatives in the Westside Fire Recovery project

Recommendation:	Addressed by:
No timber harvest from Scenic River viewsheds unless there is an overlap with WUI or within ¼ mile of private property	Alternative 1 proposes no treatment in Scenic River corridors. Alternatives 2 through 5 propose no salvage harvest units within a Scenic River corridor. All action alternatives minimize negative effects of treatments through implementation of project design features. Alternatives 1 through 5 respond to this issue.
Re-plant with a mix of conifer species suitable the area to increase vegetative diversity	Alternative 1 does not propose any planting. Action alternatives (2 through 5) propose replanting with a mix of conifer species suitable to the area to increase vegetative diversity, and encourage the natural regeneration of hardwoods where they exist, as specified in Chapter 2 (see also the response to item #4 under alternative A). All action alternatives minimize negative effects through implementation of project design features. See also response to issue D. Alternatives 2 through 5 respond to this issue.
Analyze the entire project area for prescribed burning opportunities	Alternative 1 proposes no prescribed burning. Action alternatives (2 through 5) analyzed opportunities for prescribed burning on the entire project area and proposed such treatments on up to 11,400 acres. All action alternatives minimize negative effects by implementation of project design features. Alternatives 2 through 5 respond to this issue.
Schedule future prescribed burns in strategic fire-control areas every 3-5 years	Alternative 1 does not include prescribed burns. Scheduling future prescribed burns in strategic fire-control areas every three to five years is beyond the scope of this project. Action alternatives (2 through 5) schedule prescribed burns in strategic fire-control areas five to seven years after implementation of the project begins.
Establish long-term management plans for plants important to the Karuk tribe	Long-term management plans are beyond the scope of this project. Culturally-important plants within the spatial and temporary boundaries of the project area are addressed in Alternative F. Effects of alternatives on these plants are disclosed for all action alternatives in Chapter 3 and through implementation of heritage project design features.
Use contour felling of snags to reduce sedimentation of important anadromous fish streams	Alternative 1 does not propose felling any snags. Action Alternatives 2 through 5 include measures to reduce sedimentation in important anadromous fish streams, including contour felling, through the implementation of watershed project design features. See also response to relevant issue #1. Alternative 4 responds specifically to this issue.
Incorporate large woody debris into stream channels	Alternative 1 will provide large woody debris in stream channels as dead and dying snags fall. Action Alternatives 2 through 5 incorporate large woody debris into stream channels through implementation of watershed project design features. See also response to relevant issue #1. Alternative 4 responds specifically to relevant issue #1.
In areas with highly erosive soils, plant on the bottom 1/3 of the slope	Alternative 1 does not propose planting in any areas. Action Alternatives 2 through 5 minimize negative impacts to highly erosive soils through implementation of watershed project design features. Specific information on planting on erosive soils is provided in Chapter 2.
Design sediment catchment ponds so they do not retain water in the summer months	This recommendation is beyond the scope of this project. No catchment ponds are included as part of this project.
Maintain and/or construct shaded fuel breaks along strategic ridgelines and roads;	Alternative 1 does not propose constructing or maintaining shaded fuel breaks. Action alternatives include constructing or maintaining fuel breaks along strategic ridgelines and roads as described in Chapter 2.
Manage ridge lines for fire-resilient and less flammable botanical communities	Alternative 1 does not propose managing ridge lines for fire-resilient botanical communities. Action alternatives include planting a variety of species in a mosaic to foster less flammable botanical communities on areas proposed for planting as described in Chapter 2. Strategic ridgelines will be managed as open, shaded fuel breaks as described in Chapter 2.

Recommendation:	Addressed by:
Collaborate with adjacent private landowners prior to deciding on recovery activities	Collaboration with adjacent landowners is an important part of this project. The refined proposed action (Alternative 2) and alternatives to the proposed action are based on collaboration with adjacent landowners as described in Chapter 1.
Collaborate on site-specific prescriptions in the WUI	Collaboration on site-specific prescriptions in the WUI is part of this project. The refined proposed action (Alternative 2) and alternatives to the proposed action are based on collaboration with residents in the WUI and the Community Wildfire Protection Plans of communities within the project area as described in Chapter 1.
Promote principles of Adaptive Ecosystem Management and collaborate on studies of different recovery activities	Promoting adaptive ecosystem management and collaborating on studies of different recovery activities are beyond the scope of this project but can be considered as part of future projects or programs on the Forest. The draft EIS includes different recovery actions in different alternatives; the effects of these actions are disclosed in Chapter 3.

The comment letter on which this alternative is based seeks an alternative that includes all or most of the above recommendations. Many of these recommendations are consistent with the refined proposed action (Alternative 2) and with other action alternatives.

Since recommendations that can be addressed (are not beyond the scope of this project) are either consistent with the refined proposed action or an action alternative, developing an alternative to meet all of these recommendations would be redundant. For these reasons, this alternative is eliminated from detailed study.

Alternative C

This comprehensive alternative was developed to respond to recommendations for specific treatments to reduce environmental impacts, especially in specific locations, that are listed and addressed in Table 2-49.

Table 2-49: Recommendations on specific treatments and locations, and how each is addressed by alternatives in the Westside Fire Recovery project

Recommendation:	Addressed by:
Only fell roadside hazard trees that are 100 percent dead and less than 45 inches DBH	Confirming that trees are 100 percent dead is only possible if the trees have fallen to the ground; waiting for this to happen will not meet the safety-related purpose and need for the project. Safety is the major reason on which the 60 percent certainty of mortality for roadside hazard trees is chosen, as disclosed in Chapter 2. Few of any of the roadside hazard trees are greater than 45 inches DBH; if trees of this diameter are safety hazards, they will not be left standing in any action alternative. Alternative 1 will not cut and fell any trees.
No green-tree removal in recovery prescriptions	None of the alternatives in this project propose green-tree removal. Green trees are defined as those with a 70 percent or better chance of surviving as discussed earlier in Chapter 2. Some of the trees to be removed in all action alternatives include some green needles or leaves; however, the trees have a 70 percent or greater chance of dying and becoming part of the fuel accumulation on the ground in the short term.
Increase funding for fuels reduction and prescribed fire within the CWPP and WUI areas	This recommendation is beyond the scope of this project.

Recommendation:	Addressed by:
Post fire management in the Grider Creek Watershed should protect and promote critical wildlife and fisheries habitat	All alternatives protect and promote critical wildlife and fisheries habitat by implementation of wildlife and watershed project design features. See also relevant issues #1, #2 and #3, Alternatives 3 and 4 respond specifically to these issues.
Severely burned plantations should be reviewed for best management and suitability for future planting	Severely burned plantations were reviewed for best management and suitability for planting in all action alternatives as described earlier in Chapter 2.
Jobs associated with these efforts should be prioritized to regional contractors and laborers when feasible	This recommendation is beyond the scope of this project, and contrary to law, policy and regulation.
Use strategic fuels reduction and prescribed fire in order to return to fire-adapted and ecologically resilient landscapes	Alternative 1 does not propose any fuels reduction. Action Alternatives 2 through 5 all propose strategic fuel breaks and prescribed fire as well as other fuel reduction practices as described earlier in Chapter 2. Implementation of project design features will minimize potential negative effects.

The comment letter on which this alternative is based seeks an alternative that includes all of the above recommendations. Many of these recommendations are consistent with the refined proposed action (Alternative 2) and with other action alternatives.

Reasons are provided above as to why following the first recommendation is not practicable. Since recommendations that can be addressed (are not beyond the scope of this project) are either consistent with the refined proposed action or an action alternative, developing an alternative to meet all of these recommendations would be redundant. For these reasons, this alternative is eliminated from detailed study.

Alternative D

This alternative was developed in response to comment letters which request specific project design features be implemented to minimize negative impacts. Recommended project design features and the way they are addressed are displayed in Table 2-50.

Table 2-50: Recommendations on additional project design features and how each is addressed by alternatives in the Westside Fire Recovery project

Recommendations:	Addressed by:
No new roads, permanent or temporary	None of the alternatives in the project propose new permanent (system) roads. Alternative 1 proposes no new temporary roads. Action alternatives implement project design features to minimize potential negative impacts of new temporary roads. Action alternatives differ in the number and location of new temporary roads. In response to relevant issue #1, Alternative 4 limits the number and location of temporary roads to further reduce impacts.
No tree planting units, allow for natural reseeding	Alternative 1 does not propose any tree planting. Action Alternatives 2 through 5 allow for natural reseeding where seed sources are available, and propose tree planting in other areas, as described earllier in Chapter 2. The effects all alternatives are summarized in Chapter 2, and disclosed and compared in Chapter 3 of this document. Implementation of project design features minimizes negative impacts of planting. See relevant issue #3 for further suggestions on limiting planting; Alternative 5 responds specifically to this issue.
No helicopter units	Alternative 1 does not propose any helicopter units. Action Alternatives 2 through 5 include different numbers of helicopter units as discussed earlier in Chapter 2. The effects of various numbers of helicopter units are disclosed in Chapter 3.

Recommendations:	Addressed by:
No logging in stands that sustained less than 70 percent mortality	The reasons for using the 50 percent mortality of a stand before it will be considered for harvest, and the analysis on which this percentage is selected, are provided earlier in Chapter 2. Changing the percentage of mortality used to determine if logging can take place will have little effect on determining which units can be logged. Relevant issue #2 expresses disagreement about the effects of the proposed action on wildlife habitat and connectivity. Alternative 3 addresses this issue specifically; in doing so, the mortality of stands is included in reasons for proposing elimination of stands from salvage logging as described earlier in Chapter 2.
No salvage logging at elevations above 6,000 feet	Alternative 1 proposes no salvage logging. Action alternatives use different criteria for determining which units are proposed for salvage logging, but the specific criteria of elevation is not included. Implementation of other criteria restricts the amount of salvage proposed above 6,000 feet. Implementation of project design features minimizes negative impacts of salvage logging at all elevations.
No salvage units on slopes exceeding 60 percent	Alternative 1 does not propose any salvage units. Action Alternatives 2 through 5 minimize negative effects of salvage through implementation of watershed project design features which include those that limit equipment use of slopes over 35 to 45 percent.
Burn all activity generated slash	Treating activity slash for action alternatives (2 through 5) is discussed earlier in Chapter 2. Treatments proposed for activity slash include burning and other treatments as noted in project design features.
Retain biological legacies such as large live trees, large snags, coarse woody debris and intact thickets of unburned vegetation in falling and yarding operations	Alternative 1 will retain all biological legacies. Action Alternatives 2 through 5 will retain large live trees and intact thickets of unburned vegetation. Snags and coarse woody debris will be retained to meet Forest Plan standards in all action alternatives through implementing project design features. Relevant issue #2 is based on public comments on retention of these legacies. Alternative 3 responds specifically to this issue.
Retain adequate large downed wood for slope stability and regeneration	Alternative 1 retains all downed wood. Action Alternatives 2 through 5 retain downed wood as specified earlier in Chapter 2 and through implementing project design features. See also relevant issue #2 and Alternative 3.
Leave a minimum of 70 percent of coarse woody debris parallel to topographical lines to abate water run-off and erosion	Alternative 1 retains all coarse woody debris. Action Alternatives 2 through 5 retain coarse woody debris as specified earlier in Chapter 2 and through implementing project design features. See also relevant issue #1 and Alternative 4.
Leave up to 25 snags per acre, especially those with broken or forked tops, complex branching patterns, cat faces or fire damage that provide cavity nesting habitat. Consider the retention of snags in aggregates	Alternative 1 retains all snags. Action Alternatives 2 through 5 retain snags in clumps as required by the Forest Plan and specified earlier in Chapter 2 and through implementing project design features. See also relevant issue #2 and Alternative 3 for additional retention of snags.
Retain the largest live trees and snags in all salvage units	All alternatives retain all live trees in salvage units as discussed earlier in Chapter 2 and in response to item 2 in Alternative C (Table 2-49). Alternative 1 retains all trees and snags. Action Alternatives 2 through 5 retain snags as required by the Forest Plan and specified earlier in Chapter 2; snags are retained through implementing project design features. See also relevant issue #2 and Alternative 3 for additional retention of large snags.

Recommendations:	Addressed by:
Retain all trees with green foliage	All alternatives retain all live trees (those with more than a 60 percent of surviving (for roadside hazard) and 70 percent chance of surviving (for salvage) as discussed earlier in Chapter 2. Alternative 1 retains all trees with green foliage. Action Alternatives 2 through 5 retain trees as specified earlier in Chapter 2 and through implementing project design features. See also relevant issue #2 and Alternative 3 for additional retention of trees with green foliage.

The comment letters on which this alternative is based seek an alternative that includes all of the above recommendations. Some of these recommendations are consistent with the refined proposed action and alternatives. For those recommendations, this alternative is redundant because other alternatives address the recommendations. Some of the recommendations do not help achieve the purpose of the project; therefore, this alternative is not considered in detail as a whole because it will not meet all of the purpose and need for the project.

Alternative E

This alternative was developed in response to comments that request the exclusion of specific areas or habitats from mechanical treatment. Recommended exclusions are listed and addressed in Table 2-51.

Table 2-51: Recommendations for the exclusion of specific areas and how each is addressed by alternatives in the Westside Fire Recovery project

Recommendations:	Addressed by:
No salvage logging or planting in inventoried roadless areas (IRAs), including the Grider, Tom Martin, Russian, Snoozer, Kelsey, or Johnson Roadless Areas	None of the alternatives propose salvage logging in inventoried roadless areas. Alternatives 1 and 5 do not include planting in IRAs. Alternatives 2 through 4 include about 490 acres of site preparation and planting in IRAs; both will be accomplished by hand and no ground-disturbing mechanical equipment will be used. An IRA project design feature minimizes negative impacts of planting on roadless characteristics.
No salvage logging on sensitive soils, active landslides, earthflows and other erosive soil types	Alternative 1 does not propose salvage logging in any area. Action Alternatives 2 through 5 implement watershed project design features to minimize or eliminate negative impacts from salvage logging. Relevant issue #1 is based on comments concerning effects of salvage logging on watershed health; Alternative 4 responds specifically to this issue.
No salvage units on decomposed granite	Alternative 1 does not propose salvage logging in any area. Action Alternatives 2 through 5 implement watershed project design features to minimize or eliminate negative impacts from salvage logging. Relevant issue #1 is based on comments concerning effects of salvage logging on watershed health (including soils); Alternative 4 responds specifically to this issue.
No salvage units in Riparian Reserves	None of the alternatives propose salvage units in hydrologic riparian reserves (reserves defined by proximity to water). Alternative 1 does not proposed any salvage. Action Alternatives 2 through 5 propose various acreages of salvage on geologic riparian reserves (reserves defined by active landslides, inner gorges and toe zones of dormant landslides). These action alternatives implement watershed project design features to minimize or eliminate negative impacts from salvage logging on geologic riparian reserves. Relevant issue #1 is based on comments concerning effects of salvage logging on watershed health (including riparian reserves); Alternative 4 responds specifically to this issue.

Recommendations:	Addressed by:
No salvage in Special Habitat designations including: goshawk territories; northern spotted owl activity centers Bald Eagle and Peregrine falcon management areas; and critical habitats	Alternative 1 does not propose salvage logging in any area. Action Alternatives 2 through 5 implement wildlife project design features to minimize or eliminate negative impacts from salvage logging. Relevant issue #2 is based on comments concerning effects of salvage logging on wildlife; Alternative 3 responds specifically to this issue.
No salvage in designated or recommended Wild and Scenic River corridors	Alternative 1 does not propose salvage logging in any area. None of the alternatives propose salvage logging in designated or recommended Wild River corridors or Scenic River corridors. Action Alternatives 2 through 5 implement project design features to minimize or eliminate negative impacts from salvage logging in Recreational River corridors.
No Salvage in endemic conifer stands composed of foxtail pine, Baker's cypress, or Brewer spruce	Alternative 1 does not propose salvage logging in any area. Action Alternatives 2 through 5 include prescriptions for the choice of salvage units as discussed earlier in Chapter 2.

The comment letters on which this alternative is based seek an alternative that includes all of the above recommendations. Although these recommendations are for "no salvage" in many areas, the revised proposed action (Alternative 2) and alternatives include more project design features to minimize negative effects of salvage than the proposed action as scoped included. Proposing "no salvage" will not meet the purpose and need of the project. The recommendation for no salvage in inventoried roadless areas and in hydrologic riparian reserves is met by other alternatives (and thus is redundant). Therefore, this alternative will be eliminated from detailed study.

Alternative F

This alternative was developed in response to recommendations to meet historic and pre-European settlement conditions in the project area and respond to tribal concerns. Recommendations and the way they are addressed are displayed in Table 2-52.

Table 2-52: Recommendations to meet tribal concerns and how each is addressed by alternatives in the Westside Fire Recovery project

Recommended:	Addressed by:
Consider all vegetation cover in stocking estimates including: grass, shrubs, other herbaceous plants, and hardwood tree species	Alternative 1 does not propose any actions that will affect stocking estimates. Action alternatives (2 through 5) propose replanting with a mix of conifer species suitable to the area to increase vegetative diversity, and encourage the natural regeneration of hardwoods where they exist, as specified earlier in Chapter 2 (see also the response to item #4 under alternative A). Stocking estimates will include hardwood tree species where they exist. Alternatives 2 through 5 respond to this issue.
Plant conifers only where there is a historical basis for establishing a forested landscape	Alternative 1 does not propose any planting. Action alternatives (2 through 5) propose replanting with a mix of conifer species suitable to the area to increase vegetative diversity; the species mix is based on historic conditions and suitability as specified earlier in Chapter 2 (see also the response to item #4 in alternative A). Alternatives 2 through 5 respond to this issue.

Recommended:	Addressed by:
Encourage natural regeneration and succession whenever possible	Alternative 1 maintains natural recovery regeneration and succession in all areas. Action alternatives (2 through 5) maintain natural regeneration and succession on from 88 percent of the project areas (Alternative 2) to 96 percent (Alternative 5). All action alternatives mimic natural regeneration by planting species suitable to specific areas as described earlier in Chapter 2 and by encouraging the growth of species such as hardwoods where they exist. Planting prescriptions are based on historic unit conditions, projected unit composition, and the likelihood of long-term survivability of project units within a fire ecosystem. Overall, species considered for planting in the project area include Douglas-fir, sugar pine, ponderosa pine, incense cedar, white fir, and red fir. A mosaic distribution will be achieved over time due to the spatial variability achieved by micro-site selection for planting. Conifers will not be planted next to green hardwoods; these hardwoods will be included in average spacing. Seedlings will be widely spaced on poorer sites including southerly aspects and/or rocky soils. Trees will be planted in clusters to achieve groups of conifers throughout the landscape to mimic natural units. Seedling survival rates and competition from brush species will create a natural mosaic of species and stocking densities. In order to effectively reforest these units, an average of 130 to 300 trees per acre will be planted to achieve acceptable levels of stocking, depending on site conditions. Initial planting spacing recommendations considered Forest Plan land management objectives for projected stocking needs, and the likelihood of achieving those objectives, for each unit evaluated for reforestation. Planting conifers in historically forested areas does promote faster reforestation (see the Vegetation section of this document for information on the scientific evidence that supports this conclusion). Areas were considered for site preparation, planting and release if they met the conditions listed earlier in Chapter 2 for site preparation and planting.
Count natural hardwood regeneration in stocking requirement goals	Action alternatives (2 through 5) include hardwoods in stocking requirement goals where they exist as specified earlier in Chapter 2 (see also the response to recommendation #1 above). Alternatives 2 through 5 respond to this issue.
Review 1944 aerial photos and Wieslander maps to ascertain historic vegetation to shape desired condition	The available 1944 aerial photographs and Wieslander maps for portions of the project were used to help ascertain historic vegetation as described earlier in Chapter 2.
Minimize the connectivity of fuels throughout the development of the planted stand	Alternative 1 does not include any actions to minimize the connectivity of fuels. Action Alternatives 2 through 5 propose activities for reduction of fuels connectivity as described earlier in Chapter 2.
Facilitate the application and restoration of cultural burning practices and establish areas available for managing fires for resource benefits	Alternative 1 does not include any actions to facilitate the restoration of cultural burning practices or establish areas available for managing fires for resource benefits. Action Alternatives 2 through 5 propose activities, such as fuel break construction and maintenance, that will help to make areas available for managing fires for resource benefits and prescribed burning to emphasize the restoration of culturally important plants as described earlier in Chapter 2.
Protection of infrastructures to a 500 foot radius	Alternative 1 does not include any actions to protect infrastructure. Action Alternatives 2 through 5 propose activities to protect infrastructure as described earlier in Chapter 2. As described, a 200- to 250-foot radius around infrastructure is proposed for fuel reduction treatments in all action alternatives.
Roadside hazard tree treatment with a 150-300 foot buffer	Alternative 1 does not include any roadside hazard treatment. Action Alternatives 2 through 5 propose roadside hazard treatment of trees that fit the “hazard tree” definition as described earlier in Chapter 2. A 200-foot buffer on either side of the road is used to estimate acreage being treated but the actual distance from the road will vary based on regional hazard tree guidelines (Angwin et al. 2012).

Recommended:	Addressed by:
Protection of private property	Alternative 1 does not include any treatments to protect private property. Action Alternatives 2 through 5 propose fuel reduction actions within 1/4 mile of private property as described earlier in Chapter 2. Alternative 5 includes more fuels reduction units than other action alternatives to protect private property.
Support and foster early seral conditions	Most of the project area will not be salvaged; none of the action alternatives include more than 11,700 acres of salvage units and only 6,800 acres of these will be salvage logged because salvage units include areas that will continue to be in early seral conditions (such as Riparian Reserves, clumps of snags that will be left for wildlife habitat, and areas of trees that have a 70 percent chance or better of surviving). Overall, more than 85 percent of the project area will be allowed to regenerate naturally; much of this will remain in early seral conditions.
No ground-disturbing activities should be planned in inner gorges, previously active landslides and older landslide deposits.	There are about 3,900 acres of salvage units proposed on steep, weathered granitic lands (geologic Riparian Reserves) in the proposed action as scoped; in refined Alternative 2, salvage is proposed on geologic Riparian Reserves on about 2,000 of the 3,900 acres of salvage units and other action alternative propose the same amount or less. No salvage will occur on inner gorges, active landslides or toe zones of dormant landslides through implementing project design features displayed in Chapter 2 of this DEIS. About 960 acres of site preparation and planting, up to 4,400 acres of roadside hazard tree removal, and 3,900 acres of fuel hazard treatments are proposed on unstable lands considered to be geologic Riparian Reserves. The landslide risk does not increase in any action alternative from the current situation.
Concern about the amount of roadside hazard, especially around management level 1 and 2 roads, and impacts to fisheries.	Alternative 4 is designed to reduce watershed disturbance and impacts of water quality and fisheries relatively to the proposed action as scoped. Alternative 4 will reduce or eliminate temporary road actions, especially within key watersheds as identified by the Forest Plan. The most sensitive 7th field watersheds to further ground disturbance are identified, based on existing watershed condition and the distribution of federally-listed (as threatened or endangered) and Forest Service sensitive species of fish. Within these most sensitive watersheds, restrictions or mitigations to minimize negative impacts are proposed as project design features. Due to the implementation of project design features and relevant Best Management Practices, negative effects to special status aquatic species, including fisheries, will be minimized. More information on the specifics of this alternative are displayed earlier in Chapter 2.
Emphasize fuels treatments over salvage.	There is a need for the project to include receipts from treatments to be economically viable and help pay for fuels treatments. Strategic fuels treatments are proposed in all action alternatives, and salvage logging helps treat fuels on the acres on which it is implemented. Treatments specifically to treat hazardous fuels are proposed on almost twice as many acres as are in salvage logging units and almost four times as many acres as will be salvage logged in any action alternative.
Find ways to not exclude future prescribed burning in the plantations.	Prescribed burning will be included where possible in plantations, preferably when trees are a size to survive prescribed fire.
The project should include a research component.	The project is based on the results of research but meeting the purpose and need of the project does not include research.

Recommended:	Addressed by:
Enhance hydrologic function.	Legacy sediment site treatments are included in action alternatives that will ensure that temporary access will be hydrologically restored; Alternative 4 proposes additional treatment modifications to address this concern. All temporary roads will be closed and hydrologically stabilized according the project design features in Table 2-42. Both new and existing landings will be hydrologically stabilized after use. All landings will be located according the project design features. The portion of Elk Creek within the project area contains almost 150 legacy sites. Most of the legacy sites are located on or adjacent to the Forest transportation system roads. The other legacy sites are located on existing landings or roadbeds (historic roads, abandoned temporary roads, or decommissioned roads). Temporary road and landing construction, and to a lesser degree salvage harvest and associated mechanical yarding resulting from the proposed action as scoped, have potential to further increase runoff in the project area. However, modelled results of the effects of action alternatives do not show any additional disturbance beyond 2014 fire effects for broad-scale 5th field watersheds and add only minor incremental increases to risk at small scales (7th field watersheds). Any project action alternative that includes ground-disturbing activities in the above-listed watersheds will ensure that project design features and watershed restorative actions are adequate to mitigate potential erosion and sedimentation and resulting impacts to water quality and beneficial uses. Additionally the restorative activities of legacy sediment site repairs, planting and fuels reductions will help to balance the activities that may have a negative impact to water.
No new roads, including temporary roads	No new system roads are proposed in any alternative. Action alternatives propose different mileage of temporary roads to meet the objectives of each alternative.
Retain/plant drought-resistant trees suitable for climate change	Trees are selected for planting that are likely to survive if climate change predictions are fulfilled.
Retain all green trees at harvest	Green trees are retained in the action alternatives; green trees will not be removed unless their removal is needed for safe implementation of the project (for instance, placement of cable lines for skyline harvest).
Prescribed burning plans with existing control lines and features	The primary locations of fuels management zones are strategic ridge systems used to contain the 2014 fires as well as being historic fire lines from previous large fires within the project area. The treatments aim to maintain existing control lines by removing all dead vegetation and live understory vegetation along with live conifer trees less than 12 inches in diameter at breast height.
No planting within low or moderate burned severity	Planting within salvage units will only be in areas that burned with moderate to high severity and vegetation mortality (greater than 50 percent of the trees are fire-killed on a unit level, based on Rapid Assessment of Vegetation Condition after Wildfire (RAVG) information). Site preparation, planting and release of areas outside salvage units will be focused in areas of high and moderate vegetation morality where overhead hazards can be mitigated without allowing mechanized equipment into Riparian Reserves.
Set aside areas that are un-salvaged	Many areas are set aside and not salvaged. More than 85 percent of the project area is not within any salvage or roadside hazard removal unit, and more than 90 percent will not be salvaged. Roadside hazard removal will take place along 640 miles of road in most action alternatives (610 miles in Alternative 4) but only a small fraction of the roadside acreage will have hazard trees removed. Only the trees that meet hazard tree guidelines will be cut and felled.
Do not salvage where rare habitat has been burned.	Rare habitats are identified in the Forest Plan as either Research Natural Areas of Special Interest Areas. No salvage will occur in these areas in any alternative.
Leave sufficient coarse woody debris (CWD) and snags	Project design features provide for sufficient coarse woody debris and snags.

Recommended:	Addressed by:
Avoid treatment in Riparian Reserves; promote large wood recruitment	No salvage logging will take place in hydrologic Riparian Reserves. Where hazard trees are felled in hydrologic Riparian Reserves for safety, they will be left for large woody debris recruitment. Watershed project design features that address this concern.
Delay salving to allow post-burn ecological values to persist	Ecological values of natural recovery of forests will occur on more than 85 percent of the project area. Delaying salvage treatments will reduce the economic value of the project, producing less revenue for fuels treatments, and will not meet at least one part of the purpose and need for the project.
Salvage only areas with 90 percent or greater mortality	Areas considered for salvage treatment have 50 percent of more mortality within stands. Trees that will be cut have at least a 70 percent likelihood of dying. Most of the acres in which salvage logging will take place have 80 percent to 90 percent mortality.
Don't salvage where fires were ignited from the bottom or suppression	Mapping has been completed for areas where fires were ignited by suppression forces. These maps will be compared with salvage treatment units.
In Riparian Reserves, fall trees on the contour to reduce erosion	Contour felling is addressed in watershed project design features.
Retain all tress 30 inches in diameter at breast height – living or dead	Project design features address the retention of trees greater than 40 inches in diameter at breast height for legacy components.

The comments on which this alternative is based seek an alternative that includes all of the above recommendations. Comments were considered in developing alternatives considered in detail and, as discussed above, in many areas the revised proposed action (Alternative 2) and alternatives include project design features to address these recommendations. The recommendations that are within the scope of the project are met by other alternatives, making an alternative specifically to address these recommendations redundant. Therefore, this alternative will be eliminated from detailed study. However, consultation to address tribal concerns will continue. Also see the previous section in chapter 2,

Alternative G

This alternative was developed in response to public requests to minimize or eliminate negative effects to watershed conditions from new or reopened roads and landings. Recommendations are listed and addressed in Table 2-53.

Table 2-53: Recommendations for no new infrastructure and how each is addressed by alternatives in the Westside Fire Recovery project

Recommendations:	Addressed by:
No construction of new roads, permanent or temporary	None of the alternatives in the project propose new permanent (system) roads. Alternative 1 proposes no new temporary roads. Action alternatives implement project design features to minimize potential negative impacts of new temporary roads on watershed conditions. Action alternatives differ in the number and location of new temporary roads. In response to relevant issue #1, Alternative 4 limits the number and location of temporary roads to further reduce impacts.

Recommendations:	Addressed by:
No opening of NEPA decommissioned roads	Alternative 1 proposes no opening of NEPA decommissioned roads. Action alternatives implement watershed project design features to minimize potential negative impacts on watershed conditions of using decommissioned roads as temporary roads. Action alternatives differ in the number and location of decommissioned roads being proposed as temporary roads. In response to relevant issue #1, Alternative 4 limits the number and location of temporary roads on decommissioned roads in sensitive watersheds to further reduce impacts.
No opening of self-decommissioned M1 and M2 level roads	Alternative 1 proposes no opening of "self-decommissioned" roads (roads where trees have grown into the roadway). Action alternatives implement watershed project design features to minimize potential negative impacts of opening "self-decommissioned" roads on watershed conditions. Action alternatives differ in the number and location of self-decommissioned roads proposed for opening and use. In response to relevant issue #1, Alternative 4 limits the number and location of self-decommissioned roads that are proposed for use to further reduce impacts.
No construction of new landings	Alternative 1 proposes no new landings. Action alternatives implement watershed project design features conditions to minimize potential negative impacts of new landings on watershed. Action alternatives differ in the number and location of new landings proposed. In response to relevant issue #1, Alternative 4 limits the number and location of new landings to further reduce impacts.
Use of existing landings only if no earthwork is required	Alternative 1 proposes no use of existing landings. Action alternatives implement watershed project design features conditions to minimize potential negative impacts of using existing landings on watershed. Action alternatives differ in the number and location of existing landings proposed for use.

An alternative that addresses all of these recommendations will not meet all of the project's purpose and need. Refinements to the proposed action (Alternative 2) and the development of Alternative 4 to minimize negative effects of new infrastructure to watersheds address the intent of this alternative while meeting the purpose and need of the project. Therefore, this alternative is eliminated from detailed study.

Alternative H

This alternative was developed in response to a number of comments recommending increased treatments within the project area to address the high number of fire-killed trees present on the landscape. Recommendations are listed and addressed in Table 2-54.

Table 2-54: Recommendations for increased salvage opportunities and how each is addressed by alternatives in the Westside Fire Recovery project

Recommendations:	Addressed By:
Salvage logging of all fire-killed trees in the project area	All fire-killed trees were considered for salvage logging before the proposed action as scoped was developed. Based on economic and logistic feasibility, and the need to meet Forest Plan standards, a smaller number of units were proposed for treatment in the proposed action as scoped. Based on scoping comments, the interdisciplinary team looked at all opportunities to expand the number of acres that can be salvage logged. In order to meet all laws, regulations, and policy, as well as meeting standards in the Forest Plan, salvage on most of these opportunity areas is not feasible.
Fuels treatments of all salvage-created slash	For action alternatives (2 through 5), treating activity slash, including slash created by salvage, is discussed earlier in Chapter 2. Treatments proposed for salvage-created slash include those described in project design features.

Recommendations:	Addressed By:
Extension of operating periods	Most operating periods are limited by the need to be consistent with laws, regulation, policy, and Forest Plan standards as displayed in project design features. In circumstances noted in the project design features, these limits can be modified.
No restrictions on size limit for roadside hazard trees	Criteria for roadside hazard trees are discussed earlier in Chapter 2. Size limitations are based on fuels to be removed.
Planting in all salvage areas	Alternative 1 will not propose any planting. Action Alternatives 2 through 5 include planting in all salvage areas.

Although this alternative will meet parts of the purpose and need of the project, following some of the recommendations will not meet current law, regulation, policy and the related Forest Plan standards. The proposed action has been refined as Alternative 2 to meet this direction. Therefore, developing an alternative around all of these recommendations would be redundant and this alternative is eliminated from detailed study.

Alternative I

This alternative was developed in response to a concern that the cumulative effects from private and Forest Service salvage treatments will affect habitat connectivity if salvage logging occurs in the Beaver Fire area. This recommendation is listed and addressed in Table 2-55.

Table 2-55: Recommendations to remove the Beaver Fire from the project and how this is addressed by alternatives in the Westside Fire Recovery project

Recommendations:	Addressed By:
Remove the Beaver Fire area from the project because cumulative effects from private and Forest Service salvage will affect habitat connectivity	Chapter 3 discloses the cumulative effects of salvage proposed in action alternatives added to the effects of salvage on private lands within the spatial and temporal bounds of the analysis area for each resource including habitat connectivity. See specifically the Terrestrial Wildlife section of Chapter 3.

An alternative that addresses this recommendation will not meet all of the project's purpose and need. Refinements to the proposed action (Alternative 2), including implementation of wildlife project design features to minimize negative impacts, and the development of Alternative 3 to further address habitat connectivity in the Beaver Fire area. Alternative 3 addresses the intent of alternative I while meeting the purpose and need of the project. Therefore, considering alternative I in detail is redundant and the alternative is eliminated from detailed study.

Alternative J

This alternative was developed in response to concerns about the effects of salvage harvest on many resources and the overall efficacy of this treatment. This alternative is also reflective of many of the public concerns regarding fire safety and the need for reduction of fuels. All salvage harvest units throughout the project area would be eliminated and all hazardous fuels and roadside hazard treatments would be included as described in the refined proposed action. This recommendation is listed and addressed in Table 2-56.

Table 2-56: Recommendations for a no-salvage, safety-focused alternative and how this is addressed by alternatives in the Westside Fire Recovery project

Recommendations:	Addressed By:
No Salvage—Fire Safety-focused alternative (eliminate salvage but include all hazardous fuels and roadside hazard treatments	Alternative 1 proposes no salvage within the project area. The effects of this alternative on achieving the purpose and need for the project are disclosed in Chapter 3. The effects of implementing hazardous fuels and roadside hazard treatments are displayed primarily on one of the three elements of the purpose and need (safety). Action Alternatives 2 through 5 include different levels of salvage and the effects of these treatments on safety are disclosed in Chapter 3.

This alternative will meet one part of the purpose and need for this project (to reduce safety hazards to adjacent landowners, the public and forest workers) by including hazardous fuels and roadside hazard treatments. However, it does not meet another part of the purpose and need of the project which is to obtain the maximum economic commodity and value from burned timber. It also will not meet the need to increase the likelihood and speed by which burned forested areas are restored. Refinements to the proposed action (Alternative 2), including refined project design features, and the development of Alternative 5 to limit salvage harvest to matrix lands while retaining fuels and roadside hazard treatments, address part of the intent of Alternative J while meeting the purpose and need of the project. Therefore, Alternative J is redundant and eliminated from detailed study.

Chapter 3 Affected Environment and Environmental Consequences

This chapter summarizes the biological, physical, and socioeconomic environments that may be affected by the Project and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in Chapter 2.

This chapter is organized by resource area. Following each resource description is a summary of the potential effects (environmental consequences) to the resource associated with the implementation of each alternative. The direct, indirect, and cumulative effects of the alternatives are disclosed. Effects are quantified where possible and qualitative discussions are included where quantification is not possible. Consequences relative to significance determinations are also disclosed.

This EIS incorporates the Klamath National Forest Land and Resources Management Plan (1995, as amended) (Forest Plan) by reference and tiers to the Forest Plan EIS. The discussions of resources and potential effects use existing information included in the Forest Plan and other sources as indicated. Where applicable, such information is briefly summarized and referenced to minimize duplication. The planning record includes all Project-specific information such as resource reports, ecosystem analyses, and other results of field investigations. The supporting resource specialist reports are available on the Project website http://www.fs.fed.us/nepa/nepa_project_exp.php?project=45579.

Analyzing Environmental Consequences

Environmental consequences are the effects on the biological, physical, economic, and social environment of implementing an alternative. The Council on Environmental Quality regulations implementing the National Environmental Policy Act (NEPA) includes a number of specific categories to use for the analysis of environmental consequences. Several of these regulations form the basis of much of the analysis that follows. They are explained briefly below.

Direct, Indirect, and Cumulative Effects

Direct environmental effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are spatially removed from the activity, but will occur in the foreseeable future. The Project is expected to be fully implemented within eight years after a decision. Cumulative effects result when the incremental effects of actions are added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time. Past activities contributed to the existing condition and are considered in the affected environment for the Project. Present and reasonably foreseeable future actions are assessed along with the effects of the proposed action to determine whether significant cumulative effects may occur. This analysis is consistent with the Council on Environmental Quality's memo from James L. Connaughton titled “Guidance on the Consideration of Past Actions in Cumulative Effects Analysis” dated June 24, 2005, incorporated by reference.

In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions.

Thirdly, the important residual effects of past natural events may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Public scoping for this Project did not identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality interpretive memorandum cited above states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.” The cumulative effects analysis in this EIS is also consistent with Forest Service Regulations for implementing NEPA (36 CFR 220.4(f)).

The Forest Schedule of Proposed Actions was reviewed to identify which current and reasonably foreseeable future actions on the Forest may be considered for cumulative effects analysis. Appendix C provides a list of these actions. A search of proposed timber harvest plans for future actions on private land with potential cumulative effects are noted in Appendix C.

Analysis areas vary by resource, so some ongoing or future actions are included in the cumulative effects analysis of some resources and not of others. Cumulative effects may include estimated effects from present logging (timber harvest, fuels treatments, road and landing construction and maintenance) and wildfire activities (e.g. suppression activities and the affected burn areas). Other actions may include but are not limited to fuels reduction and/or forest health projects in the vicinity.

Responsible Opposing Views and Agency’s Responses

In the following section, we disclose and discuss the substance of the dissenting views of responsible scientists from whom we received comments specific to the Westside Fire Recovery Project on the DEIS (40 CFR 1502.9(b); 1503.4(a)). Although many of the opposing viewpoints raised in comments are discussed in the effects analysis in this EIS and Response to Comments in the Appendix, here we discuss several important opinions concerning elements of the Westside Fire Recovery Project provided by Dr. Jerry

Franklin, a respected forest ecologist, educator and scientist, Monica Bonds who has published research on post fire foraging habitat and use of severely burned areas by California spotted owls, and Dr. Chad Hanson, an ecologist who has published papers on use of burned habitats by birds and mammals in the Sierra Nevada Mountains. We also consider recently received comments from the National Marine Fisheries Service on landslide risk.

While the No Action Alternative is fully considered in the Draft, and would be responsive to many of these comments, we address comments here in the context of the action alternatives that include salvage and reforestation in Late Successional Reserves (LSRs).[32] These opposing views, (with the exception of comments by National Marine Fisheries Service) are based on the contention that post-fire recovery is a natural process and is adequate to restore forest ecosystems after a high severity fire event. For Late Successional reserves, comments are built on the premise that the network of reserves was established to accommodate large intense natural disturbances and the natural recovery process that were expected to follow those disturbances (FEMAT 1993).

We agree that fire recovery would occur over time because fire, and the subsequent ecosystem response are natural processes. That is not at issue. As noted in the following discussion, the extent and severity of the 2014 Westside Fires is not characteristic of the Klamath Province in California (Skinner et al. 2006). In our response to the 2014 Westside Fire, we consider many other factors in addition to natural recovery. All of our actions are based on management direction found in the Forest Plan of the Klamath National Forest.

The following responsible opposing points of view received on the draft EIS were raised:

1. Whether the high severity fires experienced on the Klamath in 2014 are typical for the fire regime of the Project area.

Comments assert stand replacement or mixed severity fire regimes dominate the Project Area. The comments state that large pulses of coarse woody debris and snags created by these fires are characteristic for this environment and are essential for ecosystem functions and that most of the salvage proposed in the LSRs is on Plant Association Groups where large volumes of snags and logs following wildfire are characteristic.

Agency Response: We agree with the importance of an appropriate level of snags and coarse woody debris in the post fire landscape; however we disagree that the amounts of snags and coarse woody debris resulting from the Westside Fires are “characteristic” of the historical fire regime of the Klamath Province. We also disagree that all of that material must be retained for ecosystem function. Retention of all of the fire killed trees would result in fuel loads that are in excess of that which is characteristic of the Klamath Province and would create a substantial risk of future high severity fire (final EIS Chapter 3 – Fuels) which would frustrate the purposes for which the Late Successional Reserves were established.

[32] Numbers in this section for effects in LSRs are from Alternative 3 Modified, which was the basis for Section 7 consultation with the U. S. Fish and Wildlife Service, National Marine Fisheries Service and review of activities in LSRs by the Regional Ecosystem Office of the Forest Service. See Appendix E.

Most of the area of the Northwest Forest Plan lies in the Oregon and Washington Cascades and Coast Ranges. This comment equates the Mediterranean climate dry forests of the Klamath Province in northern California with the mesic forests of western Oregon and Washington. There is often a presumption that the conditions described for those forests apply to forests of the Klamath Province as well. Key old-growth structural attributes of the Coast Range and Oregon and Washington Cascades include large live old trees, a large number of snags-of various ages, a multilayered canopy, and moderate to high accumulations of logs or coarse woody debris on the forest floor (Franklin, 1981).

The fire regime of old-growth Douglas fir dominated forests of the Klamath Mountains differs from the more mesic old-growth Douglas fir forests of Oregon and Washington (described in Franklin et al. (1981) in fire frequency, fire severity, and structural attributes such as amount and persistence of coarse woody debris (Taylor and Skinner 1997). The Klamath Province also differs from the "dry forests" east of the Cascades. The Recovery Plan for the Northern Spotted Owl (USDI 2011) noted these differences observing: *"Some areas, such as dry portions of the Klamath Province, have a different fire ecology than areas in the East Cascades and may not be subject to the same generalizations (Odion et al. 2004, 2010, Skinner et al.2006, Hanson et al. 2009, 2010); this should be evaluated at a finer scale by recovery implementation teams and interested land managers."* (III-21).

The characteristic fire regime of the Klamath Mountains is actually one of frequent low to moderate intensity fire with low to moderate severity effects (Skinner et al. 2006), not "stand-replacement or mixed", as stated in the comments received. In a study from a late successional reserve just north of the Happy Camp Complex, Taylor and Skinner (1998) reported fires prior to EuroAmerican settlement burned on average every 14.5 years. Fire return intervals were shorter on south and west facing aspects than on north and east facing aspects, but the average was 16.5 years or less on all aspects. Wills and Stuart (1994) reported pre-settlement fire to occur every 10 to 17 years in the Hotelling Ridge area (14 miles southwest of the Whites Fire), and wrote that fire return intervals in the southern portion of the range of Douglas fir are considerably shorter than those found in southern or west-central Oregon. In the southern-most portion of the Klamath Mountains, fire return intervals (fires scarring two or more trees over the study area) as short as four to seven years have been reported (Fry and Stephens, 2006). With frequent fire, surface fuels are maintained at low levels – too low for intensity sufficient to produce much stand-replacement fire, except under unusual circumstances.

Even though fire suppression has since altered the fire regime and produced an unnatural accumulation of surface fuels in many areas, fire in the Klamath Mountains still generally burns with predominantly low to moderate severity effects today. Odion et al. reported that only 12 percent of their study area within the 1987 fires burned at high severity, with 59 percent of the area burning at low severity and 29 percent burning at moderate severity. Using somewhat different fire severity categories for remotely sensed satellite data for all fires from 1987 to 2008 and constraining the data to only forested areas, Miller et al. (2012) reported an average of 15.8 percent high severity, with the remainder burning at low to moderate severity. The reason for predominantly low to moderate severity effects can be explained by the topographic complexity of this landscape. With mountains and deep river canyons, smoke from large fire events tends to become trapped under inversions when atmospheric conditions are stable, leading to conditions that cause

fires to burn at low intensity despite the steep slopes and added fuels of the fire suppression period (Skinner et al. 2006, Miller et al. 2012).

The current elevated fuel conditions do sometimes lead to fires of higher intensity and severity. Such fires most frequently occur on upper slopes above where such inversions set up, but also occur at lower elevations when inversions break and the atmosphere destabilizes, or can be caused by a wind event (Skinner et al. 2006). As stated in Skinner et al. (2006), *"the extent of recent high-severity burns appears to be different than historic burning patterns. More area is burning at higher intensity, and this is related, in part, to higher quantities and more homogeneous fuels caused by accumulation during the fire-suppression period."* The percentage of historical high severity is not known, but the lower fuel loading and continuity in times of frequent fire likely led to an amount of high severity fire considerably less than the contemporary percentage of 15.8 percent reported by Miller et al. 2012. For comparison, the high severity percentage of the 2014 Westside fires was 25-35 percent, which is well outside of the predominant natural fire regime. This amount of high severity fire was likely a function of fuel accumulation from fire suppression exacerbated by extreme fire weather and drought rather than an expression of the natural fire regime.

In a fire regime dominated by low to moderate severity effects, tree mortality with wildfire is by definition generally low. In the Klamath Mountains, patches of moderate to high severity fire, when they did occur historically, were more likely on upper slope positions and on south and west-facing aspects (Skinner et al. 2006). Patches of high severity would produce a pulse of snags and then eventually down logs, until those logs were consumed by subsequent fires. Because frequent low-moderate severity fires consume wood, it is unlikely that coarse woody debris accumulated to levels seen in more mesic old-growth Douglas fir forests of Oregon and Washington (Taylor and Skinner 1997). In the Klamath Mountains snags and logs were likely clustered in time and space, with long intervals and large areas where dead wood was sparse (Skinner 2002).

The large areas of nearly continuous fire-killed trees in the Westside Fire Recovery Project are not characteristic of the Klamath Province. The Project area also is not a “stand-replacement or mixed fire regime” where large fuel loads would have been typically experienced in past post-fire environments.

2. Whether there is “excess material” that can be removed.

Comments assert that all of the fire-killed trees must be retained for current ecological processes, and that this is also necessary to maintain essential structure provided by snags and down wood until the next stand is capable of producing large wood. None of this wood legacy can be demonstrated as being in excess to ecological needs.

Agency Response: We agree that retention of large structures is beneficial for NSOs and many other species, and that any material over time would serve an ecological function for the simple reason that there is no “excess” in nature. We also agree that we should strive to maintain large structures that would persist until the next stand is capable of producing large material. That is a requirement of the Klamath National Forest Land and Resource Management Plan (Forest Plan, 4-87; MA 5-30). Retention however, of all of the dead wood now present on the landscape from the 2014 Westside Fires would create an undesirable risk of future high severity fire that is not consistent with the historical fire

regime of the Klamath Province (see previous discussion), the goals of the Forest Plan or development of desired late successional stand conditions in the current LSR land allocation (EIS Chapter 3 – Fuels; Appendix E). We do not agree that all fire killed trees, or all large fire killed trees must be retained because this would create conditions that conflict with the forest wide goals (which includes LSRs) of the Forest Plan for fire management (4-8) which state: "*Reduce unacceptable fuel buildups and potential acreage of future high intensity wildfires.*" As noted previously, and in EIS Chapter 3 fuels, retention of all of dead trees now on the landscape would create fuel conditions that would likely cause more uncharacteristic high severity fire in the future that would actually consume snags and down logs, place additional late successional forest at risk from large stand replacement fire and delay reestablishment of late successional stand conditions (EIS Chapter 3 – Fuels and Appendix E). This conflicts with the management goals for Late Successional Reserves (4-83) which state; "*The objective of LSRs is to protect and enhance conditions of late successional and old-growth forest ecosystems*."

Over the next 10-30 years, most of the fire killed trees from the 2014 fires will break off or fall and become ground fuels. In a recent study in Black's Experimental Forest on the Lassen National Forest, eight years after the Cone Fire, most of the ponderosa pine snags had fallen. Only 16 percent of pine snags between 30 and 45 cm and 41 percent greater than 45 cm were still at least partially intact (Ritchie et al, 2012). In their snag fall model, Harrod et al. choose 45 years as the time when all snags have fallen, which they term as "generous". The literature summarized by Harrod et al. 1998 shows most snags don't last more than 20-25 years. Occasionally, very large snags in sheltered locations may persist until the next stand is producing large material, but this is likely rare in the frequent fire environment of the Klamath.

To determine how much dead wood should be retained on the landscape, we use the Guidelines provided by the Forest Plan for snags (4-30, Table 4-4) and coarse woody debris (4-23). The LSR Assessment (1-5, Table 1-1) also provided metrics for snags and coarse woody debris that closely match the metrics in the Forest Plan. See Appendix E.

These metrics were developed from studies of late successional and old-growth forests. Since the Forest Plan was developed in 1995, new research has shown that even the amounts of snags and coarse wood debris noted in the Forest Plan may be excessive for the Klamath Province when compared to historical norms. Skinner et al. (2006) observed that: *"Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve."*

This suggests that even the levels of snag and coarse woody debris retention described in the Forest Plan, which are far lower than the post-fire conditions of current landscape, could increase the risk of future stand replacement fire above historical levels. Nevertheless, we are retaining these levels as required by the forest plan, and have designed their retention to reflect current science about the area's fire regime as reflected in the Skinner article quoted above.

Every stand cannot and should not attempt to meet some target for snags and down wood Stephens (2004). Homogenous or "average" conditions on every acre would not occur naturally in the frequent fire environment of the Klamath. Average snag counts on a per-acre basis provide one measure of snag density, but as noted by Zack et al. (2002), a "snags per acre" prescription is inadequate, as tree size, rate of snag generation, and mode of tree death have been disrupted this past century. Heterogeneity (i.e. concentrations of dead wood) in some areas with other areas where dead wood was sparse as described by Skinner (2002) would be an indicator of a healthy ecosystem (Knapp 2015). We address this by varying retention of snags and down wood by position on the landscape with relatively fewer snags and pieces of woody debris on fire-prone south and west facing aspects and upper slopes, and relatively more on north and east facing slopes and lower slope positions that typically experience lower fire severity. Unit design reflects this pattern. Within units we retain snags in hydrologic Riparian Reserves and designated snag retention areas that are primarily on lower slopes. Many hundreds of acres of snags, particularly in Walker Creek and Grider Creek were deleted from units on lower slope positions on north and east facing slopes during the evolution of the project to provide for the needs of snag-dependent species.

Generally, the largest trees occur within hydrologic Riparian Reserves, which are retained. By varying retention according to slope and aspect, we expect to more closely approximate the landscape patterns of snags and down wood described by Taylor and Skinner (1998), Skinner (2002) and Taylor and Skinner (2003) where snags and down wood are concentrated in time and space, with intervening large areas and periods of time where snags and down wood are sparse.

As previously noted, retaining all of the fire-killed trees is likely to create fuel loading that would actually increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; EIS Chapter 3 – fuels; Appendix E Figure 7). Because of fire frequency in the Klamath Province it is unlikely that any but the most isolated pockets of dead wood on lower slopes could persist for 80-100 years until the next stand is capable of producing large wood (Taylor and Skinner 1998; Skinner 2002) without effective reduction of the amount and continuity of surface fuels. Even with fuel reduction from salvage and activity fuel treatment, it is possible that much of the dead wood retained to meet Project Standards and Guidelines may be consumed by future fire (EIS Chapter 3 – Fuels; Skinner et al. 2006).

Within salvage units the Westside Fire Recovery Project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by:

- Retaining large "legacy" green trees wherever they occur. By virtue of their location and / or inherent resistance to fire, large green trees are more likely to persist until the next stand can develop large structures than snags. We are also marking dead legacy trees for retention however it is not likely that many of these dead trees will persist for 80-100 years (Harrod et al. 1998) because of fire history, however we acknowledge the contribution these trees make while they are on the landscape.
- Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less intensity. Large snags are more likely to persist than small snags.
- Designating additional snag retention areas in Alternative 3 Modified in association with Riparian Reserves (Appendix A, maps) or in pockets of larger trees. Emphasis for additional

snag retention areas was placed on lower slopes that historically have burned with lower intensity.

- Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels and fuel continuity, the risk of future high severity fire affecting remaining snags and down wood is reduced (Appendix E, Figure 7).
- Treating small fuels in Riparian Reserves and snag retention areas by allowing fire to back into these areas at the time that activity fuels are burned. This reduces the small surface fuels that readily ignite and carry fire but is unlikely to harm larger snags because they would not yet have developed the partially decomposed surface that is receptive to embers.

Peterson et al. (2015) observed that: *"post-fire logging can serve as an effective tool for managing fuel loadings in forests regenerating after high severity wildfires. By strategically applying and varying post-fire logging treatments within landscapes, post-fire logging could reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects. If applied using best management practices and with consideration for possible environmental impacts and meeting other management objectives, post-fire logging could serve as an effective option – along with mechanical thinning, prescribed fire, and managed low to mixed severity wildfires – for reducing fuels and restoring low and mixed severity fire regimes in dry coniferous forests of western North America and other fire-prone forest types."* The Klamath Province in northern California is, as noted previously, historically a low severity fire regime.

Thompson et al. (2007), in an important study of reburns in the Biscuit fire in southwest Oregon concluded that: *"reducing connectivity of surface fuels at landscape scales is likely the only way to decrease the size and severity of reburns until vertical diversification and fire resistance is achieved."* That is precisely the objective of the salvage units in the Westside Fire Recovery Project, and the reason that leaving all of the dead wood now present on the landscape would not meet the Project objectives.

Leaving all of the dead wood created by the 2014 Westside fires would:

- Result in amounts of dead wood in excess of what is typically found in the Klamath Province (see response to responsible opposing viewpoint no. 1 above),
- Create unacceptable fuel loads in the future that would likely contribute to high severity fire, and
- Result in amounts of dead wood in excess of amounts required in the Forest Plan.

The Westside Fire Recovery Project has a higher probability of retaining large structures until the next stand is capable of producing them than no action because salvage of fire-killed trees reduces continuity of surface fuels and the severity of future fires that would likely kill surviving green trees and consume snags and down wood present on the landscape (EIS Chapter 3 Fuels, Vegetation, Appendix E).

3. Whether salvage of fire-killed trees is permitted within an LSR.

Comments received on the draft EIS assert that the Forest Ecosystem Management Assessment Team (FEMAT) Report, on which the Northwest Forest Plan was based, severely limits salvage in LSRs. Comments assert that only smaller material in limited amounts may be removed for ecological objectives and that economic considerations should not be a factor in projects within the LSR. Dissenting comments assert that

salvage proposed within LSRs as part of the Westside Fire Recovery Project is inconsistent with the goals and principles of LSR management specifically noting that salvage, and removal of large trees should be limited.

Agency Response: We agree that the Westside Fire Recovery project, and specifically, proposed salvage, must be consistent with the goals and principles of LSR management. Those goals and principles are provided in the Forest Plan for the Klamath National Forest, not the report of the FEMAT. The FEMAT report was used as a foundation for the Northwest Forest Plan, which was later adopted and made part of the Klamath's Forest Plan. In this comment selected phrases from the FEMAT report are cited with the suggestion that those citations show the proposed Westside Recovery Project is inconsistent with the goals and principles of LSR management. The commenter however did not include other FEMAT citations that are specific to risk reduction and salvage and also did not note that the Forest Plan of the Klamath National Forest, not FEMAT, is the source of management direction for projects on the Klamath National Forest. We do not agree with the statement that the Westside Recovery Project is inconsistent with the goals and principles of LSR management described in the Forest Plan of the Klamath National Forest.

FEMAT was based on information available in 1993. Since FEMAT was written, several scientific papers on fire and fuels have been published that describe a fire environment and late successional stand structures in the Klamath Province in California that are substantially different than those found in the more mesic forests of the western Oregon Cascades and Coast Ranges. (See previous comments on characteristic fire regimes). Thus FEMAT while still relevant may not represent the current best available science on fire and fuels in the Klamath Province.

While the FEMAT report does not provide management direction and does not include recent research specific to the Klamath Province, it is useful for this discussion to clarify the intent of the FEMAT report and its subsequent incorporation into the Northwest Forest Plan. FEMAT considered salvage with 3 different prescriptions, ranging from no salvage, to salvage with minimum guidelines. Prescription 2, (FEMAT II-18) limited salvage in LSRs stated "*Valuable trees that are dead can be used for commercial purposes with the attendant employment and economic benefits. ...Increased fire danger or risk to insect and disease resulting from large accumulations of dead trees can be reduced in an economically feasible fashion. Avoided are the perceptions of economic waste if patches of dead trees are not salvaged.*"

Guidelines for salvage in LSRs were developed in the FEMAT Report to implement Prescription 2 (FEMAT III-36). These Guidelines were carried forward to the Northwest Forest Plan Record of Decision (ROD) Standards and Guidelines (C-14) and subsequently to the Forest Plan of the Klamath National Forest (4-87). It is clear that the FEMAT report anticipated that salvage would need to be considered and that those Guidelines were incorporated into the Forest Plan of the Klamath National Forest. The Secretaries of Interior and Agriculture, the decision makers who approved the Northwest Forest Plan noted their logic for salvage in LSRs in the Response to Comments in the ROD for the Northwest Forest Plan (ROD, Page 66): *"Salvage is not required to be beneficial, but is designed to permit recovery of a timber volume in those instances where catastrophic events clearly kill more trees (resulting in more snags and down logs in the short and long term) than are needed to maintain late successional conditions."*

The question of considering economics comes up in many comments. In a legal challenge of salvage in LSRs, the 9th Circuit Court of Appeals determined that, *"the Forest Service may consider economic interests in choosing how it will conduct LSR salvage operations; that it may do so is not only a matter of common sense, but it is also something explicitly contemplated by the Northwest Forest Plan (C-13-14; [M]anagement planning for Late-Successional Reserves must acknowledge the considerable value of retaining dead and dying trees in the forest as well as the benefits from salvage activities."). However, the Northwest Forest Plan does not permit a salvage project in an LSR for the purpose of recovering the economic value of timber without at least explaining—in the administrative record—how such action is compatible with the NFP's direction to protect and enhance late-successional ecosystems."*[33] The direction to "*protect and enhance late successional ecosystems*" is found in the Klamath Forest Plan on page 4-83.

The National Forest Management Act requires that projects or activities be consistent with the management direction of the national forest where the project or activity occurs. While the FEMAT report is important, it is the Forest Plan of the Klamath National Forest that provides management direction for the Westside Recovery Project, not the FEMAT report or the Northwest Forest Plan. The Forest Plan of the Klamath National Forest clearly anticipated that risk reduction salvage may be necessary and provided project Guidelines for both risk reduction in LSRs (Forest Plan 4-86; MA5-27 to 29) and for salvage (Forest Plan 4-87, MA 30-1 to MA 30-11) to ensure that the objectives of the Forest Plan were achieved. The Forest Plan of the Klamath National Forest also required completion of an LSR Assessment to guide LSR management. The LSR Assessment included the guidelines for salvage found in the Forest Plan of the Klamath National Forest.

The Regional Ecosystem Office, a coordinating body for implementation of the Northwest Forest Plan reviewed the Klamath National Forest LSR Assessment in 1999 and found that it provided sufficient framework and context for future projects and activities within the LSRs, including salvage (See Regional Ecosystem Office Correspondence, Klamath National Forest LSR Assessment). Management actions consistent with the recommendations of the LSR Assessment and the Forest Plan of the Klamath National Forest, including timber salvage, were exempted from further Regional Ecosystem Office Review. In response to comments on the DEIS concerning salvage in the LSR, the Forest conducted an extensive review of actions proposed in the LSR that is documented in Appendix E. That review found the Project as proposed was consistent with the LSR Assessment and the Forest Plan. At the request of the Klamath National Forest, the Regional Ecosystem Office reviewed the proposed salvage in the Westside Fire Recovery Project. The Regional Ecosystem Office concurred with the Forest assessment documented in Appendix E that the Project was consistent with the Forest Plan and LSR Assessment (Appendix E).

The comment notes that salvage in LSRs and in particular removal of large trees should be limited. A complete discussion of impacts in LSRs is found in Appendix E. While the Westside Fire Recovery Project appears to be large, in fact, it affects a small proportion of the LSR that experienced stand replacement fire in 2014.

[33] ONRC v. Brong (No. 05-35063; D.C. No.CV-04-00693-AA)

Of the 28,700 acres of LSR that burned at moderate to high intensity (all diameter classes, more than 50 percent of the trees killed) about 3,900 acres or less than 15 percent is proposed for salvage in LSRs (Appendix E, Figure 10). An additional 800 acres of concentrated roadside hazard removal or about 3percent of moderate or severely burned areas within the LSR is proposed (Appendix E, Table 3). Combined an estimated 4,700 acres or about 17 percent of moderate or severely burned areas would be removed between salvage harvest and concentrated roadside hazard removal. That means more than 80 percent of the stands with moderate or severe fire damage are retained. Concentrated roadside hazard and salvage harvest combined would remove about 6 percent of the 81,200 acres of LSR in all burn severities affected by the Westside Fires.

Comments also state that removal of large trees should be limited. When the Eddy Gulch and Seiad LSRs are stratified by stand size using the California Wildlife Habitat Relationship data, there are 29,600 acres of stands with a quadratic mean diameter (QMD) greater than 24 inches in all burn severities in the Eddy Gulch and Seiad LSRs (Appendix E). Of these stands, 8,650 acres of are moderately to severely burned. Using California Wildlife Habitat Relationship data (Appendix E, figure 12) shows that within the Eddy Gulch and Seiad LSRs:

- Of the 29,600 acres of stands with a quadratic mean diameter (QMD) greater than 24 inches, in all burn severities, 1,750 acres (6 percent of the size class) would be removed by the Westside Fire Recovery project in salvage harvest units. An estimated additional 240 acres of stands greater than 24 inches QMD would be removed in roadside hazard cleanup (Appendix E, Table 3) in moderate – high severity burn areas.
- With salvage units and roadside hazard combined, approximately 2,000 acres of stands with a QMD greater than 24 inches would be removed within the Eddy Gulch and Seiad LSRs from moderate – high severity burn areas.
- Of stands with a QMD greater than 24 inches, this represents about 23 percent of the 8,650 acres of moderate - high severity burn acres and about 7 percent of the medium / large tree diameter class (29,600 acres) in all burn severities in the LSRs.
- Of the stands where the QMD is greater than 24 inches that are in moderate to high severity burn patches, an estimated 77 percent would be retained. Overall, in all burn severities, over 90 percent of the stands with a QMD greater than 24 inches in the Seiad and Eddy Gulch LSRs would be retained.

From this, we conclude that salvage in the LSRs and removal of large trees is indeed limited, when considered in the context of the scale of the Westside Fires

Based on these evaluations and reviews, we believe the Westside Fire Recovery project is consistent with the goals and principles for LSR management laid out in the Forest Plan of the Klamath National Forest. We also conclude, as provided by the Forest Plan, that economic factors may be considered, but those considerations must be balanced with the need to protect and enhance late successional forests. The Westside Fire Recovery Project protects and enhances late successional forests by reducing the probability of future stand-replacement fire and accelerating the development of late successional stand conditions (See EIS Chapter 3, Vegetation; Fuels, Appendix E.).

4. Whether or not reforestation is appropriate within burn areas in Late Successional Reserves.

Comments received on the draft EIS assert that a long natural regeneration period would benefit many species including NSOs and that uniform tree planting over large areas is

inappropriate in LSRs even at low densities. Comments also assert that reforestation is not necessary and may be counterproductive to recovery objectives. A major reason for doing this was the FEMAT planners' belief that natural recovery processes could and should be accommodated following major disturbances to LSRs. Hence, guidelines for salvage included statements such as: "Management objectives [following natural disturbances in Late Successional Reserves] should focus on either simulating natural succession or allowing it to occur unimpeded."

Agency Response: We agree that a long regeneration period can benefit certain species including spotted owls and that uniform tree planting over large areas is counterproductive to recovery objectives of the LSR in the high fire frequency environment of the Klamath National Forest. We do not agree, however, that tree planting *as proposed in the Westside Fire Recovery Project* is counterproductive to recovery objectives.

Approximately 28,700 acres of the LSR land allocation burned with moderate or high severity where most of the trees (all diameter classes) were killed (Appendix E, Figure 10. Because of ongoing secondary mortality many of these areas now exhibit essentially 100 percent mortality. Within LSRs, reforestation is proposed in approximately 3, 480 acres of severely burned plantations and 3,900 acres of proposed risk-reduction salvage units in Alternative 3 Modified (Appendix E, Table 3). Combined, this represents 7,380 acres or about 30 percent of the LSR land allocation that was moderately or severely burned. That means about 21,300 acres or about70 percent of the moderate or severely burned areas within the LSR would not be site prepped or planted and would go unimpeded through the long early seral plant community described by the commenter. This includes all forested high mortality burn patches that are less than 20 acres in size except a few areas adjacent to private property or fuel breaks and all areas that are less than 50 percent mortality. This maintains the complex fire mosaic pattern created by the Westside Fires and heterogeneity that benefits NSOs described by Franklin (2002). Areas that would not be planted also include multiple large patches ranging in size from a few hundred acres to well in excess of 1,000 acres of fire-killed older trees in the Grider Creek Inventoried Roadless Area. Thus all patch sizes from very small to very large are represented in areas where no salvage harvest or site preparation and planting occurs. This contributes to the heterogeneity described by Franklin et al. (2000).

Across the total Westside Fire area considering all land allocations, approximately 10,800 acres of existing plantations, natural stands and proposed salvage units would be site-prepped and planted (final EIS Chapter 2, Table 2-30). This represents about 21 percent of the estimated 52,000 acres of moderate to high severity fire; over 40,000 acres or nearly 80 percent of moderate and high severity fire in all land allocation would not be planted and would experience the long early seral plant succession cycle described by the commenter.

In the future, as snags fall and become surface fuels in areas that are not site prepped and planted, it is probable that many of these areas will reburn multiple times because of high surface fuel loads and fuel continuity Chapter 3-Fuels; Appendix E, Figure 7). As a result, large areas that are not site prepped and planted may remain in an early seral plant community dominated by brushfields for multiple decades (EIS Chapter 3 – Vegetation). The probability of reestablishing late successional coniferous forests on these landscapes

will remain low until surface fuels created by the 2014 fires have been reduced in amount and continuity by subsequent reburns (EIS Chapter 3 – Fuels).

Because Late-Successional Reserves have been established to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions (Northwest Forest Plan C-14; LSR Assessment 1-24). Site preparation and planting is intended to increase the likelihood and speed by which burned forested areas are restored to coniferous forest and late successional habitat. The Forest Plan and LSR Assessment both identify coniferous forests with large trees as the desired condition for the LSR (Forest Plan 4-83; LSR Assessment Chapter 3). Forest Vegetation Simulation modeling shows that reforestation will establish forested conditions more rapidly by treating surface fuels and planting trees than by natural succession (EIS Chapter 3, Vegetation, Appendix E, Figure FVS-1). If surface fuels are treated and the continuity of fuels reduced the size and severity of future fires may be reduced (Thompson et al. 2007). Weatherspoon and Skinner (1995) concluded reduction surface fuels reduced damage to plantations and increased tree survival. This increases the probability that planted trees would persist into the future.

Comments note that "*planting should not be done following traditional approaches, which are directed to establishing uniformly stocked forest stands over large areas. Extensive, uniform plantings - even at the relatively low density proposed for some areas (200 trees per acre) – will not simulate the spatially heterogeneous pattern of natural seedling establishment.*"

We agree that extensive, uniform planting would not create the diversity and heterogeneity that we seek to reestablish on the landscape; trees will not be planted uniformly as the comment suggests. The reforestation stocking objective five years after planting in the Westside Fire Recovery Project is a stand of 75 to 225 variably spaced young trees with treated, discontinuous activity fuels, not densely stocked regularly spaced plantations that form continuous fuel beds. Stand density would vary with slope position and aspect with lower stocking on upper slopes and south and west aspects and higher stocking on north and east aspects that would form a closed canopy on lower slopes. Hardwoods would be included in the target stocking levels so the number of conifers would be less where hardwoods occur. We also anticipate there would losses from future fires that would further reduce stand density. Our long term objective is 30-50 large, variably spaced, fire resilient trees per acre with openings as and stand density that vary with slope position and aspect as described by Taylor and Skinner (1998). In response to comments received, text has been added to silvicultural prescriptions for the Project to make this stand objective clear. Criteria for selecting areas to plant are in the final EIS (Chapter 2 – Vegetation).

As noted earlier, about 70 percent of the moderately and severely burned areas would not be planted. Reforestation is expected to provide a measure of vegetative diversity that would not otherwise be present on the landscape. These planted stands have a much higher probability of achieving the desired late successional stand condition for the LSR than unplanted areas. Comments note the Franklin et al. (2000) report "*that in northwestern California, the highest habitat fitness for NSO is found in landscapes that are a mixture of mature and old forest with open vegetation types, such as brush fields and young forest, and not in landscapes dominated by old forests. The fact that an early*

successional species - the dusky-footed woodrat - is the primary prey for NSO in this region may be part of the reason that owls prefer a mixed landscape. In any case, the fact that habitat fitness for the owl is favored by a heterogeneous landscape mosaic should be factored into decisions regarding establishment of conifer plantations, both within and outside of LSRs." That approximates the landscape we expect to develop by reforestation of approximately 30 percent of the moderate and high severity burn areas within LSRs in the 2014 Westside Fires. Overall, in all land allocations, reforestation is proposed on about 20 percent of the moderately and severely burned areas creating the mixed landscape over time described in the comment.

For these reasons, we do not believe that reforestation of selected areas is counterproductive to achieving the desired condition described in the Forest Plan for LSRs.

5. Whether all habitat that was suitable before the fires occurred is still used by spotted owls for nesting, roosting and foraging regardless of fire severity.

Comments assert that spotted owls would use severely burned areas for all habitat needs; and therefore, all severely burned areas should be retained and that the analysis of post-fire habitat use was incomplete.

Agency Response: The agency recognizes the importance of suitable spotted owl habitat to support spotted owl recovery, but also recognizes the research is not conclusive in determining the extent and value severely burned habitat may provide spotted owls.

Spotted owl habitat is generally described as older, dense forests that provide opportunities for nesting, roosting, and foraging. Nesting/roosting habitat is generally described as a multilayered, multi-species canopy with large overstory trees with various deformities (large cavities, broken tops, mistletoe infections, and other decadence); large snags; large woody debris resulting from fallen trees; and sufficient open space below the canopy for spotted owl flight. Foraging habitat generally has attributes similar to those of nesting/roosting habitat but contains less canopy cover, forest structure complexity, and large trees (Franklin 2000). However, recent research has found that spotted owls are using previously suitable habitat that burned at low to moderate fire severity, as well as areas with mixed-severity that includes some proportion of high-severity fire (e.g. Bond et al. 2002, Clark 2007, Bond et al. 2009), but spotted owl use of these areas is likely complex.

Current research offers differing perspectives in regards to the use of severely burned coniferous forests by spotted owls (Elliot 1985, Gaines 1997, Bond et al. 2002, Bond et al. 2009, Clark 2007, Clark et al. 2012, Comfort 2013, Eyes 2014, Lee and Bond 2015). Some studies have shown owls to exhibit site fidelity, mate fidelity, and reproductive success after fires have burned a portion of their territories at varying severity levels, including high severity (Bond et al. 2002, Lee et al. 2012). Others studies have shown owls to move completely away from previously occupied areas after high severity burns (Elliot 1985, Gaines 1997) particularly when burns occurred within core areas of resident birds. Bond (2010) reported 30 percent of California spotted owls' nonbreeding-season roost locations were within the fire's perimeter. In another study, radio-telemetry locations demonstrated that the owls selected low-severity burned forests for roosting during the breeding season, and selected low, medium, and high-severity burned forests

for foraging within 1.5 km of the nest or roost site (Bond et al. 2009). Irwin et al. (2012) found that NSO in the Klamath region would often forage within more open stands that contained brush or a low basal area of conifer trees, and that the presence of a few scattered trees or snags likely facilitated hunting for prey such as woodrats, citing a particular telemetered pair that made extensive use of a burned area with manzanita shrubs and scattered live trees. This would indicate that, at least under certain circumstances, NSO will venture into more open habitats, such as areas burned at high and moderate severity, when enough structure is present to offer perching or a certain degree of cover, though the exact level of cover is unknown.

While severely burned coniferous forest is not considered suitable nesting or roosting habitat for NSO (USDI 2011), Clark (2007) study included telemetry detections of NSOs in Oregon within some areas that were burned with high and moderate severity. The condition of the burned stands in Clark's study area, such as the percentage of overstory mortality, the presence or absence of green trees, the ratio of high, moderate and low burn severities, and the juxtaposition of suitable NSO habitat in relation to severely burned areas wasn't reported. While in Clark's study owls were present within severely burned areas, it was not concluded that these areas were suitable habitat for nesting, roosting or long-term occupation by spotted owls. The burned areas may have contained individual features that were providing a short term structure for either roosting or foraging but were not suitable for long-term sustainability of a given owl or owl pair.

It is the spatial context of the overall habitat available for use by spotted owls that is critical for an analysis of habitat suitability. The proportion and arrangement of unburned or low burn severity suitable habitat in relationship to moderate- or high-severity burn areas within an NSO home range is one of the key factors in determining the likelihood of use by NSOs (USDI 2014, USDI 2011). This relationship is important because NSOs may focus their use of burned areas for foraging in areas with adjacent cover. This distance to cover is a key factor influencing use of burned areas (Comfort 2013). Because habitat selection by NSO is strongly influenced by abiotic features such as distance to water, proximity to nest, slope position, and elevation, it is possible that use of the burned habitats by NSO as described by Clark et al. (2013) or Bond et al. (2009) may occur due to the juxtaposition of the burned areas in relation to some other feature, such as a pre-fire nest location or water, rather than based on the "suitability" of the area, particularly if the owls were accustomed to using the area prior to the fire. Factors involved in the NSO's periodic selection of burned areas for foraging are not known at this time, and further research is needed to account for the many other aspects of a burned landscape that would factor into the NSO selection process.

Owl use of burned areas is well documented but links between owl use, fire severity, and intensity of salvage are not clear. Researchers were typically unable to separate effects of pre-fire timber harvest, wildfire, and post-fire salvage harvest. Research results are highly variable, depending on methods, burn severities, and proximity of NSO to fire and spatial arrangement of habitat. Research of NSO use of burned areas has also been confounded by small sample sizes. In addition, general terms used in the literature including "moderate severity" and "salvage logging" make comparison to specific conditions found within the proposed project area difficult. Most references to "salvage logging" in the literature refer to clear-cut logging, and do not factor in design features used by the Forest

Service such as leave tree groups, legacy tree retention, core area avoidance or even limited operating periods.

Studies noting changes in owl behavior or habitat selection after wildfire and/or salvage harvest have been largely unsuccessful in assigning causal factors. Clark (2007) was unable to separate the potential effects of pre-fire land management, high-severity fire and salvage harvest on NSO. Lee et al. (2012) and Clark et al. (2013) were also unable to distinguish the effects of salvage harvest in comparison to, or in combination with, other variables studied.

Overall, the research is inconclusive on the extent and value of severely burned forests that may provide towards the recovery of the Northern Spotted owl. On the other hand, there is scientific consensus regarding the features of high quality nesting roosting habitat, and that the Recovery Plan stresses the threat that fire poses to NSO habitat. The research has provided several examples of spotted owl use of low to moderate fire severity burn areas, mixed severity burned areas and sometimes high severity burn area. The research however lacks conclusive studies of long-term persistence of spotted occupancy and reproductive success at burned sites. The large patches of high severity fire that were experienced within the Westside Fire Recovery Project greatly changed the current habitat condition for several spotted owl sites. Whether these sites provide for spotted owls occupancy and reproduction over the long-term is still a lingering question, but surveys in the project area this year (the year following the fire) have not detected reproduction for sites that experienced large proportions of high severity fire in the core and home range.

Comments on the draft asserted that our analysis of post-fire habitat use by NSO was incomplete. In our analysis, the Westside Fire Recovery Project used the available research in the northern spotted owl analysis in the final EIS to address the following habitat components.

Activity Centers Analyzed: The project area has been surveyed intermittently since the 1990s but some spotted owl detections were reported in the 1980s or earlier. Using these spotted owl survey data that recorded occupancy (i.e. single or pair) and reproduction status, activity centers were placed on the central location of spotted owl activity, but over time, some of these activity centers appeared to change location. In some situations, a nest was found outside the core of a known activity center but close enough where occupancy of both cores by separate pairs is unlikely due to the territorial behavior of spotted owls. Other activity centers have experienced past wildfire that resulted in most of the core being burned severely and consequently, the core currently lacks visible nesting structures plus spotted owl surveys have not resulted in any detection for these particular activity centers thus further reducing the likelihood of occupancy. Finally, the project area contains drainages that don’t provide the distribution and quantity of habitat that is commonly associated with occupied activity centers yet there are multiple activity centers identified in the drainage which suggests that particular drainages may actually support fewer activity centers than the number identified. Despite this evidence and professional judgement that could lead to removing particular activity centers that are not likely to be occupied currently or in the near future from the analysis, the Forest chose to retain all the activity centers for analysis even though conventional wisdom could strongly argue that there is a strong likelihood that the analysis is overestimating potential effects. This is the most conservative approach to analysis the Forest could have taken.

Analysis of Habitat Fitness Potential: Comments received asserted that all activity centers were equally important. We don't agree with that point. The amount, distribution, and quality of habitat can aid in measuring the potential occupancy of an activity center now or into the near future. Using the interim guidance in the Recovery Plan for Recovery Action 10, we identified the Activity Center that were most likely to contribute to recovery. Activity centers that contain contiguous, abundant suitable habitat that contains patches of high quality habitat is more likely to be occupied by spotted owls and possibly reproduce than activity centers that have few acres of suitable habitat that are distantly distributed within the home range. This basic principle was used to identify the activity centers that are most likely to be occupied and reproduce as recommended in Recovery Action 10 of the Revised Recovery Plan for the northern spotted owl (2011). This analysis consequently resulted in adjusting project activities and meets the intent of Recovery Action 10 throughout the development of the project.

The fitness potential identified the activity centers with low, moderate, and high habitat fitness potential rankings. Ideally, all the activity centers would have high habitat fitness potential which would signify that these activity centers have a substantial amount of suitable habitat that is likely to provide resources to support spotted owls and reproduction. Activity centers with moderate fitness potential have lower suitable habitat levels with Post-Fire Forage and Fire Affected Nesting/Roosting inter-mixed which may provide foraging opportunity. Finally, the activity centers with low fitness potential are generally made up of activity centers with low amounts of habitat prior to the 2014 fires and consequently, the few acres of suitable habitat mostly became Post-Fire Forage or Fire Affected Nesting/Roosting. Consistent with the intent of the Recovery Plan for NSO, this ranking identified the sites that were most likely to contribute to recovery (i.e. survival and reproductive success) and hence where it was most important to minimize impacts.

Analysis of Fire Affected Habitat: Comments received asserted that the Forest did not consider fire affected habitat in its analysis. The final EIS identifies and describes fire affected habitat in response to the growing amount of literature on this topic. The available literature generally describes the burned areas used by spotted owls as suitable habitat that burned at low, moderate, and high fire severity. The final EIS describes suitable habitat (no fire or low fire severity) and suitable habitat that burned at moderate and high fire severity as Post-Fire Forage areas and Fire Affected Nesting/Roosting areas. Even though, the final EIS clearly recognizes the available literature's evidence of spotted owl use of Post-Fire Forage and Fire Affected Nesting/Roosting, the final EIS also recognizes that the research is unclear on the length of time these areas may be used by spotted owls; consequently, Post-Fire Forage and Fire Affected Nesting/Roosting are identified as short-term use areas that could be used by spotted owls as long as snags remain standing.

For the Westside Fire Recovery Project, Post-Fire Forage and Fire Affected Nesting/Roosting were specifically identified to display the potential effects of the proposed activities on all areas that may be used by spotted owls even though these habitats are not identified as "suitable" in the NSO Recovery Plan. Again, because of scale of effects from the fires themselves, and the proposed recovery actions, we believed it prudent address potential uses and Project impacts on these habitats. Suitable habitat is still more important and essential towards the recovery of the northern spotted owl. Post-

Fire Forage or Fire Affected Nesting/Roosting is in no way a substitute or equivalent to nesting/roosting or foraging habitat as described in the Revised Recovery Plan for the northern spotted owl (2011).

In addition, Post-Fire Forage and Fire Affected Nesting/Roosting were also identified in the northern spotted owl critical habitat analysis even though Post-Fire Forage and Fire Affected Nesting/Roosting don't fit well within the described Primary Constituent Elements as defined in the Revised Critical Habitat for the northern spotted owl: Final Rule (2012). The U.S. Fish and Wildlife Service did not find critical habitat affected by moderate and high fire severity to meet the essential aspect of critical habitat per the section called "Changes from the Proposed Rule" in the Final Rule (page 71889) "We [U.S. Fish and Wildlife Service] identified and removed lands … did not meet the definition of critical habitat. In general, lands removed from critical habitat designation had recently lost their ability to function as NSO habitat either through stand-replacing wildfire or through timber harvest conducted after 2006 (the date of our most recent comprehensive vegetation layer). When such lands were identified, we removed them from critical habitat because they were unlikely to support NSOs, and did not contain the Primary Constituent Elements or could not be otherwise considered essential." Even though the Critical Habitat rule did not count these areas as contributing to habitat needs, the body of research suggested that to be possible, so we included these areas in our analysis.

The available research still proclaims the importance of legacy features that take a long time to develop such as disproportionately large trees or large coarse woody debris. These legacy features can aid in producing high quality spotted owl habitat sooner, if these features persist till the forest regenerates and creates a closed tree canopy. Legacy features can be found almost anywhere on the forest, but these features tend to be more commonly found in areas identified as suitable spotted owl habitat. These legacy features also tend to remain mostly intact after a fire which would also improve the chances of those features to remain standing for at least a few years, but even as coarse woody debris, these legacy features still provide structure. Legacy features, to the degree they occur, have been retained in the Westside Fire Recovery Project.

Until spotted owl habitat regenerates, these legacy features in combination with the early seral vegetation can provide spotted owl prey species habitat. Whether or not spotted owls may use these areas, prey from this regenerating habitat may venture into adjacent suitable spotted owl habitat that would provide spotted owl foraging opportunity. Therefore, the final EIS analysis included Post-Fire Forage and Fire Affected Nesting/Roosting as Fire Affected Critical Habitat which represents areas that are more likely to contribute toward future critical habitat and possibly enhance current critical habitat with a possible increase in prey.

We believe the approach described above provided a reasonable analysis of the post-fire NSO habitat impacts of the Project and is responsive to concerns that post-fire habitats have not been adequately analyzed.

6. Whether salvage logging as proposed would harm Pacific fisher

Comments assert that moderate and high severity fire affected areas are used by fisher, especially burned mature/old growth forest. Maintaining "complex early seral forest" will

provide structure for current and future fisher use. The comment recommends the project be scaled back.

Agency Response: The value of snags and downed logs for many species of wildlife including Pacific fisher is discussed in the final EIS Chapter 3, the Wildlife Biological Assessment Appendix, Evaluation, and Wildlife Reports.

We agree that early seral plant communities can benefit many species however as noted earlier, the retention of all of the dead material now on the landscape would create an unacceptable risk of high severity fire in the future as those trees break and fall to the ground (EIS Chapter 3-Fuels). See the previous discussion of excess material under responsible opposing viewpoint no. 2 and early seral plant communities in responsible opposing viewpoint no. 4 above. Summarizing that discussion, in moderately and severely burned stands that are now in a post-fire early seral stage, about 21,300 acres or 70 percent of the LSR area and 40,000 acres or 80 percent of the entire fire area in all land allocations would proceed unimpeded through natural succession processes as recommended by the comment. Of the stands in the LSR where the Quadratic Mean Diameter (QMD) is greater than 24 inches that are in moderate to high severity burn patches, 77 percent would be retained. Overall, in all burn severities, over 90 percent of the stands with a QMD greater than 24 inches in the Seiad and Eddy Gulch LSRs would be retained (Appendix E). As a practical matter, brush species reoccupy burned sites rapidly in the Klamath Province. Typically, most of the project area will have brush at least four feet high providing fisher overhead cover within a few years. Additionally, where salvage does occur, Forest Plan standards for snag retention and coarse woody debris must be met.

Areas where salvage harvest would not occur includes all forested high mortality burn patches that are less than 20 acres in size except a few areas adjacent to private property or fuel breaks and all areas that are less than 50 percent mortality. Retaining these areas maintains the complex fire mosaic pattern created by the Westside Fires and heterogeneity more closely resembles the habitat needs of NSOs species described by Franklin et al. (2000) and other species. Areas that would not be planted also include multiple large patches ranging in size from a few hundred acres to well in excess of 1000 acres of fire-killed older trees in the Grider Creek Inventoried Roadless Area. Thus all patch sizes from very small to very large are represented in areas where no salvage harvest or site preparation and planting occurs. This contributes to the heterogeneity described by Franklin et al. (2000). The combined effect of these snag retention and recruitment measures will result in a mosaic of areas with low to high densities of snags, consisting of a variety of sizes, and occupying the project area both in the present and future.

Any decision to scale back the project would be made by the Forest Supervisor in the context of the project objectives. As noted by Thompson et al. (2007) “The decision to salvage-log and plant, or not, after fire depends on a number of management considerations including risk of future high-severity fire, reducing hazards to fire fighters, timber revenue, and conservation of biodiversity.” These factors were among the management considerations in the development of the Westside Fire Recovery Project (Chapter 1, Purpose and Need).

7. Whether landslide risk is increased in units 23, 32, 39, 55, 56, 57, 59, 64, 226, 228, 406, 520, 524, 525 and 530.

Comments received from National Marine Fisheries Service in response to the aquatic Biological Assessment dated April 16, 2015 disagreed with findings of the Forest Service related to landslide risk and / or debris flows. The National Marine Fisheries Service stated that units 5, 23, 32, 39, 55, 56, 57, 59, 64, 226, 228, 406, 520, 524, 525 and 530 may contribute to the risk of landslides and debris flows.

Agency Response: These areas are portions of the described units that add up to about 30 acres in total. There are no roads or landings in the areas of concern. Landslide risk was evaluated on-site in the field by a Forest Service geologist. The Forest Service determined that the areas in question had a risk of landslide and / or debris flows whether they were harvested or not. We disagree that the project would exacerbate landslide risk in these areas. The Forest Service determined that salvage harvest would not increase landslide risk because the salvage harvest activity did not affect landslide processes (final EIS Chapter 3 – Geology). The Forest Service concluded reforestation of these areas would reduce the period of elevated landslide risk from 80 years to 30 years when compared to no action. Consultation with National Marine Fisheries Service is ongoing.

Vegetation

The purpose of this section is to assess the fire impacts to vegetation on the landscape and determine what effects actions will have on increasing the likelihood and speed by which burned forested areas are regenerated. This section also assesses the consequences of not taking any action to accelerate the establishment of conifers on the landscape. Discussion of relevant scientific literature is incorporated to support the evaluation of effects from the stands to be treated by either salvage harvesting, site preparation and planting, or some combination of each.

Methodology

Site visits performed by foresters and a silviculturist to the Project area were conducted between October and December 2014. Remotely sensed data on vegetation burn severity were field-validated and potential treatment areas were identified by specialists. Stand data were collected using ocular estimates and plot data collection, as needed.

Observations included the following:

- Pre-fire stand condition of vegetation (growth, species composition);
- Post-fire stand condition of vegetation;
- Availability of natural seed sources on site and within natural seed distribution distance;
- Availability of suitable snags for retention;
- Availability and suitability of hardwoods for retention;
- Plantability (reasonable ability to plant conifers in an area), an estimate of physical effort needed to conduct artificial regeneration;
- Regeneration potential, an estimate of the potential for artificial regeneration; and
- Site class, aspect, and elevation estimates as they relate to artificial regeneration attributes and regeneration potential.

Stand data were compiled from existing plots in the Project area and were used to simulate future stand conditions based on proposed treatments. The Forest Vegetation Simulator was used to estimate time needed to establish conifer-dominated stands.

Northern spotted owl dispersal habitat characteristics were used as a threshold for considering a stand to be on a trajectory towards late-successional characteristics (diameter at breast height of 11.0 inches, canopy cover 40 percent, and percentage of conifer composition since conifers make up the majority of desired species for late-successional forest in this area). In addition to using professional judgment and visual cues during site visits, the 1944 Wieslander vegetation mapping was used to assess historic species composition and conifer dominance throughout the Project area (Kelly et al. 2005). Units proposed for planting were substantiated using this background information.

Analysis Indicators

- Acres on which conifer regeneration will be accelerated;
- Percent of moderate- to high-severity burned landscape restored to a mature conifer-dominated stand within 60 years through site preparation and planting;
- Acres on which conifer regeneration will be delayed (early successional forest will be long-lasting); and
- Type of vegetation that is likely to regenerate in the short term and long term.

Spatial and Temporal Context

Spatial bounding is limited to units within the Project area considered for regeneration treatments (including salvage units, existing plantations, and select natural stands not included in salvage) and hazard tree removal along roads (areas where regeneration is likely to be affected by the Project).

Both short-term and long-term effects will be considered in this analysis. Short-term temporal bounding is the time period of harvest activity, site preparation, and planting treatments, which is about one to eight years. Effects on regeneration will begin to be visible during this time period. Long-term temporal bounding is for an estimated 40-100 years from Project implementation and is based on the maximum time needed for reduction of surface woody fuels following fire (Peterson et al. 2014), and computer-generated modeling that shows stand conditions approaching the desired late-successional characteristics. There is no mid-term analysis because the effects progress between short term and long term.

Affected Environment

Before the fires of 2014, vegetation types within the Project area generally ranged from an oak/brush/grass type to well-stocked mixed conifers. Age classes ranged from 20 year-old plantations to late-successional forest. Using the existing vegetation layer provided from the CALVEG dataset, the size classes described in Table 3-1 were distributed throughout the Project area. California Wildlife Habitat Relationships (CWHR) type is derived primarily from CALVEG type and relative cover of conifer and hardwood trees for various mixed conditions. It represents an estimate of the variation in stand conditions that existed before the 2014 fires. Table 3-1 displays the percentage of the Project area that was classified by a specific size class prior to the fires as well as the percentage of each size class included within salvage units. The affected environment includes a mosaic of levels of severity of vegetation burned but the proposed treatment areas are focused on moderate to high severity vegetation mortality (i.e. greater than 50 percent of trees fire-killed on a unit level, based on Rapid Assessment of Vegetation Condition after Wildfire

(RAVG)). Compared to the size of the project area, relatively few acres are proposed to be treated in order to protect multiple resource concerns. In summary, Table 3-1 shows that of the large trees in the Project area (CWHR codes 4 and 5), less than five percent, are within proposed treatment units. About three percent of the 11-24 inch diameter class trees that burned at moderate to high severity are proposed for treatment and two percent of the greater than 24 inch diameter class trees that burned at moderate to high severity are within treatment units.

Table 3-1: Percentage of size classes within the Project area

CWHR Code	CWHR Size Class	Diameter at breast height	% of diameter class within Project Area	% that burned with greater than 50 percent mortality	% that burned with greater than 50 percent mortality within proposed action treatment units
1	Seedling tree	<1.0"	1 %	<1 %	
2	Sapling tree	1.0" - 5.9"	6 %	2 %	
3	Pole tree	6.0" - 10.9"	16 %	4 %	1 %
4	Small tree	11.0" - 23.9"	41 %	11 %	3 %
5	Medium/large tree	≥24.0"	25 %	6 %	2 %
6	Multi-layered tree	A distinct layer of size class 5 trees over a distinct layer of size class 4 and/or 3 trees, and total tree canopy of the layers ≥60 percent (layers must have ≥10.0 percent canopy cover and distinctive height separation).	0 %	-	N/A
0	Not Determined	N/A	<1 %	-	1 %

The oak/brush/grass type vegetation is typically found on low-elevation sites on shallow, rocky soils located on southerly and westerly aspects, which exhibit harsher conditions than on northerly and easterly aspects. As elevation increases, conifer species become more prevalent, primarily as a function of favorable environmental conditions for conifer survival and growth. Deeper, more developed soils than those found at low elevations supported mixed conifer stands of Douglas-fir, ponderosa pine, incense cedar, and sugar pine. Higher elevation sites within the Project area lend themselves to favorable conditions for red fir and white fir survival and growth, with white fir becoming a substantial component of the mixed conifer type. Hardwood species, including Pacific madrone, California black oak, canyon live oak, Oregon white oak, tanoak, and bigleaf maple are generally a minor component of mixed conifer stand composition.

Project treatments are focused on areas that burned with moderate and high vegetation severity. High severity areas are characterized by total or near-total conifer crown consumption. Individual trees in this condition were either killed or damaged by fire beyond their ability to survive. Within areas of moderate burn intensity, some crown consumption has occurred as a result of the fire, but these areas are characterized by total or near-total crown scorch. The vast majority of crown-scorched trees were killed by the fire or damaged beyond their ability to survive. Within areas of light vegetative burn

severity, the impacts on conifers were often severe, especially to the smaller size and lower crown classes. More than 50,000 acres of the Project area burned at moderate- to high-severity vegetation burn, about 30 percent of the Forest land within the burned area.

Understory vegetation has been totally consumed or top-killed throughout much of the Project area; the degree of mortality is primarily a function of fire intensity. On areas burned at moderate to high intensity levels, mortality is essentially complete. On areas burned at low-intensity levels, if the fire was hot enough to consume the organic layer then understory vegetation, including conifer seedlings and saplings, were also killed.

Light-seeded, prolific, early successional weed and grass species, having survived the fire in unburned pockets and perimeter areas, will rapidly reinvade burned areas. Well-established perennial root or rhizome species will likely re-sprout from existing root systems. Brush species, such as manzanita, snowbrush, deerbrush and whitethorn, are well-adapted ecologically to the fire-impacted ecosystems. Assuming that fire intensity and duration were at less than lethal levels, these species are capable of root collar sprouting. Brush seed, which may retain viability for 40-150 years in the duff layer, will germinate in potentially large numbers for two to three years after fire-scarification. Fire top-killed hardwood tree species, such as black oak, tanoak, madrone, and live oak are also capable of root-collar sprouting. These species are able to take immediate advantage of a well-established root system, giving them the inherent capability to grow rapidly for early site dominance.

Generally speaking, the Beaver Fire consists of more pine-dominated stands with a heavy hardwood component, while the Happy Camp Complex and Whites Fire are more mixed-conifer type stands. Forest lands within the Beaver fire incurred about 7,050 acres of moderate- to high-severity vegetation burn (greater than 50 percent loss of canopy). Within the Happy Camp complex, about 34,060 acres burned at moderate to high severity, and about 10,260 acres burned at moderate to high severity within the White fire. Additional information regarding the acreage of various levels of fire severity in the entire Project area, and in each fire-related area, is provided in Chapter 2.

Environmental Consequences

Relevant scientific literature

Relevant scientific literature on the regeneration of conifer forests includes documents that support natural regeneration and others that support the usefulness of logging and planting in restoring forests. Planting seedlings from site-specific seed sources after a wildfire may hasten the return to a large-conifer dominated forest ecosystem by as much as 50 years, compared to the alternative of not planting, which could take more than 100 years to even establish conifer forests (Sessions et al, 2004). There are many variables that contribute to successful natural regeneration, many of which are difficult to predict. Intricacies of seed production and dissemination for individual conifer species, including distance of seed dispersal, probability of germination, environmental factors contributing to failure, and periodicity of viable cone crops (Burns and Honkala 1990). White fir species, with a reliable downwind, only spreads seed 1.5 to 2 times its tree height (Burns and Honkala 1990, page 40). Ponderosa pine can spread seed up to 400 feet away, but only eight percent of the seed produced has been found at this distance. Even at 120 feet away, only 22 percent of disseminated seeds were found. Additionally, good cone crops

with heavy seed production only occur, on average, every eight years (Burns and Honkala 1990, page 416). Douglas-fir has potential for seed dissemination up to 1.2 miles in notable cases, but most seed falls within 330 feet of a seed tree. The major deterrents for successful regeneration of this species is limited seed supply, low viability of seed, consumption of seed by insects, animals and birds, competing plant species and unfavorable environments (Burns and Honkala 1990, page 532).

Other research shows that, in the absence of continued stand-replacing fires, succession may converge with the succession following a long-interval fire trending toward mature forests (Donato et al. 2006). Lindenmayer and Noss (2006) provide general discussion of potential impacts to post-fire salvage not specific to the Klamath Province or the objectives of this project.

Other scientists demonstrate that silvicultural treatments can increase stand structural variability, move stands toward multilevel canopies and increase residual tree growth (Dodson et al. 2012). Through artificial reforestation, conifers are given a head start at re-establishment, and subsequent thinning treatments can move stands towards a condition more ecologically suitable for wildlife, in a shorter time frame than if left to establish naturally. Other research has documented the advantage of planting conifers and controlling shrubs to increase tree density and growth over the early years of stand development (Shatford et al. 2007). Sessions et al. (2004) reiterate that regeneration cost effectiveness depends largely on the delay in establishment. Competition from brush and hardwoods severely hampers early conifer growth.

Thompson et al. (2007) found that salvage-logged and planted young stands southwestern Oregon were more likely to reburn with higher severity than comparable unmanaged areas. Unlike what is being proposed for the Westside project, Thompson et al. note: "*Records of site preparation and their effectiveness in reducing fuels in the plantations are incomplete; however, at least 17 of the 44 plantations are reported as ''broadcast-burned.'' In a separate analysis, we found that these 17 plantations also burned with higher severities than comparable unmanaged stands. The planting component of the system is intended to promote long-term regrowth of conifer trees, but it also creates dense or continuous fuels that are at elevated risk of high severity fire."* This finding by Thompson et al. is important because it describes the very condition we don't want to create in the Westside Fire Recovery Project. Stocking in the Thompson et al (2007) study typically ranged from 600 to 1,100 trees per hectare (240 to 440 trees per acre). From Thompson et al., we conclude that the plantations described were dense continuous fuels. We agree that plantations of that nature are at risk of being consumed in future fires and can in fact help propagate high intensity fire. What is unknown in this discussion is the amount of slash present from previous salvage operations, or how slash from competing vegetation release was handled. We do know that when dense young stands are combined with untreated or inadequately treated logging slash, the result is a volatile mix that is prone to high severity fire. In the Westside Fires, 70 percent of plantations exposed to fire survived. The common denominator in plantations that survived was treated activity fuels (Varak, personal communication). In the Westside Fire Recovery, we propose to treat the activity fuels (slash) from salvage logging, and plant at lower densities and variable spacing to create stands with discontinuous fuel that would be resilient to fire and could tolerate low to moderate severity fires typical of the Klamath Province. Thompson et al (2007) note that "*reducing connectivity of surface fuels at*

landscape scales is likely the only way to decrease the size and severity of reburns until vertical diversification and fire resistance is achieved." That is exactly the objective of the Westside Fire Recovery Project in salvage harvest units.

Thompson et al. (2007) conclude that *"The decision to salvage-log and plant, or not, after fire depends on a number of management considerations including risk of future high-severity fire, reducing hazards to fire fighters, timber revenue, and conservation of biodiversity."* These are considerations in the development of the Westside Fire Recovery Project.

Other research in drier forests indicates that by reducing surface fuels, the probability that planted areas will survive future fires is increased (Weatherspoon and Skinner, 1995). These planted stands are more likely to survive than the young trees that become established in large areas where fuels remain untreated. The planted trees in areas where fuels have been successfully reduced are expected to provide "islands" of coniferous forest in a sea of brushfields perpetuated by reburns where fuels have not been reduced. This would provide a measure of vegetative diversity that would not otherwise be present on the landscape. These planted stands also have a much higher probability of achieving the desired late- successional stand condition for the Late Successional Reserve than unplanted areas.

Alternative 1

Project Area A: Beaver Fire

Direct and Indirect Effects

Under Alternative 1, the entire burned area, of which about 7, 050 acres burned at moderate to high severity, will be left to recover naturally. Severely burned trees that survived the Beaver Fire will continue to die for several years due to injuries to crowns and cambium tissue, drought stress, and post-fire insect attack of weakened trees. Natural regeneration of coniferous forest may occur in severely burned patches, but it will be highly variable. Larger burn patches will regenerate more slowly because of distances from seed sources.

Successful natural regeneration within one to two decades, though highly variable, has been documented within white fir, Douglas-fir, and Douglas fir/tanoak stands following stand-replacing fires in the Klamath Province (Shatford et al. 2007; Joint Fire Science Program Final Report, Project 05-2-1-40 2009). Pine and mixed-conifer associations were not sampled in the Shatford et al. study. More typically, vegetation is likely to go through an extensive time-period of hardwood- and brush-dominated site occupancy (Zhang, Webster, Powers and Mills 2008). Reforestation will slowly occur naturally but may take many decades to replace brushfields (Zhang et al. 2008). In larger patches, where the majority of the trees were killed by the fire, re-establishment of forest cover would rely on natural regeneration and may take decades or longer. For the larger, contiguous areas of high-severity burn, distance from seed sources may further delay natural regeneration. In some cases of high-severity burn, there are no living conifer trees within several miles of the burned area. This condition is most evident in portions of the Walker Creek drainage, including the East Walker Creek, upper O'Neil Creek, and Slinkard Peak areas. There are very few conifer trees remaining in these areas capable of

providing potential seed sources for future potential natural regeneration needs in the near-term.

Overstory and understory vegetation which was killed, but not consumed, by the fire will remain and over time contribute to higher fuel loadings (Peterson et al. 2014). Given the high residual fuel loading, probable length of time required for site dominance by conifers and the fire history, it is likely the area will re-burn before fire-resilient trees can become established.

Lands unsuitable for conifer growth will re-vegetate through natural successional processes. Grasses, forbs, brush, and hardwoods will continue to dominate these sites for many years.

Suitable lands for conifer regeneration will be re-occupied, generally by brush and hardwood species. Without salvage, site preparation, planting, and proposed fuels treatments, severely burned stands will likely be replaced by shrubs and brush (Skinner et al. 2006) and regeneration of conifers and restoration of forested wildlife habitat may take decades.

Without the reforestation and fuels treatments proposed, these areas will re-vegetate primarily as areas of grass, shrubs and some hardwoods for an indefinite period of time, resulting in a loss of the conifer forest habitat that previously existed. Conifers will generally consist of scattered individual or small groups of ponderosa pine, sugar pine, knobcone pine, Douglas-fir, incense cedar, and white fir.

Although natural regeneration of conifer species has occurred elsewhere, following more typical wildfire site conditions, the Project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007). Assuming large, stand-replacing fires will continue to occur, long-lasting early-seral plant communities will increase within the Project area primarily because more area is burned at higher intensities than historic patterns predict (Skinner et al. 2006). Although post-fire observations may indicate surprisingly prolific regeneration, even on severely burned sites, natural regeneration establishment in local wildfires in the past led to desired stocking levels typically only being met around the edges of the fire, where a good seed source is still intact (Bonnett et al. 2005). Most of the Project area will be allowed to naturally regenerate. It is likely that smaller patches across the landscape will successfully regenerate conifers if a seed source is present. Most treatment units are part of larger areas that have minimal, if any, conifer seed sources to assist in the natural regeneration of conifers. The remaining standing dead trees would be a hazard to new plantations, forest visitors, and forest workers as dead trees fall or create increased fuel on the ground.

The likelihood and time required for conifer regeneration is also affected by bark beetle infestations. Alternative 1 has a sizeable risk of bark beetle population increases, primarily because all stressed trees remain. This results in the maximum potential habitat source for beetles, and the maximum potential loss of living trees as the insect population moves into lightly burned areas and adjacent green stands. Lesser levels of mortality are anticipated in stands outside the fire-affected area than in the Project area, but some increase in beetle infestation is expected among live trees. Experience from previous wildfires indicates that an outbreak can be intense for the first two years post-fire.

Activities that accelerate the regeneration of forests (conifer and hardwood) after moderate- to high-severity vegetation burns, promote the use of dead and dying wood rather than allowing it to decay, and lessen the likelihood of stand-replacing wildfire and insect disturbance, would have a beneficial effect on carbon storage. Therefore, beneficial effects of this alternative on carbon storage are expected to be less than those of action alternatives.

Cumulative Effects

Adding the effects of Alternative 1 to those of current and reasonable foreseeable future actions listed in Appendix C for the Beaver fire-related area will provide no measurable cumulative effects to the extent and time required for conifer regeneration.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for the Beaver fire-related area except there would be 34,060 acres of moderate to high severity burn on which conifer regeneration would be delayed.

Cumulative Effects

Adding the effects of Alternative 1 to those of current and reasonable foreseeable future actions listed in Appendix C for the Happy Camp fire-related area will provide no measurable cumulative effects to the extent and time required for conifer regeneration.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for the Beaver fire-related area except there would be 10,260 acres of moderate to high severity burn on which conifer regeneration would be delayed.

Cumulative Effects

Adding the effects of Alternative 1 to those of current and reasonable foreseeable future actions listed in Appendix C for the Whites fire-related area will provide no measurable cumulative effects to the extent and time required for conifer regeneration.

Alternative 2

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Salvage Harvest and Reforestation

Salvage harvest, and subsequent site preparation, planting, and fuels treatments, are proposed, on an estimated 590 acres within the Beaver Fire area. Proposed acres of salvage harvest and planting are in areas that primarily burned with high severity effects on vegetation. High-severity burned areas have very few seed-cone capable trees remaining to provide natural seedling capability. Without salvage and planting, these areas will likely not regenerate satisfactorily for many decades. The techniques used for salvage harvest, site preparation and planting, and the number of acres proposed for each technique, are displayed in Chapter 2. For the purposes of this analysis, trees within

salvage units that have a 70 percent or greater probability of mortality from fire damage are considered fire-killed and may be harvested; trees that have greater than 30 percent probability of surviving are considered green and will be retained, unless they pose an eminent threat to safety or must be removed for safe and efficient logging operations. Salvage harvest unit boundaries may include Riparian Reserves and patches of green trees that burned with lower severity, but these areas will not be harvested.

Acres salvage-harvested and site-prepared will be planted with a variety of coniferous species to ensure diversity, and will be released from competing vegetation within a year or so of being planted. Appendix A of the silviculture report provides specific trees per acre and species mix for the proposed harvest units. “Crop row” reforestation is not our intent, and planting will be at a wider, more variable spacing than in the past. Most salvage units are prescribed for 300 trees per acre to be planted, which roughly translates to a 12 foot by 12 foot spacing. It is expected that by the third year 40-50 percent of the planted seedlings will experience mortality which will result in a much lower stocking density than the original 300 trees planted per acre. The desired condition is to have an adequately stocked stand of conifers, representative of historic species mix and density; this desired forest also incorporates naturally-regenerating/sprouting hardwood species and shrubs. Trees will be planted on the most favorable sites for their growth which will lend to natural variability in spacing including gaps and clumps of conifers across the landscape. Seedlings will be produced from seeds selected for their ability to adapt to future climate changes. The Regional Genetics program has been collecting selected cones throughout the Klamath Mountains, growing seed, and monitoring growth so that the seedlings produced have a wide genetic base allowing these future forests to adapt to changing conditions.

The reforestation stocking objective after planting in the Westside Fire Recovery Project is a stand of 75 to 225 variably spaced young trees with treated, discontinuous activity fuels, not densely stocked regularly spaced plantations that form continuous fuel beds. Stand density would vary with slope position and aspect with lower stocking on upper slopes and south and west aspects and higher stocking on north and east aspects that would form a closed canopy on lower slopes. Hardwoods would be included in the target stocking levels so the number of conifers would be less where hardwoods occur. Most reforestation units in the Beaver Fire area would be planted at lower densities as most of the units are on upper slopes or dry south aspects. We also anticipate there would be losses from future fires that would further reduce stand density. Our long term objective is 30-50 large, variably spaced, fire-resilient trees per acre with openings as described by Taylor and Skinner (1996).

Salvage harvest, followed by site preparation, planting, and release gives the highest likelihood of successful conifer regeneration. Twenty-eight percent of the landscape that burned at moderate to high severity will be treated to achieve mature conifer stands. Planting without fuels reduction and site preparation would likely result in the loss of conifer plantations before they mature, given the median 8- to 38-year fire return interval of the Klamath Province (Skinner et al. 2006).

Planting when combined with the effective fuels treatments proposed, may likely reduce the amount of time needed to restore the site to a sustainable coniferous forest. Removing large trees by salvage alone is not sufficient fuel treatment. Low-impact site preparation methods, which create fewer suitable planting spots, combined with losses inflicted by

falling snags, and limited access, result in generally poor chances for conifer re-establishment on these sites.

Research has shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated, burned with much less intensity or not at all (Weatherspoon and Skinner 1995). Research has also shown that the quickest way to reestablish a coniferous forest after stand-replacing fire is by active reforestation (Zhang et.al. 2008). The reduction of residual fuels, as proposed, is necessary to prevent future fire events from becoming stand-replacing fires that destroy planted seedlings. Fuel treatments increase the likelihood of planted trees surviving future fires (Weatherspoon and Skinner 1995, Omi and Kalabokidis 1991). Heavy residual fuels need to be reduced substantially to help assure sustainability of plantations. Follow-up reforestation surveys will be completed to assure that the reforestation objectives are achieved.

About only five percent of the total fire area will be salvage harvested with another five percent being site prepared and planted outside salvage harvest units. Since most of the fire-burned areas will be allowed to regenerate naturally, many acres of lands suitable for conifer growth will continue to be understocked or not stocked by conifers, possibly for decades. These suitable lands will generally be re-occupied by early seral species (e.g. grasses, forbs, and brush) and hardwood species. Substantial snag stocking will remain. (See Chapter 1 for a discussion of salvage harvest in Late Successional Reserves.)

Lands unsuitable for conifer growth will also re-vegetate through natural successional processes. Early seral species, including grasses, forbs, brush, and hardwoods will dominate vegetation on these sites. Since activities that accelerate the regeneration of forests (conifer and hardwood) after moderate- to high-severity vegetation burns promote the use of dead and dying wood rather than allowing it to decay, and lessen the likelihood of stand-replacing wildfire and insect disturbance would have a beneficial effect on carbon storage. As a result, Alternative 2 is expected to be more beneficial than Alternative 1.

Natural Stand Areas Reforestation and Conifer Plantation Reforestation outside Salvage Units

Conifer plantations and selected natural stands that were deforested as a result of the 2014 fires will be re-established as part of Alternative 2. Natural stand and conifer plantation site preparation and planting are proposed on an estimated 1,780 acres within the Beaver Fire area. Proposed acres of site preparation and planting are primarily in high severity burned areas that have very few seed-cone capable trees remaining to provide natural seedling capability. Thus, without site preparation and planting, these areas will likely not satisfactorily regenerate conifers for many decades. Techniques and acres assigned to each technique are displayed in Chapter 2.As discussed earlier, fuels reduction treatments will also help to ensure successful regeneration efforts.

Under Alternative 2 within the Beaver Fire area, there would be 2,370 acres on which conifer regeneration will be accelerated (about 34 percent of the area burned at moderate to high severity) and 4,680 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will occur on about 590 acres, and about 1,780 acres of planting will follow site preparation, for a total of 2,370 acres of site preparation and planting.

Roadside Hazard Tree Removal

Hazard tree removal is not a silvicultural treatment to promote conifer regeneration. Hazard tree felling, and where appropriate, removal, is proposed to address public and administrative safety concerns due to the risk of trees falling onto roads. Where hazard tree removal overlaps with proposed salvage harvest units, the effects are the same as the effects of salvage harvest. Hazard tree removal where it does not overlap with proposed salvage harvest units will decrease fuel loading and, therefore, potential fuels hazard indirectly promoting conifer regeneration through reduced fire risk. Where seed sources are adjacent to roadside hazard removal areas, it is likely that natural regeneration will occur.

Cumulative Effects

No Forest projects are within the spatial bounds of the Beaver fire-related analysis area for vegetation, so none are added to the effects of the past actions (the affected environment). Projects on private land that are interspersed with the Forest in the Beaver area include private land salvage; adding the effects of these projects to the effects of Alternative 2 would result in an increase in acres treated to provide fuels reduction and conifer restoration.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for the Beaver fire-related project area except there would be 12,230 acres on which conifer regeneration will be accelerated (about 36 percent of the area burned at moderate to high severity) and 21,830 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will occur on about 6,790 acres and planting after site preparation on another 5,440 acres for a total of 11,570 acres of site preparation and planting.

The reforestation stocking objective after planting in the Westside Fire Recovery Project is a stand of 75 to 225 variably spaced young trees with treated, discontinuous activity fuels, not densely stocked regularly spaced plantations that form continuous fuel beds. Stand density would vary with slope position and aspect with lower stocking on upper slopes and south and west aspects and higher stocking on north and east aspects that would form a closed canopy on lower slopes. Hardwoods would be included in the target stocking levels so the number of conifers would be less where hardwoods occur. We also anticipate there would be losses from future fires that would further reduce stand density. Our long term objective is 30-50 large, variably spaced, fire-resilient trees per acre with openings as described by Taylor and Skinner (1996).

Cumulative Effects

Among Forest projects added to the effects of the past actions (the affected environment) and the direct and indirect effects of the proposed project are portions of the Elk Thin project (underburning), the Happy Camp Fire Protection project, Phase 2 (roadside buffer) and the Thom-Seider Vegetation Management and Fuel Reduction project (various treatments); see Appendix C for a list of projects that may have cumulative effects. Projects on private land that are interspersed with the Forest in the Happy Camp fire-related area include some private land salvage and timber harvest plans; adding the effects of all of these projects to the effects of Alternative 2 would result in an increase in acres treated to provide fuels reduction and conifer restoration.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for the Beaver fire-related project area, except there would be 1,200 acres on which conifer regeneration will be accelerated (about 12 percent of the area burned at moderate to high severity) and 9,060 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will occur is proposed on about 560 acres and site preparation and planting on another 640 acres for a total of 1,200 acres of site preparation and planting.

The reforestation stocking objective after planting in the Westside Fire Recovery Project is a stand of 75 to 225 variably spaced young trees with treated, discontinuous activity fuels, not densely stocked regularly spaced plantations that form continuous fuel beds. Stand density would vary with slope position and aspect with lower stocking on upper slopes and south and west aspects and higher stocking on north and east aspects that would form a closed canopy on lower slopes. Hardwoods would be included in the target stocking levels so the number of conifers would be less where hardwoods occur. We also anticipate there would be losses from future fires that would further reduce stand density. Our long term objective is 30-50 large, variably spaced, fire-resilient trees per acre with openings as described by Taylor and Skinner (1996).

Cumulative Effects

Among Forest projects added to the affected environment and the direct and indirect effects of the proposed Project are portions of the Eddy Late Successional Reserve project (underburning), the Jess project (insect and disease reduction) and the Salmon Salvage project (removal of dead and dying trees); see Appendix C for a list of these projects. Projects on private land that are interspersed with the Forest in the Whites fire-related area include some private land salvage and timber harvest plans; adding the effects of all of these projects to the effects of Alternative 2 would result in an increase in acres treated to provide fuels reduction and conifer restoration.

Alternative 3

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 1,780 acres on which conifer regeneration will be accelerated (about 25 percent of the area burned at moderate to high severity) and 5,270 acres of moderate to high severity burn on which conifer regeneration would be delayed. No salvage harvest will take place.

Cumulative Effects

Cumulative effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2, except there would be 11,570 acres on which conifer regeneration will be accelerated (about 34 percent of the area burned at moderate to high severity) and 22,490 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 6,130 acres and site preparation and planting on another 5,440 acres for a total of 11,570 acres.

Cumulative Effects

Cumulative effects for Alternative 3 are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 1,100 acres on which conifer regeneration will be accelerated (about 11 percent of the area burned at moderate to high severity) and 9,160 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 460 acres and site preparation and planting on another 640 acres for a total of 1,100 acres.

Cumulative Effects

Cumulative effects for Alternative 3 are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Alternative 4

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 2,300 acres on which conifer regeneration will be accelerated (about 33 percent of the area burned at moderate to high severity) and 4,750 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 520 acres and site preparation and planting on another 1,780 acres for a total of 2,300 acres.

Cumulative Effects

Cumulative effects for Alternative 4 are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 11,270 acres on which conifer regeneration will be accelerated (about 33 percent of the area burned at moderate to high severity) and 22,790 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 5,830 acres and site preparation and planting on another 5,440 acres for a total of 11,270 acres.

Cumulative Effects

Cumulative effects for Alternative 4 are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 1,200 acres on which conifer regeneration will be accelerated (about 12 percent of the area burned at moderate to high severity) and 9,060 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 560 acres and site preparation and planting on another 640 acres for a total of 1,200 acres.

Cumulative Effects

Cumulative effects for Alternative 4 are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Alternative 5

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 2,350 acres on which conifer regeneration will be accelerated (about 33 percent of the area burned at moderate to high severity) and 4,700 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 580 acres and site preparation and planting on another 1,770 acres for a total of 2,350 acres.

Cumulative Effects

Cumulative effects for Alternative 5 are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 3,830 acres on which conifer regeneration will be accelerated (about 11 percent of the area burned at moderate to high severity) and 30,230 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 1,750 acres and site preparation and planting on another 2,080 acres for a total of 3,830 acres.

Cumulative Effects

Cumulative effects for Alternative 5 are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 30 acres on which conifer regeneration will be accelerated (less than 1 percent of the area burned at moderate to high severity) and 10,230 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 30 acres and no additional acres of site preparation and planting for a total of 30 acres.

Cumulative Effects

Cumulative effects for Alternative 5 are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Alternative 2 Modified

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 2,000 acres on which conifer regeneration will be accelerated (about 28 percent of the area burned at moderate to high severity) and 5,050 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 220 acres and site preparation and planting on another 1,780 acres for a total of 2,000 acres.

Cumulative Effects

Cumulative effects for Alternative 2 Modified are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 11,780 acres on which conifer regeneration will be accelerated (about 35 percent of the area burned at moderate to high severity) and 22,280 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 6,340 acres and site preparation and planting on another 5,440 acres for a total of 11,780 acres.

Cumulative Effects

Cumulative effects for Alternative 2 Modified are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Effects to analysis indicators would be the same as for Alternative 2 except there would be 1,140 acres on which conifer regeneration will be accelerated (about 11 percent of the area burned at moderate to high severity) and 9,120 acres of moderate to high severity burn on which conifer regeneration would be delayed. Salvage harvest will take place on about 500 acres and site preparation and planting on another 640 acres for a total of 1,140 acres.

Cumulative Effects

Cumulative effects for Alternative 2 Modified are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Alternative 3 Modified

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Effects of Alternative 3 Modified within the Beaver Fire will be substantially different from Alternative 2, as no salvage is proposed. Twenty four percent (1,660 acres) of Forest lands that burned with moderate to high severity within the Beaver Fire will be treated to achieve mature conifer stands including the zero net acres of salvage and 1,660 acres of planting existing plantations and natural stands that are not part of salvage units.

Cumulative Effects

Cumulative effects for Alternative 3 Modified are the same as for Alternative 1 for salvage (none proposed). Effects of site preparation and planting outside the salvage units are the same as for Alternative 2.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Effects of Alternative 3 Modified within the Happy Camp Complex will be the same as those for Alternative 2 for areas in which salvage harvest is implemented (5,200 net acres

within 6,210 acres in salvage harvest units). Thirty percent (10,120 acres) of Forest lands that burned with moderate to high severity within the Happy Camp Complex will be treated to achieve mature conifer stands including the 5,200 acres of salvage and an additional 4,920 acres of planting existing plantations and natural stands that are not part of salvage units.

Cumulative Effects

Cumulative effects for Alternative 3 Modified are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Effects of Alternative 3 Modified within the Whites Fire will be the same as those for Alternative 2 for areas in which salvage harvest is implemented (550 net acres within 680 acres of salvage harvest units). Eleven percent (1,110 acres) of Forest lands that burned with moderate to high severity within the Whites Fire will be treated to achieve mature conifer stands including the 550 acres of salvage and an additional 560 acres of planting existing plantations and natural stands that are not part of salvage units.

Cumulative Effects

Cumulative effects for Alternative 3 Modified are the same as for Alternative 2 for areas in which salvage harvest is implemented. Effects of site preparation and planting outside of salvage units are the same as for Alternative 2. Effects of areas that are not salvage-harvested are the same as those in Alternative 1.

Comparison of Effects

Alternative 2 would provide for the most acres on which conifer regeneration would be accelerated over the greatest extent of the landscape. Alternative 2 Modified, Alternative 3, Alternative 3 Modified and Alternative 4 would all result in fewer acres on which conifer regeneration would be accelerated compared to Alternative 2, with reductions occurring on all three fire areas. Alternative 3 and Alternative 3 Modified result in no salvage harvest proposed in the Beaver fire-related area, leaving previously conifer-dominated forests to naturally regenerate to early seral species, primarily brush and hardwoods. The areas around O'Neil and Walker Creeks in the Happy Camp fire-related area will have substantial snag component and subsequent high fuel loadings intermixed with treated areas. Alternative 4 affects the conifer regeneration potential in Upper Elk and Little Elk Creeks of the Happy Camp fire-related area by reducing considerable salvage treatments in those areas as well as leaving land located behind private land in Seiad Valley as brush fields and snag patches for decades to come. The Tyler Meadows and Faulkstein areas will also become brush-dominated in spite of previous conifer dominance due to large distances from viable seed sources to grow trees. Alternative 5 would provide for substantially reduced acres on which conifer regeneration would be accelerated, with reductions occurring mostly on the Happy Camp Complex and Whites fire areas although several units in Beaver Fire were also eliminated. Most of the previously existing conifer-dominated landscape within the Happy Camp Complex and

Whites Fire will become brush and hardwood dominated. Alternatives 1 and 5 will, over an intergenerational period, result in reestablishment of a coniferous forest (Zhang et al. 2008, Shatford et al. 2007). However, that forest may not be sustainable in terms of fuels and fire history because residual fuels will not have been treated or will only have been treated in part, and it may also take decades to reach that stage (Zhang et al. 2008). Given the fire return interval of the Klamath Province and the fuels present on the site, a stand replacement re-burn is likely because it takes so long for a coniferous forest to reestablish itself. Without fuels reduction and active reforestation in these conditions, re-burns where fuels are heavy tend to be stand-replacement events (Skinner et al. 2006, Weatherspoon and Skinner 1995). The result will likely be a loss of forest cover in this area and a conversion to brush/hardwoods.

Analysis indicators for each alternative for the Beaver fire area are compared in Table 3-2: , for the Happy Camp fire area they are compared in Table 3-3 and for the Whites fire area they are compared in Table 3-4.

Table 3-2: Summary of Effects by analysis indicator for the Beaver Fire Area

Indicator		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 2 Mod.	Alt. 3 Mod.
Acres on which conifer regeneration will be accelerated		0	2,370	1,780	2,300	2,350	2,000	1,660
Percent of moderate to high severity burned landscape restored to a mature, conifer-dominated stand within 60 years		0%	34%	25%	33%	33%	28%	24%
Acres of moderate to high severity burn on which conifer regeneration will be delayed		7,050	4,680	5,270	4,750	4,700	5,050	5,390
Type of vegetation likely to regenerate in short term and long term	Short term	Grass, forbs, brush	Brush, hardwoods, young conifers	Brush, hardwoods, young conifers	Brush, hardwoods, young conifers	Brush, hardwoods, some young conifers in treated matrix lands	Brush, hardwoods, young conifers	Brush, hardwoods, young conifers
	Long term	Brush, hardwoods, isolated patches of conifers	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas

Table 3-3: Summary of Effects by analysis indicator for the Happy Camp Fire Area

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 2 Mod.	Alt. 3 Mod.

Indicator		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 2 Mod.	Alt. 3 Mod.
Acres on which conifer regeneration will be accelerated		0	12,230	11,570	11,270	3,830	11,780	10,120
Percent of moderate to high severity burned landscape restored to a mature, conifer-dominated stand within 60 years		0%	36%	34%	33%	11%	35%	30%
Acres of moderate to high severity burn on which conifer regeneration will be delayed		34,060	21,830	22,490	22,790	30,230	22,280	23,940
Type of vegetation likely to regenerate in short term and long term	Short term	Grass, forbs, brush	Brush, hardwoods, young conifers	Brush, hardwoods, young conifers	Brush, hardwoods, young conifers	Brush, hardwoods, some young conifers in treated matrix lands	Brush, hardwoods, young conifers	Brush, hardwoods, young conifers
	Long term	Brush, hardwoods, isolated patches of conifers	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas	Brush, hardwoods, mature mixed conifer within treated matrix lands, isolated conifers in LSRs and IRAs	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas

Table 3-4: Summary of Effects by analysis indicator for the Whites Fire Area

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 2 Mod.	Alt. 3 Mod.
Acres on which conifer regeneration will be accelerated	0	1,200	1,100	1,200	30	1,140	1,110
Percent of moderate to high severity burned landscape restored to a mature, conifer-dominated stand within 60 years	0%	12%	11%	12%	<1%	11%	11%
Acres of moderate to high severity burn on which conifer regeneration will be delayed	10,260	9,060	9,160	9,060	10,230	9,120	9,150

Indicator		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 2 Mod.	Alt. 3 Mod.
Type of vegetation likely to regenerate in short term and long term	Short term	Grass, forbs, brush	Brush, hardwoods, young conifers	Brush, hardwoods, young conifers	Brush, hardwoods, young conifers	Brush, hardwoods, some young conifers in treated matrix lands	Brush, hardwoods, young conifers	Brush, hardwoods, young conifers
	Long term	Brush, hardwoods, isolated patches of conifers	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas	Brush, hardwoods, mature mixed conifer within treated matrix lands, isolated conifers in LSRs and IRAs	Mature, mixed conifer stands in treated areas	Mature, mixed conifer stands in treated areas

Compliance with law, regulation, policy, and the Forest Plan

All alternatives are in compliance with law, regulation, policy and the Forest Plan in relation to vegetation as displayed in the Forest Plan consistency checklist. Silvicultural prescriptions under action alternatives comply with the Forest Plan. Salvage, site preparation and planting are all methods for establishing desired conifer stocking with some level of fire resilience once seedlings are established.

Fire and Fuels

This section provides a synopsis of the effects of the Project on fire behavior potential and resistance to control of future wildland fire activity across the Project area.

Methodology

The fire and fuels report takes into consideration the three elements that affect fire behavior: fuels, weather, and topography. The interactions of these elements present potential issues to vegetation and fire suppression capabilities. Although all of the elements are important, the Project realistically can only affect the fuels element. A combination of field-collected data, geospatial data, fire modeling, professional judgment, and literature review were used to provide a landscape level picture of potential fire behavior and analyze environmental consequences of the Project to fire and fuels.

Using Behave Plus and FlamMap fire behavior modeling programs, fire behavior outputs were generated to compare all alternatives over time. Post-fire stand data were collected in areas that burned with high, moderate and low severity effects. The collected data were entered into the Fire Management Analyst (FMAPlus 3) model to quantify canopy and tree bole biomass loading. These data were used to enter into a snag-fall and decay model that quantifies potential surface fuel loads overtime as snags weaken, break and/or fall over. Selected stands were also evaluated using the Forest Vegetation Simulator along with the Fire and Fuels Extension of Forest Vegetation Simulator to project future surface fuel loads over time. More detailed information and modeling assumptions for each

program are provided in the Fire and Fuels resource report, available on the Project website.

Analysis indicators used to evaluate effects of the Project include potential fire hazard and resistance to control; these are measured by flame length, fireline intensity, rate of spread, and surface fuel loading.

Fire hazard is defined as a fuel complex, defined by volume, type condition, arrangement, and location, which determines the degree of ease of ignition and of resistance to control. Fire severity and fire behavior are often terms used to describe how a fire may burn depending on the fuels conditions (i.e. fire hazard). Since the terms fire severity and fire behavior are used throughout the Fire and Fuels Report to describe affects to the measurement indicator fire hazard, there is a need to further define.

Although the term fire behavior commonly refers to the variable characteristics of an active flaming front, in some instances, the term fire behavior is used interchangeably with fire severity. The term fire severity relates specifically to the level of effects of fire on the post burn landscape. In most cases when the term fire behavior is used to indicate fire severity, it adds the qualifier "problem fire behavior." According to the Fire Effects Information System website "Fire severity generally indicates the degree of environmental change caused by fire. Scott and Reinhardt (2007) provide a slightly more detailed definition: "[fire severity is] the effect of a fire on ecosystem properties, usually described by the degree of soil heating or mortality of vegetation. Fireline intensity is the rate of heat release per unit time per unit length of fire front. Not synonymous with fire severity, which refers to the degree of environmental change caused by fire."

Measurement indicators to assess fire hazard include flame length, fireline intensity, and rate of spread as fire modeling predicts fire behavior based on surface fuels less than three inches in diameter. Fuels larger than 3" in diameter are not used in fire modeling programs to display potential fire behavior outputs but are important indicators of resistance to control.

Flame lengths are a visual indicator of fireline intensity; as flame lengths increase, fireline intensity increases (see the body of the Fire and fuels resource report).

Byram (1959) defined fireline intensity as the rate of heat energy release per unit time per unit length of fire front, regardless of the depth or width of the zone of active flaming combustion. With respect to fire suppression, fireline intensity is how hot the fire is burning and how close resources can be to the fire. Fireline intensity is used to forecast whether to use direct or indirect firefighting tactics.

Resistance-to-control is generally viewed as an estimate of the suppression force required for controlling a unit of fire perimeter. For example, "high" resistance to control means "slow work for dozers, very difficult for hand crews; hand line will be difficult" (Brown, Reinhardt, & Kramer, 2003).

Surface fuel loading by fuel size category is evaluated as a measure of resistance to control. To quantify potential intensity of large fuels (greater than three inches in diameter) Byram's (1959) fireline intensity equation and surface fuel loadings (tons/acre) of zero to three inch and three to ten inch diameter material is used to measure resistance to control related to fireline production capabilities of fire suppression resources (see the body of the fire and fuels resource report).

Spatial and Temporal Context

This analysis is limited to the spatial extent of the Project area because effects on fire and fuels can be accurately estimated within this area.

Short-term analysis is considered at one to five years post-fire, and long-term analysis extends out to greater than 20 years to model the potential effects of standing snags, downed wood and subsequent surface fuel loading over time.

Affected Environment

Few forested regions have historically experienced fires as frequently and with such high variability in fire severity as the Klamath Mountains Bioregion (Taylor & Skinner, 1998), this is primarily due to climatic variables and the diverse physical and biotic arrangement of the Klamath Mountains. South and west facing aspects and upper slope positions typically experienced higher severity fire than lower slopes and north- and east-facing aspects. On the eastern edge of the Klamath Mountains, median fire return intervals range from 8 to 38 years (Taylor, Skinner, & Agee, 2006). With frequent fire of low to mixed severity, fuel accumulations over most of the area were historically maintained at low levels, and landscape features such as ridge-tops and streams were often sufficient to impede fire spread.

Fire history data from years 1911-2012 provides insight into fire cause and size to identify trends in fire patterns and relationships on the landscape. Table 3-5 displays fire ignitions by cause. Lightning accounts for 74 percent of fire starts, and 82 percent of the acres burned within the Project area over a 101 year history, which highlights the notion that fire will continue to be a factor across the Project area. Table 3-6 outlines fire by size class indicating that 72 percent of all fires in the Klamath Mountain Bioregion are less than .25 acres.

Table 3-5: Wildfire ignition by cause and total acreage burned

Fire Cause	Total Number of Ignitions	Total Reported Acres Burned
Lightning	1410	93,207
Human	355	15,605
Unknown	143	3,965
Grand Total	1908	112,776

Table 3-6: Wildfire ignition by size class.

Fire Size Class	Total Number of Fires
A (0-.25 acres)	1383
B (.25-1 acres)	397
C (1-10 acres)	76
D (10-100 acres)	18
E (100-1000 acres)	12
F (1000-5000 acres)	16
G (> 5000 acres)	6
Grand Total	1908

Figure 3-1 graphs acreage burned by decade. The data includes large fire history within the Project area including the 2014 Beaver, Happy Camp Complex and Whites Fires. 2014 fires represent 59 percent of the acreage burned over the 103 year period. **Table 3-7** displays the acreage burned by decade within the Project area.

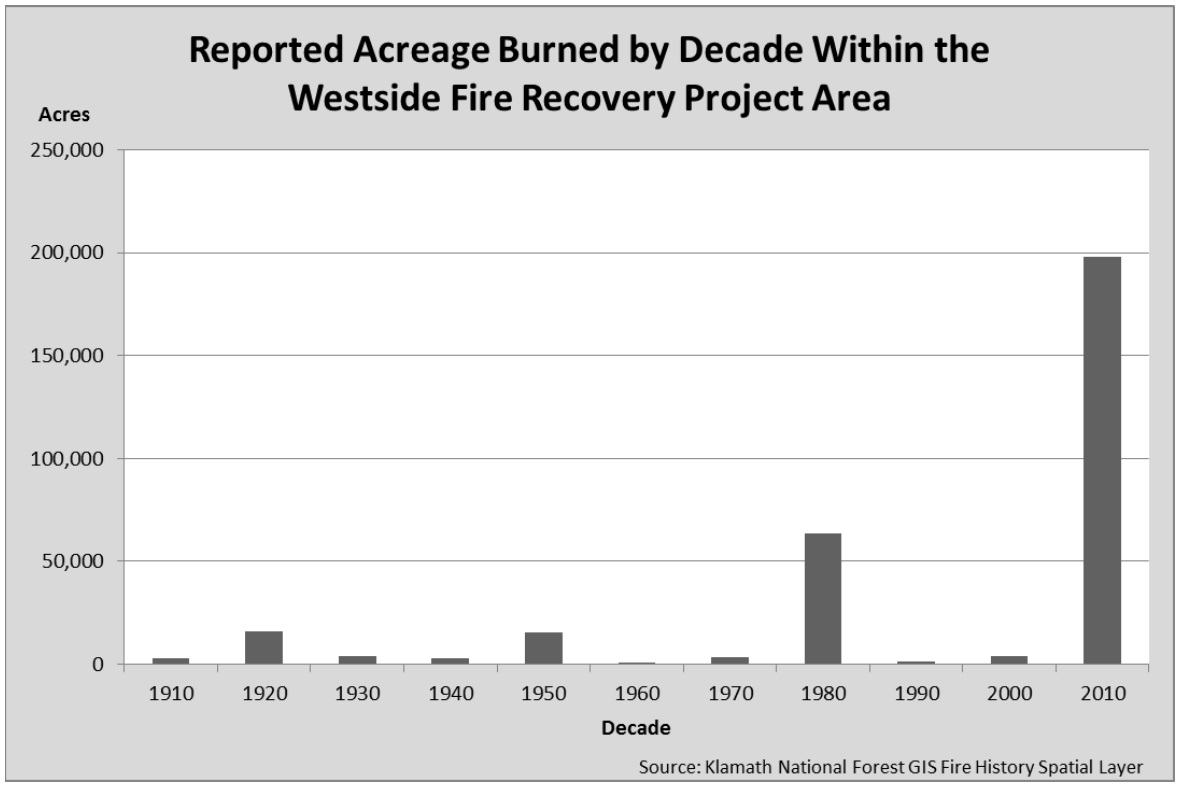

Figure 3-1: Summary of the acreage burned by decade within the Westside Fire Recovery Project area.

Table 3-7: Acreage burned by decade.

Decade	Acres Burned By Decade
1910	2,811
1920	15,914
1930	4,063
1940	2,660
1950	15,399
1960	103
1970	3,155
1980	63,287
1990	1,501
2000	3,882
2010	197,967
Total	310,743

Figure 3-2 provides a spatial representation of past fire history over a 103 year period time. What can be observed is that the fires within the Project area have experienced long periods with an absence of fire on the landscape. A great portion of the landscape has not experienced large fire within the past 20 to 100 years within the Project area.

Prior to the 2014 fires, much of the landscape within the Project area had a long absence of fire. Fire history is rich and overlapping outside of the Project area; moreover, fire will continue to be a presence on the landscape and shape future fuels and vegetation profiles within the Project area in the future.

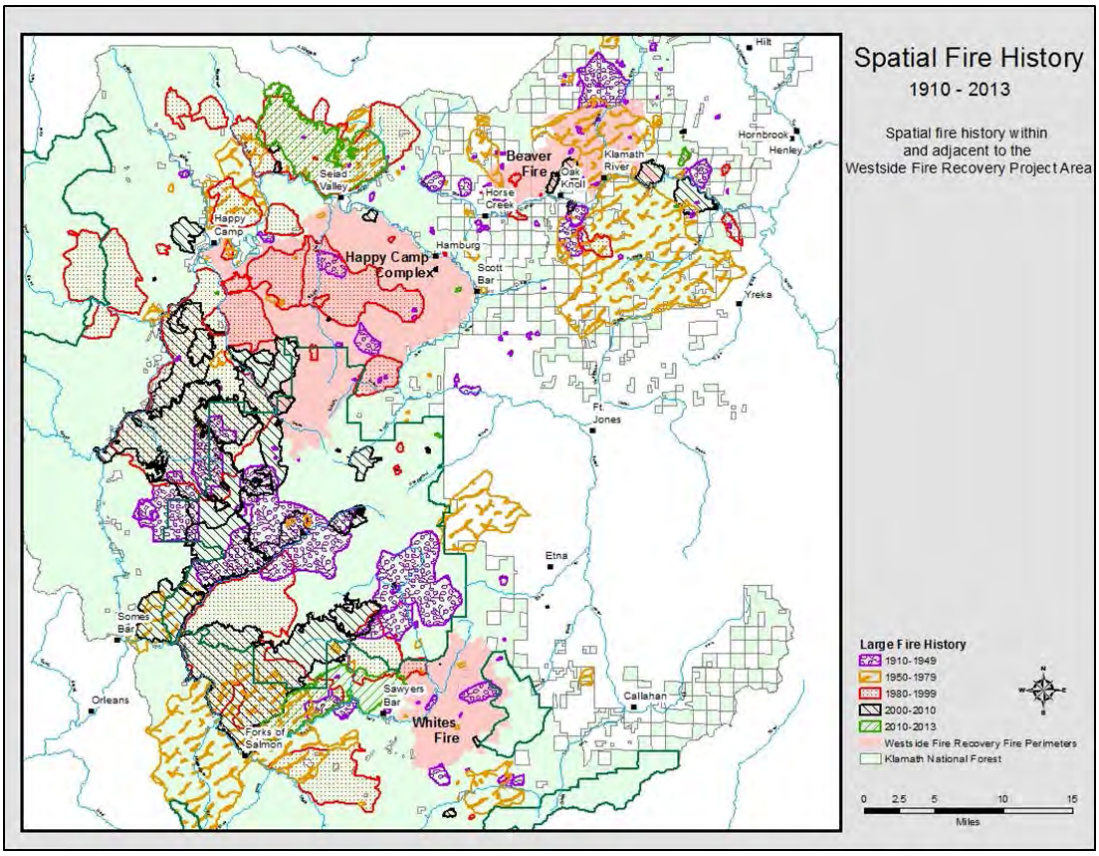

Figure 3-2: Spatial Large Fire History within and adjacent to the Westside Fire Recovery Project.

Fuels

The effects of uniform fuel beds at the surface and canopy in combination with weather and climatological conditions, led to significant fire growth and high severity fire effects on the Forest during 2014. The resulting fires brought upon a mosaic mix of fire severity within each fire and across the Project area (Table 3-8). High severity fire effects occurred over 26 percent of the Project area resulting in 75 to 100 percent mortality of trees (based on tree basal area loss). Patch size within high severity fire areas ranged from less than 1 acre to 3,890 acres in size; 37,325 acres within the Project area have contiguous patch sizes greater than 100 acres.

Table 3-8: Fire (Vegetation Burn) Severity (Basal Area Loss) within the Westside Fire Recovery project area

Fire Severity	Beaver		Happy Camp Complex		Whites		Total	
	Acres	%	Acres	%	Acres	%	Acres	%
Low	14,310 (43%)	43%	73,152	62%	21,666	63%	109,129	59%
Low/Moderate	3,139	10%	9,986	8%	2,087	6%	15,213	8%
Moderate/High	2,465	7%	7,305	6%	1,566	5%	11,336	6%
High	13,012	40%	27,334	23 %	8,889	26%	49,236	27%

High severity fire areas experienced crown fire activity resulting in full consumption of ground, surface and aerial canopy fuels. High severity crown fires result in high levels of tree mortality, consuming leaves and small branches but leaving the boles largely intact (Ritchie, Knapp, & Skinner, 2012). At the ground and surface fuel level, duff and needle cast, small branches and large downed woody material were fully consumed. In the canopy full consumption of leaf and needle foliage occurred leaving standing dead trees and barren soils. Overall, the impact led to high levels of tree mortality.

Moderate to high severity fire areas experienced similar conditions. Surface fuel loadings were primarily fully consumed. Pockets of larger downed fuels remain visible on the surface. Generally, full consumption within all categories of surface fuel loads were consumed (i.e. small branches, twigs, and large downed woody debris).Dead needles continue to fall from the canopy covering the forest floor. The crown fuel profile varied with some trees being consumed by the fire and other trees retaining needles in the tree canopy. Overall, the majority of the overstory canopy burned intense enough resulting in brown needles with few green needles remaining on conifer trees with full consumption of hardwood species.

Low to moderate severity stands have a mix of live and dead trees remaining within the understory. Primarily, overstory crown fuels remain intact and survived the fire while surface fuels and small trees within the understory were consumed leading to small tree and shrub mortality.

Resistance to Control

The influence of fuels, weather and topography plays a role in the ability to effectively suppress unplanned ignitions. Topography and road access is the primary factor inhibiting the suppression or control of fires within the Forest. The high density of fire-killed trees within the Project area, present a unique hazard to fire fighters and promote future problem fire behavior, as these are both ember producers and receptors to fire

ignition. Over time, dead trees fall and new vegetation establishes across the fire area, contributing to surface fuel loadings. The result is the difficulty of control increases. For example, additional kinds and types of fire equipment may be needed or firelines might take longer to construct.

Coarse Woody Debris

Within Late Successional Reserve's, it is necessary to retain snags and large woody logs that are likely to persist until late successional conditions develop. However, retaining snags and large woody debris is not desirable where they would be in excess of fuel reduction requirements, as excessive large woody debris loads are not characteristic of a fire resilient ecosystem that allows old growth characteristics to re-occur on the landscape (see responsible opposing points of view discussion at the beginning of Chapter 3). The concept of retaining an adequate number of large logs is explained in Beardsley and Warbington (1996) whose findings and data are used as a guide within the Forest-Wide Late Successional Reserve Assessment (LSRA, 1999). It is important to note that this data reflects 60 to 80 years of fire suppression, in which values may be inflated over historical conditions (LSRA, page 1-4). Table 1-1 of the LSRA, and Table 2 of Beardsley and Warbington, show that downed dead trees (logs) at least 20 inches in diameter ranged from an average of 5 to 10 trees per acre for vegetation types most impacted within the Project.

Table 3-9 is a summary of the number of downed logs by vegetation type in Late Successional Reserve's.

Table 3-9: Table 1-1 of the LSR Assessment shows the number of downed logs by series (vegetation) type.

Vegetation Series Type	Number of Downed Logs > 20" diameter at breast height
Mixed Conifer	7
White fir	10
Red fir	9
Douglas-fir - Tanoak	9

Pages 3-4 and 3-5 of the LSRA also show that the number of large downed logs per acre would be expected to be higher on north and east facing aspects as compared to south and west facing aspects. Snags and large downed wood would also be occurring in scattered clumps. This pattern is consistent with conclusions found in Skinner, 2002 (PSW-GTR-181).

Skinner (2002) describes the influence of fire on the dynamics of dead woody material and states that fire history resulted in a “landscape with many of the snags and logs clustered in both time and space, and very sparsely distributed in the intervening time and space.” Skinner also concluded that “it is unlikely that much large woody material survived long enough to decompose fully in fire regimes that proceeded the fire-suppression era.” This research suggests that the amount of dead wood would have been much less under the historical fire regime than exists today and is consistent with other research with similar fire regimes (Knapp 2015 and Stephens 2004).

The purpose and need for the Project includes a need for a restored and fire-resilient ecosystem and a reduction in fuels. This purpose and need is supported by the desired

condition in the Late Successional Reserve Assessment (page 3-4) which states that, generally, fuels conditions will be such that flame lengths would be less than 4 feet. The analysis within the Fire and Fuels Report further describes the need for action and is primarily related to the need to reduce snag densities and fuel loading (see Fire and Fuels Report). The following figures and tables (Figure 3-3, Figure 3-4, and Figure 3-5) compare Alternative 1 (no action) and Alternative 2 at representative sites proposed for treatment under Alternative 2.

Plot 3 100% Mortality						Plot 3 100% Mortality					
Year	Surface Fuel < 3" dbh (tons/acre)	Surface Fuels > 3" dbh (tons/acre)	Intensity (btu/ft/sec) 26 ch/hr	Intesity (btu/ft/sec) 40 ch/hr	Resistance to Control	Year	Surface Fuel < 3" dbh (tons/acre)	Surface Fuels > 3" dbh (tons/acre)	Intensity (btu/ft/sec) 26 ch/hr	Intesity (btu/ft/sec) 40 ch/hr	Resistance to Control
1	1.35	9.58	40	40	Low	1	0.27	1.92	8	8	Low
10	8.91	67.26	5155	7870	Extreme	10	1.78	13.45	1030	1572	Low
20	11.38	93.04	6963	10630	Extreme	20	2.27	18.61	1391	2124	Low
30	11.08	98.96	7224	11030	Extreme	30	2.21	19.79	1443	2204	Low
40	9.72	95.75	6813	10401	Extreme	40	1.94	19.15	1361	2079	Low
50	8.11	88.69	6152	9393	Extreme	50	1.62	17.74	1230	1877	Low

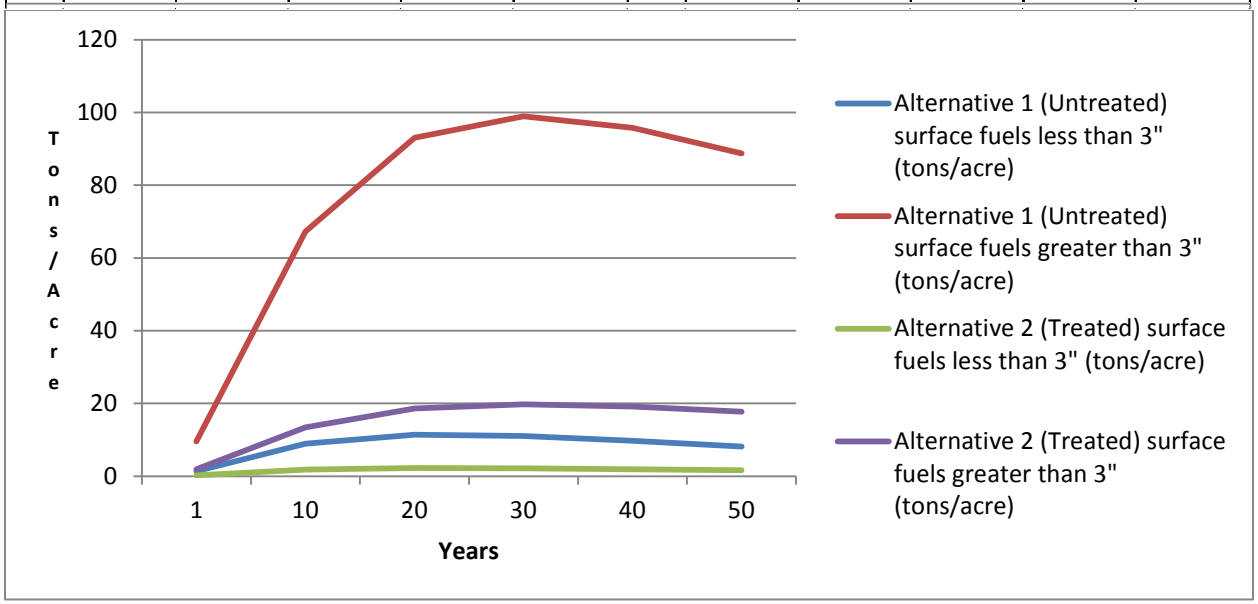

Figure 3-3: Representative stand for the Beaver Fire area with and without salvage harvest and follow-up fuels treatment. The Table on the left represents the fire area with no salvage harvest (Alternative 1) over time and the right Table represents the areas post salvage harvest and fuels reduction treatments.

Walker/Grider Creek Stand ID 050552ABCD001116414144205					
Year	Surface Fuel < 3" dbh (tons/acre)	Surface Fuels > 3" dbh (tons/acre)	Intensity (btu/ft/sec) 26 ch/hr	Intesity (btu/ft/sec) 40 ch/hr	Resistance to Control
1	1.49	14.40	55	55	Low
10	14.34	51.11	5259	8029	Extreme
20	16.82	73.97	6912	10553	Extreme
30	12.89	80.54	6567	10025	Extreme
40	10.83	76.98	6013	9179	Extreme
50	10.00	70.61	5526	8437	Extreme

Walker/Grider Creek Stand ID 050552ABCD001116414144205					
Year	Surface Fuel < 3" dbh (tons/acre)	Surface Fuels > 3" dbh (tons/acre)	Intensity (btu/ft/sec) 26 ch/hr	Intesity (btu/ft/sec) 40 ch/hr	Resistance to Control
1	3.48	12.90	70	70	Low
10	4.59	17.12	1724	2632	Low
20	5.01	18.89	1892	2889	Moderate
30	4.95	18.14	1841	2811	Low
40	5.80	15.60	1857	2835	Low
50	8.08	14.53	2204	3365	Low

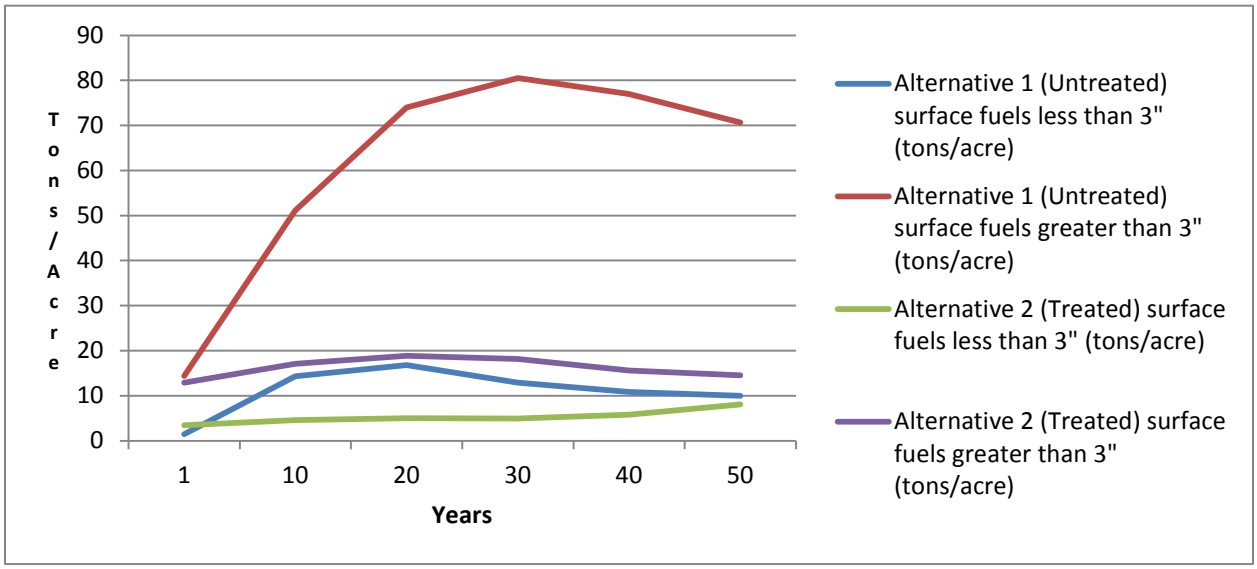

Figure 3-4: Representative stand for the Happy Camp Fire area with and without salvage harvest and follow-up fuels treatment. The Table on the left represents the fire area with no salvage harvest (Alternative 1) over time and the right Table represents the areas post salvage harvest and fuels reduction treatments.

Scott River Stand ID 05055518010208060009						Scott River Stand ID 05055518010208060009					
Year	Surface Fuel < 3" dbh (tons/acre)	Surface Fuels > 3" dbh (tons/acre)	Intensity (btu/ft/sec) 26 ch/hr	Intesity (btu/ft/sec) 40 ch/hr	Resistance to Control	Year	Surface Fuel < 3" dbh (tons/acre)	Surface Fuels > 3" dbh (tons/acre)	Intensity (btu/ft/sec) 26 ch/hr	Intesity (btu/ft/sec) 40 ch/hr	Resistance to Control
1	1.15	19.32	66	66	Low	1	3.49	10.46	63	63	Low
10	17.04	49.41	5647	8622	Extreme	10	4.71	13.44	1549	2364	Low
20	19.48	74.90	7434	11349	Extreme	20	4.86	15.21	1669	2548	Low
30	17.28	84.58	7559	11540	Extreme	30	2.12	10.27	922	1408	Low
40	15.33	89.31	7464	11395	Extreme	40	4.71	14.64	1613	2463	Low
50	13.65	89.70	7187	10973	Extreme	50	4.69	14.12	1582	2416	Low

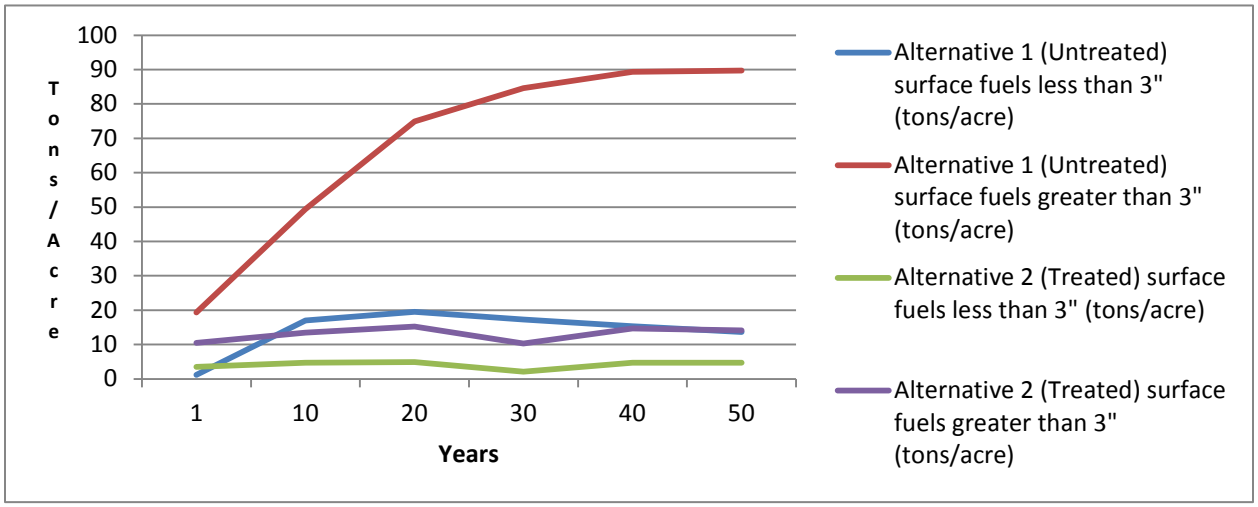

Figure 3-5: Representative stand for the Whites fire area with and without salvage harvest and follow-up fuels treatment. The Table on the left represents the fire area with no salvage harvest (Alternative 1) over time and the right Table represents the areas post salvage harvest and fuels reduction treatments.

Figure 3-3, Figure 3-4, and Figure 3-5outlines that fuel loading under Alternative 1 does not meet desired conditions for the Project for measures of fire hazard and resistance to control. The number of snags left on the landscape under Alternative 1 would create conditions in the future for an increased probability of high severity and stand-replacing fire.

Project mitigations are aimed at balancing the number of snags needed for wildlife and watershed concerns while still meeting fire and fuels resource objectives. For example, snags are being retained in aquatic Riparian Reserves and inner gorges. In addition, snags are being retained in areas related to critical habitat elements; and include legacy trees across the landscape, plus areas that will aid in maintaining wildlife connectivity. Alternatives for the Project have different levels of retention areas, where no treatment is to occur, to help describe the effects to resources.

Between draft and final, plots were taken within snag retention areas. The data shows that on average (over a 100-acre area); there are over 20 trees per acre larger than 20 inches diameter at breast height within retention areas. These snags will aid in meeting the objectives of the Late Successional Reserve and Land Management Plan as standing dead trees and as course woody debris. The Late Successional Reserve Assessment standards

are expected to be exceeded. In addition, the plots did not account for course woody debris already on the ground.

This data was used to help describe if desired conditions were met for the Project area. See individual resource reports for further analysis and the "Responsible Opposing Points of View" section in Chapter 3, EIS.

Environmental Consequences

Alternative 1

Direct and Indirect Effects

No direct effects will occur under Alternative 1 since no activities will be implemented as a result of the Project. Immediate post-fire effects in the Project are reduced fire spread and intensity, due to the reduction of available surface fuels. Over the next one to five years flame lengths, fireline intensity and rate of spread are expected to remain in a condition that will allow fire suppression resources to be capable of containing any unplanned ignition within the Project area.

From previous high severity fires on the Forest, vegetation typically begins to re-sprout and establish the year following a fire. Grasses, forbs and shrubs, such as manzanita, sprout along with oak and madrone tree species. Forested stands which had low to moderate fire severity will be expected to maintain relatively shrub free due to the overstory canopy layer shading out these species. Over the next one to five years, dead tree branches, conifer and broadleaf litter, small trees and shrubs not entirely consumed by the fire will overtime fall to the surface and contribute to surface fuel loading. In lieu of a significant fire weather event, predominately surface fire activity with low severity fire effects are projected up to five years or longer.

Over time, indirect effects of not taking any action will result in an increased potential of high severity fire occurring across the landscape again, as vegetation reestablishes and grows. Within moderate to high severity fire areas, hundreds of dead trees with few live trees remaining characterize the post-fire landscape. Indirect effects to future vegetation, fire behavior, spread and severity may be impacted as a result of taking no action and leaving standing dead trees on portions of the landscape. Standing snags may retain a substantial amount of biomass that will contribute to surface fuels over time as snags fall (Ritchie, Knapp, & Skinner, 2012).

Currently, standing dead trees are storing an enormous loading of dead fuel. Within high severity fire areas, as time increases without disturbance (i.e. fire) to the fire area, it is expected that forested areas will re-establish into non-forested vegetation predominately with shrub species. In a matter of 10 years fire hazard is expected to increase, and again be susceptible to high severity fire. Shrubs, which can act as a "heat sink" with high live fuel moisture contents, can increase duration (or heating) required to ignite foliage; however,, typical live fuel moisture patterns decrease moisture contents over time as seasonal drying and lack of precipitation continue through the summer months. These result in these fuels becoming a "heat source" and are susceptible to ignition, rapid spread rates and increased fireline intensities. The post fire effects of dead surface fuel conditions along with standing trees now add to the area's susceptibility to fire.

The Chips (2012) fire on the Plumas and Lassen National Forests highlights reburn potential within a 12 year old fire scar. The Chips fire, while occurring in the Sierra Nevada, started and burned for a long period of time within steep drainages of the Feather River Canyon and was subject to daily thermal inversions. Shrub regrowth amongst standing snags created high severity fire effects within the footprint of the 2000 Storrie fire on the Plumas and Lassen National Forest. Heavy consumption of shrub, herb, grass, snag and downed fuels is evident (Fites, Ewell, & Bauer, 2012).

FlamMap provides the ability to spatially predict fire behavior across the landscape. Fuel models are based on future vegetation utilizing fire history and vegetation regrowth after these fires. Within 10 to 20 years (Figure 3-6), approximately 60 percent of the landscape could see flame lengths greater than 4 feet and fireline intensities greater than 100 btu/ft/sec (British Thermal Units/foot/second). FlamMap does not incorporate 1000-hour fuel loadings (fuels greater than 3" diameter) into fire behavior modeling; within areas that have increased fuel loadings due to snag fall, fireline intensities could exceed 3000 btu/ft/sec.

Table 3-10: 10 to 20 Year potential flame length within the Westside Fire Recovery Project Area.

Flame Length (ft)	Acres	Percent of Project Area	Interpretation
< 4 Feet	80,739	37.55%	Persons using handtools can generally attack fires at the head or flanks. Handline should hold the fire
4 to 8 Feet	98,039	45.60%	Fires are too intense for direct attack on the head by persons using handtools. Handline cannot be relied on to hold fire. Equipment such as dozers, engines, and retardant aircraft can be effective.
8 to 11 Feet	10,875	5.06%	Fires may present serious control problems such as torching, crowning, and spotting. Control efforts at the head of the fire will probably be ineffective.
> 11 Feet	25,365	11.80%	Crowning, spotting, and major runs are common; control efforts at the head of the fire are ineffective.

Table 3-11: 10 to 20 year potential fireline intensity within the Westside Project Area.

Fireline Intensity (btu/sec/ft)	Acres	Percent of Project Area	Interpretation
< 100	75,407	35.07%	Persons using handtools can generally attack fires at the head or flanks. Handline should hold the fire
100 to 500	108,685	50.55%	Fires are too intense for direct attack on the head by persons using handtools. Handline cannot be relied on to hold fire. Equipment such as dozers, engines, and retardant aircraft can be effective.
500 to 1000	17,659	8.21%	Fires may present serious control problems such as torching, crowning, and spotting. Control efforts at the head of the fire will probably be ineffective.
> 1000	13,267	6.17%	Crowning, spotting, and major runs are common; control efforts at the head of the fire are ineffective.

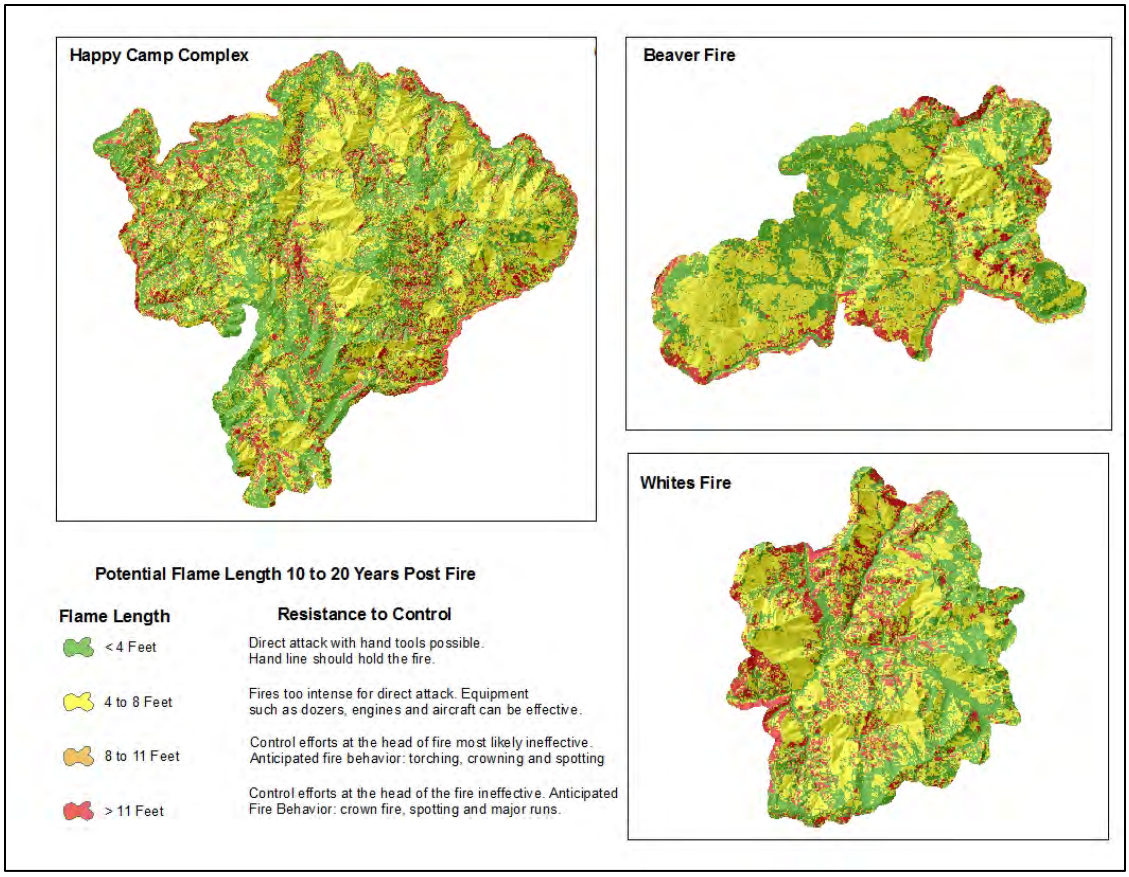

Figure 3-6. Potential flame lengths based on 90th percentile weather conditions 10 to 20 years post fire.

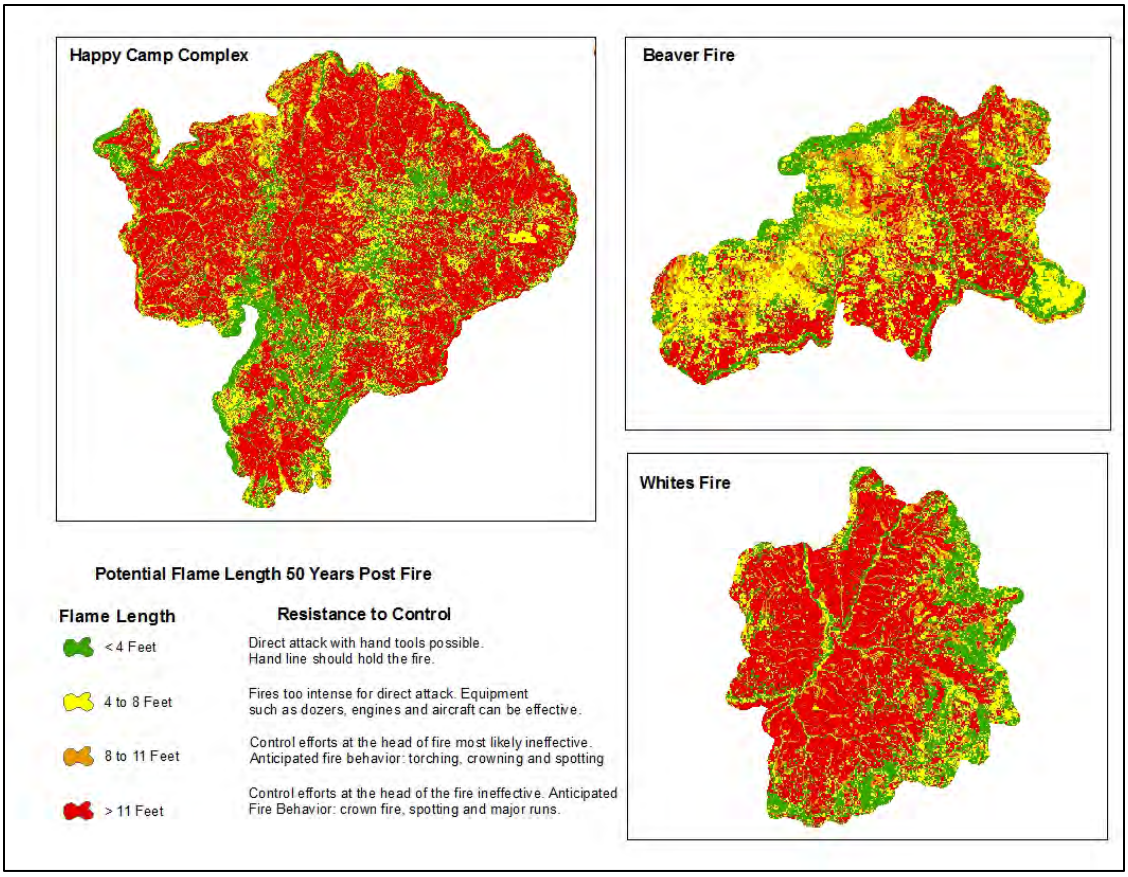

Figure 3-7: Potential flame lengths based on 90th percentile weather conditions 50 years post fire.

Fire persistence, resistance-to-control, and burnout time (which affects soil heating) are significantly influenced by loading, size and decay state of large woody material (Brown, Reinhardt, & Kramer, 2003). Large woody material can contribute to fire behavior and fire spread by acting as a source of embers, both directly by lofting from burning snags and indirectly through torching of trees preheated by burning of heavy fuels on the forest floor (Ritchie, Knapp, & Skinner, 2012).

Within ten years, large fuels have the potential to produce conditions that would result in high fire intensities and high severity fire effects in addition to increased resistance to control of wildland fires. This is especially the case where large trees are intermixed with shade tolerant small diameter trees. Such areas present a high risk of future fire effects. This is because smaller fuels accumulate to increase fire ignition and rate and size of spread. By contrast, large fuels smolder which contributes to sustained ignition during the flaming front, long duration burns, and high intensities for longer periods of time. Over the course of the next 50 years, without fire or other disturbance activities, low severity fire areas should be expected to look similar to pre-fire conditions. Odion et. al. (2004) and Thompson et al. (2007) describes this in their reviews of the 1987 Klamath National Forest fires and Biscuit fire areas, respectively. Both studies found that where low severity fire areas occurred in the past, the areas re-burned at low severity again. Conversely, areas that burned with high severity in the past tended to reburn with high severity again.

In high and moderate severity stands, large accumulations of fuels have the potential to exhibit intensities greater than 6,000 btu/ft/sec over the course of 50 years. It is

anticipated that these intensities could exhibit higher outputs based on the type of vegetation that establishes and intermixes with large fuel accumulations, affecting reburn potential and increased resistance to control over time. Much of the high severity fire areas were mixed conifer stands with closed canopies. Within areas of high severity that fully consumed forested canopies, it can be expected that non-forested conditions consisting of shrubs and grasses will persist.

The probability of a reburn is higher, though to an unknown extent, in heavy accumulations of coarse woody debris because of the high fire persistence that characterizes coarse woody debris (Brown, Reinhardt, & Kramer, 2003). (See responsible opposing points of view at the beginning of Chapter 3.) Beyond the initial flaming front, the residence time of fires is affected as large fuels smolder for long periods and then, through radiation and conduction, spread into soils and surrounding vegetation. The Fire Behavior Assessment Report from the Beaver Fire provides an example of temperature from initial flaming front through residence burn down time of larger fuels. Within the plot, estimated surface fuel loading was 70 tons/acre. The initial flaming front spiked temperatures to 1,000° Celsius then subsided to above 200 ° Celsius but sustained those temperatures for 30 minutes. Long-term smoldering can cause extended high soil heating, frequently above 140 ° Fahrenheit, which is the temperature required to kill plant tissue (Hood, 2010). Ground fires and consumption of large-diameter surface fuels can cause root and basal stem injury by consuming fine roots growing in the duff layer and through long-term heating of the soil and cambium at the tree base (Hood, 2010). As conifers reestablish within shrub fuels, they will be at risk of reburn at high severity and extended periods of heating (residence time) as large fuels burn down and smolder.

The same future conditions may exist over the course of a 50 year time period as shrubs establish and grow. Standing snags fall and contribute dead fuel loading and trees begin to intermix among the shrubs directly correlating to increased flame lengths, fireline intensity and subsequent fire severity from prolonged heating (residence time) of large surface fuels. Torching, crowning, and spotting, which contribute to large fire growth, are greater where large woody fuels have accumulated under a forest canopy and contribute to surface fire heat release (Brown, Reinhardt, & Kramer, 2003). Over time, it can be expected that the potential for high severity fire to occur where non-forested vegetation continues to grow and areas of high tree mortality continue to add to surface fuel loadings, especially where larger trees fall and decay. After enough fuels have accumulated, fire hazard likely increase with time as fuels accumulate and coarse woody debris rots, increasing its flammability (Monsanto & Agee, 2008; Peterson & Harrod, 2010). Within 50 years, approximately 80 percent of the Project area (, Figure 3-7) could exhibit flame lengths greater than four feet and fireline intensities greater than 100 feet. At this point in time, any new trees that have had the opportunity to establish in the post fire burn area will again be susceptible to crown fire activity.

Table 3-12 . Fifty year potential flame length within the Westside Project Area.

Flame Length (ft)	Acres	Percent of Project Area	Interpretation
< 4 Feet	40,906	19.02%	Persons using handtools can generally attack fires at the head or flanks. Handline should hold the fire
4 to 8 Feet	40,259	18.72%	Fires are too intense for direct attack on the head by persons using handtools. Handline cannot be relied on to hold fire. Equipment such as dozers, engines, and retardant aircraft can be effective.
8 to 11 Feet	24,510	11.40%	Fires may present serious control problems such as torching, crowning, and spotting. Control efforts at the head of the fire will probably be ineffective.
> 11 Feet	109,343	50.85%	Crowning, spotting, and major runs are common; control efforts at the head of the fire are ineffective.

Table 3-13 . Fifty year potential fireline intensity within the Westside Project Area.

Fireline Intensity (btu/sec/ft)	Acres	Percent of Project Area	Interpretation
< 100	35,849	16.67%	Persons using handtools can generally attack fires at the head or flanks. Handline should hold the fire
100 to 500	74,944	34.85%	Fires are too intense for direct attack on the head by persons using handtools. Handline cannot be relied on to hold fire. Equipment such as dozers, engines, and retardant aircraft can be effective.
500 to 1000	51,839	24.11%	Fires may present serious control problems such as torching, crowning, and spotting. Control efforts at the head of the fire will probably be ineffective.
> 1000	52,386	24.36%	Crowning, spotting, and major runs are common; control efforts at the head of the fire are ineffective.

Fire Suppression Capability

Snags are present within the wildland urban interface, road systems and strategic locations that have historically been used as primary control lines to contain previous large fire events. The impact of standing dead timber and subsequent surface fuel loading within moderate and high severity fire areas upon firefighter safety and wildland fire containment will increase resistance to control over the course of 50 years. In high severity fire areas, sampled tree data reveals snag densities ranging from 200 to 1,500 snags per acre.

It is anticipated that snags and increased surface fuels will subsequently increase suppression resource needs and the time required to control a wildland fire, even a small lightning-caused start-up. If a fire were to start in the Project area in 10 to 50 years, large downed fuel will present an increased resistance to control along with snags taking additional time and effort to control a fire. Large fuels require heavy mop-up utilizing engines or helicopters for water support to cool down the area as these fuels take time to consume and emit high fireline intensities and increase firefighter exposure to other environmental and physical factors.

To safely attack and contain a large fire in the future will also be difficult, time consuming, and require large amounts of suppression resources. Fires which start in

surrounding snag patches may require indirect suppression tactics due to safety. When fire suppression resources encounter snags, falling the tree is an option; however, when numerous standing snags exist, resources may decide to relocate control lines away from the hazards adding unburned fuel between resources and the fire, adding a new hazard. This added element generally means constructing safety zones and control lines cleared to mineral soil with equipment such as dozers and feller-bunchers. It is not uncommon to build indirect control lines 20 to 30 feet wide and safety zones five to ten acres in size utilized by firefighters as place to escape to should fire behavior be such to warrant withdrawal. When control lines are constructed by heavy equipment, the understory vegetation is pushed aside and piled without regard to consideration of other resources including archeological, soils and other sensitive features. After the fire, extensive time and energy goes into suppression repair to remove and repair control lines.

Large dead fuels that continue to decay increase their availability to ignite and consume due to increased surface area for direct flames impingement subsequently increase fireline intensity and resistance to control. Several previous fires within pre-existing fire scars have shown that large quantities of resources and indirect firefighting tactics are utilized to reduce exposure to snags. The Chips (Plumas/Lassen NF, 2012), Big Meadow (Yosemite NP, 2009), Backbone (Shasta-Trinity NF, 2009) and Corral Complex (Six Rivers NF, 2012) are examples where indirect strategies were utilized due to the presence of high amounts of snags. In these previous fire scars, fire suppression resources cut down snags along control lines to reduce aerial hazards and spot fire potential adjacent to control lines. The consequences surface fuel loadings are significantly increased adjacent to planned control lines. This results in high quantities of large fuels and subsequent potential for increased surface fireline intensities. The outcome requires equipment such as engines, dozers and aircraft to prep indirect control lines and hold burnout operations estimates potential resistance to control over the 50 year period; high to extreme resistance to control are estimated based on plots sampled within the fire area.

Snags, both ember producers and receptors in the wildland fire environment promote problem fire behavior. During the Big Meadow Fire, snags exhibited problem fire behavior as spot fires were emitted more than .25 miles ahead of the main fire and falling into receptive dead and down coarse woody debris from the 1996 A-Rock Fire scar. This result in the inability of fire suppression resources to safely construct fireline utilizing direct line tactics as the fire quickly increased in size as spot fire generated ahead of the main fire growing in size.

A case study on the Chips fire (2012) discussed resistance to control issues due to steep slopes hampering containment efforts However, once the fire burned into an area with a high density of snags, downed logs and shrub regrowth, fire intensity increased and large column development occurred causing fire suppression resource to withdrawal from direct attack and move to safer distances to construct control lines. Fireline construction on the Chips fire required great effort due to the steep terrain, heavy fuels and snags which hindered line construction. Much like the Chips fire, the Project contains steep slopes. Within the course of 10 to 50 years the Project area has the potential for significant fuel loading resulting in extreme fire behavior potential.

Wildland Urban Interface (WUI)/Strategic Fire Management Areas

Within the Project area, numerous communities, infrastructure, and private timberlands are located adjacent to National Forest System lands. With regards to the WUI, snags can jeopardize road systems as a serious ingress/egress issues during access to a fire and/or leaving the area in an emergency. Heavy fuel loads within WUI areas increases the likelihood of accelerated spread rates and higher resistance to control as a result of spot fire ignition, high intensities and large quantities of suppression resources to control a fire.

Fire suppression managers have identified and used strategic areas to control large fires. Many of the areas including natural barriers, ridge systems, and roads used to contain the 2014 fires had been used in previous fires on the Forest. It is reasonable to assume fire managers will gravitate to these locations to control an unplanned ignition. The King Fire (2014) on the Eldorado National Forest is an example of how fire managers utilized historic fire lines from the Ralston (2006) and Star (2001) fires in planning their containment efforts. Taking no action in the Project area will make future efforts to utilize these locations as effective control lines risky. Cutting snags increases the surface fuel loading adjacent to control lines and presents serious hazards to firefighters. Trees felled have been in a state of decay and weakened further subjecting hazards to falling teams (Sawyers who utilize chainsaws to fall trees) who cut down the trees. The increased fuel loading makes holding control lines difficult due to increased intensity as fuels continue to burn down igniting fires adjacent to control lines. Under Alternative 1, we can expect similar conditions along the ridge systems where high severity fire occurred.

Project Area A: Beaver Fire

The effects are the same as described above. There are currently 1,765 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 10 years post fire.

Project Area B: Happy Camp Complex

The effects are the same as described above. There are currently 6,895 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 10 years post fire.

Project Area C: Whites Fire

The effects are the same as described above. There are currently 3,740 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 10 years post fire.

Cumulative Effects

Project Area A: Beaver Fire

The McCollins Late Successional Reserve Enhancement project overlaps the spatial and temporal bounds with the Beaver fire area. This Project will reduce fuel loading on about 50 acres within the fire area.

The majority of the rest of the burned area is owned by Fruit Growers Supply Company and Michigan California Timber Company, and is located within the Beaver Fire Area. Both of these companies are either currently treating or planning to treat their land by conducting salvage operations on their respective properties. This accounts for about

9,900 acres in the Beaver fire area. It is understood that Fruit Growers Supply Company is planning a series of fuel breaks within the ridge and road systems of the Beaver fire area; lands owned by Fruit Growers are intermixed between Forest lands. On private timber land, salvage harvest is generally planned on slopes less than 45 percent, while commercial trees are being removed on slopes greater than 45 percent. After salvage operations are completed, replanting within these areas is expected. It is also expected that herbicide treatments will be applied to the planted areas to reduce shrub growth. As a result of operations expected on privately owned timberlands, these areas are expected to be relatively fire safe. This is primarily due to removal or reduction of most of the dead and dying trees on these lands and the use of herbicides to reduce regrowth. When added to the 1,765 acres already meeting desired condition, there will be 11,665 acres meeting desired condition over the next 10 years.

Project Area B: Happy Camp Complex

Projects that overlap in space and time with the Happy Camp Complex area include the Happy Camp Fire Protection project, Phase II, Lake Mountain Foxtail Pine project, Lovers Canyon project and Thom Seider project. These projects will reduce fuel loading on about 13,850 acres in the Project area. When added to the 6,895 acres that are meeting desired condition currently there will be a total of 20,745 acres meeting desired condition.

Project Area C: Whites Fire

The Eddy Late Successional Reserve project and Sawyers Bar Fuels Reduction project overlap with the Project area. These projects will reduce fuel loading on about 5,000 acres within the fire area. When added to the 3,740 acres that are currently meeting desired condition there will be a total of 8,740 acres meeting desired condition.

Alternative 2

Direct and Indirect Effects

Alternative 2 uses a variety of treatments to increase safety to public and forest users, reduce future surface fuel loadings, alter fire behavior and subsequently increase fire resilience over the long term as compared to Alternative 1. Alternative 2 includes salvage, site preparation, planting and release, hazardous fuels and roadside hazard treatments to meet the purpose and need of the Project and Fire Management Standards and Guides contained within the Forest Land and Resource Management Plan (2010).

Salvage Harvest & Site Preparation, Planting and Release

Post-fire logging can serve as an effective tool for managing fuel loadings in the regenerating forests after high severity wildfires (Peterson, Dodson, & Harrod, 2014). The direct effect of salvage harvest includes reducing the density of snags on the landscape (Ritchie, Knapp, & Skinner, 2012) and subsequently reducing future accumulations of large diameter surface fuels, as trees fall to the forest floor.

Within units identified for treatment, snag retention is proposed within stream course Riparian Reserves, inner gorges and identified leave locations. No salvage harvest is proposed in stream course Riparian Reserves and inner gorges. Snag retention outside of stream course Riparian Reserves and inner gorges will be in a clumping pattern in order to retain snags. This will promote decreased surface fuel loadings outside of these zones.

Within snag retention areas and RRs, surface fuel loadings will mirror conditions outlined under Alternative 1.

Post-fire logging produces a transient pulse of elevated surface woody fuel loadings followed by a much longer period of reduced surface woody fuel loadings relative to burned stands that are not logged. Peterson et al. (2014) found that post-fire logging altered post-fire fuel succession by: (1) greatly accelerating the deposition of surface woody fuels from logged snags; (2) reducing peak loadings of large diameter woody fuels; and (3) initiating the woody fuel decay earlier. Ritchie et al. (2012), evaluated salvaged units following the Cone Fire on the Lassen National Forest. They found that after four years, higher levels of surface fuel accumulations occurred in lower intensity salvage plots. The highest surface fuel accumulations occurred in un-salvaged plots four to eight years after the fire. Furthermore, the highest levels of large woody debris were associated with un-salvaged areas. Where whole tree yarding is not used follow-up fuels treatment is needed to treat activity-generated fuels (Ritchie, Knapp, and Skinner, 2012). Under Alternative 2, activity generated slash will be piled and burned, reducing surface fuels to levels consistent with low fire hazard.

Tree harvesting methods include ground based logging, cable logging and helicopter logging. It is anticipated that there will be a delay between harvesting activities and associated fuel reduction activities. During this time, logging activities will result in an accumulation of surface fuels, especially within cable and helicopter units where whole tree yarding is not planned. Logging will result in broken tops and branch wood and have a short term effect on elevated surface fuel loading. Post-harvest fuel loading is expected to be greatest within helicopter units, followed by skyline and ground-based units. However, activities following harvest break the structure and composition of the fuel bed. Ground-based units will be expected to reduce the greatest amount of surface fuels upon completion of fuels reduction due to the ease of facilitating piling and other fuels reduction activities on gentler slopes. Steeper slopes (greater than 40 percent) would require hand piling and/or broadcast burning to achieve desired surface fuel loadings of less than 10 tons per acre. Larger diameter fuels (greater than three inches in diameter) within helicopter units, or those areas on steep slopes, may increase fuel loading as these fuels can be difficult to pile by hand.

Post-implementation surface fuel loading is projected in these values, resulting from residual activity slash on site. While the tables and figures (

Table 3-12 and Table 3-13) do not contain descriptions of all of the distinct areas within the Project area, they do demonstrate the range of conditions that are predicted to exist.

Alternative 2 post treatment activities are expected to significantly reduce large surface fuel accumulations in the future, as compared to Alternative 1. Furthermore, while modeling predicts an expected increase in surface fuels that are less than three inches in diameter at breast height, it also predicts that Alternative 2 will promote low accumulation of surface fuel loadings after implementation of activities. Comparatively, Alternative 1 significantly elevates surface fuels for decades. Post-logging fuel treatments, such as piling and burning, can rapidly reduce total amounts and spatial continuity of surface woody fuels, and may allow logged stands to serve as fuel-breaks in a landscape-level fire management strategy (Peterson & Harrod, 2010).

The combination of residual slash and future fuel loading from standing trees, is low enough so that the accumulation of additional surface fuels from snags left standing for wildlife, fisheries and water quality purposes will not present a large fuels buildup over time and contribute to fire suppression difficulties.

Mastication is essentially the mulching or chipping of wood material, and may be utilized in selected stands to reduce high snag densities, in lieu of piling stands. Mastication will have a direct effect on the structure and composition of fuel beds post fire. Under Alternative 1, surface fuels will fall over in random patterns essentially "crisscrossing" as they fall, with some fuels resting on top of others, and will increase fuel bed density and height. Higher surface fuel beds will be subject to wind and fuels preheating lower in the surface profile, thus increasing fire behavior potential. Where mastication is identified as a treatment option under Alternative 2, chipped material will create a compact fuel bed, rather than having standing dead material that falls overtime Material will also be expected to decay faster with masticated material due to its proximity to the ground and being saturated for longer period of time during the winter months.

Roadside Hazard Treatments

Roadside hazard treatments increase the safety of accessing the Forest by reducing the potential for dead trees to fall across Forest roads and within recreation sites. Trees removed offsite reduce surface fuel loadings adjacent to road systems and allow for safe and improved fire control along ingress/egress roadways.

Hazardous Fuels Treatments

Hazardous fuels treatments are proposed within the WUI and along strategic road and ridge systems. Fire suppression resources have historically used these areas for the control of unplanned fires and for the implementation of prescribed underburning. Hazardous fuels treatment not meeting desired conditions will require maintenance.

Proposed thinning with follow-up pile burning, lop and scatter, or chipping, decreases surface fuel loadings to desired conditions of less than seven tons per acre (zero to three inches diameter fuels), reduces ladder fuels by removing small diameter trees, and increases canopy base heights of retained green trees. Surface fuel reduction, in conjunction with increasing canopy base heights, will reduce flame lengths and crown fire initiation.

Fuel reduction within the WUI will reduce fuel loading and minimize ladder fuels in order to create a more defensible WUI during future fire events. Both live and dead

understory vegetation (less than 14 inches in diameter at breast height) will be altered or removed to reduce potential flame length, potential fire intensity, and the potential for crown fire activity. Identified treatment areas may receive either mechanical or hand methods of fuel reduction. Mechanical treatments, other than mastication, will be followed with piling and burning of activity slash. Mastication treatments are not expected to result in activity slash that is suitable for piling and will only be used in situations where the resulting fuel bed is not determined to pose a risk to fire control or fire ecology objectives. Activity slash resulting from hand treatment will be piled and burned, chipped, or lopped and scattered. Dead trees greater than 14 inches in diameter can be cut and used for firewood, piled and burned, or lopped and scattered.

Strategic ridge systems are features on the landscape that can aid in the control or containment of future wildfires. Existing and historic control lines are being used as strategic ridgetop fuel breaks. Ridge systems will maintain existing (used in the 2014 wildfires) and historic control lines as described in Chapter 2 description of alternatives

Post-fire conditions are such that fuel loadings will be expected to recover to sufficient levels to implement low intensity fire to mimic a frequent fire return interval as dead vegetation falls from the canopy over the next three to six years. Many of the prescribed burn locations will use existing control lines established in recent large fires within the Project area. Line construction activities will occur around the perimeter of the prescribed fire unit, and will include using dozers to re-scrape control lines to mineral soil. Hand line construction to soil level will occur where mechanized equipment has no access, is impractical, or for some other reason is not available. Removal of understory vegetation (12 inches diameter or less) along control lines may occur in order to facilitate holding operations during prescribed fire implementation.

Prescribed fire activities naturally prune the lower branches of trees by burning the live and dead needles and small branch wood, which effectively increases the canopy base heights. Overall, canopy bulk density will be expected to be comparable to current conditions, since mid-story and overstory canopies will remain mostly intact. A mosaic burn pattern will be expected due to post fire burn severity patterns.

Fire Behavior Synopsis

Without active post-fire fuel reduction treatments, fuel succession processes create high potential for subsequent high severity wildfire 20-40 years following wildfire in dry coniferous forests (Peterson & Harrod, 2010). Proposed treatments in Alternative 2 effectively reduce fuel loading in the short and long term which in turn reduces fire behavior, when compared to Alternative 1. Fire hazard is diminished in the short term, one to three years, due to the lack of surface fuels to support the spread of fire. However, actions taken to reduce standing dead trees will now reduce fire behavior (flame length, fireline intensity, and spot fire potential) and associated fire hazard in the long term.

Within ten years, reductions in surface fuel loadings, as a result of planned activities, have the potential within proposed treatment areas to reduce flame lengths to less than four feet, reduce fireline intensity to less than 100 btu/ft/sec, and decrease spot fire activity through removal of snags and future fuel loading. This will effectively produce fire behavior such that persons using hand tools can generally attack fires at the head or flanks and handline is sufficient to hold the fire.

Post treatment fire hazard is expected to be reduced due to the change in structure, continuity and composition of the fuel bed, and reduction in long term fuel loadings. Within areas that receive treatment, the primary carrier of fire would be expected to consist of small diameter woody material, less than three inches diameter. Moderate load activity slash would be a representative fuel bed post-harvest prior to fuel reduction activities. The key difference from Alternative 1 is the removal of snags and reduction of large woody debris. Upon completion of harvest and site preparation activities, fuel loadings would be consistent with a low load activity slash and/or low/moderate conifer/hardwood litter, with the primary carrier of fire being small woody fuels. Conversely, Alternative 1 would consist primarily of shrub-dominated species intermixed with accumulated dead woody fuels from snag fall and still standing snags.

The type of fire behavior predicted under Alternative 2 will enable direct attack by ground crews within the units proposed for treatment. Untreated portions of units, such as RRs or snag retention pockets, will be expected to produce flame lengths greater than four feet and fireline intensities greater than 100 btu/ft/sec. Additionally, with recognition that prescribed fire activities will produce a mosaic burn pattern, within these areas, potential increases in fire behavior will occur where fire did not burn.

When compared to Alternative 1, decreased accumulations of large surface fuel loads will reduce the duration of fuel consumption and associated long term heating to surrounding vegetation and soils resulting in less fire intensity and potential severity within treated areas.

Reforestation efforts will have better chances of survival due to anticipated surface fuel load reductions within planted areas. Using empirical data for northern California forests, Weatherspoon and Skinner (1995) found that when wildfire in natural plantations spreads to adjacent plantations, fire intensity and damage to the overstory are much lower in plantations where slash has been removed following logging (Peterson, et al., 2009). Younger conifer and hardwood stands will still be susceptible to reburn and subsequent mortality even with Alternative 2, until tree age and canopy base heights increase. Younger trees have thinner bark and low canopy base heights allowing for easier transition to crown fire even with predicted flame lengths less than four feet over the majority of the proposed units. The lower the canopy is to the surface, the lesser the fire behavior required to generate crown fire initiation. However, with the removal of large surface fuels, higher survival will be expected within stands that continue to have management activities to maintain desire fuel conditions, as trees and canopy base heights increase in size.

Thompson, Spies and Olsen (2011) identified plantation age as the most important predictor of canopy damage. Older plantations experience lower levels of canopy damage; the fire resistance of Douglas-fir increases with age due to a continually thickening bark and increasing crown base heights, which reduce the likelihood of torching or crown fires. Alternative 2 effectively reduces future surface fuel loadings, especially within large fuels. This reduction in loading translates to lower predicted intensity and subsequent reduction in long duration heating to surrounding vegetation and preheating of the canopy to reduce crown fire initiation potential; thus, planted trees have a higher probability of success compared to Alternative 1.

The additional importance of fuels treatments under Alternative 2, related to reforestation, is reducing shrub growth through grubbing within planted areas, and breaking the uniformity and continuity of the fuel bed. However, without follow up maintenance, shrubs will be expected to reestablish and intermix within planted areas, producing similar fire behavior characteristics as Alternative 1. This risk may remain high for several decades if shrubs and other surface fuels are not frequently reduced. Even though maturing trees can withstand increasingly greater heat from a surface fire, in stands without fuel reductions, both litter loads and ladder fuels result in continued high vulnerability (McGinnis, Keely, Stephens, & Roller, 2010). Throughout the life of the Project, it is anticipated that tree growth (either planted or natural regeneration) is expected to reach at least 50 feet tall with 6 to 10" diameter at breast height. Post treatment units are anticipated to consist of low/moderate load conifer litter or a low slash fuel loading resulting in less than ten percent probability of mortality should a fire occur under 90th percentile weather conditions. Comparatively, under Alternative 1, shrub regrowth intermixed with snag fall would be anticipated to have mortality potentials greater than 95 percent.

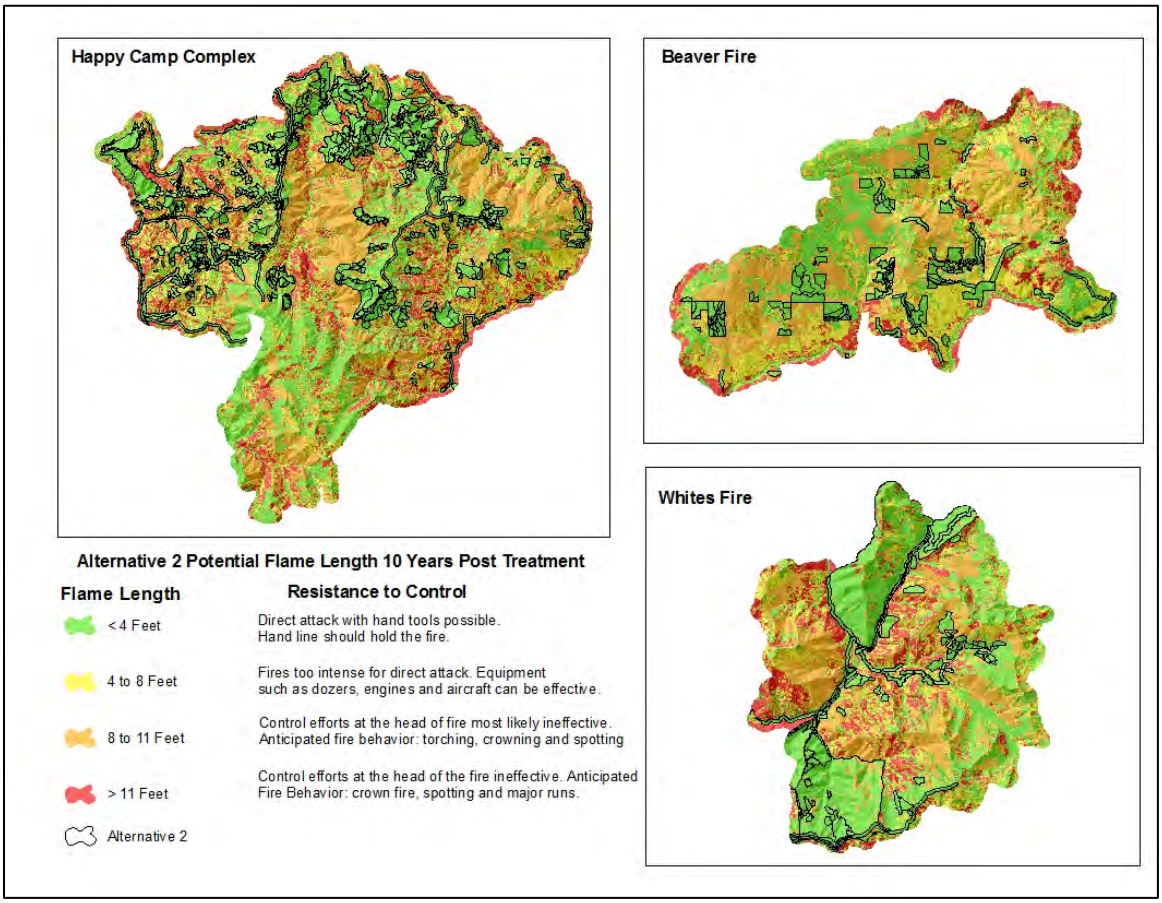

Figure 3-8. Alternative 2 potential flame length 10 years post treatment.

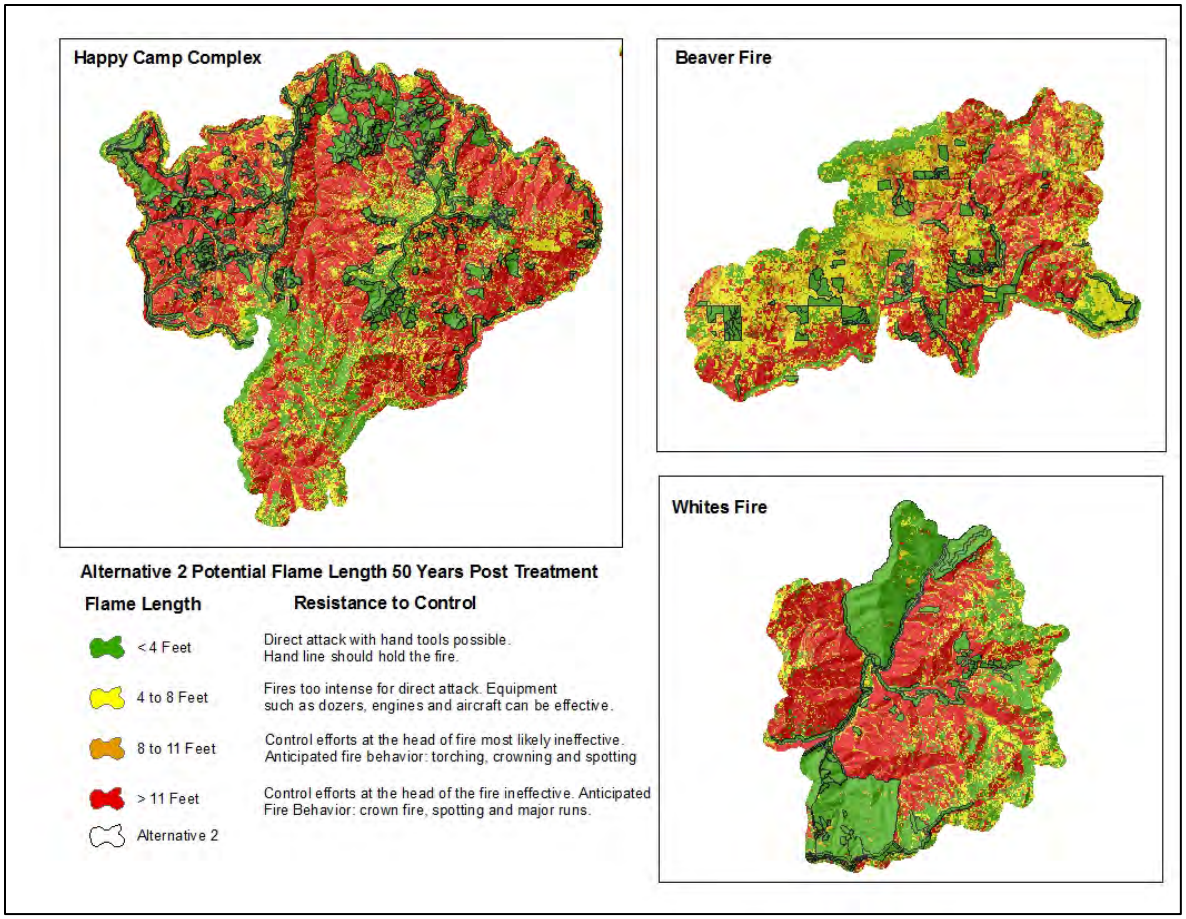

Figure 3-9. Alternative 2 projected flame lengths > 20 years post treatment.

Fire Suppression Capabilities

Under Alternative 2, safer and more efficient fire suppression actions are anticipated as a result of the proposed activities, when compared to Alternative 1. Removal of roadside hazard trees provides for safe ingress and egress to fires. The reduction of snags and subsequent fuel loadings modifies flame length and fireline intensity which enables direct attack and increases fireline production rates, effectively decreasing resistance to control by removing large fuel accumulations. Moreover, a general lack of snags will permit safer nighttime fireline operations.

Project Design Features to clump snags effectively achieves fire suppression capability. Clumped snags will allow firefighting resources to locate control lines around these areas and safely engage a fire with limited need to fall high densities of snags. Snag retention is planned in areas that are rarely used by fire managers to contain a large fire; for example, lower one-third of slopes, away from roads and ridgetops.

The Kyburz Fire provides an example of suppression success within a previous salvaged area. The fire started at the bottom of the slope within the South Fork American River; diurnal winds fanned the fire up-drainage toward the community of Kyburz, (approximately 1 mile from the fire origin) and reburned within the footprint of the Freds Fire (2004). Portions of the Freds fire included post fire logging activity to reduce future fuel loading and snag density. The lack of heavy dead and down fuels allowed for fire suppression resources to continue to construct direct control lines keeping their safety

zone with them as the "black". All things considered, salvage harvest lead to: lower intensity fire, less exposure to hazard trees, and less exposure during mop-up activities. If direct tactics were not available as a result of an increase in snag densities, indirect line would have been required during nighttime operations requiring indirect tactics and increase in fire size. Resources including aircraft, heavy equipment and personnel were safely able to drop water and retardant in open areas and construct line with minimal large woody debris, which increased line production rates, and decreased resistance to control. This allowed for resources to effectively work through the night to complete control lines, keeping the fire from entering the community of Kyburz.

Identified treatments in the WUI modify fire behavior such that fires are anticipated to spread slower, with flame lengths less than four feet, allowing responding resources to take direct action to control fires due to the change in the composition and structure of fuels which promotes low resistance to control when compared to Alternative 1.

Fuel treatments within the WUI promote safer firefighting actions and evacuation of the public should a future large fire occur within the Project area. An indirect effect of eliminating high snag densities and treating surface fuels within the WUI is a reduction in future material being available as a source of embers both as a spotting source and receptive fuel bed, when compared to Alternative 1. Spotting and increased radiation make structures more difficult to defend from crown fire than surface fire (Cohen & Butler, 1996) (Scott & Reinhardt, 2001). Spot fires commonly occur at distances of one-half miles ahead of the main fire; however, observations greater than one mile have been observed during extreme fire behavior events. For example, on two occasions, the Beaver Fire experienced multiple spot fires over one mile ahead of the main fire.

Several case studies have documented the effects of fuels treatments within the WUI. Both the Grass Valley (Rogers, Hann, Martin, Nicolet, & Morgan., 2008) and Angora Fires (Murphy & Sexton, 2007) documented how fuel treatment effectiveness assisted with protection of structures, securing control lines, and reduction of fire behavior resulting in the ability to "pick-up" spot fires with direct actions. More importantly, Cohen and Butler (1996) noted that the degree of structure survival "results from a complex, interactive sequence of events involving the ignition and burning of vegetation and structures accompanied by varying fire protection efforts by homeowners and firefighters." Treatments proposed within Alternative 2 have projected surface fuel loadings to reduce fire behavior and allow for safe and effective fire suppression actions.

The 2012 Goff Fire highlights the benefits of fuel treatments in which the objective is to reduce surface fuel loading and modify fire spread and intensity within the WUI. The Seiad Creek Road Shaded Fuel Break project, completed in 2009, was utilized as a control line for the Goff Fire. Fuels treatment contributed to easier holding and burning along Seiad Creek Road, in the community of Seiad Valley. Both proposed salvage and hazardous fuels treatments planned under Alternative 2 of the Project will produce similar fire behavior. This fire behavior could support fire suppression resources with opportunities to burnout, hold fireline and safely take action on any identified spot fires in the advent of a large fire occurring after completion of the Project.

Fuels treatments identified along strategic ridge and road systems will enhance future fire management activities including fire suppression, managing unplanned ignitions, and implementation of prescribed fire. Maintaining these treatments provides opportunities

for fire managers to focus resources at priority locations (such as in the WUI) as well as provide options to utilize confine and contain strategies of future fires where untreated areas still contain high densities of snags, which inhibit safe work areas for fire suppression resources.

In the advent of a future large fire, strategic ridge and road systems are identified as areas that could be used and maintained by fire suppression resources providing time and opportunity to ignite backfire operations ahead of the main fire. Salvage and Site Preparation units provide an added depth to hazardous fuels treatments by increasing the size and scale. For example, a large fire within an untreated portion of the landscape, spreading uphill toward a treated area, will not immediately decrease to predicted fire behavior. As fire enters the treated area, the fringes of the treatment will likely see increased fire behavior as a result of fire front entering the treatment.

As fire continues through the treated area, fire behavior is altered reducing the spread and intensity of the fire. This type of activity was observed on the King Fire where fire activity outside of the completed fuels treatment consisted of a running crown fire. As the fire entered the treated area, the fringes saw high mortality within the overstory trees and understory vegetation. However, approximately 50 to 100 feet into the unit, the fire transitioned to surface fire and eventually arrested in the fuels treatment. This area was a 50 year old plantation that was thinned in 2010 and burned one year prior to the fire.

By strategically applying and varying post-fire logging treatments within landscapes, post-fire logging could reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects (Peterson, Dodson, & Harrod, 2014). With approximately 98 percent of the post treated units exhibiting flame lengths less than four feet, these locations assist with “buffering” fuels treatments within WUI and identified strategic ridge and road systems. These areas provide locations that can be used as safety zones and anchor points to effectively engage future fires as well as implement prescribed fire activities.

Snag Retention

Within salvage harvest units, Alternative 2 has leave areas where no treatment is proposed within aquatic Riparian Reserves and inner gorges. Large patches of untreated retention areas would not meet the purpose and need and desired condition into the future for the fire and fuels resource. Areas with more contiguous treatment would be more effective at meeting the purpose and need. Snag retention areas within treatment units would affect fuels conditions within the treatment unit to varying degrees, depending on size and placement of the leave area. Generally, larger snag retention areas would make the treatment unit less effective in meeting desired conditions. Retention areas would increase fuel loading adjacent to the treatment units, increase fire hazard, and decrease suppression capability. In general, snag retention areas make implementation of fuels treatments more difficult.

Project Area A: Beaver Fire

There are currently 4,730 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-8 and Figure 3-9.

Project Area B: Happy Camp Complex

There are currently 23,610 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-8 and Figure 3-9.

Project Area C: Whites Fire

There are currently 12,830 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-8 and Figure 3-9.

Cumulative Effects

Project Area A: Beaver Fire

See Alternative 1 under cumulative effects of the Beaver Fire for a discussion of the activities considered for cumulative effects. The McCollins Late Successional Reserve Enhancement project adds 50 acres of fuel load reduction treatment within the fire areas. When added to the 4,730 acres already meeting desired condition there will be 14,680 acres meeting desired condition over the next 20 years.

Project Area B: Happy Camp Complex

The Happy Camp Fire Protection project, Phase II, Lake Mountain Foxtail Pine project, Lovers Canyon project and Thom Seider project overlap in space and time with the Happy Camp Complex area. These projects will reduce fuel loading on about 13,850 acres within the Project area. When added to the 23,610 acres that are currently meeting desired condition there will be 37,460 acres meeting desired condition cumulatively.

Project Area C: Whites Fire

The Eddy Late Successional Reserve project and Sawyers Bar Fuels Reduction project overlap with the Project area. These projects will reduce fuel loading on about 5,000 acres in the fire area. When added to the 12,830 acres that are currently meeting desired condition, there will be a total of 17,830 acres meeting desired condition.

Alternative 3

Direct Effects and Indirect Effects

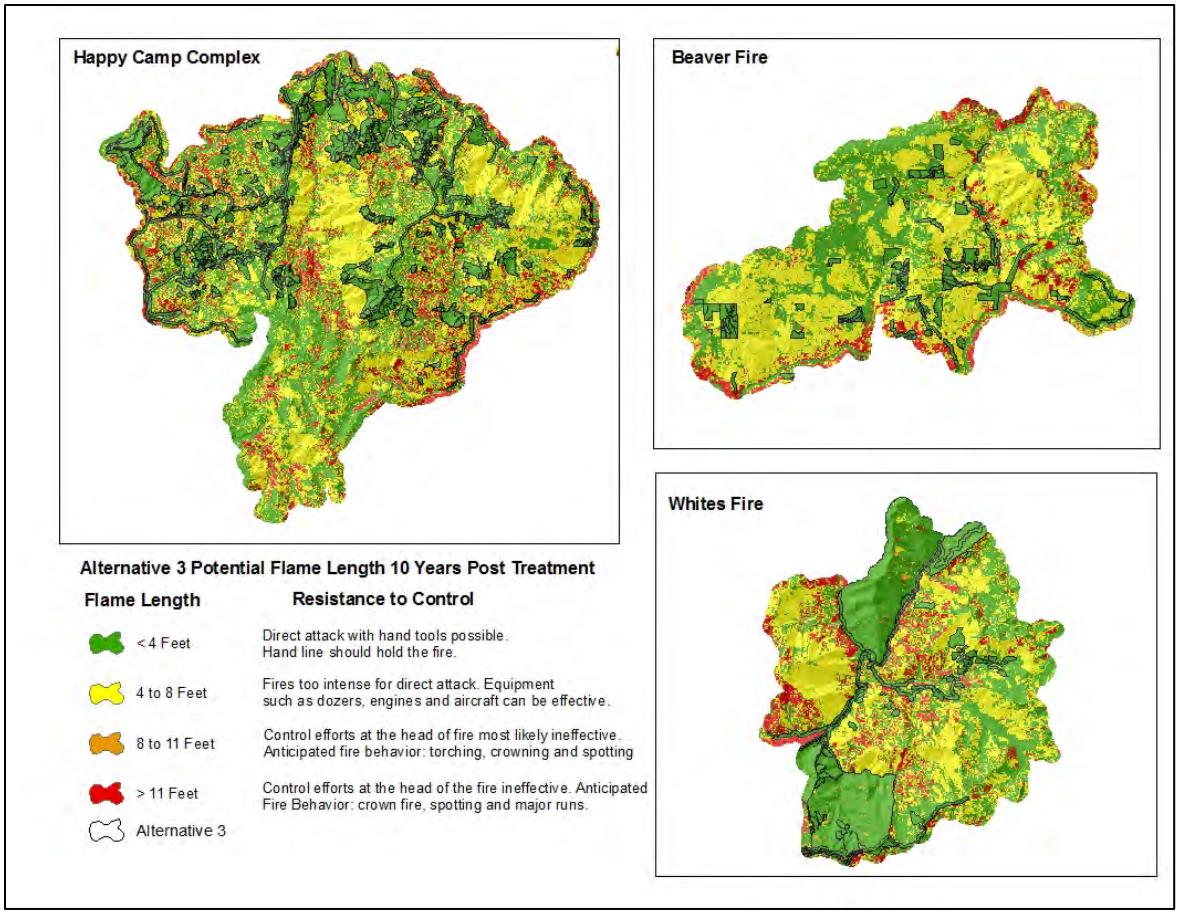

Figure 3-10 . Potential flame length 10 years post treatment, Alternative 3.

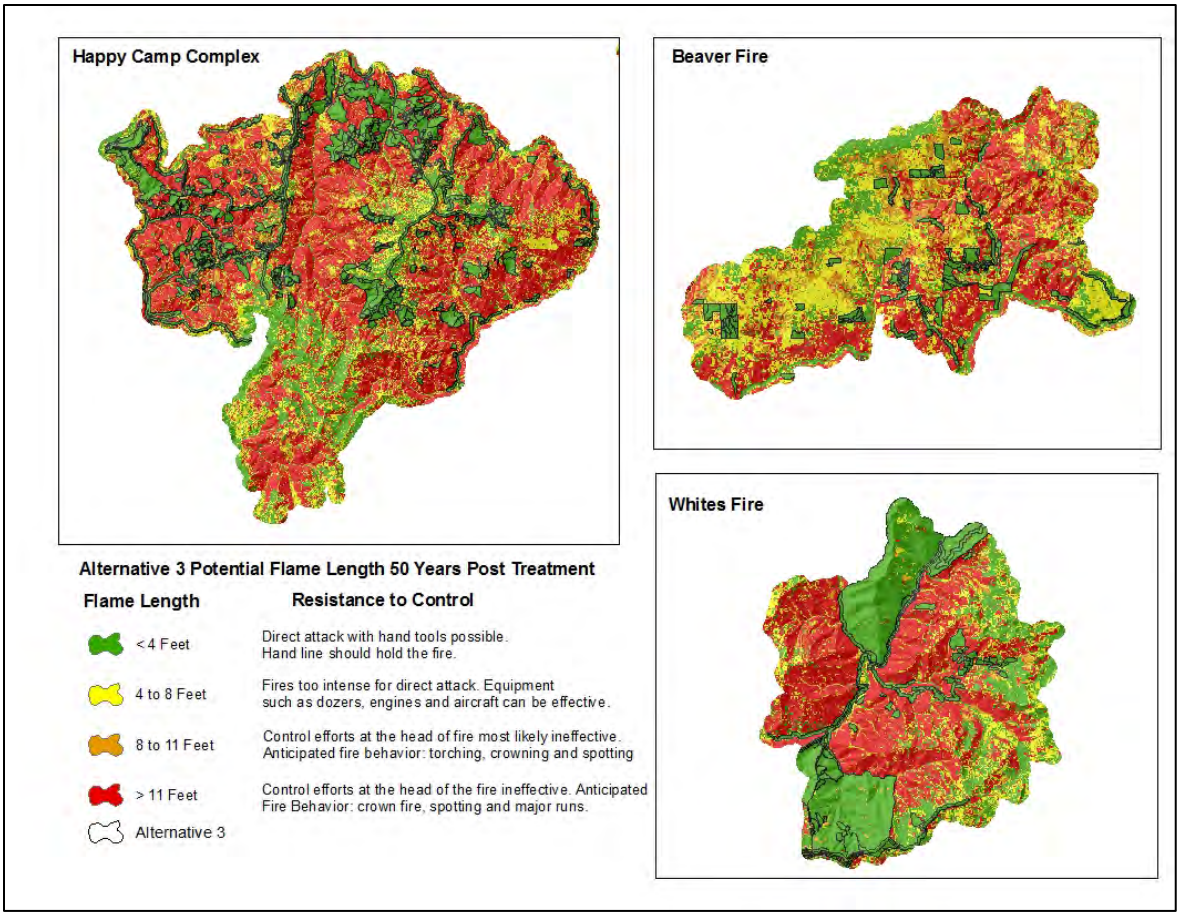

Figure 3-11. Potential flame length (Alternative 3) greater than 20 years post treatment.

Project Area A: Beaver Fire

Alternative 3 removes all salvage harvest activities from the Beaver Fire area. Areas not being treated are anticipated to be similar to those described in Alternative 1. Compared to Alternative 2, fuel loading in these areas would increase through time as snags decay and fall. Suppression capabilities would therefore decrease while fire severity and behavior would likely increase. This would increase meeting desired conditions for the additional fuels treatments proposed. There are currently 3,870 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in **Error! Reference source not found.** and Figure 3-11.

Project Area B: Happy Camp Complex

Alternative 3 has a reduction in fuel treatment area to reduce impacts to other resources compared to Alternative 2. There would be an overall reduction in fuels treatment effectiveness in meeting desired conditions and are primarily in salvage and site preparation units. There are currently 22,580 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in **Error! Reference source not found.** and Figure 3-11.

Project Area C: Whites Fire

The effects are the same as described in Alternative 2. There are currently 12,670 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in **Error! Reference source not found.** and Figure 3-11.

Cumulative Effects

Project Area A: Beaver Fire

Same as Alternative 2. When added to the 3,870 acres already meeting desired condition, there will be 13,820 acres meeting desired condition over the next 20 years.

Project Area B: Happy Camp Complex

Same as Alternative 2. When added to the 22,580 acres that are meeting desired condition currently there will be 36,430 acres meeting desired condition cumulatively.

Project Area C: Whites Fire

Same as Alternative 2. When added to the 12,670 acres that are currently meeting desired condition there will be a total of 17,670 acres meeting desired condition.

Alternative 4

Direct Effects and Indirect Effects

Project Area A: Beaver Fire

Alternative 4 would have the same proposed actions as described in Alternative 2, and therefore, the same effects. With the exception of the removal of salvage and site preparation units in section 32 and 4 of Doggett Creek, direct and indirect effects will be comparable in type and acreage described in Alternative 2. In order to mitigate the effects of dropping salvage and site preparation units in Section 32 and 4, a 200’ fuels treatment strip would be implemented along the west and south borders of Section 32. This would be an overall reduction in fuels treatment effectiveness in meeting desired conditions for this area. There are currently 4,620 acres meeting desired conditions, which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-6 and Figure 3-7.

Project Area B: Happy Camp Complex

Alternative 4 has a reduction in fuel treatment area to reduce impacts to other resources, as compared to Alternative 2. There would be an overall reduction in fuels treatment effectiveness in meeting desired conditions and are primarily in salvage and site preparation units. There are currently 22,320 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-8 and Figure 3-9.

Project Area C: Whites Fire

The effects are the same as described in Alternative 2. There are currently 12,830 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-8 and Figure 3-9.

Cumulative Effects

Project Area A: Beaver Fire

Same as Alternative 2. When added to the 4,620 acres already meeting desired condition there will be 14,570 acres meeting desired condition over the next 20 years.

Project Area B: Happy Camp Complex

Same as Alternative 2. When added to the 22,320 acres that are meeting desired condition currently there will be 36,170 acres meeting desired condition cumulatively.

Project Area C: Whites Fire

Same as Alternative 2. When added to the 12,830 acres that are currently meeting desired condition there will be a total of 17,830 acres meeting desired condition.

Alternative 5

Direct Effects and Indirect Effects

Project Area A: Beaver Fire

Alternative 5 would be similar to Alternative 2 with additional fuels treatments proposed. Additional fuels treatments include fuel breaks and prescribed fire to protect private timberlands. There are currently 5,900 acres meeting desired conditions, which means these acres will have a low fire hazard and a very low resistance to control for about 10 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-12 and Figure 3-13.

Project Area B: Happy Camp Complex

Alternative 5 has a reduced amount of fuels treatment in the Happy Camp Fire area, as compared to Alternative 2. Salvage units and associated fuels treatments removed from Alternative 5 would be expected to significantly reduce opportunities to modify fire spread. There would be an increase in fuel loading, increase if fire severity and a reduction in fire suppression capability. For much of the Happy Camp Fire area, it would be expected to be comparable to Alternative 1effects described for Alternative 1. There are currently 13,300 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-12 and Figure 3-13.

Project Area C: Whites Fire

Alternative 5 removes all site preparation and all but 30 acres of salvage units with associated fuels treatment. Alternative 5 would continue to have hazardous fuels and roadside fuels treatments. The removal of salvage units would decrease firefighter safety and suppression capability in the future. Fuel treatments effectiveness would decrease across the Whites Fire area. Hazardous fuels treatments, primarily prescribed fire, overlap salvage units dropped in this alternative. This would dampen the effect of future fuel

loading and fire severity. However, future fires would likely be more difficult to control and require more time and effort of resources due to the safety exposure to snags and other anticipated fire hazards associated with accumulation of large fuels. There are currently 11,420 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-12 and Figure 3-13.

Cumulative Effects

Project Area A: Beaver Fire

Same as Alternative 2. This is primarily due to the removal or reduction of most of the dead and dying trees on these lands. When added to the 5,900 acres already meeting desired condition there will be 15,850 acres meeting desired condition over the next 10 years.

Project Area B: Happy Camp Complex

Same as Alternative 2. When added to the 13,300 acres that are meeting desired condition currently there will be 27,150 acres meeting desired condition cumulatively.

Project Area C: Whites Fire

Same as Alternative 2. When added to the 11,420 acres that are currently meeting desired condition there will be a total of 16,420 acres meeting desired condition.

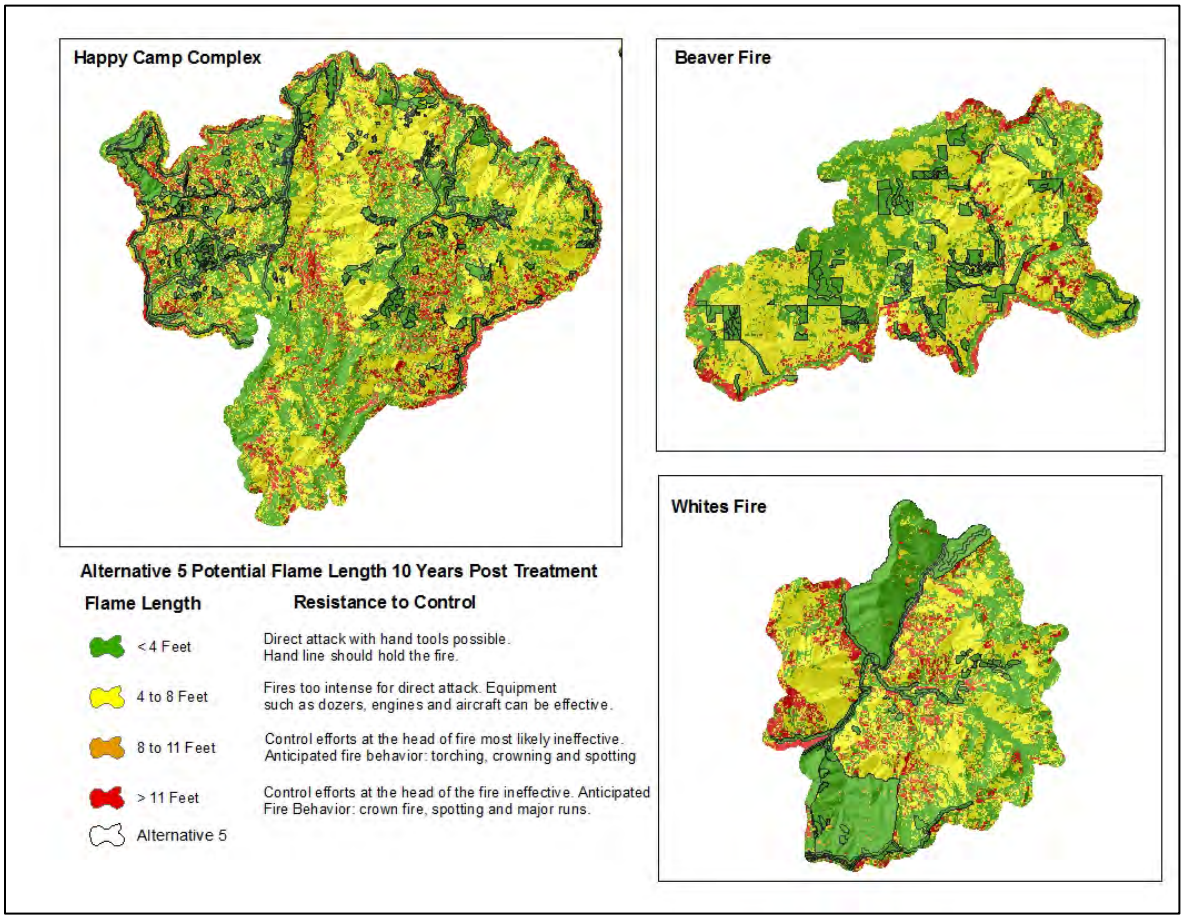

Figure 3-12. Potential flame length 10 years post treatment (Alternative 5).

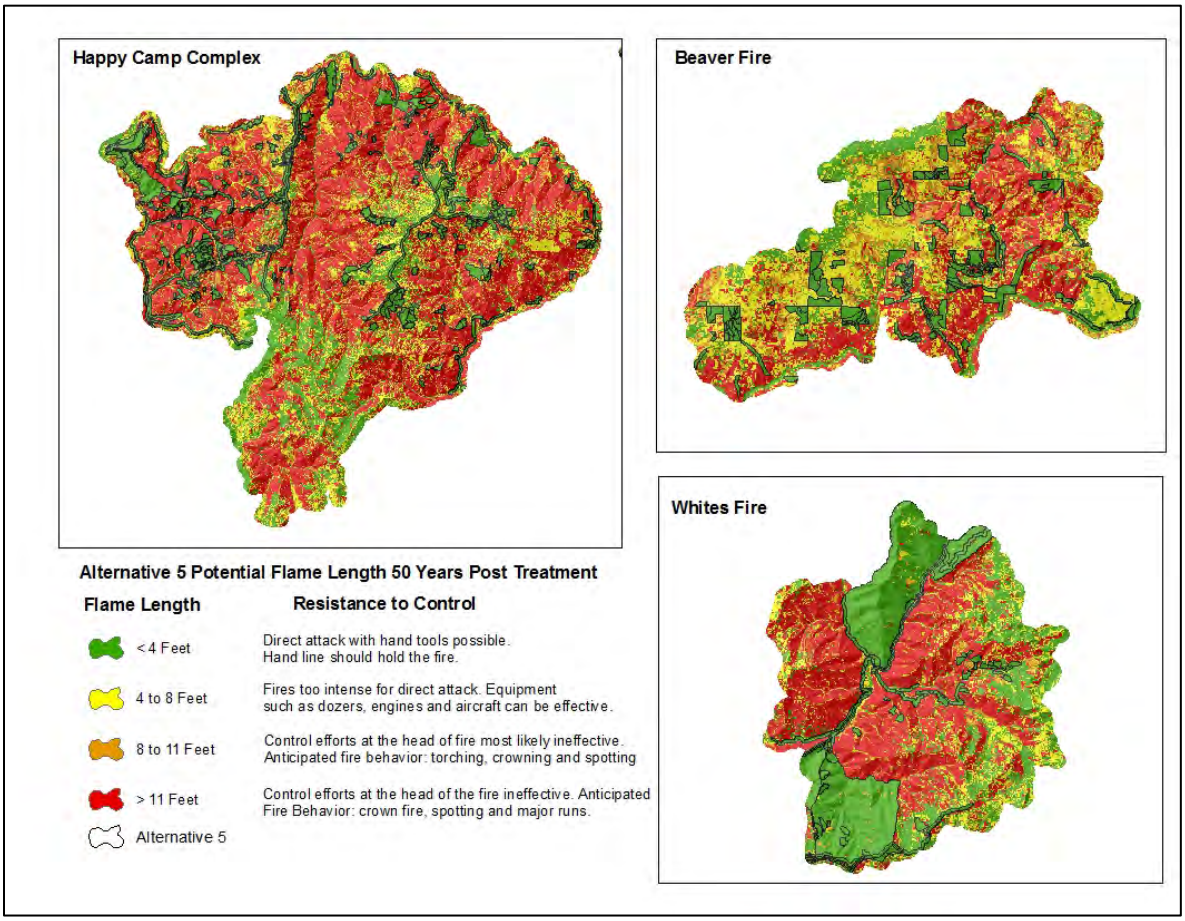

Figure 3-13 Potential flame length (greater than 20 years) Alternative 5.

Alternative 2 Modified

Direct Effects and Indirect Effects

Project Area A: Beaver Fire

The effects are the same as described in Alternative 2. There are currently 4,300 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-8 and Figure 3-9.

Project Area B: Happy Camp Complex

Alternative 2 Modified would have similar effects to those described in Alternative 2 with only a slight reduction in overall treated area. There are currently 22,870 acres meeting desired conditions, which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-8 and Figure 3-9.

Project Area C: Whites Fire

The effects are the same as described in Alternative 2. There are currently 12,720 acres meeting desired conditions which means these acres will have a low fire hazard and a

very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-8 and Figure 3-9.

Cumulative Effects

Project Area A: Beaver Fire

Same as Alternative 2. When added to the 4,300 acres already meeting desired condition there will be 14,250 acres meeting desired condition over the next 20 years.

Project Area B: Happy Camp Complex

Same as Alternative 2. When added to the 22,870 acres that are meeting desired condition currently there will be 36,720 acres meeting desired condition cumulatively.

Project Area C: Whites Fire

Same as Alternative 2. When added to the 12,720 acres that are currently meeting desired condition there will be a total of 17,720 acres meeting desired condition.

Alternative 3 Modified

Direct Effects and Indirect Effects

Project Area A: Beaver Fire

Alternative 3 Modified removes all salvage harvest activities from the Beaver Fire area. Areas not being treated are anticipated to be similar to those described in Alternative 1. Compared to Alternative 2, fuel loading in these areas would increase throughout time as snags decay and fall. Suppression capabilities would therefore decrease while fire severity and behavior would likely increase. Alternative 3 Modified would add additional fuels treatments proposed in Alternative 5. This would increase meeting desired conditions for the additional fuels treatments proposed. There are currently 4,695 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-10 and Figure 3-11.

Project Area B: Happy Camp Complex

Alternative 3 Modified has a reduction in fuel treatment area to reduce impacts to other resources, as compared to Alternative 2. Alternative 3 Modified would add additional retention areas for the Wildlife resource. This increase in retention areas is most pronounced in the Walker and Grider Creek drainages. Fuels treatment effectiveness in meeting desired conditions would be reduced in this area. More strategic areas such as roads and ridgetops would still be effective because leave areas were largely outside of these areas. Also, Alternative 3 Modified adds approximately 695 acres proposed in the Karuk Alternative to fuels treatment in the Happy Camp Fire area. This would increase the total area meeting desired conditions. Overall purpose and need, including forest resiliency, would be reduced from these actions for the Fire and Fuels resource.

There are currently 20,870 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented in Figure 3-10 and Figure 3-11.

Project Area C: Whites Fire

Alternative 3 Modified reduces the acres of salvage and site preparation compared to Alternative 2. The majorities of these units were small acreage and isolated in nature. Therefore, similar effects would still be anticipated to those described in Alternative 2. The stand scale of units no longer being treated would not meet the desired condition. Alternative 3 Modified proposes additional hazardous fuels treatment proposed by the Karuk Alternative. Approximately 55 acres of treatment in the Rainbow Mine area would occur. This would improve meeting desired conditions for this small area and provide benefit to the adjacent private land. Overall, treatment effectiveness on the White Fire project area would be similar to Alternative 2.

There are currently 12,645 acres meeting desired conditions which means these acres will have a low fire hazard and a very low resistance to control for about 20 years post fire. The pattern of acres meeting desired condition across the landscape is represented Figure 3-10 and Figure 3-11.

Cumulative Effects

Project Area A: Beaver Fire

Same as Alternative 2. When added to the 4,695 acres already meeting desired condition there will be 14,465 acres meeting desired condition over the next 20 years.

Project Area B: Happy Camp Complex

Same as Alternative 2. When added to the 20,870 acres that are meeting desired condition currently there will be 34,720 acres meeting desired condition cumulatively.

Project Area C: Whites Fire

Same as Alternative 2. When added to the 12,645 acres that are currently meeting desired condition there will be a total of 17,645 acres meeting desired condition.

Compliance with law, regulation, policy, and the Forest Plan

All alternatives comply with law, regulation, policy and the Forest Plan pertinent to fire and fuels as displayed in the Forest Plan consistency checklist.

Terrestrial Wildlife

The Project is analyzed for its potential effects on wildlife species listed as Endangered, Threatened, or Proposed under the Endangered Species Act; designated critical habitat; Forest Service Region 5 Sensitive Species; Survey and Manage Species (under current consideration), Management Indicator Species, and Migratory Birds (MOU 2008). This section synthesizes the information and analysis of effects on Threatened, Endangered, Forest Sensitive Species, and Management Indicator Species, and compliance with requirements for Survey and Manage Species, and Migratory Birds. Relevant scientific literature is discussed in context throughout this section.

Methodology

The analyses are based on the best[34] scientific and commercial data available at the time this document was written. Information such as data collected from Forest databases, remote sensing vegetation analysis, the Forest existing vegetation (EVEG), direct field assessments, California Natural Diversity Database, and the most recent and appropriate scientific research and species information, was all used for the consideration of direct, indirect and cumulative effects.

Threatened, Endangered, Proposed and Candidate species in the Project area are identified using the U.S. Fish and Wildlife Service list of Threatened, Endangered, Proposed or Candidate Species (Document #490143515-161248 retrieved on February 11, 2015). The Forest Service (Pacific Southwest Region (Region 5)) Sensitive Species list (revised July 3, 2013) identifies the species to consider for this analysis. Survey and Manage Species are identified in Record of Decision (2001) as adjusted in 2014 and interpreted by Forest Service, Region 5 guidance (2014). Using these three lists, a determination is made of whether the species range overlaps the Project area and whether habitat is likely to exist in the Project area. If both are true, then the species is analyzed for the Project.

Special Habitat

Peregrine falcons were delisted under ESA in 1999 because the peregrine falcon is considered to be recovered by the USDI Fish and Wildlife Service. The falcon is not included in the Forest Service Sensitive Species or Management Indicator Species lists. However, the Forest Plan includes a provision for the Special Habitat Management Area around peregrine falcon eyries for the recovery of the species by managing for high quality habitat; the Forest Plan has not been amended to remove this provision so the provision will be followed.

The Project proposes fuels reduction treatment that occurs within the Special Habitat area. The treatment will reduce the risk of high severity fire and consequently maintain the existing habitat. Therefore, the proposed treatment is consistent with the management of this area and will not be analyzed further for this Project.

Bald eagles were also delisted under ESA but the eagle is included in the Forest Service Sensitive Species list. Forest Plan provisions for the Special Habitat Management Area around bald eagle nests will be followed. Effects of the project on bald eagles are disclosed under discussions of Forest Service Sensitive Species.

Northern Spotted Owl

Rapid Assessment of Vegetation Condition (RAVG) after wildfire and habitat data

For the post-fire assessment of habitat, we used Rapid Assessment of Vegetation Condition after wildfire (RAVG) data to estimate the level of fire effects to owl habitat. RAVG is a vegetation burn severity modeling approach to assess the change in vegetation condition. The RAVG data show the tree basal area loss due to fire throughout the burned area. Therefore, in any given spot in the fire perimeter, we can estimate the

[34] Best available science is defined as scientific literature that is relevant to the project and available to the reader and decision maker.

fire effects to the vegetation using the RAVG level of basal area loss. For this analysis the RAVG data were split into five classes. We interpreted these five classes into RAVG Class 0 (no burn--zero percent basal area loss), RAVG Class 1 (very low--greater than 0-25 percent loss), RAVG Class 2 (low--25-50 percent loss), RAVG Class 3 (moderate--50-75 percent loss), and RAVG Class 4 (high--75-100 percent loss) to represent the fire severity.

Using the RAVG data and the habitat GIS data, we can identify each area of habitat with a specific level of basal area loss using RAVG. Then we compared the GIS habitat layer and RAVG accuracy through multiple field visits performed in 2014 and 2015. The field reviews resulted in determining these data were sufficient for estimating the potential effects of the Project.

Habitat description

Northern Spotted Owl (NSO) habitat is commonly separated into nesting/roosting (NR), foraging (F), and dispersal (D) habitat, and these habitat types are described in detail in the NSO Recovery Plan (USDI USFWS 2011). Nesting/roosting is generally described as mid- to late-seral forests that contain stands of large trees with high canopy cover (greater than or equal to 60 percent), multilayered canopies, and nesting platforms. Foraging habitat can be described as slightly reduced canopy cover, fewer large trees, but still enough space in the understory for NSO to maneuver through the trees for hunting prey. Dispersal habitat contains a moderate level of canopy closure and trees large enough to provide shelter and potential foraging opportunities for traveling NSO. For this analysis, suitable habitat is defined as NR and F habitat.

Multiple aspects of suitable habitat are required for habitat to be considered suitable or high quality habitat such as the presence of defect and decay in the stand, large downed logs and snags, and the presence of water in appropriate distance and juxtaposition to stands that contain these attributes (USDI USFWS 2011). These habitat elements cannot be queried from the EVEG data; for specific areas of the Project, these elements were assessed through field evaluation, National Agriculture Imagery Program imagery, and discussions with field personnel familiar with vegetative conditions in the Project area. Given this level of uncertainty of the accuracy of suitable habitat designation in the GIS layer, the actual quantity of suitable habitat may be somewhat overestimated. Due to the scope and scale of this Project, it was not practicable to field validate the remotely sensed habitat data (EVEG) for all areas affected by all Project activities. However, the portion that was field evaluated resulted in a reasonably accurate assessment of the habitat layer depicting NRF habitat even though there was some error in accurately splitting NR and F over the entire analysis area. Even though NR and F are sometimes presented separately in this analysis, most of the analysis combines NR and F to reduce this potential error.

Suitable habitat that burned at very low or low fire severity typically retains the important habitat attributes associated with the NR, and F habitat function. However, NR and F habitats that burned at moderate and high fire severity typically experience a large change in vegetation structure which is evident by having the tree canopy cover reduced typically well below 40 percent and most, if not all, the understory consumed by the fire. Suitable habitats that burned at moderate and high fire severity are discussed in the literature as areas used by spotted owls for foraging (e.g. Bond et al. 2002, Clark 2007, and Bond et al. 2009). Even though the research has described spotted owl use of burned forest, there

is still a lack of certainty and agreement on this topic. For purposes of this analysis, suitable habitat that experienced moderate and high fire severity were described in categories called post-fire foraging (PFF) and fire-affected nesting/roosting (FANR).

These categories (PFF and FANR) of habitat were delineated to capture the potential for continued use by NSO of previously suitable NR and F, at least in the short term until the ultimate deterioration of the burned habitat and loss of standing trees. Even with the loss of canopy cover and key habitat components typically found in NR and F habitat, studies indicate that burned areas can still provide foraging opportunity after the fire, depending on many factors including patch size, edge type, burn severity, and proximity to known owl sites (Bond et al. 2002, Bond et al. 2009, Clark 2007, Clark et al. 2011, and Clark et al. 2013).

Although NSO use of PFF is well documented, there is still some uncertainty on how PFF contributes to reproduction. However, assuming that foraging habitat is important for providing a food supply necessary for NSO survival and reproduction, and PFF, although physically different from F habitat, may provide foraging opportunity, tracking PFF and analyzing the effects from post-fire salvage provides useful information. The foraging opportunity provided by PFF may be particularly important for active sites in core areas that have been affected by fire (Lee and Bond 2015b). The core area contains the concentrated owl use during nesting and this area likely provides all or almost all the resources for nesting.

The EVEG habitat layer provided the baseline of suitable NR and F prior to the 2014 fires. Post-fire foraging habitat was then determined by overlaying the correctly categorized RAVG data to the pre-fire NR and F. PFF was delineated where moderate fire severity or high fire severity occurred in pre-fire foraging habitat or where high fire severity occurred in pre-fire nesting/roosting habitat.

A large proportion of PFF is NR and F habitat that burned at the highest severity and, therefore, contains minimal amounts of structure or cover. Because of this, it was assumed that NSO are not likely to use PFF when it occurs too far away from existing cover (estimated to be more than 500 feet). This distance was derived from a review of recent literature on the use of edge habitat (Comfort 2013, Eyes 2014) and professional judgment. For this analysis, PFF1 is PFF that is within 500 feet of suitable habitat patches greater than or equal to five acres in size. PFF2 is the PFF that doesn’t meet the definition of PFF1.

FANR was delineated for this analysis as NR habitat that burned at moderate severity because NR habitat that has been affected at this level is not expected to function in the same way as NR habitat that has been affected by low severity fire. Because stands of habitat that burn at moderate severity can result in 50 to 75 percent of the basal area loss, fire severity can result in a wide variety of stand conditions post-fire. If a stand was typed as nesting/roosting prior to the fire, it was comprised of high canopy closure and larger trees, among other variables. Therefore, if a fire burned at the low end of moderate severity (grid code 3, closer to 50 percent loss of basal area), then the stand may retain more canopy cover and less tree mortality than a stand that received moderate fire severity at the higher end of moderate fire severity (grid code 3, closer to 75 percent basal area loss). Stands that burned at the higher end of moderate fire severity have more of the appearance of a high-severity burn and lack the characteristics necessary for cover and/or

thermoregulation to be used as nesting/roosting or foraging habitat. Fire-affected nesting/roosting is a small portion of the total acres of NRF, PFF and FANR because FANR typically occurs on the fringes of high severity burn patches, in the transition zone between high and low burn severities of pre-fire NR habitat.

In this analysis, NR habitat that burned at moderate severity is categorized separately so that fire effects specific to these areas of habitat can be accounted for in the analysis and the role that this habitat type plays in NSO use of the post-fire landscape can be captured.

FANR is considered in this analysis as possibly providing foraging opportunity rather than as NR habitat because FANR no longer contains adequate cover and structure for nesting but it can contain enough prey habitat and perch structure to allow for effective foraging. When compared to PFF, FANR will generally have larger trees/snags on average that can provide more physical structure that is likely to persist, standing for a longer period of time (assuming similar site conditions and disturbance). However, trees/snags in FANR will likely succumb to the eventual effects from the fire as many, but generally not all, of the trees in a stand that have burned at moderate severity will die and many of these will fall, possibly as soon as three to five years of this analysis. In general, some of the fire-damaged trees will have needles and leaves and these trees may provide some cover for foraging NSO.

Analysis Indicators, Spatial and Temporal Context by Status of Species

Threatened and Endangered Species

Northern Spotted Owl

Relevant Scientific Literature

Use of Fire-Affected Habitat

Research on all three spotted owl subspecies (northern, California, and Mexican) indicates uncertainty and disagreement on the extent to which spotted owls use burned forests (Jenness 2000, Bond et al. 2009, Clark et al. 2013, Lee and Bond 2015a). Spotted owls are one of the most studied bird species and the general agreement in the research is the importance of large-diameter, closed canopy forests for nesting, roosting, and successful reproduction. The loss of this habitat to high-severity fire is one of the primary threats to spotted owls (NSO Recovery Plan 2011). However, the extent to which spotted owls use this high severity fire-affected habitat still remains unclear.

Areas burned with high- and moderate-burn severity are typically no longer considered suitable habitat for nesting, roosting or long term occupation by spotted owls because these areas no longer supply the habitat attributes needed for thermal protection, nesting structure and cover from predators necessary for long-term viability. While these stands do not contain all the attributes that typically define NSO habitat, high severity burned areas are known to be used by NSO to a limited extent possibly for foraging; . Observations indicate that under certain circumstances NSO use the edges along less severely burned areas (likely existing habitat) and avoid large, contiguous patches of high severity burn (Clark 2007, Comfort 2014).

Although spotted owls may use former nesting, roosting, and foraging habitat burned with high and moderate severity located within their home range for foraging, the overall importance of these areas to NSO's survival and reproduction is still relatively unknown.

Results from radio-telemetry studies of spotted owls in post-fire landscapes indicate that spotted owls will use forest stands that have been burned, but many other factors dictate the extent and degree to which this will occur. such as the relative position to existing habitat and the contrast of edge between moderate to high severity burned areas and areas that burned with low severity or are unburned (Bond et al. 2002, Bond et al. 2009, Lee et al. 2013, Comfort 2014, Eyes 2014). Many studies indicate that NSO are potentially capitalizing on the increased prey abundance that may have resulted from the fire effects on habitat (Bond et al. 2009, Roberts et al. 2011, and Clark et al. 2013). Even though areas with little cover, like PFF and FANR, appear to possibly increase the risk of NSO being predated, foraging along the edges of suitable habitat may provide a balance between consuming the potential abundance of prey and being close to escape cover where an NSO could avoid being predated.

In the Klamath region, NSO have been found foraging within more open stands not recently affected by fire, but these areas contain brush or a low basal area of conifer trees. The presence of a few scattered trees or snags may facilitate hunting for prey such as woodrats. For one study, a particular telemetered pair made extensive use of a burned area with manzanita shrubs and scattered live trees (Irwin et al. 2012). This would indicate that, at least under certain circumstances, NSO will venture into more open habitats such as areas burned at high and moderate severity when vertical structure is present to offer perching or a certain degree of cover, although the exact level of cover that is needed to meet spotted owl needs is unknown. However, NSO use of a particular area is likely more complex than simply the amount of cover.

Site Occupancy

The amount of high severity fire within the core and home range may be an important component for estimating the likelihood that an owl may occupy a particular area. In a burned landscape, NSO generally select nesting areas with low to moderate severity fire effects (Clark 2007, Bond et al. 2009, and Clark et al. 2011) but, given the choice, NSO may select unburned areas for nesting or foraging (Clark 2007). Clark et al. (2013) found about 64 percent reduction in NSO occupancy following a fire as compared to the unburned portion of the study site that experienced about 25 percent reduction in occupancy during the same time period; however, post-fire land management likely influenced occupancy in the burned portion of the study area. Although limited by a small sample size, Gaines et al. (1997) found a similar pattern of spotted owl site occupancy as did Clark et al. (2013); both studies found that sites that were largely unaffected by fire in the core were more likely to be occupied than sites that were extensively burned. Conversely, Lee and Bond (2015a) found that NSO occupancy was largely unaffected by burn severity.

The use of fire-affected core and home range may be related to site fidelity despite possible negative tradeoffs (e.g. lower survival). Bond et al. (2002) found that a large portion of the monitored spotted owls returned to their pre-fire nest site the year following a fire, despite varying fire severities. The strength of site fidelity is shown by findings in southern California forests that spotted owls had an increased likelihood of site abandonment when most of the core area (124 acres of their 200-acre core areas) burned at high severity and not when less acreage burned at high severity; high severity fire affected about 62 percent of the core use area (Lee et al. 2013). Lee et al. (2012) also found strong site fidelity despite an average of 32 percent of the suitable habitat burned at

high severity in the core. Strong site fidelity was also apparent for the California spotted owls monitored after the Rim fire; spotted owls showed only a slightly negative response to the increased proportion of high severity fire within the protected activity center. The authors conclude that high severity fire doesn't affect spotted owl occupancy (Lee and Bond 2015). Lee and Bond (2015b) attempt to qualitatively correlate occupancy with survival and reproduction, but occupancy of a previously used site may be a result of strong site fidelity despite the habitat quality of the site. A measure of reproduction success or survival would provide a much better understanding of relating spotted owl use of fire-affected areas and possible tradeoffs.

NSO with strong site fidelity that experience moderate to high fire severity in the core and home range may encounter additional challenges. Clark (2007) generally found that severe wildfires in NSO home ranges caused owls to increase the size of their home range to encompass more suitable habitat. He also found that spotted owls with territories located immediately adjacent to moderate- and high-severity burned areas, avoided these areas; less than five percent of their locations fall within the boundaries of the fire. Owls that ventured into the burned areas were typically individuals that were displaced by fire and periodically visited their old territory. According to Clark's study, when given the opportunity, owls focused their activities in unburned habitat. In his study, several owls with territories inside the fire frequently traveled long distances to forage in unburned habitat, supporting his prediction that owls would focus activities in the oldest forest stands with the least amount of fire damage (Clark 2007).

The amount, quality, and distribution of post-fire habitat in the core and home range may influence NSO use areas and possibly nesting success. The amount of forest habitat with high (greater than or equal to 60 percent) canopy cover dominated by medium- and large-sized trees is an important predictor of survival and reproduction (Franklin et al. 2000, Dugger et al. 2005, Temple et al. 2014). The amount of habitat affected by high severity fire in the nest stand or within frequently visited foraging areas likely has a greater negative effect than does high severity fire in other areas in the home range (Jenness et al. 2004, Dugger et al. 2005). Although typically short term (one to two growing periods), low severity fire can also affect suitable habitat by removing smaller trees and/or brush that are important habitat components for prey species but low severity fire is not likely to remove all prey habitat structure. Roberts et al. (2011) found that low and moderate severity fires don't affect occupancy, especially when the area contains abundant large trees and high canopy cover.

The proportion and arrangement of unburned or low-severity burned suitable habitat in relationship to moderate- or high-severity burned areas within an NSO home range is important in determining the likelihood of NSO use of these areas. This relationship is important because NSOs will likely focus their use of burned areas for foraging in areas with adjacent cover. The distance to cover is likely a key factor influencing use of burned areas. Because habitat selection by NSOs is strongly influenced by abiotic features such as distance to water, proximity to nest, slope position and elevation, it is possible that use of the burned habitats by NSO as described by Clark et al. (2013) or Bond et al. (2009) may occur due to the juxtaposition of the burned areas to some other feature, such as a nest site or water, rather than based on the "suitability" of the area, particularly if the owls were accustomed to using the area prior to the fire. Factors involved in the NSO's periodic selection of burned areas for foraging are not known at this time; further

research is needed to account for the many other aspects of a burned landscape that may influence the NSO selection process.

Land management

Owl use of burned areas is well documented but links between owl use, fire severity, and level of salvage are not clear. Researchers are typically unable to separate effects of pre-fire timber harvest, wildfire, and post-fire salvage harvest (Bond et al. 2002, Clark et al. 2011, Roberts et al. 2011, Lee et al. 2012, Clark et al. 2013, Temple et al. 2014);). Consequently, study results are highly variable, depending on methods, burn severities, proximity of NSO to fire and spatial arrangement. Research of NSO use of burned areas has also been confounded by small sample sizes. In addition, general terms used in the literature including "fire severity" and "salvage logging" make comparison to specific conditions found within the Project area difficult. Most references to "salvage logging" in the literature refer to clear-cut logging, and do not factor in design features such as leave tree groups, legacy tree retention, treatment in relationship to core area, or even the use of limited operating periods.

Clark et al. (2013) examined the potential effects on nesting territory occupancy in areas that recently experienced fire and suggested that past timber harvest, high severity fire, and salvage within the core nesting area best explained a decrease in NSO occupancy; however, high severity fire effects to occupancy were confounded with past timber harvest and salvage logging suggesting that NSO occupancy may not persist in burned landscapes. This is not surprising given the fact that timber harvest and high severity fire commonly remove habitat attributes associated with NSO habitat; this removal leads to a reduction in habitat quality or habitat loss. Salvage logging in the Clark et al. (2013) study area used clearcutting where all the trees were harvested within an area and no areas left untreated (untreated areas are often called retention areas). Retention areas in salvage treatments can provide structure needed by NSO (Clark 2007). Clark (2007) examined NSO use of burned areas and found 60 percent of owl locations within salvaged areas were in retention areas (clumps or along riparian areas) within the unit, suggesting that owls may use salvage areas with remnant structures.

In southern California, Lee et al. (2013) found no statistically significant effects of fire or salvage logging on spotted owl occupancy. However, the authors claim that the weak statistical relationship may be biologically meaningful. They describe an inverse relationship between the amount of high severity burn in the core and occupancy but indicate this effect could be exacerbated by salvage logging (i.e. clearcutting). Salvage logging effects alone could not be separated from the fire effects; the spatial configuration of the salvage was not provided for a qualitative assessment. The authors, however, described the 203 hectare cores on average containing 106 hectares of habitat where 24 hectares burned at high severity and 63 hectares were salvaged logged. Lee et al. (2013) did not provide any information on the prescription of the salvage in the study except the salvage was visible using satellite or aerial imagery thus implying that the treatment removed many to all trees within a particular area.

Another study used an observation approach to estimate NSO use of fire-affected forest within the home range; however, without a measure of fitness, the results are inconclusive or correlative (Bond et. al 2009). Bond et al. (2009) studied four spotted owl territories (4 males and 3 female) within a wildfire perimeter about four years after the

fire; they found the owls foraged in all burn severities, with a preference for high-severity burned areas. Although this study has been widely used to demonstrate the importance of high-severity burned forests for NSO, the study is limited by the small sample size, brief study period (12 weeks), and non-random owl selection. The authors provide a snapshot of information without any link to potential effects to survival or reproduction.

Overall, research is inconclusive and contradictory regarding spotted owl use of severely burned coniferous forests (Elliot 1985, Gaines 1997, Bond et al. 2002, Bond et al. 2009, Clark 2007, Clark et al. 2012, Comfort 2013, Eyes 2014). Some studies have shown spotted owls to exhibit site fidelity and occupancy of sites is not likely to be affected by fires even if a large portion of a territory is burned at high severity (Bond et al. 2002, Lee et al. 2012, Lee and Bond 2015) while others studies have shown owls to move completely away from previously occupied areas after high-severity burns (Elliot 1985, Gaines 1997) particularly when burns occurred within core areas of resident birds. Bond et al. (2010) reported 30 percent of California spotted owls' nonbreeding-season roost locations were within the fire's perimeter. In another study, radio-telemetry locations demonstrated that the owls selected low-severity burned forests for roosting during the breeding season, and selected low, medium, and high-severity burned forests for foraging within 1.5 km of the nest or roost site, with the strongest selection for high-severity burned forest (Bond et al. 2009). Despite these contradictory findings, the research does provide some agreed-upon principles for spotted owl use of fire affected landscapes:

Spotted owls appear to display strong site fidelity by returning to their activity centers after a fire, even if the activity center is completely burned and may not contain areas that meet the definition of suitable habitat.

Spotted owls appear to use high-severity fire affected areas for possibly roosting or foraging, although nesting in these areas is not likely to occur.

Spotted owls using burned areas may use standing snags and surviving green trees as perch sites for foraging, particularly along edges where sufficient cover is available.

Spotted owl use of burned areas appear to be influenced by the distance from suitable forest cover (use of burned habitat decreases with increased distance from suitable habitat), but a maximum distance an owl might travel from suitable habitat is unknown.

Pre-fire nesting/roosting and foraging habitat that burned at moderate and high fire severity appears to provide foraging opportunity for spotted owls but the level of effect on spotted owl survival and reproduction is unclear.

The amount, quality, and distribution of suitable habitat remaining in the core and home range after a fire appear to influence occupancy.

Salvage harvest of pre-fire nesting/roosting and foraging habitat that burned at moderate and high fire severity likely contributes to the reduction in spotted owl occupancy, but the effects may be more pronounced when salvage occurs in the core.

Analysis Indicator: Risk to Reproduction

Recent research has concluded that spotted owls use habitat that burned at moderate and high fire severity likely for the purpose of foraging, but the potential value of these fire affected areas in comparison to suitable habitat is not clear. Suitable habitat has been well described in the literature and the relationship between the habitat quality and quantity of

suitable habitat in the core and home range with successful reproduction has also been described. Foraging habitat provides habitat for prey species while providing cover, among other benefits, for spotted owls. Suitable habitat that experienced moderate and high severity fire has an apparent physical difference compared to unburned suitable habitat. Consequently, this burned habitat doesn't meet the definition of nesting, roosting, or foraging habitat which is evident by less than 40 percent tree canopy cover, little or no stand complexity, and the lack of coarse woody debris and understory vegetation that provides prey habitat (immediately after the fire). However, vegetation that composes prey habitat can regenerate quickly and, for particular prey species (i.e. deer mouse), abundance can increase rapidly.

Despite this potential reward (abundant prey) to spotted owl use of moderate and high severity fire affected suitable habitat, the cost or benefit to spotted owls may be evident in terms of survival and reproduction. A recent study looked at occupancy and reproduction of California spotted owls which identified a negative correlation between occupancy and fire and post-fire logging (Lee and Bond 2015b). For core areas affected by high severity fire, occupancy and reproduction was greater for sites with reproductive spotted owl prior to the fire than sites that were occupied by non-reproductive owls or unoccupied. In addition, post-fire logging in the core areas resulted in a lower probability of occupancy in sites with previously non-reproductive owls or unoccupied versus sites with previously reproductive owls. This study identifies the importance of previously reproductive[35] sites and the potential effects of high severity fire and post-fire logging may have on occupancy and reproduction.

Even though Lee and Bond (2015b) demonstrate the importance of minimizing disturbance in the core areas of reproductively active sites, the study didn't clearly link the pre-fire habitat condition, post-fire habitat condition, and reproduction. The authors acknowledge the inaccuracies of their vegetation data and consequently, the analysis wasn't able to fully explore the relationship between reproductive success and habitat quality, quantity, and distribution. A large body of research describes the amount of nesting, roosting, and foraging habitat that occurs in the core and home range of reproductively successful nests which provides a level of measure in concert with the abiotic variables to estimate the potential level of effects given a particular treatment. Despite the fact that suitable habitat burned at high fire severity doesn't resemble suitable habitat, it is being described in the literature as "potentially suitable" habitat (Lee and Bond 2015a).

Given the uncertainty and sometime conflicting interpretation of spotted owl use of fire-affected habitat, we have attempted to incorporate this information into our analysis by clearly separating suitable habitat from habitat that was burned at moderate and high severity to track and account for changes in this fire-affected habitat.

Fire affect habitat is described in terms of fire-affected nesting/roosting (FANR), post-fire foraging 1 (PFF1) and post-fire foraging 2 (PFF2) (see methods for detailed description). The literature provides several examples of spotted owl detections within moderate and high severity fire-affected habitat but the information is limited on

[35] Reproduction occurred during the reproductive period prior to the fire. Sites may have been active years prior to the fire, but the site may not have been active during the reproductive period prior to the fire.

determining the role that fire-affected habitat may play in spotted owl reproduction. Several authors have assumed that owls are foraging in these fire-affected areas based on the possible increase in prey abundance; however, this potential foraging opportunity may or may not offset the loss of suitable habitat. Therefore, comparison between suitable habitat and fire-affected (FANR and PFF) habitat is difficult given the large amount of uncertainty in the cost or benefits of NSO using FANR and PFF in terms of NSO survival and reproduction. However, the analysis presented in this document attempts to incorporate the possibility that this fire-affected habitat may provide foraging opportunity but at a lower quality than foraging habitat.

Therefore, the analysis indicator called "Risk to Reproduction" is split into four categories representing the relative levels of effects resulting from each alternative. Using the existing quality and amount of habitat within each core and home range (activity center), the acres of suitable habitat (nesting/roosting and foraging habitat) and FANR and PFF are calculated as the existing condition for each activity center. Since the literature doesn't provide a clear linkage between suitable habitat, fire affected habitat, and spotted owl reproduction, we used recommended habitat minimums of suitable habitat (USDI FWS 2009) as a starting point and used professional judgment to estimate the possible spotted owl use of moderate- and high-severity fire-affected habitat. Obviously, any deviation in this estimate will affect the assignment of a particular activity center (AC); however, this analysis indicator is providing a relative measure and not an absolute. The risk to reproduction category is assigned to each activity center depending on the amount of habitat, PFF, and FANR in the core and home range.

Table 3-14: Criteria for each category in the analysis indicator "risk to reproduction"

Risk to Reproduction	Criteria
Very Low	In the core, >400 acres of NRF, FANR, and PFF1 (≥250 NR must occur in the core), AND In the home range, >935 acres of NRF, FANR, and PFF1
Low	In the core, >250 acres being NRF, FANR, and PFF1 (≥150 NR must occur in the core), AND In the home range, >1,086 acres NRF, FANR, and PFF1
Moderate	In core and home range, 665 to 1,336 acres of NRF, FANR, and PFF1 (≥500 acres NRF must occur in core and home range combined)
High	In core and home range, <665 acres of NRF, FANR, and PFF1

A high risk means that successful reproduction is least likely to occur when compared to the other categories; reproduction may be attempted but ACs with high risk are considered to be deficient in resources to support the adult owls plus the offspring. High risk level ACs may have large pockets of moderate and high severity that result in the core and/or home range containing a small amount of suitable habitat. Possibly more common, high risk level ACs have a low amount of suitable habitat prior to the 2014 fires and these ACs would be considered high risk regardless of the fire effects.

Moderate level represents the ACs that are likely to have difficulty in finding resources and these owls will likely need to transverse openings (areas without overstory tree canopy) or use areas of low habitat quality to find enough resources. These challenges may result in lower survival or reproduction potential for the pair occupying moderate level ACs. Low level ACs have enough habitat in the core and home range to support reproduction, but the habitat may not be ideally distributed in large patches of high

quality habitat. The final category, very low, represents the habitat quality and distribution associated with successful reproduction over the species range.

The spatial bounds of the analysis will be limited to the home ranges that overlap the fire perimeter plus the Project area. The short-term (less than or equal to eight years) covers the time when the majority of snags will remain standing. The long-term (greater than 10 years) includes the time when the snags will likely have started falling, resulting in changes to the physical structure of the area.

Analysis Indicator: Changes to Critical Habitat

The California Klamath Province is considered a 'fireprone' area because of its frequent fire return intervals and existing vegetation condition that likely elevates the potential of fire (USDI USFWS 2012). Within fire-prone areas, resource agencies planning vegetation management in critical habitat for the northern spotted owl (NSO) are encouraged to ameliorate current threats of on-going habitat loss from uncharacteristic fires and vegetation changes that are largely related to past fire exclusion (USDI USFWS 2012). Resource agencies are also encouraged to work toward maintaining or enhancing the characteristics of older forest and providing large habitat blocks and associated interior forest conditions. Regional variations should be taken into account; in the Klamath Province this means providing mosaics of interior habitats and edges to provide for the diversity of prey for NSO.

Critical habitat is generally described as the specific geographic area occupied by the species at the time of listing plus areas that contain the physical and biological features that are essential to the conservation of endangered and threatened species and may need special management or protection. Instead of having general recommendations that cover the entire critical habitat area, critical habitat was split into units and subunits with specific recommendations because units or subunits may provide different functions to aid in the recovery of the species. For the spotted owl, the Project overlaps portions of the Klamath East and Klamath West Critical Habitat units; these units were further divided into four critical habitat subunits (KLE6, KLE7, KLW7, and KLW8). Generally, all four subunits have special management considerations to enhance or protect existing essential biological or physical features, reduce the loss of habitat to wildfire, reduce change in habitat as a result of fire exclusion, and buffer competition between NSO and barred owls, but the primary function for these subunits is to support the survival, reproduction, and dispersal of NSO (USDI USFWS 2012).

Primary Constituent Elements (PCEs) are the physical and biological features that provide the essential life history requirements of the species. The 2011 CHU designation identifies the primary constituent elements for NSO as those physical and biological features that support nesting, roosting, foraging, and dispersal. Specifically the PCEs for the NSO are summarized (from USDI Fish and Wildlife Service 2012):

1. Forest types that support the northern spotted owl across its geographic range. Within the Klamath Province, these include mixed conifer/mixed conifer-hardwood, mixed evergreen, Douglas-fir, white fir, and Shasta red fir. These forest types may be in early-, mid-, or late-seral stages.
2. Nesting, roosting, and
3. Foraging habitat,
4. Dispersal habitat.

This analysis estimates the number of critical habitat acres affected by each alternative. Given the types of treatment proposed for this Project that are likely to maintain or remove habitat, we focus the reporting of effects on downgrading and removing habitat. Habitat removal means the habitat prior to treatment will no longer function as NSO habitat after treatment. NSO habitat is generally described as a hierarchy in habitat quality with nesting/roosting being the highest quality and foraging and dispersal following in order; habitat downgrading signifies the lowering of a habitat quality from one level to the next.

Even though the NSO critical habitat rule doesn't specifically identify suitable habitat that burned at moderate and high severity within the design of PCEs, the final rule does identify the importance of early seral habitat and areas that may provide for foraging opportunity. Therefore, PCE 2 and 3 that burned at moderate and high fire severity are reported as fire-affected critical habitat.

The spatial boundary is all of the areas designated as critical habitat within the analysis area. The analysis area is the same as the spatial bounds described in the Risk to reproduction. The temporal bounds will be the same as for the analysis indicator called "Risk to Reproduction".

Forest Sensitive Species

Bald Eagle

Bald eagles generally nest near rivers, large lakes or streams that support an abundant food source. Eagles have been recorded to nest in a variety of natural and manmade structures but most often nest in mature trees or snags. The nest tree or snag is typically the tallest tree with strong limbs that can support the heavy nest. Nest sites also include a perch that is near the nest but in sight of water where the eagles would forage. Given the specific needs of an eagle, nest trees are a rare resource and should be conserved.

During the reproductive period (January 1 to August 1), eagles are sensitive to human activities. Eagles appear to be most sensitive during the beginning part of nesting - nest building through incubation (December through May). However, each eagle pair can respond to disturbance differently. Some pairs have been recorded to nest successfully just yards from human activity (e.g. along roads) while other pairs may abandon their nest in response to human activities much further away. The variability may be related to a number of factors: visibility of the disturbance, duration of the disturbance, noise level, extent of the area affected by the activity, prior experiences with humans, and tolerance of the nesting pair.

During the nesting period, human activity can also disrupt eagle roosting or foraging which can result in negative affects to nesting. Disruptive activities that result in interfering with eagle foraging can increase the time it takes for a parent to find food and feed the chicks. This could result in the chicks not receiving enough food.

The U.S. Fish and Wildlife Service (USDI FWS 2007) has developed a series of management recommendations to minimize effects on bald eagles. These recommendations include: 1) keeping a distance from nest sites; 2) maintaining landscape buffers between the nest and the activity; and 3) avoiding certain activities during the reproductive period. The size and shape of the buffer around nest sites depend on the activity and topographical features. Natural noise barriers like forest and mountains can

reduce the visual effects and loudness of the activity, thus reducing the disturbance. The U.S. Fish and Wildlife Service provides general guidance and buffer distance for various activities that might disturb an eagle nest, but these buffers may need to be adjusted depending on nest location and nesting pair tolerance of activity.

- Recommendations for an active eagle nest (January1 to August 1):
- No loud noises (e.g. chainsaw and yarder) within 660 feet of the nest;
- No aircraft within 1,000 feet of nest site; and
- Avoid any potentially disruptive activities in the eagles' direct flight path between their nest site and foraging area.
- Recommendations for habitat management (November 1 to March 31):
- Preserve potential roost and nest trees within 0.5 mile of large rivers or lakes.

Analysis Indicator: Level of Disturbance to Nest/Roost Sites

The two most common activities likely to occur in this Project that may disturb eagles are helicopters and noise created by equipment. Helicopters typically present loud and intermittent noise disturbance over a large area that are also visible to a nesting eagle thus these activities are likely to disturb nesting eagles. Unlike helicopters, equipment noise (e.g. chainsaw or yarder) can be loud when it occurs near a nest but the noise is not expected to travel far given the forested environment and topography.

Disturbance will be assessed as a distance from the known nest sites. Any level of disturbance less than 1,000 feet from a known nest is a high level of disturbance. Disturbance that occurs between 1,000 feet and 1,500 feet of the nest is a moderate disturbance. A low level of disturbance is any noise producing activity that is farther than 1,500 feet from known nests. For this analysis, a high level of disturbance will likely result in an eagle pair abandoning the nest. Moderate level of disturbance will result in the adults leaving the nest for a short period of time; this may result in delayed feeding of young or not incubating the egg(s). Low level of disturbance may result in the adult eagles displaying behavior indicating acknowledgment of the human activity but the adults continue to feed offspring.

The spatial boundary of the analysis is known nest sites in the Project area plus a 1,500-foot buffer. The temporal bounds for the short-term will be the time during implementation (about eight years) during the reproductive period (January 1 to August 1) and roosting period (November 1 to March 31); long term will be ten years.

Analysis Indicator: Risk to Future Potential Nest Areas

Bald eagles usually build nests on prominent features in the landscape that overlook aquatic foraging area typically within stands of mature and old-growth forest (Anthony et al. 1982). However, eagles have been documented to build nests in a variety of tree species and in California and Oregon, nests are most often found in large ponderosa pine (diameter at breast height of greater than 40 inches) (Anthony et al. 1982). Nest trees are typically used for many years, but nest trees do fail at some point and another nest tree will be needed or an alternate nest may be used. Alternate nest is a nest that is not used for a given breeding season, but the longer an alternate nest goes unused, the likelihood of the nest being used again decreases over time. Alternate nest or a new nest is usually occupied within one mile of the former nest site but topographic features should be considered when determining the area an alternate nest may occur because nests are typically contained within a single drainage (Anthony and Isaacs 1989).

For land management, the National Bald Eagle Management Guidelines (2007) recommends no removal of overstory trees within 330 feet of the nest tree and to protect and preserve potential nest sites by retaining mature trees within 0.5 mile from water. The Forest Plan uses a nest protection zone for the area up to 0.5 mile around a nest site to identify the area that may influence nesting conditions (pg. 4-90). For known eagle nests along the Klamath River (portion within the Forest), the average distance from a nest to the Klamath River is 0.23 mile.

It is important to note that the bald eagle management guidelines are just guidelines. These guidelines provide useful information on minimizing effects to eagles, but they don't provide recommendations for every situation. For this analysis, we used these guidelines as a starting point and used professional judgment and experience to create the risk categories. These risk categories are a relative measure that attempt to estimate a level of effects resulting from the proposed activities. However, these risk levels are not a guaranteed result; rather these risk levels represent a scenario of potential consequences.

A low level of risk will result in a distribution of potential future nest trees that will likely provide ample opportunity for a new nest site. Moderate level of risk will result in fewer potential nest trees. High level of risk may result in the eagle not finding another nest tree near the current nest tree; thus, the eagles may need to move to another portion of the drainage or possibly leave the drainage to find another nest site.

The analysis assumes that future potential nest areas will be within 0.5 miles of the known nests. If the nest is greater than 0.5 miles from the river then the analysis area includes the area between the buffer and the river as well. The temporal bounds for the short-term will be the time during implementation (about eight years) and long term will be ten years.

Northern Goshawk

Analysis Indicator: Level of Disturbance to Nest Sites

Loud noises further from the nest site are expected to create less disturbance than the same noise closer to the nest. Disturbance will be assessed as a distance from the known nest sites. If there are any treatments within 500 feet of a known nest site during nesting period (March through August), the level of disturbance is high. Treatments between 500 feet and 0.25 miles of the nest during the nesting period will lead to a moderate level of disturbance; greater than 0.25 miles from known nests during the nesting period is a low disturbance.

Low level of disturbance means that the nesting goshawk is not likely to respond to the noise; thus, the noise will not reduce the likelihood of the success of the nest. Moderate level of disturbance is likely to result in one of the adults alarm-calling and possibly flying toward the noise, thus reducing the time spent foraging to feed the offspring. A high level of disturbance will likely result in both adults moving toward the source of the disturbance and displaying aggressive behavior; this may lead to the nest being abandoned.

The spatial boundary for the analysis is 0.25 miles from all known goshawk nest sites. The nest sites considered for this analysis have the foraging zone that overlaps the Project area. The short-term and long-term temporal bounds are eight years and 10 years, respectively.

Analysis Indicator: Risk to Reproduction

The amount and quality of nesting habitat can affect successful reproduction. Risk to reproduction is analyzed using the amount of habitat in each primary nest zone (0.5 mile from nest) and the foraging habitat zone (one mile from nest). The smaller the number of acres in each zone, the greater the risk to reproduction (see the Terrestrial Wildlife Biological Evaluation for details).

A high level of risk will result in a nesting pair of goshawks not finding enough resources to successfully produce offspring and contribute to the population. A moderate risk may provide enough habitat to raise offspring but the pair may spend more time foraging for food, which may be more difficult for nests with more than one chick. A low level of risk will provide enough habitat and diversity of habitat to find sufficient resources to produce a successful nest.

The spatial bound for the analysis is one mile from known goshawk nest sites. The nest sites considered for this analysis have the foraging zone that overlaps the Project area. The short-term temporal bound is the time for Project implementation (about eight years) and the long-term temporal bound is ten years.

Fisher, Marten, and Wolverine

Fisher

Fishers are strongly associated with dense, mature forest which provides the necessary food, water, shelter for reproduction and survival. Fisher use a variety of mid- to low-elevation forested types in California such as Douglas fir, mixed conifer, ponderosa pine, and mixed conifer-hardwoods (Zielinski et al. 2004). Throughout the varying tree species composition types, moderate and dense forest canopy closure appears to be an important predictor of fisher occurrence at the landscape scale (Carrol et al. 1999, Zielinski et al. 2004, Zielinski et al. 2006, Davis et al. 2007). At the stand scale, fisher habitat may have a diversity of tree sizes and species creating a closed canopy (greater than 40 percent) (Zielinski et al. 2004) along with canopy gaps and associated understory vegetation and decadent structures (snags, cavities, and fallen trees) (Zhao et al. 2012, Powell and Zielinski 1994).

Tree species composition may be less important to fisher than components of forest structure, which can affect foraging success and provide denning and resting sites (Buskirk and Powell 1994). Common resting structures include live trees, snags, cavities, large branches, large woody debris and mistletoe clumps, but fisher have been found using many other resting structures (Zielinski et al. 2004, Yaeger 2005). Trees used for resting are usually the largest trees (typically greater than 30 in dbh) in the fisher home range (Zeilinski et al. 2004). Denning sites are commonly associated with cavities in large live or dead trees (Powell and Zielinski 1994). Large denning trees (greater than 30 in dbh conifer and greater than 16 in dbh hardwood) are needed because fisher need a large cavity (greater than 12in diameter) to provide enough space for the female fisher and young (Truex et al. 1998, Weir and Corbould 2008, Weir et al. 2012). Potential denning and resting sites can be found in younger and mid-seral forest which may contain only a few large trees with cavities, large logs, and snags (Self and Kerns 2001, Lindstrad 2006).

Juvenile fishers are capable of dispersing long distances and navigating various landscape features such as highways, rivers, and rural communities to establish their own home range (Weir and Corbould 2008). Long distance dispersal has been documented for fishers; males move greater distances than females. Arthur et al. (1993) reported an average maximum dispersal distance of 9.3 mi and 10.7 mi for females and males, respectively (range = 4.7 mi to14.0 mi for females and 6.8 mi to 14.3 mi for males). However, dispersing individuals that traveled longer distances have a greater risk of mortality (Weir and Corbould 2008).

The dispersal distance for a fisher is likely related to habitat quality and spatial separation of habitat. Fisher can use closed canopy habitat to cross the landscape, if available, but fisher tend to avoid areas with no overhead cover likely because of the exposure to predators (Buskirk and Powell 1994). Large areas without overhead cover may create a barrier to dispersing fisher (Jones and Garton 1994, Weir and Corbould 2010) and dispersing fisher may have difficulty locating and occupying distant, disjunct but suitable habitat (Carroll et al. 2001). In general, fisher dispersal is affected by the reduction in fisher habitat and the distance between patches of habitat (Weir and Corbould 2010).

Given the uncertainty of the maximum elevation a fisher may occur on the west-side of the Forest, we are not using an elevation maximum for this analysis.

Fire effects on fisher habitat

Wildfires are a natural part of California's forests and given the severity, fires can dramatically affect fisher habitat. Depending on the severity and spatial distribution of the fire and the habitat prior to the fire, the level of fire effects can vary. Low severity forest fires are considered to have a beneficial effect on fisher habitat in the long-term by building fire resiliency. In the short-term, low severity fires can decrease habitat components for fisher prey species thus reducing prey abundance and availability. Reduction in prey populations would affect the fisher's ability to find enough food within a home range (Lehmkuhl et al. 2006). Catastrophic, or stand-replacing, wildfires burn at high intensity over large areas removing forest habitat. Since fisher are dependent on dense canopy cover and late-seral forest structures for resting and denning, the loss of these important habitat components are likely to negatively affect fisher over the long-term (Powell and Zielinski 1994, Naney et al. 2012). The regeneration of forest development into large-diameter trees may require 100 or more years of growth before the trees reach the desired size.

Moderate and mixed severity fires can affect fisher habitat by removing canopy cover and important habitat components. Small patches of habitat may receive moderate or mixed fire severity while leaving other patches of habitat minimally affected. Regardless of the fire severity, the loss of canopy cover greatly diminishes the potential of fisher use likely because the lack of canopy cover increases the risk of predation (Buskirk and Powell 1994, Naney et al. 2012).

Fisher use of fire-affected habitat is not well understood (Hanson 2013). In the southern Sierra Nevada, fisher scat was found in pre-fire dense, mature mixed conifer that was both fire effected and not fire effected (Hanson 2013). Complex forests are likely important to fisher, but logging can remove structural diversity; consequently, the loss of structural diversity can negatively affect fisher (Hanson 2013).

Overall, fisher use of fire-affected conifer forest is likely related to the pre-fire habitat quality and the amount of post-fire canopy cover, large live or dead trees, woody debris, and understory vegetation. Low to moderate severity fire in high quality fisher habitat may still provide enough physical cover for fisher to forage or disperse, but not likely denning in the short-term. For high severity fires, retention of large trees and snags may be more important than canopy cover (Thompson et al. 2011). Observations of fisher in high severity fire affected areas may be related to the amount remaining physical structure especially for dispersal or possibly movements through the home range. However, high severity fire affected areas typically have no canopy cover or understory vegetation, immediately after the fire. Fishers are known to avoid crossing openings with no cover (Powell 1993, Jones and Garton 1994, Weir and Corbould 2010). Even areas with shrub and other ground cover, fisher are subject to higher rates of predation (Wengert 2013). In high fire severity affected habitat, the area may be used for dispersal, but denning and resting structures, although possibly present, may not have enough physical cover for fisher to adequately avoid predation.

Marten

Marten population viability is related to the amount and quality of habitat. Like fisher, marten are also associated with late-successional conifer forests characterized by an abundance of large dead and downed wood and large, decadent live and dead trees (Powell et al. 2003, Buskirk and Ruggiero 1994). In general, marten elevation range overlaps the fisher slightly, but marten occupy higher elevations, typically in true fir and lodgepole forests. Marten appear to select particular physical structure in the forest over the tree species composition. Foraging sites are commonly associated with riparian areas near late-successional habitat (Zielinski 1983). Resting sites are common in large trees and snags and possibly logs and stumps that create an opening near the ground (Spencer 1987). Denning sites are typically cavities in large diameter trees or snags. Marten may inhabit younger forests as long as the area contains important habitat components for resting and denning (e.g. large trees and snags) (Thompson et al. 2012).

Martens typically avoid areas lacking sufficient overhead cover (Slauson et al. 2007) and are sensitive to forest fragmentation (Chapin et al. 1998). Distribution of mature forest on the landscape scale may be the primary determinant of marten distribution and subsequently affect habitat selection at finer scales (e.g. home range) (Kirk and Zielinski 2009). Marten were found to select areas with more habitat, larger patch sizes, and larger areas of interior forest (Hargis et al. 1999, Kirk and Zielinski 2009). Habitat characteristics usually include high (greater than 40 percent) canopy cover (Hargis et al. 1999).

Areas without overhead cover may inhibit marten movements. In the Rocky Mountains, marten were found to cross clearcuts (no standing trees) about 460 feet in width (Heinemeyer 2002) while a different study found a similar relationship from a habitat modeling approach (Hargis et al. 1999). In other forest treatment areas that contain some structure (isolated trees, snags, and logs) in the unit, marten crossed areas up to 600ft in width (Heinemeyer 2002).

Marten dispersal is not well known or documented (Broquet et al. 2006). In Ontario, Canada, marten were found to disperse about 4 miles (maximum 112 miles) on average for females and about 11 miles (maximum 150 miles) for males (Johnson et al. 2009).

Genetic testing has shown evidence of marten disperse over long distances (greater than 150 miles) (Kyle and Strobeck 2003). The variation in the distances for marten dispersal may be in response to changes in landscape pattern and habitat loss (Hargis et al. 1999). Martens are sensitive to increasing size of open areas and decreasing distance between openings (Hargis et al. 1999). However, marten survival decreases as the distance of dispersal increases (Johnson et al. 2009). Therefore, marten that travel long distances have a much higher likelihood of dying compared to marten that disperse a short distance.

Fire effects on marten habitat

Fire, especially high severity fire, will affect marten habitat components similarly as described for fisher. Marten were found in burned habitat that had large amount of coarse woody debris (Paragi et al. 1996). Even though little research examines the effects of fire on marten habitat, fire effects on habitat are likely very similar to fisher except martens use higher elevation habitat.

Wolverine

Wolverine population viability is related to the amount and quality of habitat. Wolverines are typically associated with high elevation (greater than 7,200 feet) montane conifer forest consisting of Douglas fir in lower elevation to true fir and lodgepole pine at higher elevation (Copeland et al. 2007). In California, wolverines have been documented at much lower elevations (1,600feet) than recorded for most of the species range. Studies in Montana, Yukon, and Alaska reported wolverines having a strong association to mid- to late-successional conifer forest habitat possibly indicating conifer forests as the preferred habitat type (Hornocker and Hash 1981, Banci and Harestad 1990), but wolverines have been found in a variety of high elevation habitat types (Copeland et al. 2006).

Young females typically establish residency next to or within the natal home range (Magoun 1985). Natal dens are difficult to find, but the small number of dens located were found in a variety of conditions from snow created caves, under tree stump or boulders or within dense conifer forest (Hash 1987). Males typically disperse possibly traveling great distances (e.g. 230 miles) and through varying habitat types (Magoun 1985). Wolverines are known to use rivers and streams as travel routes possibly because the riparian area provides water and food resources (Magoun 1985). Wolverines typically avoid humans and human related infrastructure, but a few exceptions have been recorded (Copeland et al. 2006).

"The dispersal and travel corridors that connect refugia, at least for males, likely need not have the habitat attributes necessary to support self-sustaining populations. Atypical or low quality habitats may be important to wolverines if they connect otherwise isolated populations and allow for genetic exchange or colonization." (Ruggiero et al. 1994)

Fire effects on wolverine habitat

Very little information is available for describing possible fire effects on wolverine habitat. The closest research related fire effects was a study that examined the effects of timber harvest on wolverine (Hornocker and Hash 1981) which is difficult to relate to fire effects because of the possible effects of human activity. However, wolverines commonly use conifer habitat that is susceptible to fire. Like marten and fisher, fire would alter wolverine habitat by removing canopy cover, large trees, snags, and large woody debris.

Fisher, marten, and wolverine occupy similar habitat of late-successional, dense conifer forest. These species are commonly found at different elevations with some overlap. Fishers are commonly observed on the lower 2/3 of the slope while martens occupy higher elevations with true fir vegetation types. Wolverines have not been observed on the Forest for several years. There is very little information on wolverines in California, but wolverines are suspected to use the true fir to alpine zones. However, all three of these species move across the landscape and use higher or lower elevation conifer forests even though the elevation being used may be outside the average elevation range for the particular species.

Analysis Indicator: Connectivity of Habitat for fisher, marten, and wolverine

For this analysis, connectivity will be assessed by measuring the change in gap distance between areas that provide the necessary cover to avoid predation.

- High level of connectivity is when the average gap distance is less than 160 feet.
- Moderate connectivity is when the average gap distance is between 160 and 460 feet.
- Low connectivity is when the gap distance is between 460 and 600 feet; very low connectivity is when gap distance is more than 600 feet.

High connectivity means that there is sufficient habitat to provide cover for fisher, marten, and wolverine moving within a 7th field watershed. Moderate connectivity means there is some challenge to the species moving within a 7th field; this increases the risk to mortality and requires extra expense of energy to deviate around large openings. Low connectivity presents a great challenge because these species are likely to shift their territory to a more contiguous placement of habitat or move through areas with little to no cover. The final category, very low connectivity, represents a situation where openings exceed the gap distance that would let these species move through a 7th field watershed; risk to survival is substantially increased when compared to the high level of connectivity.

The spatial boundary for the analysis is the 7th field watersheds within the Project area because this scale represents the area that is likely to affect movement within a home range or dispersal of individuals. The short-term temporal bound is the time during implementation (about eight years). The long-term is greater than 20 years to represent the time when the snags will begin to fall over and connectivity may decrease.

Analysis Indicator: Change in Fisher Home Range

Fisher home range selection is important because the home range must provide sufficient resources for survival and reproduction. Some of the basic characteristics of home range selection appear to be related to tree canopy closure, tree size class, percentage of conifer, and openness (area with little to no overhead cover) (Carroll et al. 1999, Wier and Corbould 2010). However, the amount and distribution of these habitat characteristics can affect a fisher home range. Fisher habitat can be split into three habitat categories: denning/resting, foraging, and movement (described in table 8). Denning/resting habitat is typically the least common on the landscape followed by foraging. Movement habitat which provides overhead cover for fisher to move from one patch of denning/resting habitat to another and avoid predation is more common.

The loss overhead cover creates openings that may affect the function of a fisher home range. Fishers avoid crossing large openings (discussed earlier in the fisher, marten, and

wolverine analysis indicator section) and moving around these large openings while staying within habitat may not be feasible for a home range to function. For example, Weir and Corbould (2010) found that fisher occupancy decreases with the increase in openness within the home range. This basically means that fisher home ranges that experience an increase in openness (loss of overhead cover) to about 20 percent of the home range will likely not be occupied by fisher. In addition, fisher home ranges need about 50 percent or more denning/resting and foraging habitat in the home range with at least 50 percent tree canopy cover. Therefore a fisher home range needs about half of the home range with at least 50 percent canopy cover and 30 percent of the home range with 20 percent overhead cover.

Identifying the actual home range of fisher is difficult because it requires extensive monitoring of individuals that are tagged with some kind of transmitting device. We don't have this level of information for any of the fisher home ranges in the Project area, but using some the basic principles identified in fisher research, we can estimate the potential effects.

For this analysis indicator, the change in fisher home range is designed to estimate the effect to fisher at the home range scale. The amount of habitat in each 7th field watershed is assessed for this analysis in its current post-fire condition. If more than 50 percent of the watershed contains denning/resting or foraging habitat, and more than 80 percent of the watershed contains denning/resting, foraging and movement habitat, the 7th field watershed contains a viable home range. If the watershed does not meet these criteria, it is assumed that the 7th field watershed does not contain a home range.

The effect of a loss of a home range is difficult to estimate in terms of population viability. Habitat lost is difficult to replace and it may take many years before the area develops into habitat again. However, this analysis doesn't use true home ranges; rather, the analysis provides a metric to display the potential effects. The loss of one home range may not have large effects on the population, but the loss of several home ranges can result in large effects to the population.

The spatial bound is the 7th field watersheds that intersect the Project area. The 7th field watershed is used because the size of the watershed fits within the range of a female fisher's home range and it is a natural division in the landscape.

Pallid Bat, Townsend's Big-eared Bat, and Fringed Myotis

Analysis Indicator: Risk of Disturbance to Roost Sites

The Project area doesn't contain any known bat hibernacula or maternity roosts but does have caves and mines that can provide habitat for bats that do exist in the Project area. A hibernaculum (plural: hibernacula) is usually a cave or mine that provides a constant temperature and protection for bats during the winter months. A maternity roost is a place where bats give birth and rear their young; maternity roosts can occur in a variety of structures such as caves or abandoned buildings. In order to account for the potential existence of an undiscovered hibernaculum and maternity site, geological mapping is used as a proxy to locate bedrock that typically contains caves (marble/limestone deposits). For mining activity, Forest mining data is used to identify the type of mine and locations. Using the combination of the geological data and mining data, a 250-foot buffer is created for a distance from all potential areas that may contain cave and cave-

like structures (possibly containing a maternity roost or hibernaculum); the location of this buffer is overlaid with Project activities for each alternative to estimate affects to these bat species.

If treatment occurred within 250 feet of the potential hibernaculum or maternity site, the risk of disturbance is high. If there is only treatment between 250 feet and 1,320 feet of the potential site, the risk of disturbance is moderate. If treatment occurs more than 1,320 feet from the potential site, the risk of disturbance is low.

High risk of disturbance may result in a maternity roost being abandoned with the fate of the offspring likely dependent on their age. High disturbance of a hibernaculum will likely result in all bat ages leaving the warmth of the cave to the colder outside; this may result in death of the bats. Moderate risk of disturbance is not likely to affect the maternity roost or hibernaculum but instead disturb individuals that come and go from the cave (excluding the winter months). Low risk of disturbance will be potentially moving a very few individuals from a foraging area but no disturbance of the hibernaculum or maternity roost.

The spatial bound for these bat species is 0.25 miles around all potential hibernacula and maternity roosts within the Project area. The temporal bound is about eight years for the short-term representing the time during implementation and greater than ten years for the long-term.

Willow Flycatcher

Analysis Indicator: Level of Habitat Alteration

This analysis will estimate the amount of habitat disturbed by the proposed activities; the level of effect will be presented in acres and in proportions of habitat affected, based on the 7th field watershed scale. Habitat for the species is assumed to be 3rd order streams (extent or location of resident trout used as a proxy) and wet meadows (mapped springs used as a proxy). If more than ten percent of the habitat is disturbed the level of habitat alteration is high. If between five percent and ten percent of habitat is disturbed, this is a moderate level of habitat alteration. If less than five percent of the habitat is disturbed, the level of habitat alteration is low.

High level of habitat alteration will likely affect flycatcher reproduction for a given 7th field watershed and possibly an entire population. Moderate level will likely affect a small number of territories and possibly affect a portion of a population. Low level of habitat alteration may affect individuals but the population is not likely affected.

The spatial bound is the 7th field watershed. The temporal bound in the short-term is about eight years and long-term is ten years.

Siskiyou Mountains Salamander

Analysis Indicator: Risk of Disturbance

The Siskiyou Mountains salamander habitat is generally described as diverse, typically on slopes with conifer or mixed conifer canopy cover with wet microclimates in rocky substrates (DeGross and Bury 2007) but there is some variation in habitat descriptions. Olivier et al. (2001) study described the area surrounding salamander locations with more boulders, deeper leaf litter, higher canopy closure, higher subsurface temperatures, and lower fern cover; these microhabitat conditions described areas where the species was

found south of the Siskiyou Crest which includes a portion of the Klamath National Forest. Welsh et al. (2007) found similar habitat attributes; they found Siskiyou Mountains salamanders in moist, older, closed canopy forests with deep litter and cobble- to boulder-sized rock substrates. Other studies have described this species' habitat with the presence of talus and canopy cover (Clayton et al. 1999, Suzuki et al. 2008). However, these microhabitat characteristics may not completely describe every site the salamander has been located. Sometimes, the species is located in areas that don't meet this general habitat description like areas with low amount of canopy cover; these sites may be able to maintain rocky, cool, moist habitat based on the physical location (e.g. aspect) (DeGross and Bury 2007).

The loss of canopy cover may not affect micro-site conditions equally across sites thus other factors may need to be considered to determine whether a site may persist after a disturbance event. The Siskiyou Mountains salamander activities are affected by the micro-site conditions; this species is typically associated with cool, moist conditions (Chen et al. 1995 and Welsh et al. 2007). The effects on micro-site conditions are variable depending on the habitat characteristics and the distance from the edge into the habitat (Chen et al. 1993). Latitude, aspect, and local climate are important for considering changes in micro-site conditions (Chen et al. 1993). South aspects are generally hotter and drier than north aspects; south aspects may only provide a limited period during the year where the micro-site conditions may meet the conditions needed for these salamanders to be active at or near the ground surface while the north aspects may create favorable conditions for a longer period of time (Chen et al. 1995, Welsh et al. 2007).

Fire can change the micro-site climate conditions by changing the site composition. Even though fire can physically change the rocky substrate that makes up a large portion of the salamander habitat, the change isn't usually enough to change the rock quality of the salamander habitat; however, fire can consume the organic material (e.g. leaf litter) that may cover the rocky areas and reduce the surrounding vegetation that shades the rocky areas. The surrounding vegetation and organic ground material likely contribute to the micro-site conditions by creating cooler and moister site conditions (Bury et al. 2002). The loss of canopy cover and organic ground material can affect these desirable conditions and possibly result in reducing the capability of the salamanders to be active at or near the ground surface. However, like described above, other physical features (e.g. aspect) may aid in offsetting the change in vegetation.

The Siskiyou Mountains salamander's range overlaps one subunit (Happy Camp) of the Project area. This area has been surveyed using a strategic survey approach over the last few years (not part of this Project) and several occupied sites have been found. Strategic surveys target areas that are likely to contain the species, but this approach didn't survey every acre in the Project area. For this Project, additional surveys are underway that are focused in the treatment units and areas identified as salamander habitat are subject to the project design features that are intended to reduce the effects this species.

For this analysis, an analysis indicator is used to estimate the level of risk to disturbing a known site. The following criteria were used for this analysis indicator. If more than 25 percent of the known sites are disturbed by the Project, the risk of disturbance is high. If between 20 percent and 25 percent of known sites are disturbed, the risk of disturbance is

moderate; if less than 20 percent of the known sites are disturbed, it is considered a low risk of disturbance.

A high risk of disturbance would include a large proportion of known sites being affected by the use of heavy equipment during Project activities that disturb habitat and likely result in negatively affecting the population. The moderate level may include effects to localized areas and the population as a whole but to a lower magnitude than high risk. Low risk will affect individuals but it is not likely to affect the population.

The spatial bound will be defined by a 130-foot buffer around all known sites. The temporal bound in the short-term is the time during implementation about eight years. The long-term is greater than ten years.

Tehama Chaparral Snail

Analysis Indicator: Likelihood of Dispersal

Snails, in general, have limited mobility and are reliant on specific habitat requirements. Snails require moisture for breathing and movement thus moist to wet, humid microclimates are critical for most snail species' survival and reproduction. During dry periods of the year, snails must conserve body water by avoiding intense sun exposure, elevated temperatures, and reduced humidity (Kappes 2005). Snails are so sensitive to the loss of moisture that the primary cause of snail death (all life stages) is considered to be desiccation (Asami 1993).

The level of moisture needed for snail to reproduce and survive is dependent on the species (Asami 1993). Snail species found in arid habitat tend to have greater tolerance and range of moisture conditions compared to a snail species found in moist habitat (Asami 1993). Moisture conditions are related to several factors, but dense tree canopy cover, abundant physical structures, and close proximity to water can produce desired microclimatic conditions (Asami 1993).

Snail habitat can vary between species, but the habitat must meet their needs. Plant (dead or alive) is the base food source for most snail species even though preferred plant species may vary greatly between snail species (Gervais et al. 1998, Sarma et al. 2007). Although one study reported a higher snail density in conifer forest (Locasciulli and Boag 1987), most studies found snails dependent on deciduous tree litter (Addison and Barber 1997, Abele 2010). Reasons for the reduced number of species found in conifer forests is thought to be related to reduced food sources, lack of essential mineral (i.e. calcium), and resinous extracts from conifer tree species (Karlin 1961). There are species specific responses to particular habitat types, but generally, most land snails are found in deciduous forests while others may be found in deciduous and conifer mixed forests (Abele 2010). Overall, deciduous tree leaf litter appears to be a component of land snail habitat.

Coarse woody debris is an important habitat component for many mollusk species. Woody debris can absorb and retain water for several weeks during periods without precipitation thus creating moist environment for snails (Kappes 2005). Moist, decaying logs provide an area for hibernation, feeding, breeding, egg development, and simply shelter thus a shelter from microclimatic extremes (Kappes 2005). Coarse woody debris may also buffer the effects of disturbance. The removal of canopy cover can change the microclimate, but woody debris may provide cool, moist conditions for possibly a short

period of time (Bros et al. 2011). However, coarse woody debris can't correct the overall result of losing canopy cover to microclimate conditions.

The Tehama chaparral snail is not well studied thus little information is available that describes the habitat. Generally, the species' habitat is composed of rocky areas (talus), deciduous hardwood and shrub leaf litter, and other debris (e.g. logs) covered with abundant shade (Burke et al. 1999). Dunk et al. (2002) found a weak but statistically significate relationship between species occurrence and riparian reserves suggesting this species may be prefer habitat near streams; riparian areas typically provide high relative humidity that is desired by most, if not all land snails. In the drier portions of this species range, the talus areas provide refugia from predators, temperatures, and moisture extremes; the snails rarely travel more than 33ft beyond talus habitat (Duncan et al. 2003). The size and type of the rock in the talus may be an important habitat characteristic; this species is more commonly associated with talus composed of small (less than three inches in diameter) limestone and basalt rock (Duncan et al. 2003).

Areas affected with high severity wildfire are less likely to support a snail population, and snails are likely to disperse to less-affected habitat. This analysis will use the pre-fire GIS habitat layer and known sites where snails have been located to identify treatment units that may contain snails. The amount of woody debris (greater than 12 inches in diameter) will equate to the likelihood of snails being able to disperse to viable habitat. If there are more than seven logs (greater than 12 inches in diameter) the likelihood of dispersal is high. If there are five to seven logs per acre, the likelihood of dispersal is moderate. If there are fewer than five logs per acre, the likelihood of dispersal is low.

High likelihood of dispersal means that there will be a sufficient amount of woody debris to provide cover and moist conditions for snails to move from one location to another. Moderate likelihood of dispersal will provide enough woody debris for snails to move through part of the area but open areas that impede movement or reduce potential survival are likely to be present. Low likelihood of dispersal means little continuous cover is present and there is a lower survival of individuals, with the possibility of severing connectivity between populations of snails.

The spatial scale is the Happy Camp and Beaver project areas. The temporal scale is about eight years, which is the time for implementation. Long-term is greater than 20 years.

Western Bumble Bee

Analysis Indicator: Level of Habitat Disturbance

The western bumble bee, like other species of bumble bees, is sensitive to habitat disturbance. In the Project area, high-quality habitat for bees is likely to occur in the meadows where several species of flowering plants occur. Meadows also offer a high density of plants to provide additional structure and small animal burrows that bees also use for nesting. Heavy equipment and tree harvest are the most likely source of ground disturbance in this Project. If more than five acres of meadow habitat will be disturbed by ground-based equipment, the level of disturbance is high. If one to four acres of meadow are disturbed, the level of disturbance is moderate. If less than one acre of meadow is disturbed, the level is low.

A high level of disturbance will result in affecting at least one bee colony where reproduction will be compromised. Moderate level of disturbance will result in removing flowering plants or preventing bees from using an area because of activities. This will result in bees traveling further to find food resources if a colony is present within close proximity to the treatment. A low level of disturbance will be a temporary interruption of bee activities lasting a few hours but bees will return to the area.

The spatial bound is the meadows within the Project area. The temporal bound in the short-term is about eight years (during the period when implementation is expected to occur and bees may be disturbed) and long-term is ten years.

Management Indicator Species

The requirement to evaluate landscape and Project-level impacts to habitat conditions associated with species associations and related management indicator species is identified in the Forest Plan (page 4-39). Habitat monitoring requirements are summarized in the Management Indicator Species Report Part I. “Habitats” are the vegetation types (for example, mixed conifer forest) and/or ecosystem components (for example, river and ponds) and special habitat elements (for example, snags) identified in the Forest Plan. “Habitat status” is the current amount of habitat on the Forest. For the post-fire assessment of habitat, the Rapid Assessment of Vegetation Condition after Wildfire (RAVG) data are used (Appendix A).

Project-level effects on management indicator species are analyzed and disclosed by examining the impacts of the proposed Project on habitat for management indicator species by discussing how direct, indirect, and cumulative effects will change the quantity and/or quality of habitat in the analysis area for each habitat association. For this analysis, the following analysis indicators are used to determine the level of effects.

Hardwood-Associated Species

Analysis Indicator: Change in hardwood habitat abundance

Overlaying treatment prescriptions for each defined treatment unit with the defined habitat results in estimating the acres of hardwood habitat affected by the treatment and the levels of effects to the habitat (whether habitat will be degraded or removed). Degraded hardwood habitat means that physical structures are changed to the point that the quality of the habitat is lessened. Removed habitat is no longer functioning as habitat as a result of proposed activities or events. For each alternative, the acres of habitat affected are reported for each habitat association.

Spatial bounding for the hardwood associated species is defined by the Project area. The temporal bound for the hardwood associated species is eight years for the short-term to include the expected time to complete implementation of the Project. The long-term spatial bound is ten years which will capture the anticipated fire affected vegetation response (e.g. hardwood regeneration).

Snag-Associated Species

Guidelines for Snag Retention and Coarse Woody Debris

The Species Associations identified in the Forest Plan under the Management Indicator Species sections was developed to represent habitats or features of a habitat type that are

important for many plant and animal species. Snags are an important feature so a series of Snag Associated Species were identified to represent the snag feature in different but sometimes overlapping habitat types as a measure of potential effects of passive and active land management. However, the importance of snags extends across all of the land management allocations including the Late-Successional Reserves. The Late-Successional Reserves have similar guidance in the Forest Plan but serve a different purpose; Late-Successional Reserve guidance targets a wide spectrum of plants and animals associated with late-successional forests which also includes snags as part of the habitat. Below describes and discusses the guidance for managing snags and coarse woody debris in the Forest Plan and the Late-Successional Reserves and the relevant research. Although this discussion doesn't apply strictly to snag associated species, public comment typically points out the need for the management of snags in reference to the Snag Associated Species so the discussion is presented in this section even though snags and coarse woody debris are important to many other species analyzed for this Project.

Snag and down wood are essential parts of late successional forest stands. There is however a tension between leaving enough snags and coarse woody debris for habitat needs and leaving so much dead wood that fuel loads are unacceptably high (Knapp 2015). The LSRA, in describing Desired Condition, noted that minimum amounts of snags and coarse woody debris (CWD) could be exceeded, but not to the point that they were likely to create the likelihood of a stand-replacing event (LSRA 1-3). Skinner et al. (2006) observed that:

> *"Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve."*

As noted by Knapp (2015):

> *While the importance of woody detritus to the ecological health of many forested ecosystems is undeniable, it is also recognized that in seasonally dry forests a balance is necessary so that excessive fire hazard does not result (Brown and See, 1981; Brown et al., 2003; Lehmkuhl et al., 2007). A substantial proportion of lighting- ignited fires start in snags (Komarek, 1968). Burning snags, particularly ones that are highly decayed, are also a prolific source of embers that propagate spot fires, contributing to rapid fire spread (Barrows, 1951). In addition, the instability and unpredictability of burning snags are a serious safety issue for fire management personnel (Page et al., 2013). While a greater proportion of the dead wood biomass in coniferous forests is typically found in CWD than in snags (Harmon et al., 1986), consumption of both standing snags and CWD increases fire-line intensity, contributing to extreme fire behavior and more severe fire effects (Page et al., 2013). <u>With CWD, Brown et al. (2003) speculated that an optimum quantity for warm and dry ponderosa pine and Douglas fir forest types of the western U.S. that would provide for wildlife, nutrients and other ecological benefits, without contributing to excessive risk of an uncharacteristically severe wildfire, would fall within the range of 11.2–44.8 Mg ha-1 (5–20 tons ac-1), with the higher fuel loading acceptable if the CWD was comprised of larger pieces.</u> (Emphasis added).*

In the Westside Fire Recovery Project, we address this balance between habitat and fuel accumulation by utilizing landform, slope position and aspect to determine snag and coarse woody debris amounts and distribution. All snags and coarse woody debris are

retained in hydrologic Riparian Reserves and designated snag retention areas which are generally associated with hydrologic Riparian Reserves or pockets of larger trees and lower slope positions. This mimics the natural fire pattern because fires burned with lower severity in riparian areas particularly on lower slope positions where riparian areas are wider and denser. Historically even in a frequent fire environment there would tend to be more snags in these areas. Coarse woody debris is retained as specified in the Forest Plan but in amounts that vary with slope position.

The Forest Plan provided guidelines for retention of snags (Forest Plan, page 4-30) and coarse woody debris (Forest Plan, page 4-25). Guidelines for snag retention in the Forest Plan are reproduced here in Table 3-18.

> *Forest Plan Standard and Guide 8-25: Use Table 4-4 [Table 3.18] as guidelines in ecosystem analysis and project-level planning. The relative numbers of hard and soft snags in various size classes show the habitat needs of the different cavity-association Forest wildlife species. The number of snags on a given acre will vary, depending on the site and on the number of snags within the landscape.*

Table 3-15: Numbers of Snags Required per 100 acres to support "Good" Quality Habitat for Primary Cavity-Association Species ( )= Number of Snags per 100 acres

Snag Diameter (DBH)	Hard Snags	Soft Snags	Total Snags by diameter class
11+		Downy (16)	(16)
15+	Red Breasted / Black Backed (45	Hairy / White hd. (225)	(270)
20+	Vaux's Swift(200)		(200+)
24+	Pileated(14)		(14)
		Total Snags	(500)

The Forest Plan direction does not require that these snag metrics be met on every acre; the Forest Plan requires that within any 100-acre area, the appropriate number of snags be retained. This allows Project design to mimic the natural snag distribution described by Skinner (2002) and Taylor and Skinner (1996) with concentration of snags in time and space, and intervening areas where snags would be relatively sparse or would not occur.

To meet the snag standards of the Forest Plan shown in Table 3-18, the following project design features would be implemented:

- Within harvest units, all snags are retained in hydrologic Riparian Reserves, which include inner gorge areas and additional snag retention areas associated with hydrologic Riparian Reserves
- Within hydrologic Riparian Reserves in salvage units, surface fuels would be treated by broadcast burning at the time that activity fuels within units are burned. This reduces surface fuels, and increases the probability that retained snags would survive future fires.
- Green trees and lower-severity fire areas where most of the trees survived will be retained as they occur and are not "included timber" in proposed salvage harvest areas even if they occur within salvage unit boundaries. Over time, these green trees contribute to snags and coarse woody debris. Trees with less than 70% probability of mortality would be maintained.
- Large, fire-resistant legacy live trees, legacy trees killed by the fire and trees that were dead at the time of the fire are retained where they occur within salvage units. If these pose a safety hazard, they would be felled and left to provide large woody debris.

The Forest Plan also provides guidelines for coarse wood debris (CWD) (Forest Plan, Forest-wide Standard and Guideline 6-16, page 4-25). These are shown in Table 3-16, which includes a brief discussion of implementation.

Table 3-16: Guidelines for Coarse Woody Debris

Guideline	Implementation
6-16 Until standards are developed as described above, the following guidelines apply in areas of regeneration harvests and other vegetation manipulation:	No additional standards have been developed for CWD. The standards provided in the Forest Plan will be implemented.
a) Manage to provide a renewable supply of large down logs well distributed across the matrix landscape in a manner that meets the needs of species and provides for ecological functions. Develop models for groups of plant associations and stand types that can be used as a baseline for developing prescriptions.	Green trees have been retained wherever they occur. Reforestation will contribute to down logs in the future.
b) Maintain 5 to 20 pieces of CWD per acre in various states of decay. The specific amount of materials specified for retention on individual projects shall be determined by the project ID team. At a minimum, the ID team should consider the amount of materials existing on site, the amount of material needed to provide for nutrient cycling and site productivity, the denning needs of wildlife species, and the fire risk as a result of fuel material on site. Attempt to maintain these levels of CWD on site throughout the life of the project or throughout the rotation (if timber harvest is planned.) Leave large logs, conifer and hardwood, sound and cull of at least 20 inches in diameter and about 40 cubic feet in volume when they are available. Most of the logs should be in Decay Class 3, 4 and 5 (defined in the USDA Handbook 553, page 80) with at least 2 logs per acre in decay Class 1 or 2. Do not count logs less than 12 inches in diameter or stumps as CWD. This guideline may be waived in strategic fuelbreak areas or for documented safety reasons. Down logs should reflect the species mix of the original stand. In areas of partial harvest, the same basic guidelines should be applied, but they should be modified to reflect the timing of stand development cycles where partial harvesting is practiced.	CWD in these amounts and size classes will be retained. On upper slopes and south and west aspects, fewer pieces (~5 pieces > 15 inches diameter and 10 feet long - the lower range) would be retained because historically, frequent fires consumed down wood in these locations. On north and east aspects and on lower slopes, relatively more pieces (up to 20 pieces - the upper range) will be retained because historically, these areas burned less frequently, or burned with less severity. Snags in clumps, and green trees within units may count towards these targets. These values are consistent with those recommended by Brown et al. (2003) and cited by Knapp (2015). Fuel modeling shows that salvage harvest followed by activity fuel treatment would accomplish the LRMP goal of reducing fuel concentrations that would contribute to future high-intensity fire (Forest Plan, page 4-8). Areas of snag retention would provide large pulses of dead wood as that material breaks and falls to the ground.
c) CWD already on the ground should be retained and protected to the greatest extent possible from disturbance during treatment (e.g., slash burning and yarding) which might otherwise destroy the integrity of the substrate.	All CWD that is currently on the ground will be retained.
d) Down logs should be left within forest patches that are retained under green-tree retention guidelines in order to provide the microclimate that is appropriate for various organisms that use this substrate.	All CWD within patches of standing trees will be retained.

Analysis Indicator: Change in snag habitat abundance

The analysis of habitat is the same as for hardwood associated species except with a focus on snag habitats[36]. Spatial bounding for snag-associated species is defined by the Project area. The temporal bound for snag associated species is eight years for the short-term to include the expected time to implement the Project. The long-term spatial bound is ten years which will capture the anticipated fire affected vegetation response (e.g. the time for most or all snags to fall over).

[36] Snags ranging in diameter and distribution in the project area were created by the 2014 fires. The current conditions resulting from these fires include a particular type of habitat that is favorable to some wildlife species. One of those species, the black-backed woodpecker, occurs in the snag species association for this project. It is a well-studied species that uses stands of dense trees that are affected by high-severity fires. Although habitat for black-backed woodpeckers may be affected by this project, the snag association was chosen as a management indicator to represent the use of true fir habitat, not the use of fire-affected areas. Therefore, effects of the project on snag associated species are analyzed based on the assigned habitat type for each species as described in the Forest Plan.

Survey and Manage

Analysis Indicator: Habitat protection

Each alternative is evaluated in terms of how the proposed activities will meet the requirements of the species-specific management recommendations if known sites of survey and manage species are present, and how the Project will comply with the 2001 Record of Decision (USDA 2001) and the 2001, 2002, and 2003 annual species reviews. Requirements of the 2001 Record of Decision include management of known sites as recommended by species review and conducting pre-disturbance surveys of potential habitat and managing any discovered sites for Siskiyou Mountain salamander and Tehama chaparral snail (both analyzed as sensitive species), and the blue-gray taildropper. The analysis indicator for effects on survey and manage species is the number of known sites affected by the Project activities.

For action alternatives (2, 3, 4, 5, Alternative 2 Modified, and Alternative 3 Modified) the spatial boundary will be limited to the treatment units. For Alternative 1, the spatial boundary will be the same as Alternative 2 since this alternative has the maximum footprint of treatment. The short-term temporal bounds will be limited to the time for each activity to be implemented which is about eight years. The long-term bound will be 20 years.

Summary of Analysis Indicators, and Spatial and Temporary Boundaries

Table 3-17 displays a summary of the name, status, and spatial and temporary boundaries of each species considered in this analysis with relevant analysis indicators for each.

Table 3-17: Analysis Indicators, Spatial and Temporary Boundaries by Species

Species	Status	Analysis Indicator	Spatial Boundary	Temporal Boundary
Northern spotted owl	Federally-listed as Threatened	Risk to Reproduction	Home ranges that overlap fire perimeter	Short-term = ≤ 8 years Long-term = >10 years
		Changes to Critical Habitat	Area designated as critical habitat within the home ranges that overlap the fire perimeter	Short-term = ≤ 8 years Long-term = >10 years
Bald eagle	Forest Service Sensitive	Level of disturbance to nest/roost sites	Known nest sites plus a 1,500-foot buffer around known sites in the project area	Short-term = ≤ 8 years during reproductive period (Jan. 1 to Aug. 1) and roosting period (Nov. 1 to Mar. 31) Long-term = >10 years
		Risk to future potential nest areas	Within ½ mile of known sites and the area between the nest and a river if the known nest is greater than ½ mile from a river in the project area	Short-term = ≤ 8 years Long-term = >10 years
Northern goshawk	Forest Service Sensitive	Level of disturbance to nest sites	¼ mile from all known goshawk nest sites (foraging zone overlap the project area)	Short-term = ≤ 8 years during reproductive period (March 1 to August 31) Long-term = >10 years
		Risk to reproduction	1 mile from known goshawk nest foraging zone that overlap the project area	Short-term = ≤ 8 years Long-term = >10 years
Fisher, Marten, Wolverine	Forest Service Sensitive	Connectivity of habitat	7th field watersheds that intersect the project area	Short-term = ≤ 8 years Long-term = >20 years
		Changes in fisher home range	7th field watersheds that intersect the project area	Short-term = ≤ 8 years Long-term = >20 years
Pallid Bat, Townsend's Big-eared Bat, Fringed Myotis	Forest Service Sensitive	Risk of disturbance to roost sites	¼ mile around all potential hibernaculum and maternities in project area	Short-term = ≤ 8 years Long-term = >10 years
Willow Flycatcher	Forest Service Sensitive	Level of habitat alteration	Meadow and riparian (3rd order streams or greater) within project area	Short-term = ≤ 8 years Long-term = >10 years
Siskiyou Mountains Salamander	Forest Service Sensitive and Survey and Manage Species	Risk of Disturbance	130-foot buffer around all known sites in project area	Short-term = ≤ 8 years Long-term = >10 years
Tehama Chaparral Snail	Forest Service Sensitive and Survey and Manage Species	Likelihood of dispersal	Boundaries of Happy Camp and Beaver project areas	Short-term = ≤ 8 years Long-term = >20 years
Western Bumble Bee	Forest Service Sensitive	Level of habitat disturbance	7th field watersheds that contain meadow features in the project area	Short-term = ≤ 8 years Long-term = >10 years
Hardwood-Associated Species	Management Indicator Species	Change in hardwood habitat abundance	Project area	Short-term = ≤ 8 years Long-term = >10 years
Snag-Associated Species	Management Indicator Species	Change in snag habitat abundance	Project area	Short-term = ≤ 8 years Long-term = >10 years
Survey and Manage Species	Survey and Manage Species	Habitat protection	Potential treatment units	Short-term = ≤ 8 years Long-term = >20 years

Affected Environment

Project Area A: Beaver Fire

Wildlife Biological Evaluation

Northern Spotted Owl

Risk to Reproduction

The Beaver analysis area contains 23 activity centers; seven of these activity centers are completely outside the fire perimeter or they are only affected on the far outside portions of their home ranges. The remaining 16 activity centers have varying levels of fire effects; nine activity centers were mostly burned through. Given the existing habitat in the activity centers analyzed in the Beaver analysis area, two activity centers have very low risk to reproduction. Six activity centers have low, eight activity centers have moderate, and seven activity centers have high risk to reproduction. Therefore, without any treatments, in the seven activity centers in the "high" category, a pair of owls occupying the area may have a difficult time finding enough resources to support themselves plus offspring.

Changes to Critical Habitat

The analysis estimates the number of critical habitat acres affected by each alternative. Northern Spotted Owl (NSO) use of fire affected areas for foraging is unclear in the literature for several possible reasons, but for this analysis, the pre-fire suitable habitat that burned at moderate and high fire severity is included. Suitable habitat that burned at very low and low fire severity still contains the physical attributes of suitable habitat thus this habitat is identified as suitable habitat. Given the types of treatment proposed for this Project, the treatments are likely to result in maintaining, degrading, downgrading or removing habitat. We focus the reporting of effects on downgrading and removing habitat. Habitat removal means the habitat prior to treatment will not function as spotted Owl habitat after treatment. NSO habitat is generally described as a hierarchy in habitat quality with nesting/roosting being the highest quality and foraging and dispersal following in order; habitat downgrading signifies the lowering of a habitat quality from one level to the next.

NSO critical habitat overlaps a large portion of the 2014 fires and consequently, a large number of critical habitat acres were burned at high severity. The loss of critical habitat is often coinciding with the loss of the better NSO habitat. Alternative 1 will not affect NSO critical habitat. The lack of treatment will retain all the remaining habitat and important legacy structures to aid in the development of NSO habitat by providing physical structure as the stand regenerates. Since NSO and their prey rely on these structures to fulfil their needs for survival and reproduction, the maintenance of large trees and large woody debris may increase the quality of future NSO habitat, if subsequent fires don't consume these features. However, the lack of treatment will not aid in reducing fuels that can increase the potential of these areas to naturally regenerate without interruptions of high severity fire.

The Beaver analysis area contains about 4,881 acres of critical habitat and about 229 acres of fire affected critical habitat within two critical habitat subunits (KLE6 and KLE7). The estimated amount of critical habitat for each habitat type is summarized in Table 3-18.

Table 3-18: Existing conditions for Northern Spotted Owl Critical Habitat for the Beaver fire area.

Critical Habitat Subunit	Critical Habitat area in Analysis Area (acres)	Northern Spotted Owl Critical Habitat			
		Nesting/roosting (acres)*	Foraging (acres)*	Dispersal (acres)*	Fire-Affected Critical Habitat (acres)
KLE6	7,429	1,577	1,402	1,401	229
KLE7	650	172	52	277	0

Bald Eagle

There is one nest site in this fire area. It is at the bottom of Dona Creek along the Klamath River.

Northern Goshawk

There are three potentially occupied Northern Goshawk territories in the Beaver fire area. The territories are the Beaver, Kohl and the Woodchopper nests. Woodchopper and Kohl territories have a high risk to reproduction and Beaver has a moderate risk to reproduction. The risks are a result of past events including the 2014 wildfire event.

Fisher, Marten, and Wolverine

Level of Habitat Connectivity

Past fires that created large openings in a given watershed are among the causes of the number of watershed with low or very low connectivity. The Beaver analysis area has seven watersheds with a moderate level of connectivity, five watersheds with a low and one with a very low level of habitat connectivity.

Change in Fisher Home Range

The Beaver analysis area contains 4 watersheds that may support a fisher home range. Nine of the watersheds have too many open areas (many of which were created by the 2014 fires) or do not have enough acres of denning/resting and foraging habitat to meet the criteria of a home range.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis

There are seventeen potential hibernacula/maternities in the Beaver Fire area.

Willow Flycatcher

There are eleven watersheds with potential willow flycatcher habitat in the Beaver fire area.

Siskiyou Mountain Salamander

The Siskiyou Mountains salamander is known to occur in the Happy Camp project area, but there are no detections of the species in the Beaver or Whites project areas.

Tehama Chaparral Snail

There are no known sites in the Beaver fire area. Generally, the known sites inside and outside the Project area are located on southerly aspects close to riparian areas. The area outside the riparian areas around the known sites is much drier and the riparian areas are likely important for this species. However, the general area that appears to fit the habitat description best burned mostly at low and moderate severity in the riparian area during

the 2014 fire. Given this species possible association with riparian habitat, the species may have pockets of remaining high quality habitat.

Western Bumble Bee

Level of Habitat Disturbance

The western bumble is likely to occur over much of the Forest. However, the species has only been incidentally observed on the Forest. The actual distribution of the bee on the Forest is not known. Although the species is not exclusively associated with meadows, there is a strong relationship with the habitat needs and meadows. Meadows can occur on the Forest at almost any elevation possible, but the majority of the meadows in the Project area occur above 4,000ft in elevation. The elevation range and the differences in aspect can provide bumble bees with a diversity of flowering plants. There are five watersheds that have potential Bumble Bee habitat (meadows) in this fire area.

Management Indicator Species

Snag Species Association

Changes in Snag Habitat Abundance

There is about 23,400 acres of snag species associated habitat in the Beaver fire area. Many of the cavity-nesting, snag-associated species that potentially occur in the Project area have interdependent and complex life cycles that rely specifically on this habitat type. The abundant selection of snags can provide primary cavity nesters the opportunity to construct several cavities that will in turn provide secondary cavity nesters more potential nest sites.

Hardwood Species Association

Changes in Hardwood Habitat Abundance

There is about 4,250 acres of hardwood species associated habitat in the Beaver fire area. This doesn't mean that these species will not enter a hardwood stand that burned with high severity effects to retrieve their food caches but the lack of canopy cover in these areas doesn't provide much escape cover to avoid predation. Plus, these species rely on the acorn mast as a food source; without live hardwoods, these species may need to move to other areas in search of food. However, some of the hardwoods do re-sprout after a fire and may produce a mast in about ten years. Hardwood re-sprouting is already evident in the Project area.

Survey and Manage

Habitat Protection

The Beaver project area prior to the 2014 fires contained a patchwork of conifer habitat, but due to previous fires, most of the older forest was greatly fragmented and connected by younger conifer forest, oak woodland, or chaparral. The 2014 fires resulted in the loss of many acres of various habitat types due to the loss of canopy cover, decaying large coarse woody debris, and leaf litter to provide micro-site conditions. These changes mean habitat conditions are less favorable for these species.

Habitat within pre-fire habitat that burned at very low and low severity may contain the micro-site conditions associated with the Survey and Manage species analyzed for this Project. However, the habitat affected by moderate and high severity may not provide the needed micro-site conditions for these species given the lack of canopy cover and

understory vegetation. Moderate and high severity fire kills most, if not all the trees and consumes most of the small vegetation resulting in little to no canopy cover. These changes in conditions can create a hot, dry condition that is not conducive habitat for mollusk or salamander species, these conditions may change as vegetation regenerates. Even if a site experiences moderate or high fire severity, it is difficult to confirm a site not occupied so we are assuming all known sites are occupied. Therefore, standards and guidelines are applied to all known sites.

Big Game

Forage and cover are important attributes of quality deer and elk habitat. These conditions have been removed on the short term in the areas that experienced high fire severity. The conditions have been degraded in areas with moderate fire severity, but resprouting of hardwoods and existing shrubs will recover quickly to provide cover and forage (2-5 years). If deer or elk are present in areas with high or moderate fire severity, they may use the areas along the periphery that still contain some vegetation cover.

Project Area B: Happy Camp Complex

Wildlife Biological Evaluation

Northern Spotted Owl

Risk to Reproduction

The Happy Camp analysis area contains 57 activity centers; eight of these activity centers are completely outside the fire perimeter or are only affected on the far outside portions of their home ranges. The remaining 49 activity centers have varying levels of fire effects. Given the existing habitat in the activity centers analyzed in the Happy Camp analysis area, 2 activity centers have very low, 11 activity centers have low, 39 activity centers have moderate, and 5 activity centers have high risk to reproduction. Therefore, without any treatments, the five activity centers in the “high” category, a pair of owls occupying the site will likely have a difficult time finding enough resources to support themselves plus any offspring.

Changes to Critical Habitat

The overall affected environment is described in the Beaver fire area section. The Happy Camp analysis area contains about 38,733 acres and about 9,273 acres of fire affected critical habitat within three critical habitat subunits (KLE6, KLE7, and KLW7). The estimated amount of critical habitat for each habitat type summarized in Table 3-19.

Table 3-19: The current acres of Northern Spotted Owl Critical Habitat for Happy Camp fire area.

Critical Habitat Subunit	Critical Habitat area in Analysis Area (acres)	Northern Spotted Owl Critical Habitat			
		Nesting/roosting (acres)*	Foraging (acres)*	Dispersal (acres)*	Fire-Affected Critical Habitat (acres)
KLE6	287	73	16	117	0
KLE7	39,962	7,606	6,864	6,480	8,434
KLW7	28,876	2,619	8,027	6,931	839

Bald Eagle

There are three Bald Eagle nests in this fire area. These are Fryingpan, Muck-a-Muck and Caroline Creek (named for the drainages in which they are located). They are all along the Klamath River. These nests have a low risk to future nest tree sites.

Northern Goshawk

There are nine potentially occupied territories in the Happy Camp fire area. These are the China, East Fork Elk, Elk, Kelsey, Kuntz, Middle, O'Neil, Stanza and Walker territories. China, Kelsey and Kuntz territories have a moderate risk to reproduction as a result of past events including the 2014 wildfires. The remaining potentially occupied territories have a high risk to reproduction.

Fisher, Marten, and Wolverine

Level of Habitat Connectivity

The Happy Camp analysis area contains 26 watersheds with moderate level of connectivity while the remaining 10 watersheds had a low level of connectivity.

Change in Fisher Home Range

The Happy Camp analysis area contains 18 out of the 36 watersheds that may support a fisher home range.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis

There are twenty-eight potential hibernacula/maternities in the Happy Camp fire area.

Willow Flycatcher

There are thirty-eight watersheds with potential willow flycatcher habitat in the Happy Camp fire area.

Siskiyou Mountain Salamander

The Siskiyou Mountains salamander has a narrow species range that generally covers the area from Applegate Valley to the Klamath River. The southern portion of the range overlaps with the Happy Camp project area. Depending on the species range map, the Happy Camp project area could overlap up to 25 percent of the species range.

There are 48 known sites within the project area and many of these sites occur in areas with smaller sized talus with dense conifer canopy cover that creates cool, moist conditions. Most of these sites have experienced high and moderate severity fire from the 2014 fires that removed all or most of the tree canopy cover. The lack of canopy will likely create conditions at the sites that are hotter and drier. The change in temperature and moisture will likely make conditions difficult for the salamanders to persist, but any vegetation and large woody debris may offset these conditions. These sites are likely still occupied.

Tehama Chaparral Snail

There are three known sites in the Project area which are all in the Happy Camp fire area. Generally, the known sites inside and outside the Project area are located on southerly aspects close to riparian areas. The area outside the riparian areas around the known sites is much drier and the riparian areas are likely important for this species. However, the general area that appears to fit the habitat description best burned mostly at low and moderate severity in the riparian area during the 2014 fire. Given this species possible

association with riparian habitat, the species may have pockets of remaining high quality habitat.

Western Bumble Bee

Level of Habitat Disturbance

The affected environment is the same as described in the Beaver fire area. There are twenty-six watersheds that have potential Bumble Bee habitat (meadows) in this fire area.

Management Indicator Species

Snag Species Association

Changes in Snag Habitat Abundance

There is about 146,700 acres of snag species associated habitat in the Happy Camp fire area. Many of the cavity-nesting, snag-associated species that potentially occur in the Project area have interdependent and complex life cycles that rely specifically on this habitat type. The abundant selection of snags can provide primary cavity nesters the opportunity to construct several cavities that will in turn provide secondary cavity nesters more potential nest sites.

Hardwood Species Association

Changes in Hardwood Habitat Abundance

There is about 4,070 acres of hardwood species associated habitat in the Happy Camp fire area. This doesn't mean that these species will not enter a hardwood stand that burned with high severity effects to retrieve their food caches but the lack of canopy cover in these areas doesn't provide much escape cover to avoid predation. Plus, these species rely on the acorn mast as a food source; without live hardwoods, these species may need to move to other areas in search of food. However, some of the hardwoods do re-sprout after a fire and may produce a mast in about ten years. Hardwood re-sprouting is already evident in the Project area.

Survey and Manage

Habitat Protection

The affected environment is similar to that described in the Beaver fire area. The difference is that the Happy Camp fire area contained larger patches of mid- to late-successional habitat mostly connected by young forest prior to the fire.

Big Game

The affected environment is the same as described in the Beaver fire area.

Project Area C: Whites Fire

Wildlife Biological Evaluation

Northern Spotted Owl

Risk to Reproduction

The Whites analysis area contains 15 activity centers; two of these activity centers are completely outside the fire perimeter or are only affected on the far outside portions of their home ranges. The remaining 13 activity centers have varying levels of fire effects. Given the existing habitat in the activity centers analyzed in the Whites analysis area, 11

activity centers have low and four activity centers have moderate risks to reproduction; there is no activity center with a very low or high level of risk to reproduction.

Changes to Critical Habitat

The overall affected environment is described in the Beaver fire area section. The Happy Camp analysis area contains about 20,518 acres of critical habitat and about 2,217 acres of fire affected critical habitat within one critical habitat subunits (KLW8). The estimated amount of critical habitat for each habitat type is summarized in Table 3-20.

Table 3-20: Current Northern Spotted Owl Critical Habitat acres for Whites fire area.

Critical Habitat Subunit	Critical Habitat area in Analysis Area (acres)	Northern Spotted Owl Critical Habitat			
		Nesting/roosting (acres)*	Foraging (acres)*	Dispersal (acres)*	Fire-Affected Critical Habitat (acres)
KLW8	30,148	6,703	7,393	6,422	2,217

Bald Eagle

There are no known Bald Eagle nest sites in the Whites fire area.

Northern Goshawk

There are three Northern Goshawk potentially occupied territories in the Whites fire area. These are the Hickory, Sixmile and West Whites territories. Hickory has a high risk to reproduction. Sixmile and West Whites have moderate risk to reproduction. The risk levels are a result of past events including the 2014 wildfires.

Fisher, Marten, and Wolverine

Level of Habitat Connectivity

The Happy Camp analysis area contains 6 watersheds with moderate level of connectivity. There are eight and four watersheds with low and very low connectivity respectively.

Change in Fisher Home Range

The Whites analysis area contains 14 out of 21 watersheds that may contain a fisher home range.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis

There are thirteen potential hibernacula/maternity in the Whites fire area.

Willow Flycatcher

Level of Habitat Alteration

There are eighteen watersheds with potential willow flycatcher habitat in the Whites fire area.

Siskiyou Mountain Salamander

The Happy Camp fire area is within the range of the Siskiyou Mountain Salamander, but the Beaver and Whites fire areas are outside the known range of this species.

Tehama Chaparral Snail

There are no known sites in the Whites fire area. Generally, the known sites inside and outside the Project area are located on southerly aspects close to riparian areas. The area outside the riparian areas around the known sites is much drier and the riparian areas are likely important for this species. However, the general area that appears to fit the habitat description best burned mostly at low and moderate severity in the riparian area during the 2014 fire. Given this species possible association with riparian habitat, the species may have pockets of remaining high quality habitat.

Western Bumble Bee

Level of Habitat Disturbance

The general affected environment is the same as described in the Beaver fire area. There are eleven watersheds that have potential Bumble Bee habitat (meadows) in this fire area.

Management Indicator Species

Snag Species Association

Changes in Snag Habitat Abundance

There is about 49,200 acres of snag species associated habitat in the Whites fire area. Many of the cavity-nesting, snag-associated species that potentially occur in the Project area have interdependent and complex life cycles that rely specifically on this habitat type. The abundant selection of snags can provide primary cavity nesters the opportunity to construct several cavities that will in turn provide secondary cavity nesters more potential nest sites.

Hardwood Species Association

Changes in Hardwood Habitat Abundance

There is about 700 acres of hardwood species associated habitat in the Whites fire area. This doesn't mean that these species will not enter a hardwood stand that burned with high severity effects to retrieve their food caches but the lack of canopy cover in these areas doesn't provide much escape cover to avoid predation. Plus, these species rely on the acorn mast as a food source; without live hardwoods, these species may need to move to other areas in search of food. However, some of the hardwoods do re-sprout after a fire and may produce a mast in about ten years. Hardwood re-sprouting is already evident in the Project area.

Survey and Manage

Habitat Protection

The affected environment is the same as described in the Happy Camp fire area.

Big Game

The affected environment is the same as described in the Beaver fire area.

Environmental Consequences

Alternative 1

Project Area A: Beaver Fire

Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

Alternative 1 will not directly affect this indicator because there are no treatments to remove or degrade any northern spotted owl habitat. Almost all the activity centers analyzed in this Project will continue to accumulate fuels resulting from the burned trees falling over. Regeneration of habitat will likely take more than 100 years to develop into high quality northern spotted owl habitat as long as high severity fire doesn't interrupt forest development. A delay in habitat development is especially difficult for the activity centers that were heavily affected by the 2014 fires. The loss of suitable habitat can affect Northern Spotted Owl reproduction.

Most of the activity centers in the Beaver analysis area were affected by the 2014 fires. The two activity centers that have a very low risk to reproduction are just outside the fire area but are within the Project area. There are six activity centers with a low risk to reproduction, eight with moderate and 7 with high risk to reproduction. Without treatment, the remaining owl pairs may stay at the current location or move to a new location where the habitat may be more conducive to fulfilling their needs.

Changes to Critical Habitat

Critical habitat for the northern spotted owl overlaps a large portion of the 2014 fires; a large number of critical habitat acres were burned at high severity. Critical habitat units typically contain high quality habitat or sites that are capable of producing high quality habitat therefore the loss of critical habitat often coincides with the loss of the better owl habitat. Alternative 1 will not affect northern spotted owl critical habitat. The lack of treatment will retain all the remaining habitat and important legacy structures to aid in the development of owl habitat by providing physical structure as the stand regenerates. Since northern spotted owls and their prey rely on these structures to fulfill their needs for survival and reproduction, the maintenance of large trees and large woody debris will increase the quality of future owl habitat.

Cumulative Effects

Risk to Reproduction

The Beaver analysis area is a checkerboard distribution of land ownership primarily between the Forest and private forest companies. Given the fire effects to both ownerships, private land has many acres of fire-affected habitat that are likely to be removed or have already been removed. Although private land is not held to the same rules as the Forest, we are assuming the salvage harvest on private land is limited to moderate and high fire severity affected areas. Deviations from this assumption could affect the magnitude of effects for activity centers within the Beaver analysis area given the proportion and distribution of private land ownership. Despite these uncertainties, one activity center is identified with an increased risk to reproduction as a result of the cumulative effects; cumulative effects are the result of adding the direct and indirect effects of Alternative 1 to effects of other actions on private and public lands. The activity center activity center went from low risk to moderate risk level.

Changes to Critical Habitat

The cumulative effects of Alternative 1 in Beaver analysis area will result in no change in the amount of critical habitat affected. Since there is no direct or indirect effect to critical habitat there are no cumulative effects. Critical habitat doesn't occur on private land.

Bald Eagle

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

There will be no disturbance to nest sites as a result of Alternative 1. Any nesting eagles will likely nest without any disturbance created by helicopters or other equipment that would be used to implement this Project.

Risk to Future Potential Nest Trees

The eagle nests that may be affected by this Project will likely continue to provide nesting opportunity without treatment. The current nesting tree will likely continue to stand, but other possible nesting trees that are available near the current nest site will not be affected. In the long-term, the nest tree may still be standing, but other possible nest trees will be available as they occur on the landscape.

Cumulative Effects

Level of Disturbance to Nest Sites

There are no direct or indirect effects to this indicator so there are no cumulative effects.

Risk to Future Potential Nest Trees

The only action considered for cumulative effects that affect the Dona nest site is Timber Harvest Plan number 87. This Project will occur in about 10 acres where there are potential nest trees. This will not decrease the current risk to future potential nest trees when added to the effects of this alternative.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The Alternative 1 will not disturb any of the goshawk territories. Any active nests in the Project will not be disturbed by heavy equipment and increased road activity. In the long-term, the lack of disturbance is expected to continue without action.

Risk to Reproduction

The risk to reproduction will be the same as described in the affected environment. Without treatment, the high risk territories will continue to struggle to support reproduction. Over the long-term, the high risk nests will remain in poor condition until habitat can regenerate which may take several decades, but this is dependent on several factors including fire. Moderate risk territories will likely be occupied, but conditions will make reproduction more difficult when compared to low risk level sites. Low risk level sites have habitat levels that are conducive to reproduction and the lack of treatment will retain the existing habitat.

Cumulative Effects

Level of Disturbance to Nest Sites

There are no direct or indirect disturbance to Northern Goshawks so there is no cumulative effect.

Risk to Reproduction

The actions that have the potential for cumulative effects for Northern Goshawks is private land salvage for Beaver fire area. The salvage downgrades some habitat in the Woodchopper and Kohl territories. These territories already have a high risk to reproduction so the risk is not increased by the effects of cumulative actions.

Woodchopper and Kohl will likely have more difficulty supporting reproduction as a result of the cumulative effects even though the risk level didn't change.

Fisher, Marten, and Wolverine

Direct Effects and Indirect Effects

Level of Habitat Connectivity

The Project area had a large proportion of habitat affected by moderate and high fire severity during the 2014 fires which created conditions that are less desirable for fisher, marten, and wolverine connectivity. These species are closely associated with forested habitat that has a high proportion of overhead cover. Moderate and high fire severity removes most, if not all, vegetation in the understory and kills most of the overstory thus leaving mostly standing dead trees and possibly stems of dead shrubs. The time between the fire and regeneration of the vegetation may take as little as one growing season to provide some cover for fisher and marten, but early seral vegetation may not provide sufficient cover until the shrubs or trees grow to about 4feet in height. The time needed for the vegetation to reach this height is typically dependent on several factors like site conditions, but generally, the Project area is capable of regenerating vegetation quickly.

In the short-term, fisher, marten, and wolverine (to a much lesser degree) may have some challenges moving through the watersheds largely affected by moderate and high fire severity, but the actual level of connectivity is more related to the connectivity level prior to the fire and the amount and distribution of the remaining denning/resting and foraging habitat. Watersheds with existing denning/resting and foraging habitat are more likely to provide opportunities for these species to find food, water, and resting opportunities with adequate cover during their travels through the watershed as compared to watersheds that currently contain a small amount of habitat that may or may not be a result of the 2014 fires.

The Beaver analysis area currently contains seven watersheds with a moderate level of connectivity, five with a low and one with a very low level of connectivity. The lack of treatment in this alternative will result in these watershed regenerating without the interruption of treatment and many, if not all, of the treatment units will grow herbaceous and shrub vegetation quickly. In the short-term, watersheds with low and very low habitat connectivity will likely create conditions where an individual may have challenges moving through a watershed while the watersheds with a moderate level of connectivity will likely still provide these species to move through the watershed. In the long-term, tall shrubs and possibly small trees that regenerate in fire affected areas may be large enough to provide sufficient cover for marten, fisher, or to a lesser degree, wolverine thus increasing connectivity.

Change in Fisher Home Range

Although tall shrubs and woody debris likely provide structure for fisher and marten to move across openings, one of the most important factors for fisher and marten home ranges is sufficient denning/resting and foraging habitat. Denning/resting and foraging habitat affected by the 2014 fires will take many years to regenerate; any additional assistance to accelerate the regeneration process is likely to help. In the short-term, protection of existing denning/resting habitat from future high severity fire is important to conserve viable home ranges. Alternative 1 will not reduce the risk of high severity fire. Fuels created by the 2014 fires will continue to accumulate and will create conditions that increase the likelihood of future high severity fire (see the fire and fuels resource report

for more detailed information). This accumulation of fuels will threaten denning/resting and foraging habitat that may increase fragmentation of home ranges. Alternative 1 will allow the forest to regenerate and if high severity fire doesn't interrupt the regeneration, denning/resting habitat may regenerate in about 100 years. Nine of the thirteen watersheds in the Project area do not meet the home range potential criteria. The watersheds that are not meeting the home range potential criteria are Buckhorn Creek, Buckhorn Gulch, Doggett Creek, Dona Creek, Dutch Creek, Kohl Creek, Lumgrey Creek, Miller Gulch, and Quigleys Creek.

Cumulative Effects

Level of Habitat Connectivity

The Beaver analysis area is a checkerboard distribution of land ownership primarily between the Forest and private forest companies. Given the fire effects to both ownerships, private land has many acres of fire-affected forested habitat that are likely to be removed or have already been removed. Although private land is not held to the same rules as the Forest, we are assuming the salvage harvest on private land is limited to moderate and high fire severity affected areas. Deviations from this assumption could affect the magnitude of effects on connectivity in the analysis area given the proportion and distribution of private land ownership.

The cumulative effects reduced the habitat connectivity in 9 of the 13 watersheds analyzed in the Beaver analysis area. Two "moderate" level watersheds were reduced in connectivity to a "very low" level and two other "moderate" level watersheds were reduced in connectivity to a "low" level. Five watersheds went from "low" to "very low" habitat connectivity.

Change in Fisher Home Range

The cumulative actions considered in the fire area (private land salvage and timber harvest plans) decreased habitat enough in one watershed (Jaynes Canyon) to keep it from not meeting the home range potential criteria. The addition of Jaynes Canyon results in a total of ten watersheds that do not meet the home range potential criteria.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis

Direct Effects and Indirect Effects

Any roost sites that retained the micro-climate condition necessary to support a hibernaculum or maternity colony will continue to provide those services. For Alternative 1, the lack of action will not affect bats. The rate of forest regeneration will be slow without treatment but bats will be able to continue to use the abundant source of snags. The lack of disturbance created by treatment will maintain any hibernacula or maternity sites. Therefore, for this analysis indicator, there is no effect on disturbance to bats.

Cumulative Effects

There are no direct or indirect effects resulting from Alternative 1, thus no cumulative effects.

Willow Flycatcher

Direct Effects and Indirect Effects

Level of Habitat Alteration

Willow flycatchers are dependent on live riparian vegetation; the loss of this vegetation is likely to affect the number of possible areas for nesting. Alternative 1 will not change the

current condition of the habitat. The remaining areas of habitat will continue to provide nesting opportunity to flycatchers. Burned forest is not likely to be beneficial to flycatchers so the retention of these snags will likely not affect this species. In the long-term, the habitat will regenerate and possibly produce willow or alder patches for flycatchers. For this analysis indicator, the lack of action will have no effect on habitat alteration from the current condition.

Cumulative Effects

Level of Habitat Alteration

There are no direct or indirect effects resulting from Alternative 1, thus no cumulative effects.

Siskiyou Mountains Salamander

Direct Effects and Indirect Effects

Alternative 1 will not change the existing cool, moist talus habitat typically created by dense conifer canopy on northerly slopes associated with Siskiyou Mountains salamander. Habitat burned by the 2014 fires at moderate to high severity is likely to have little to no canopy cover; the small amount of canopy cover left after the fires will be retained in this alternative. In addition, the small spaces between pieces of talus needed by the salamander to move deeper or shallower in the talus profile to reach desired temperature and moisture will not be disturbed by activities that may compact the talus. For this analysis indicator, there is no effect on risk of habitat disturbance.

Cumulative Effects

There are no direct or indirect effects resulting from Alternative 1, thus there are no cumulative effects.

Tehama Chaparral Snail

Direct Effects and Indirect Effects

Alternative 1 will not affect any talus in conifer and hardwood mixed habitat near riparian reserves in Project area. There are likely to be some patches of habitat where canopy cover and micro-site conditions will provide for the needs of several individuals remaining after the 2014 fires. The pre-fire woody debris which is likely to be supplemented by the abundant post-fire dead trees will provide small areas of possible refugia for dispersing snails. The lack of habitat disturbance will allow remaining habitat to provide habitat. For this analysis indicator, there is no effect on snails dispersing.

Cumulative Effects

There are no direct or indirect effects resulting from Alternative 1, thus no cumulative effects.

Western Bumble Bee

Direct Effects and Indirect Effects

Alternative 1 will not affect bumble bee habitat, most of which is in meadows that provide nesting and foraging opportunity for bees. According the vegetation burn severity data, most of the 4,000 acres of meadows in the Project area burned at low severity in the 2014 fires; therefore, it is likely that many of the meadows still contain vegetation which can provide basic structure for a bumble bee nest site and will produce flowering plants this spring. Retaining snags outside meadows will not affect the ability of bumble bees to

survive or reproduce. For this analysis indicator, there is no effect on bumble bee nest disturbance.

Cumulative Effects

There are no direct or indirect effects resulting from Alternative 1, thus no cumulative effects.

Management Indicator Species

Snag Species Association

Direct Effects and Indirect Effects

In this alternative, there will be no removal of trees, road construction, or any other activities associated with the Project. Potential negative effects of no action would be high fuel loads and risk of future high severity fire adjacent to remaining forest habitat or within regenerating habitat. Positive effects would include the total retention of snags which are important habitat features within remaining late seral closed canopy coniferous habitat.

Snag-associated species have abundant source and variety of snags. Black-backed woodpeckers, if present, would have the maximum available habitat produced by the high intensity fire. Other snag-associated species like the Vaux's swift and downy woodpecker would have a possible increase in more open stands of snags or creation of new snag habitat. Secondary cavity nesters, however, may have a reduction in older, decaying snags with cavities as those tend to burn up in the fires but, in the long-term, these species will likely have an abundant source of previously excavated snags.

Cumulative Effects

Other projects in the analysis area are expected to affect habitat to the point that it may not function as snag-associated habitat. Overall, about 2,786 acres of the 105,410 acres of snag habitat in the analysis area will be affected by actions considered for cumulative effects (appendix C of the final EIS). These acres represent the footprint of habitat for snag-associated species because habitat for some species overlaps. Affected acres represent about 2 percent of the habitat within the analysis area.

Hardwood Species Association

Direct Effects and Indirect Effects

Changes in Hardwood Habitat Abundance

Alternative 1 does not have any direct effects on hardwood-associated species. Hardwood stands burned with moderate or high severity effects in the 2014 fires are not likely to meet the needs of these species because they are completely or partly dependent on hardwood mast as a food source. Without a food source, the species are likely to leave this fire-affected habitat to occupy areas with live trees. In the long-term, some of the hardwoods will re-sprout and provide future habitat for these species assuming wildfire doesn't return in the near future. An indirect effect of Alternative 1 comes from the large fuel loads within or adjacent to the hardwood stands that are likely to contribute to another wildfire occurring that will prevent these stands from developing into a hardwood forest.

Cumulative Effects

For hardwood associated species, the effects of other actions in the analysis area will result in removing about 327 acres of the habitat in the Project area. Therefore, the

cumulative effects of adding the non-quantified indirect effects of this alternative to the 590 acres of hardwood habitat that will be removed in other actions will result in less habitat available in the future for hardwood-associated species.

Survey and Manage

Direct Effects and Indirect Effects

Habitat Protection

Alternative 1 will not have any direct effects on survey and manage species. The lack of treatment will not affect important habitat components such as current canopy cover, coarse woody debris, or leaf litter/duff. In the short term, the snags and limited down wood in high fire severity affected habitat will continue to provide hot, dry conditions for these species. In the moderate fire severity affected habitat, the small amount of canopy cover will likely decrease in the short-term with delayed tree mortality, thus creating even hotter and drier conditions that may be similar to the high severity fire affected habitat.

In the long term, the abundant source of snags will provide a source of woody debris (an important habitat component for the species, especially for the blue-gray tail dropper) for many years. Large woody debris in conjunction with regenerating trees may provide micro-site conditions for these species in the long term (20 years) but the regeneration of habitat will take much more time (beyond the long-term time span for this analysis).

Cumulative Effects

The only cumulative actions within the analysis bounds are Forest projects. These projects all have project design features to avoid effects to known sites for survey and manage species so there are no cumulative effects from Alternative 1 to known sites.

Migratory Bird

Direct Effects and Indirect Effects

This alternative will have no direct or indirect effect on the compliance with the Memorandum of Understanding between the USDA Forest Service and USDI Fish and Wildlife Service. Migratory birds affected by the 2014 fires will continue to be threatened by the possible re-occurring wildfires that may affect unburned habitat. Bird species associated with snags and early seral habitat will have abundant habitat and predicted future wildfires will add to this already abundant habitat.

Cumulative Effects

This alternative will have no direct or indirect effect on complying with the Memorandum of Understanding, thus no cumulative effects.

Big Game

Direct Effects and Indirect Effects

Forage will recover quickly in most areas due to shrub and hardwood re-sprouting and the recolonization of grasses in areas that now have an open canopy as a result of tree mortality. Cover and thermal refugia, however, will take longer to recovery. This is especially true in areas that experienced high and moderate fire severity. The increase in forage opportunities will be limited by the availability of adjacent cover. The no action alternative will not affect the understory browse and cover species for deer and elk.

Cumulative Effects

The private land salvage in the Beaver fire area will limit the availability of both cover and foraging on more than 9,900 of the fire area. The private land salvage is focused on reforestation for timber production so efforts will likely be made to discourage shrub and hardwood resprouting which would provide both forage and cover. When added to the effects of Alternative 1 the recovery of understory browse and cover species will be primarily limited to Forest Service lands in the Beaver fire area.

Project Area B: Happy Camp Complex

Wildlife Biological Evaluation

Northern Spotted Owl

Direct Effects and Indirect Effects

Risk to Reproduction

The overall direct and indirect effects of no action in the Happy Camp analysis area are the same as those described in the Beaver section above. There are two activity centers that have a very low risk to reproduction because they were not in the fire perimeter. There are fourteen, thirty-seven and four activity centers that have low, moderate or high risk to reproduction as a result of the 2014 wildfires.

Changes to Critical Habitat

The overall direct and indirect effects are the same as those described in the Beaver section above. There will be no change in acres of suitable habitat or fire affected habitat in any activity centers as a result of Alternative 1.

Cumulative Effects

Risk to Reproduction

The cumulative effects of Alternative 1 in the Happy Camp analysis area will result in no change in the activity center's level of reproduction risk because adding the effects of this alternative to the effects of other projects in the analysis area and within the relevant temporal boundaries will not change the level of reproduction risk.

Changes to Critical Habitat

The cumulative effects of Alternative 1 in the Happy Camp analysis area will result in about 225 acres of nesting/roosting and foraging habitat being downgraded to dispersal habitat in KLE7. There are no changes in the other two critical habitat subunits.

Bald Eagle

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

There will be no disturbance to nest sites as a result of Alternative 1.

Risk to Future Potential Nest Trees

The effects are the same as described in the Beaver fire area.

Cumulative Effects

Level of Disturbance to Nest Sites

There are no direct or indirect effects to this indicator so there are no cumulative effects.

Risk to Future Potential Nest Trees

Thom Seider and Happy Camp Fire Protection Phase 2 project intersect the Caroline nest site and the Fryingpan nest site respectively. These projects have project design features

that will limit the removal of potential nest trees. The effects of these actions are small and will not add to the risk to potential nest tree sites.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

Alternative 1 will not disturb any of the goshawk nests. Any active nests in the project will not be disturbed by heavy equipment. In the long-term, the lack of disturbance is expected to continue without action.

Risk to Reproduction

Without treatment, the high risk nests will continue to struggle to support reproduction. Over the long-term, the high risk nests will remain in poor condition and will not provide habitat. The risk to reproduction is the same as described in the affected environment.

Cumulative Effects

Level of Disturbance to Nest Sites

There are no direct or indirect disturbance to Northern Goshawks so there is no cumulative effect.

Risk to Reproduction

The Lovers Canyon project will increase the risk of the Kelsey territory from a moderate risk to a high risk. This is likely an overestimate of effects but since the Lovers Canyon project is still in early stages of planning the worst case (habitat removal) was assumed in this analysis. All other territories will remain at their current risk levels as described in the affected environment.

Fisher, Marten, and Wolverine

Direct Effects and Indirect Effects

Level of Habitat Connectivity

The direct and indirect effects of no treatment in the Happy Camp analysis area are similar to the Beaver analysis area except the Happy Camp analysis area has a different number of watersheds and distribution of habitat connectivity for each watershed.

Happy Camp contains 26 moderate and 10 low level of habitat connectivity for a total of 36 watersheds.

Change in Fisher Home Range

The direct and indirect effects for Happy Camp are the same as those described in the Beaver section above. There are 18 watersheds that do not meet the home range criteria.

The watersheds that do not meet the home range potential criteria are Bear Creek, Big Ferry Swanson, Bishop Creek, China Creek, Deep Creek, Doolittle Creek, Headwaters Elk Creek, Lower East Fork Elk Creek, Lower Grider Creek, McCarthy Creek, Middle Creek, Middle Elk Creek, North Fork Kelsey Creek, Rancheria Creek, Tom Martin Creek, Tompkins Creek, Upper Grider Creek, and Walker Creek.

Cumulative Effects

Level of Habitat Connectivity

The cumulative effects of Alternative 1 in this analysis area will result in the level of habitat connectivity for one watershed (Big Ferry –Swanson) to decrease from “low” to

"very low" habitat connectivity. This reduction in habitat connectivity in Big Ferry-Swanson is primarily a result of proposed treatment and potential salvage on private land.

Change in Fisher Home Range

Thom Seider and Elk Thin projects move Upper East Fork Elk Creek and Upper Elk Creek from meeting the home range potential criteria to not meeting the criteria. Private land salvage and Timber Harvest Plans move Franklin Gulch, Horse Creek, and Schutts Gulch from meeting the home range potential criteria to not meeting it when combined with the affected environment and the effects of Alternative 1.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Direct Effects and Indirect Effects
Risk of Disturbance

The effects are the same as for the Beaver fire area.

Cumulative Effects
Risk of Disturbance

The effects are the same as for the Beaver fire area.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects are the same as for the Beaver fire area.

Cumulative Effects
Level of Habitat Alteration

The effects are the same as for the Beaver fire area.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The effects are the same as for the Beaver fire area.

Cumulative Effects
Risk of Habitat Disturbance

The effects are the same as for the Beaver fire area.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects are the same as for the Beaver fire area.

Cumulative Effects
Likelihood of Dispersal

The effects are the same as for the Beaver fire area.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for the Beaver fire area.

Cumulative Effects
Level of Habitat Disturbance

The effects are the same as for the Beaver fire area.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The effects are the same as for the Beaver fire area.

Cumulative Effects
Changes in Snag Habitat Abundance

The effects are the same as for the Beaver fire area.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

The effects are the same as for the Beaver fire area.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The effects are the same as for the Beaver fire area.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

The effects are the same as for the Beaver fire area.

Cumulative Effects

The effects are the same as for the Beaver fire area.

Migratory Bird
Direct Effects and Indirect Effects

The effects are the same as for the Beaver fire area.

Cumulative Effects

The effects are the same as for the Beaver fire area.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for the Beaver fire.

Cumulative Effects

The private land Timber Harvest Plans and small amount of private land salvage is focused on timber production so re-sprouting shrubs and hardwoods are discouraged in these areas. Forest Service projects will have a limited effect on big game species because they are mainly fuels reduction and thinning from below actions. There is only 700 acres of private Timber Harvest Plans and private land salvage in the Happy Camp fire area so the effects to browse and cover recovery will be localized and small.

Project Area C: Whites Fire

Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

The overall direct and indirect effects of no action in the Whites analysis area are the same as those described in the Beaver section above. There are 11 activity centers with low risk to reproduction and four with moderate risk.

Changes to Critical Habitat

The direct and indirect effects of no action in the Whites analysis area are the same as those described in the Beaver section above.

Cumulative Effects

Risk to Reproduction

The cumulative effects of Alternative 1 in the Whites analysis area will result in no change in the activity center's level of reproduction risk because adding the effects of this alternative to the effects of other projects in the analysis area and within the relevant temporal boundaries will not change the level of reproduction risk.

Changes to Critical Habitat

The cumulative effects of Alternative 1 in the Whites analysis area will result in about 214 acres of nesting/roosting and foraging habitat being downgraded to dispersal habitat in the KLW8 critical habitat subunit.

Bald Eagle
Direct Effects/Indirect and Cumulative Effects

There are no known eagle nest sites in the Whites project area so there are no effects to bald eagles from this alternative.

Northern Goshawk
Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

Alternative 1 will not disturb any of the goshawk nests. Any active nests in the Project will not be disturbed by heavy equipment. In the long-term, the lack of disturbance is expected to continue without action.

Risk to Reproduction

The risk to reproduction will be the same as described in the affected environment. Without treatment, the high risk nests will continue to struggle to support reproduction. Over the long-term, the highly fire affected habitat will remain in poor condition and habitat will require many years to regenerate.

Cumulative Effects
Level of Disturbance to Nest Sites

There are no direct or indirect disturbance to Northern Goshawks so there is no cumulative effect.

Risk to Reproduction

The Eddy Late Successional Reserve project overlaps with the Six Mile territory. However, project design limits the effects to Northern Goshawk habitat and there is no change in the risk to reproduction as a result of the cumulative effect of the Eddy Late Successional Reserve project. All of the other territories have no cumulative effects to be added to the direct and indirect effects of the alternative.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

Overall, the effects in the Whites analysis area is the same as those described in the Happy Camp section. However, the White analysis area contains four watersheds with very low habitat connectivity, eight with low connectivity and six with moderate connectivity.

Change in Fisher Home Range

Overall, the Whites analysis has the same effects described in the Beaver section above. There are four of the eighteen watersheds that do not meet the home range potential criteria.

The watersheds not meeting the home range potential criteria are Music Creek, Specimen Creek, Sugar Creek, and Upper French Creek.

Cumulative Effects
Level of Habitat Connectivity

The cumulative effects of Alternative 1 in this analysis area will result in the same level of habitat connectivity for two watersheds (Jessups Gulch and Music Creek) to increase from “moderate” to “low” habitat connectivity. This reduction in habitat connectivity in the Jessups Gulch watershed is primarily a result of proposed treatment in the Jess, Glassups, and Sawyers Bar Fuels Reduction projects. Music Creek watershed reduction in habitat connectivity is primarily a result of treatment and potential salvage occurring on private land.

Change in Fisher Home Range

The Jess project reduced the habitat enough to move Jessups Gulch from meeting the home range potential criteria to not meeting the criteria. Eddy Late Successional Reserve and Sawyers Bar Underburn move Robinson Gulch and Lower North Russian Creek from meeting the home range potential criteria to not meeting the criteria. When the effects of the these projects, which move Jessups Gulch, Robinson Gulch and Lower North Russian Creek from meeting the home range potential criteria to not meeting the criteria, are added to the effects of Alternative 1, the cumulative effects are to not meet the home range potential criteria.

Pallid Bat, Townsend’s Big-eared Bat, and Fringed myotis
Direct Effects and Indirect Effects
Risk of Disturbance

The effects are the same as for the Beaver fire area.

Cumulative Effects
Risk of Disturbance

The effects are the same as for the Beaver fire area.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects are the same as for the Beaver fire area.

Cumulative Effects
Level of Habitat Alteration

The effects are the same as for the Beaver fire area.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The effects are the same as for the Beaver fire area.

Cumulative Effects
Risk of Habitat Disturbance

The effects are the same as for the Beaver fire area.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects are the same as for the Beaver fire area.

Cumulative Effects
Likelihood of Dispersal

The effects are the same as for the Beaver fire area.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for the Beaver fire area.

Cumulative Effects
Level of Habitat Disturbance

The effects are the same as for the Beaver fire area.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The effects are the same as for the Beaver fire area.

Cumulative Effects
Changes in Snag Habitat Abundance

The effects are the same as for the Beaver fire area.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

The effects are the same as for the Beaver fire area.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The effects are the same as for the Beaver fire area.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

The effects are the same as for the Beaver fire area.

Cumulative Effects

The effects are the same as for the Beaver fire area.

Migratory Bird
Direct Effects and Indirect Effects

The effects are the same as for the Beaver fire area.

Cumulative Effects

The effects are the same as for the Beaver fire area.

Big Game
Direct Effects and Indirect Effects

The effects are the same as described in the Beaver fire area.

Cumulative Effects

The primary action considered for cumulative effects within the fire area that may affect big game habitat is the Eddy Late Successional Reserve. The other projects considered for cumulative effects have a very small footprint in the fire area. The Eddy Late Successional Reserve project is intended to promote, protect and connect old growth habitat which includes openings, brush component and multi-layered understory. These are compatible with browse and cover species big game use. The areas in the Eddy Late Successional Reserve project treatment units will provide browse and cover conditions.

Alternative 2

Project Area A: Beaver Fire
Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

The number of activity centers within each risk level did not change as a result of the proposed activities in Alternative 2. This alternative has the greatest level of effect on habitat when compared to the other action alternatives. About half of the treatment in the Beaver area will degrade habitat or occur within areas that didn't contain habitat before the 2014 fires. The other half of the treatment will downgrade habitat; the effects are distributed over a large area, primarily because of the distribution of land ownership in the Beaver analysis area. Therefore, the distribution of effects resulted in spreading out the effects across several activity centers but the effects are not large enough to change the level of risk to reproduction for any of the activity centers. Therefore, the level of risk for the activity centers in Beaver are the same level of risk as described before treatment even though treatment in this alternative did affect habitat.

Changes to Critical Habitat

The Beaver project area contains small portion of Northern Spotted Owl critical habitat subunit KLE6 but the analysis area for Beaver includes a small portion of KLE7, but this portion of KLE7 doesn't contain proposed activities. Therefore, this alternative affects about 87 acres of critical habitat and about 152 acres of fire affected critical habitat.

Cumulative Effects
Risk to Reproduction

The direct and indirect effects of Alternative 2 plus the effects resulting from other actions (including private land salvage and private timber harvest plans) within the

analysis area change the risk level for two activity centers (0283 and 4143). One activity center (4143) went from low to moderate risk level, primarily as a result of the effects resulting from other projects. The second activity center (0283) went from moderate to high risk level primarily as a result of the proposed activities of this alternative.

The high risk category is intended to identify activity centers that are likely to have difficulty supporting reproduction based on the amount of habitat. Activity centers with a high level of risk will continue to have a high level risk to reproduction regardless of treatment but any additional effects to these high risk level activity centers will likely further reduce these activity centers ability to support reproduction.

Changes to Critical Habitat

For this analysis indicator, the cumulative effects of adding the effects of Alternative 2 to those of other projects (including private land salvage and private timber harvest plans) will result in additional acres of critical habitat being removed. The direct and indirect effect of this alternative (about 63 acres of nesting/roosting and foraging) plus the effect of actions from other projects will remove the same number of acres of critical habitat (nesting/roosting, foraging, and dispersal) and about 152 acres of fire affected critical habitat.

Bald Eagle

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The level of disturbance to the Dona nest site is mitigated by a limited operating period and will be low.

Risk to Future Potential Nest Trees

The risk to future potential nest trees will remain low for the Dona Creek nest site when the effects of the alternative are added to the existing condition.

Cumulative Effects

Level of Disturbance to Nest Sites

The only action considered for cumulative effects that affect the Dona nest site is Timber Harvest Plan number 87. The proposed activities will follow the limited operating period design feature. The design feature is intended to limit disturbance to active Bald Eagle nests during the nesting period. Even though a private timber company is not subject to the Forest's limited operating period, it is highly likely that the private timber company will minimize disturbance to this eagle nest. There will be no cumulative effect to the Dona nest as a result of cumulative effects.

Risk to Future Potential Nest Trees

The only action considered for cumulative effects that affect the Dona nest site is Timber Harvest Plan number 87. This project will occur in about 10 acres where there are potential nest trees. This will not decrease the current risk to future potential nest trees when added to the effects of this alternative.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

A project design feature will be used to avoid disturbance of these nests through the sensitive part of nesting. Therefore, this alternative will have a low risk of disturbing known goshawk nests.

Risk to Reproduction

All three of the potentially occupied territories have activities proposed in them in this alternative. The risk to reproduction is not increased for any of the potentially occupied territories by this alternative. Beaver will remain at a moderate risk and Kohl and Woodchopper will remain at a high risk.

Cumulative Effects
Level of Disturbance to Nest Sites

Since there is no direct or indirect disturbance to nest sites there is no cumulative effects.

Risk to Reproduction

Actions considered for cumulative effects for the Beaver fire area are private land salvage and timber harvest plans. When the effects of the alternative are added to the effects from actions considered for cumulative effects there is no change in risk levels for any of the three territories.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

Alternative 2 will reduce habitat connectivity in 5 watersheds. Three watersheds (Buckhorn Creek, Dona Creek-Klamath River, and Dutch Creek) went from “moderate” to “low” habitat connectivity while the remaining 2 watersheds (Buckhorn Gulch-Beaver Creek and Doggett Creek) went from “low” to “very low” habitat connectivity. The combination of pre-fire habitat conditions and the 2014 fires (to varying degrees for each watershed) resulted in almost half of the watershed to currently have “low” or “very low” habitat connectivity. The two watersheds with moderate level of habitat connectivity were near the level of “low” habitat connectivity so even small amount of treatment was likely to push these two watersheds into the “low” level. Even though Alternative 2 resulted in 5 watersheds to have a reduced level of connectivity, the 2 watersheds with “moderate” connectivity had a small amount of affected habitat compared to the other 3 watersheds that were reduced in the level of habitat connectivity from “low” to “very low”.

Change in Fisher Home Range

The number of watersheds not meeting the home range criteria is the same as described in Alternative 1.

Cumulative Effects
Level of Habitat Connectivity

The Beaver analysis area is a checkerboard distribution of land ownership primarily between the Forest and private forest companies. Given the fire effects to both ownerships, private land has many acres of fire-affected forested habitat that are likely to be removed or have already been removed. Although private land is not held to the same rules as the Forest, we are assuming the salvage harvest on private land is limited to moderate and high fire severity affected areas. Deviations from this assumption could

affect the magnitude of effects on connectivity in this analysis area given the proportion and distribution of private land ownership.

The direct and indirect effects of this alternative plus the estimated cumulative effects reduced the habitat connectivity in 7 of the 13 watersheds analyzed in the Beaver analysis area. One "moderate" level watershed was reduced in connectivity to a "low" level and 6 "low" level watersheds were reduced in connectivity to a "very low" level.

Change in Fisher Home Range

Just as in Alternative 1, none of the cumulative actions considered in the fire area (private land salvage and timber harvest plans) reduce the habitat enough to move any watersheds from meeting the home range potential criteria to not meeting the criteria.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis

Direct Effects and Indirect Effects

Risk of Disturbance

There are five, seven, and five potential hibernacula with high, moderate and low risk of disturbance respectively. The treatments are not likely to overlap with times of hibernation but may overlap with the use of maternities. Although unlikely, the watersheds with moderate risk of disturbance could affect a maternity, but more realistically, treatment greater than 250 feet is only likely to disrupt foraging bats. Therefore, the sites with potential cave or cave like structures with a high risk of disturbance are likely the most vulnerable to abandonment. Maternities are not common because bats need specific cave environment conditions and although there are several possible caves or cave like structures, very few meet the criteria.

Cumulative Effects

Risk of Disturbance

Cumulatively there will be thirteen, two and two potential hibernacula with a high, moderate and low risk of disturbance respectively. Adding the effects of this alternative to the effects of private lands salvage and other timber harvest plans move many of the potential hibernacula from a moderate risk to a high risk. The majority of this effect is because of the uncertainty of mitigations occurring on private land. Therefore, the cumulative effects may be an overestimate, especially if private lands are implementing mitigation to minimize the negative effects on roost sites.

Willow Flycatcher

Direct Effects and Indirect Effects

Level of Habitat Alteration

Nine of the eleven watersheds in the Beaver fire area have a low level of habitat alteration. Buckhorn Gulch has a high level of habitat alteration and Miller Gulch has a moderate level of alteration. Project design features intended to protect water quality, including ground-based equipment exclusion zones and harvest restrictions, will mitigate this effect but not enough to reduce the level of habitat alteration.

Cumulative Effects

Level of Habitat Alteration

Cumulatively the risk level is the same for seven of the watersheds in the Beaver fire area. Adding the effects of this alternative to those of private land salvage increases the level of disturbance from low to high in Doggett and Kohl Creeks, low to moderate in Dutch Creek, and moderate to high in Quigley's Cove.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The Beaver fire area is outside of the Siskiyou Mountain Salamander's range and, therefore, there will be no direct or indirect effect of the alternative on the species.

Cumulative Effects
Risk of Habitat Disturbance

There are no direct or indirect effects to Siskiyou Mountain Salamander as a result of the treatments in the Beaver fire area so there are no cumulative effects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

Tehama chaparral snail dispersal habitat which consists of some type of physical structure to provide cooler and moisture conditions during dispersal. Providing this structure is most important for snails that are dispersing across areas without canopy cover. Project design features provide varying sizes of woody debris of trees equal to or greater than12 inches in diameter after fuels treatments so that treatment units have sufficient woody debris. In addition, project design features will retain live and dead trees in the treatment units to provide future woody debris, and the known sites of Tehama chaparral snails will not be treated so that remaining habitat will be retained. Therefore, given the project design features, the likelihood of dispersal will be high for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

There are no other actions that will affect snail dispersal because no known sites in the project area overlap with any other project. Therefore, there will be no cumulative effects to snail dispersal or to risk of habitat alteration.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

Four of the five watersheds in the fire area with potential western Bumble Bee habitat will have a low level of disturbance as a result of this alternative. Collins Creek has a high level of disturbance with more than five acres of potential habitat being disturbed by ground-based equipment.

Cumulative Effects
Level of Habitat Disturbance

The cumulative effect on level of disturbance moves three of the 7th field watersheds from a low level of disturbance to a high level of disturbance. These watersheds are Buckhorn Gulch, Dutch Creek and Kohl creek. The increase in level of disturbance is a result of adding the effects of this alternative to those of the private land salvage harvest in the fire area.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 2 varies between individual species but about 9 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 2 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects

Changes in Snag Habitat Abundance

Snag retention in the private land salvage will likely be incidental and it isn't likely to provide any current or habitat in the near future. Even though private land isn't required to follow the same requirements of the Forest, the Forest Plan standards for snag retention will be met on Forest land. The reported total habitat affected for all alternatives and fire areas is a summation of habitat for all snag associated species chosen for the analysis. The species within snag association occupy habitat that may overlap with another species in the association; this results in overlapping acres of habitat affected so the estimated acres affected is an overestimate. The cumulative effects of Alternative 2 are 2,171 acres of snag habitat will be affected by the project; 2,786 acres will be affected by actions considered for cumulative effects. This is a total of 4,957 acres affected.

Hardwood Species Association

Direct Effects and Indirect Effects

Changes in Hardwood Habitat Abundance

Alternative 2 will affect 201 acres of hardwood habitat. This is about 5 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but the hardwoods may be damaged during implementation.

Cumulative Effects

Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 2 are 201 acres of hardwood habitat will be affected by the project; 327 acres will be affected by actions considered for cumulative effects. This is a total of 528 acres affected.

Survey and Manage

Direct Effects and Indirect Effects

Habitat Protection

The sites affected by moderate and high fire severity are likely to have little or no canopy cover. Canopy cover is an important habitat characteristic for these species because tree canopy cover can increase relative humidity and lower temperatures at the microsite scale. Despite the loss of tree canopy cover, these sites may still provide habitat for all or most of the survey and manage species likely to occur in the project area. In order to avoid potential effects to known sites, a protection buffer will be applied to known sites using a project design features thus mitigating potential effects. These protection buffers will retain any existing tree canopy cover within and around known sites. If the trees are fire killed, these snags will still provide woody debris in these known sites.

Cumulative Effects

Since the project will use protection buffers around known sites, there will be no direct or indirect effects from the alternative so there are no cumulative effects.

Migratory Birds

Direct Effects and Indirect Effects

Action alternatives for this project will not adversely impact migratory species or their associated habitats. The habitat affected by the project will still provide habitat for many migratory bird species. Potential impacts to migratory species will be minimized through the adherence to Forest Plan standards and guidelines for snags and downed woody debris, riparian reserve buffers, limited ground disturbance, and maintenance of canopy closure. Specific project design features will be used to minimize negative impacts include retaining snags within treatment units which include riparian reserves, and retaining legacy components and snags mixed in with green trees. Any soft (snags existing prior to the fires) snags (greater than14 inches in diameter) felled for safety reasons will be left on site as downed woody debris. Additional cull logs will be left on site from the operation as well. The project complies with the Migratory Bird Treaty Act Memorandum of Understanding.

Cumulative Effects

All U.S. Forest Service projects considered for cumulative effects comply or are assumed to comply (if analysis is not complete) with the Migratory Bird Memorandum of Understanding. There may be additional effects to migratory birds from private land activities including Bald Eagle, Northern Goshawk, Willow Flycatcher and Management Indicator Species. The general finding is that, while there are effects, they will not cumulatively prevent the compliance with the Migratory Bird Memorandum of Understanding.

Big Game

Direct Effects and Indirect Effects

Browse species will passively regenerate in this alternative as described in Alternative 1. Cover in areas with high and moderate vegetation severity burn with salvage or site preparation and planting will recovery more quickly than under the no action alternative. This is because planting will increase the speed at which conifer forest is recovered on the landscape. This along with the re-sprouting of shrubs and hardwoods will more quickly recover browse species and adjacent cover needed by big game.

Cumulative Effects

The private land salvage in the Beaver fire area will limit the availability of both cover and foraging on more than 9,900 acres of the fire area. The private land salvage is focused on reforestation for timber production so efforts will likely be made to discourage shrub and hardwood re-sprouting which would provide both forage and cover. When added to the effects of Alternative 1 the recovery of understory browse and cover species will be primarily limited to Forest Service lands in the Beaver fire area.

Project Area B: Happy Camp Complex

Wildlife Biological Evaluation

Northern Spotted Owl

Direct Effects and Indirect Effects

Risk to Reproduction

Alternative 2 will result in an increase in risk to reproduction for nine activity centers; seven activity centers (0241, 1030, 1121, 1130, 1214, 1266, 4099, and 9991) went from low risk to moderate risk while the remaining two activity centers (4133 and 9992) went from moderate to high risk. The seven activity centers that went from low to moderate risk are a result of salvage, roadside hazard, and fuels treatments; each of these treatments will affect each activity center at different proportions but the combination of treatments will affect many acres of habitat. The two activity centers that went from moderate to high risk have different levels and types of treatment but both activity centers have a resulting increase in risk; one activity center had mostly salvage and roadside hazard while the other activity center had mostly fuels treatments. Regardless of the treatment, the estimate of risk to reproduction is based on the effects to habitat within each activity center.

Generally, activity centers with very low or low risk to reproduction are likely to have enough resources based on habitat to support reproduction without much difficulty; an activity center in the moderate risk category has less habitat, and that is likely more fragmented, than an activity center with low risk. Therefore, moderate risk activity centers can still support reproduction but resources are likely less abundant and more effort may be required for an owl pair to find enough resources to support themselves and their offspring. The high risk category represents the activity centers with very little habitat; reproduction will be very difficult and possibly not occur. However, an owl pair can move to a nearby location, typically within the activity center home range, where the distribution, quality, and quantity of habitat is better and possibly improve the probability of successful reproduction.

All reproductively-active activity centers, or activity centers that provide enough habitat to support reproduction but are not currently active, are important for maintaining Northern Spotted Owl populations. The increased risk for the nine activity centers in the Happy Camp analysis area is likely to affect reproduction. The effects to the seven low risk activity centers may be more critical to the local population as compared to the moderate and high risk activity centers. Low risk activity centers are more likely to persist despite small natural disturbances because these activity centers typically have excess habitat to possibly absorb small changes in habitat while still retaining enough habitat to continue to support reproduction over the long term as compared to moderate risk activity centers. Even though moderate risk activity centers typically contain habitat conditions that may support reproduction, any change in habitat will likely diminish the possibility of reproduction; moderate risk activity centers are still important for Northern Spotted Owl populations. The two activity center that are estimated to have an increase in risk from moderate to high will receive treatment that will reduce habitat; this will likely result in these activity centers having difficulty providing sufficient resources for reproduction as a result of Alternative 2.

Changes to Critical Habitat

The change to critical habitat on the Happy Camp analysis area is 844 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres increased to 495 acres while the fire affected critical habitat was reduced by 3,306 acres.

Cumulative Effects

Risk to Reproduction

The direct and indirect effects of Alternative 2 plus cumulative effects resulting from other actions within the Happy Camp analysis area will not change the risk level for any of the activity centers.

Changes to Critical Habitat

The direct and indirect effects of Alternative 2 plus cumulative effects resulting from other actions within the Happy Camp analysis area will result in 1,071 acres of nesting/roosting and foraging habitat being downgraded or removed and a net increase of 721 acres of dispersal habitat. However, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The level of disturbance to the Fryingpan, Muck-a-Muck and Caroline Creek nest sites is mitigated by a limited operating period and will be low.

Risk to Future Potential Nest Trees

The risk to future potential nest trees is low for Fryingpan and Muck-a-Muck nest sites. The risk for the Caroline Creek nest site would be high but the snag retention requirements mitigate the risk and it becomes a moderate risk.

Cumulative Effects

Level of Disturbance to Nest Sites

Thom Seider and Happy Camp Fire Protection Phase 1 have a limited operating period design feature. The design feature is intended to limit disturbance to active Bald Eagle nests during the nesting period. There will be no cumulative effect to the Dona nest as a result of cumulative effects. Project design features will be used to avoid disturbance of these nests through the sensitive part of nesting for all actions considered for cumulative effects. Therefore, this alternative will have a low risk of disturbing known goshawk nests.

Risk to Future Potential Nest Trees

Thom Seider and Happy Camp Fire Protection Phase 2 project intersect the Caroline nest site and the Fryingpan nest site respectively. These projects have project design features that will limit the removal of potential nest trees. The effects of these actions are small and will not add to the risk to potential nest tree sites.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

Project design features will be used to avoid disturbance of these nests through the sensitive part of nesting. Therefore, this alternative will have a low risk of disturbing known goshawk nests.

Risk to Reproduction

The project has activities proposed in all nine of the potentially occupied territories in the fire area. The effects to habitat are not enough to increase the risk of any of the territories over existing conditions.

Cumulative Effects

Level of Disturbance to Nest Sites

Since there is no direct or indirect disturbance of nest sites there are no cumulative effects.

Risk to Reproduction

The Lovers Canyon project will increase the risk of the Kelsey territory from a moderate risk to a high risk. This is likely an overestimate of effects but since the Lovers Canyon project is still in early stages of planning worst case was assumed in this analysis. All other territories will remain at their current risk levels as described in the affected environment.

Fisher, Marten, and Wolverine

Direct Effects and Indirect Effects

Level of Habitat Connectivity

Alternative 2 will affect the level of habitat connectivity within 14 of the 36 watersheds analyzed. Thirteen watersheds were reduced in the level of habitat connectivity from "moderate" (Caroline, Cougar, China, Horse, Lower Grider, Middle, O'Neil, Schutts Gulch, Tompkins, Upper East Fork Elk, Upper Elk, Upper Grider, and Walker Creeks) to "low" (9) or "very low" (4). The remaining watershed (Lower East Fork Elk Creek) had reduced level of habitat connectivity from "low" to "very low".

Change in Fisher Home Range

Alternative 2 will result in reducing the number of home ranges by 7 in the Happy Camp analysis area (Cougar Creek, Franklin Gulch, Horse Creek, O'Neil Creek, Schutts Gulch, Upper East Fork Elk and Upper Elk Creek). There are twenty-five watersheds that do not meet the home range potential criteria.

Cumulative Effects

Level of Habitat Connectivity

The direct, indirect, and cumulative effects resulted in reducing the habitat connectivity of one watershed (Big Ferry – Swanson) from "low" to "very low" habitat connectivity. Private land Timber Harvest Plans are the reason for the downgrade in connectivity.

Change in Fisher Home Range

None of the cumulative actions considered in the fire area, which include Happy Camp Fuels Reduction Phase 2, Lovers Canyon or private land salvage, reduce the habitat enough move any additional watersheds from meeting the home range potential criteria to not meeting the criteria when added to the effects of the alternative.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis

Direct Effects and Indirect Effects

Risk of Disturbance

The overall effects of the alternative are described in the Beaver fire area. There are five, five, and eighteen potential hibernacula with a high, moderate and low risk of disturbance as a result of the alternative.

Cumulative Effects

Risk of Disturbance

Adding the effects of this alternative to those of the actions considered for cumulative effects moved one low risk potential hibernacula to a high risk, one low risk potential

hibernacula to a moderate risk, and one moderate risk to a high risk. The majority of this effect is because of the uncertainty of mitigations occurring on private land. Therefore, the cumulative effects may be an overestimate, especially if private lands are implementing mitigation to minimize the negative effects on roost sites.

Willow Flycatcher

Direct Effects and Indirect Effects

Level of Habitat Alteration

There are twenty-six watersheds with a low level of habitat alteration as a result of Alternative 2. There are three with a moderate level of habitat alteration. These are Deep Creek, Hoop and Devil Creek and Schutts Creek. The nine with a high level of habitat alteration are Caroline, China, Cougar, Doolittle, Lower East Fork Elk, O'Neil, Upper East Fork, Upper Elk, and Walker Creeks. Project design features intended to protect water quality, including ground-based equipment exclusion zones and harvest restrictions will mitigate this effect but not enough to reduce the level of habitat alteration.

Cumulative Effects

Level of Habitat Alteration

When adding the effects of this alternative to those of other projects to predict cumulative effects, the level of habitat alteration remains the same for all of the watersheds except Rancheria Creek. The amount of potential habitat in Rancheria Creek is less than 30 acres, so the small amount of private land salvage that overlaps about five acres of Riparian Reserves leads to about 17 percent of potential habitat altered; this is a high level of alteration.

Siskiyou Mountains Salamander

Direct Effects and Indirect Effects

Risk of Habitat Disturbance

There are fourteen known Siskiyou Mountains Salamander sites in the project area that are in treatment units with the potential for ground disturbance. There are no known sites in salvage units with proposed ground-based harvest. Eleven of the sites are in hazard tree removal units and three are in site preparation units where mechanical preparation is proposed. In order to minimize effects to these known sites, a project design feature is incorporated into the alternative that will buffer the sites and maintain live or dead trees within the buffer. This project design feature will make the risk of habitat disturbance of known sites low.

Cumulative Effects

Risk of Habitat Disturbance

Adding the direct and indirect effects of this alternative to the effects of actions on private land that may affect talus habitat will result in four known sites potentially being cumulatively affected. The level of risk of disturbing a known site is cumulatively low and the cumulative effects may be overestimated if mitigations to reduce effects are used on private land projects.

Tehama Chaparral Snail

Direct Effects and Indirect Effects

Likelihood of Dispersal

Tehama chaparral snail dispersal habitat consists of some type of physical structure to provide cooler and moisture conditions during dispersal. Providing this structure is most

important for snails that are dispersing across areas without canopy cover. Project design features provide varying sizes of woody debris of trees equal to or greater than12 inches in diameter after fuels treatments so that treatment units have sufficient woody debris. In addition, project design features will retain live and dead trees in the treatment units to provide future woody debris, and the known sites of Tehama chaparral snails will not be treated so that remaining habitat will be retained. Therefore, given the project design features, the likelihood of dispersal will be a high for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

There are no other actions that will affect snail dispersal because no known sites in the project area overlap with any other project. Therefore, there will be no cumulative effects to snail dispersal or risk of habitat alteration.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

There are eighteen watersheds in the fire area that will have a low level of disturbance as a result of this alternative. Lower East Fork Elk, Middle Creek, Rancheria and Upper Grider Creek will have a moderate level of disturbance. China, Cliff Valley, Tom Martin and Tompkins Creeks will have a high level of disturbance.

Cumulative Effects
Level of Habitat Disturbance

None of the levels of disturbance change as a result of adding the effects of this alternative to those of the other actions considered for cumulative effects in the fire area.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 2 varies between individual species but about 14 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 2 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of “good” snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of Alternative 2 are 19,873 acres of snag habitat will be affected by the project; 217 acres will be affected by actions considered for cumulative effects. This is a total of 20,090 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects

Changes in Hardwood Habitat Abundance

Alternative 2 will affect 443 acres of hardwood habitat. This is about 11 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 2 are 443 acres of hardwood habitat will be affected by the project; 10 acres will be affected by actions considered for cumulative effects. This is a total of 453 acres affected.

Survey and Manage
Direct Effects and Indirect Effects

The effects to survey and manage species are the same as described for the Beaver Fire area.

Cumulative Effects

The cumulative effects to survey and manage species are the same as described for the Beaver Fire area.

Migratory Birds
Direct Effects and Indirect Effects

The effects are the same as described in the Beaver Fire area.

Cumulative Effects

The effects are the same as described in the Beaver Fire area.

Big Game
Direct Effects and Indirect Effects

The direct and indirect effects are the same as described in the Beaver Fire area.

Cumulative Effects

The private land Timber Harvest Plans and small amount of private land salvage is focused on timber production so re-sprouting shrubs and hardwoods are discouraged in these areas. Forest Service projects will have a limited effect on big game species because they are mainly fuels reduction and thinning from below actions. There is only 700 acres of private Timber Harvest Plans and private land salvage in the Happy Camp fire area so the effects to browse and cover recovery will be localized and small.

Project Area C: Whites Fire

Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

There are nine and six activity centers with low and moderate risk to reproduction in the Whites fire area. Alternative 2 will result in an increase in risk to reproduction for two activity centers (1030 and 99912); both activity centers are estimated to go from low risk to moderate risk. Although the effects result in the same level of risk for these two

activity centers, the level of effects in each activity center is very different. One activity center (1030) contains habitat levels close to the minimum amount in the low risk category before treatment and Alternative 2 affects a small amount of habitat that results in an increase in risk level. The other activity center (99912) is well above the habitat minimums for the low risk category but treatment downgrades or removes many acres of habitat, thus resulting in an increase risk level. Despite the differences in amount of habitat acres affected by Alternative 2, these two activity centers are likely to have difficulty providing enough resources to support Northern Spotted Owl reproduction.

Changes to Critical Habitat

The change to critical habitat on the Whites analysis area is 357 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres increased to 320 acres while the fire affected critical habitat was reduced by 784 acres.

Cumulative Effects
Risk to Reproduction

The direct and indirect effects of Alternative 2 plus cumulative effects resulting from other actions within the Whites analysis area will not change the risk level for any of the activity centers.

Changes to Critical Habitat

The direct and indirect effects of Alternative 2 plus cumulative effects resulting from other actions within the Whites analysis area will result in 580 acres of nesting/roosting and foraging habitat being downgraded or removed and a net increase of 543 acres of dispersal habitat. However, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle
Direct Effects/Indirect and Cumulative Effects

There are no known eagle nest sites in the Whites project area so there are no effects to bald eagles from this alternative.

Northern Goshawk
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

Project design features will be used to avoid disturbance of these nests through the sensitive part of nesting. Therefore, this alternative will have a low risk of disturbing known goshawk nests.

Risk to Reproduction

The project has activities proposed in all three of the potentially occupied territories in the fire area. The effects to habitat are not enough to increase the risk of any of the territories over existing conditions.

Cumulative Effects
Level of Disturbance to Nest Sites

There is no direct or indirect disturbance to any of the nest sites so there are not cumulative effects.

Risk to Reproduction

None of the actions considered for cumulative effects overlap in space with the potentially occupied territories in the White Fire area.

Fisher, Marten, and Wolverine

Direct Effects and Indirect Effects

Level of Habitat Connectivity

There are six, seven, and five watersheds with moderate, low, and very low connectivity respectively. Alternative 2 will affect the level of habitat connectivity within 1 of the 18 watersheds analyzed. One watershed (Whites Gulch) was reduced in the level of habitat connectivity from "low" to "very low".

Change in Fisher Home Range

Alternative 2 will result in a reduction of 5 home ranges in the Whites analysis area. Nine of the eighteen watersheds do not meet the home range potential criteria.

The alternative moves Lower North Russian Creek, Lower South Russian Creek, Robinson Gulch, Upper North Russian Creek and Upper South Russian Creek from meeting the home range potential criteria to not meeting the criteria.

Cumulative Effects

Level of Habitat Connectivity

Direct, indirect, and cumulative effects resulted in 2 watersheds (Jessups Gulch and Music Creek) being reduced in habitat connectivity from "moderate" to "low." Jessups Gulch has a downgrade in connectivity because of the estimated effects of the Jess project and Music Creek from the private land salvage in the watershed.

Change in Fisher Home Range

When the effects of the Jess project, which moves Jessups Gulch from meeting the home range potential criteria to not meeting the criteria, and private land salvage in the Music Creek watershed are added to the effects of Alternative 2, the cumulative effects are to not meet the home range potential criteria for these watersheds.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis

Direct Effects and Indirect Effects

Risk of Disturbance

The overall effects are the same as described in the Beaver fire area. There are three potential hibernacula with a high risk of disturbance. There are three and seven potential hibernacula with a moderate and low risk respectively.

Cumulative Effects

Risk of Disturbance

Adding the effects of this alternative to those of actions considered for cumulative effects moved one low risk potential hibernacula to a high risk, and low risk potential hibernacula to a moderate risk. The majority of this effect is because of the uncertainty of mitigations occurring on private land. Therefore, the cumulative effects may be an overestimate, especially if private lands are implementing mitigation to minimize the negative effects on roost sites.

Willow Flycatcher

Direct Effects and Indirect Effects

Level of Habitat Alteration

There are twelve watersheds that have a low level of alteration as a result of Alternative 2. There are no moderate levels of risk. The six watersheds with a high level of alteration are Lower North Russian Creek, Lower South Russian Creek, Robinson Gulch, Upper North Russian, Whites Gulch and Yellow Dog Creek. Project design features intended to protect water quality, including ground-based equipment exclusion zones and harvest restrictions will mitigate this effect but not enough to reduce the level of habitat alteration.

Cumulative Effects
Level of Habitat Alteration

None of the levels of habitat alteration are changed by the addition of actions considered for cumulative effects in the Whites fire area.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The Whites fire area is outside of the Siskiyou Mountain Salamander's range and, therefore, there are no direct or indirect effects on this species.

Cumulative Effects
Risk of Habitat Disturbance

There are no direct or indirect effects to Siskiyou Mountain Salamander as a result of the treatments in the Whites fire area so there are no cumulative effects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

Tehama chaparral snail dispersal habitat which consists of some type of physical structure to provide cooler and moisture conditions during dispersal. Providing this structure is most important for snails that are dispersing across areas without canopy cover. Project design features provide varying sizes of woody debris of trees equal to or greater than12 inches in diameter after fuels treatments so that treatment units have sufficient woody debris. In addition, project design features will retain live and dead trees in the treatment units to provide future woody debris, and the known sites of Tehama chaparral snails will not be treated so that remaining habitat will be retained. Therefore, given the project design features, the likelihood of dispersal will be a high for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

There are no other actions that will affect snail dispersal because no known sites in the project area overlap with any other project. Therefore, there will be no cumulative effects to snail dispersal.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

Nine of the watersheds in the fire area with Bumble Bee habitat will have a low level of disturbance as a result of this alternative. Music Creek and Robinson Gulch will have a moderate level of disturbance. There are no watersheds with a high level of disturbance in this fire area.

Cumulative Effects
Level of Habitat Disturbance

None of the levels of disturbance change as a result of adding the effects of the actions considered for cumulative effects in the fire area.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 2 varies between individual species but about 9 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 2 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of Alternative 2 are 4,347 acres of snag habitat will be affected by the project; 194 acres will be affected by actions considered for cumulative effects. This is a total of 4,541acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Alternative 2 will affect 23 acres of hardwood habitat. This is about 3 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 2 are 23 acres of hardwood habitat will be affected by the project; 4 acres will be affected by actions considered for cumulative effects. This is a total of 27 acres affected.

Survey and Manage
Direct Effects and Indirect Effects

The effects are the same as described in the Beaver Fire area.

Cumulative Effects

The effects are the same as described in the Beaver Fire area.

Migratory Birds

Direct Effects and Indirect Effects

The effects are the same as described in the Beaver Fire area.

Cumulative Effects

The effects are the same as described in the Beaver Fire area.

Big Game

Direct Effects and Indirect Effects

The direct and indirect effects are the same as described in the Beaver fire area.

Cumulative Effects

The primary action considered for cumulative effects within the fire area that may affect big game habitat is the Eddy Late Successional Reserve. The other projects considered for cumulative effects have a very small footprint in the fire area. The Eddy Late Successional Reserve project is intended to promote, protect and connect old growth habitat which includes openings, brush component and multi-layered understory. These are compatible with browse and cover species big game use. The areas in the Eddy Late Successional Reserve project treatment units will provide browse and cover conditions.

Alternative 3

Project Area A: Beaver Fire

Wildlife Biological Evaluation

Northern Spotted Owl

Direct Effects and Indirect Effects

Risk to Reproduction

There are two activity centers with very low risk to reproduction. There are six, eight and seven activity centers with a low, moderate and high risk to reproduction respectively. Although salvage is removed in the Beaver project area for this alternative, the resulting level of risk for each activity center is the same as Alternative 2. Although the amount of habitat affected within five activity centers is less than Alternative 2, the resulting risk level doesn't display a difference between alternatives. This result is likely related to the dispersed habitat distribution and dispersed proposed activities.

Changes to Critical Habitat

The change to critical habitat on the analysis area is 63 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres decrease of 24 acres while the fire affected critical habitat was reduced by 152 acres.

Cumulative Effects

Risk to Reproduction

Unlike Alternative 2, the direct and indirect effects resulting from Alternative 3 plus the effects resulting from other projects are expected to result in one activity center (4143) having an increase in risk from the low to moderate risk level.

Changes to Critical Habitat

The direct and indirect effects of Alternative 3 plus cumulative effects resulting from other actions within the analysis area will result in 63 acres of nesting/roosting and foraging habitat being downgraded or removed and a net decrease 152 acres of dispersal habitat. However, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The level of disturbance to the Dona nest site is mitigated by a limited operating period and will be low.

Risk to Future Potential Nest Trees

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The cumulative effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The cumulative effects are the same as for Alternative 2.

Northern Goshawk
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

There are four, six and three watersheds with moderate, low and very low connectivity respectively. Although the number of acres affected in Alternative 3 is different from Alternative 2, the effects didn't rise to the level to result in a reduction of the level of connectivity. The watersheds and the associated level of connectivity is the same as Alternative 2.

Change in Fisher Home Range

The direct and indirect effects of Alternative 3 resulted in the same effects as described in Alternative 2 for this analysis area. The watersheds not meeting the home range potential criteria are the same as for Alternative 1.

Cumulative Effects
Level of Habitat Connectivity

The direct, indirect, and cumulative effects resulted in the same watersheds and associated level of habitat connectivity as those presented in Alternative 2.

Change in Fisher Home Range

Just as in Alternative 1, none of the cumulative actions considered in the fire area (private land salvage and timber harvest plans) reduce the habitat enough move any watersheds from meeting the home range potential criteria to not meeting the criteria.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Direct Effects and Indirect Effects
Risk of Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The cumulative effects are the same as for Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects to willow flycatcher are the same as for alterative 2.

Cumulative Effects
Level of Habitat Alteration

The cumulative effects to willow flycatcher are the same as for alterative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The Beaver fire area is outside of the Siskiyou Mountain Salamander's range and, therefore, there are no direct or indirect effects of the alternative on these species.

Cumulative Effects
Risk of Habitat Disturbance

There are no direct or indirect effects to Siskiyou Mountain Salamander as a result of the treatments in the Beaver fire area so there are no cumulative effects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative effects are the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects

Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 3 varies between individual species but about 8 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 3 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of Alternative 3 are 1,834 acres of snag habitat will be affected by the project; 2,786 acres will be affected by actions considered for cumulative effects. This is a total of 4,620 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Alternative 3 will affect 196 acres of hardwood habitat. This is about 5 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 3 are 196 acres of hardwood habitat will be affected by the project; 327 acres will be affected by actions considered for cumulative effects. This is a total of 523 acres affected.

Survey and Manage
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The cumulative effects are the same as for Alternative 2.

Migratory Birds
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Project Area B: Happy Camp Complex

Wildlife Biological Evaluation

Northern Spotted Owl

Direct Effects and Indirect Effects

Risk to Reproduction

There are two, nine, forty-one and five activity centers with very low, low, moderate and high risk to reproduction respectively. Alternative 3 will result in an increase in risk to reproduction for six activity centers; five activity centers (0241, 1121, 1214, 1266, and 4099) went from low risk to moderate while the remaining activity center (9992) went from moderate to high risk. Alternative 3 has two fewer activity centers (4133 and 9991) with an increase in risk level when compared to Alternative 2; Alternative 3 has one less activity center (9991) going from low to moderate and one activity center (4133) going from moderate to high risk level.

Changes to Critical Habitat

The change to critical habitat in the analysis area is 844 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres increased to 501 acres while the fire affected critical habitat was reduced by 3,129 acres.

Cumulative Effects

Risk to Reproduction

Adding the direct and indirect effects of this alternative to the effects resulting from other projects is not expected to increase the cumulative risk to reproduction for any of the activity centers in the Happy Camp analysis area. The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will not change the risk level for any of the activity centers.

Changes to Critical Habitat

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will result in 1,071 acres of nesting/roosting and foraging habitat being downgraded or removed and a net increase of 727 acres of dispersal habitat. However, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The effects are the same as for Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The cumulative effects are the same as described in Alternative 2.

Risk to Future Potential Nest Trees

The cumulative effects are the same as described in Alternative 2.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine

Direct Effects and Indirect Effects

Level of Habitat Connectivity

Even though Alternative 3 typically affects fewer acres of habitat within each watershed when compared to Alternative 2, the watersheds and the associated level of connectivity is the same as Alternative 2.

Change in Fisher Home Range

The direct and indirect effects of Alternative 3 resulted in the same effects as described in Alternative 2 for this analysis area.

Cumulative Effects

Level of Habitat Connectivity

The direct, indirect, and cumulative effects resulted in the same watersheds and associated level of habitat connectivity as those presented in Alternative 2.

Change in Fisher Home Range

The cumulative effects are the same as for Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis

Risk of Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects

Risk of Disturbance

The cumulative effects are the same as for Alternative 2.

Willow Flycatcher

Direct Effects and Indirect Effects

Level of Habitat Alteration

The effects to willow flycatcher are the same as for alterative 2.

Cumulative Effects

Level of Habitat Alteration

The cumulative effects to willow flycatcher are the same as for alterative 2.

Siskiyou Mountain Salamander

Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The effects of this alternative are the same as for Alternative 2.

Cumulative Effects
Risk of Habitat Disturbance

The cumulative effects of this alternative are the same as for Alternative 2.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative effects are the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 3 varies between individual species but about 13 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 3 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of “good” snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The cumulative effects of Alternative 3 are 18,463 acres of snag habitat will be affected by the project; 217 acres will be affected by actions considered for cumulative effects. This is a total of 18,680 acres affected..

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Alternative 3 will affect 437 acres of hardwood habitat. This is about 11 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the

hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 3 are 437 acres of hardwood habitat will be affected by the project; 10 acres will be affected by actions considered for cumulative effects. This is a total of 447 acres affected.

Survey and Manage
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Migratory Birds
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Project Area C: Whites Fire

Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

There will be nine and six activity centers with a low and moderate risk to reproduction respectively. Like Alternative 2, Alternative 3 will result in an increase risk to reproduction for two activity centers (1030 and 99912); both activity centers are estimated to go from low risk to moderate risk. The proposed activities for Alternatives 2 and 3 are very similar in the Whites analysis area; thus, the estimated effects are the same for these two activity centers. As a result of this alterative, these two activity centers are likely to have difficulty providing enough resources to support Northern Spotted Owl reproduction.

Changes to Critical Habitat

The change to critical habitat in the analysis area is 357 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres increased to 320 acres while the fire affected critical habitat was reduced by 320 acres.

Cumulative Effects
Risk to Reproduction

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will not change the risk level for any of the activity centers.

Changes to Critical Habitat

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will result in 580 acres of nesting/roosting and foraging habitat being downgraded or removed and a net increase of 543 acres of dispersal habitat. However, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle
Direct Effects/Indirect and Cumulative Effects

There are no known eagle nest sites in the Whites project area so there are no effects to bald eagles from this alternative.

Northern Goshawk
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

Even though Alternative 3 generally affects fewer acres of habitat within each watershed when compared to Alternative 2, the watersheds and the associated level of connectivity is the same as Alternative 2.

Change in Fisher Home Range

The direct and indirect effects of Alternative 3 resulted in the same effects as described in Alternative 2 for this analysis area.

Cumulative Effects
Level of Habitat Connectivity

The direct, indirect, and cumulative effects resulted in the same watersheds and associated level of habitat connectivity as those presented in Alternative 2.

Change in Fisher Home Range

The direct, indirect, and cumulative effects of this alternative resulted in the same effects as described in Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis

Risk of Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The cumulative effects are the same as for Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects to willow flycatcher are the same as for alterative 2.

Cumulative Effects
Level of Habitat Alteration

The cumulative effects to willow flycatcher are the same as for alterative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The Whites fire area is outside of the Siskiyou Mountain Salamander's range and, therefore, there are no direct or indirect effects on this species or habitat.

Cumulative Effects
Risk of Habitat Disturbance

There are no direct or indirect effects to Siskiyou Mountain Salamander as a result of the treatments in the Whites fire area so there are no cumulative effects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative effects are the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 3 varies between individual species but about 8 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of

project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 3 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects

Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of Alternative 3 are 4000 acres of snag habitat will be affected by the project; 194 acres will be affected by actions considered for cumulative effects. This is a total of 4,194 acres affected.

Hardwood Species Association

Direct Effects and Indirect Effects

Changes in Hardwood Habitat Abundance

Alternative 3 will affect 23 acres of hardwood habitat. This is about 3 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects

Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 3 are 23 acres of hardwood habitat will be affected by the project; 4 acres will be affected by actions considered for cumulative effects. This is a total of 27 acres affected.

Survey and Manage

Direct Effects and Indirect Effects

Habitat Protection

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Migratory Birds

Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game

Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Alternative 4

Project Area A: Beaver Fire

Wildlife Biological Evaluation

Northern Spotted Owl

Direct Effects and Indirect Effects

Risk to Reproduction

Like Alternative 2, Alternative 4 didn't change the level of risk for the activity centers in the Beaver analysis area. This result is likely related to the dispersed habitat distribution and dispersed proposed activities.

Changes to Critical Habitat

The change to critical habitat in the analysis area is 62 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres reduced by 24 acres while the fire affected critical habitat was reduced by 152 acres.

Cumulative Effects

Risk to Reproduction

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will change the risk level for two activity centers.

Changes to Critical Habitat

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will result in the same acres of critical habitat being downgraded or removed as presented in the direct and indirect effects. Additionally, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The effects are the same as for Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The cumulative effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The cumulative effects are the same as for Alternative 2.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

Even though Alternative 4 affects fewer acres when compared to Alternative 2, the watersheds and the associated level of connectivity is the same as Alternative 2.

Change in Fisher Home Range

The direct and indirect effects of Alternative 4 resulted in the same effects as described in Alternative 2 for this analysis area.

Cumulative Effects
Level of Habitat Connectivity

The direct, indirect, and cumulative effects resulted in the same watersheds and associated level of habitat connectivity as those presented in Alternative 2.

Change in Fisher Home Range

Just as in Alternative 1, none of the cumulative actions considered in the fire area (private land salvage and timber harvest plans) reduce the habitat enough move any watersheds from meeting the home range potential criteria to not meeting the criteria. The direct, indirect, and cumulative effects resulted in the same effects presented in Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Risk of Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The cumulative effects are the same as for Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects to willow flycatcher are the same as for alterative 2.

Cumulative Effects
Level of Habitat Alteration

The cumulative effects to willow flycatcher are the same as for alterative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The Beaver fire area is outside of the Siskiyou Mountain Salamander's range and, therefore, there will be no direct or indirect effects of this alternative on the species or habitat.

Cumulative Effects
Risk of Habitat Disturbance

There are no direct or indirect effects to Siskiyou Mountain Salamander as a result of the treatments in the Beaver fire area so there are no cumulative effects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative effects are the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 4 varies between individual species but about 8 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 4 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of “good” snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of Alternative 4 are 1,875 acres of snag habitat will be affected by the project; 2,786 acres will be affected by actions considered for cumulative effects. This is a total of 4,661 acres affected..

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Alternative 4 will affect 158 acres of hardwood habitat. This is about 4 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 4 are 158 acres of hardwood habitat will be affected by the project; 327 acres will be affected by actions considered for cumulative effects. This is a total of 485 acres affected.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

The effects are the same as described in Alternative 2.

Cumulative Effects

The cumulative effects are the same as described in Alternative 2.

Migratory Birds
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Project Area B: Happy Camp Complex

Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

There are two, seven, forty-two and six activity centers with very low, low, moderate and high risk to reproduction respectively. Like Alternative 2, Alternative 4 will result in an increase in risk to reproduction for nine activity centers; seven activity centers (0241, 1121, 1130, 1214, 1266, 4099, and 9991) went from low risk to moderate risk while the remaining two activity centers (4133 and 9992) went from moderate to high risk. The seven activity centers that went from low to moderate risk are a result of salvage, roadside hazard, and fuels treatments that will affect each activity center at different proportions; the combination of treatments will affect many acres of habitat. The two activity centers that went from moderate to high risk have different levels and types of treatment but both activity centers have a resulting increase in risk; one activity center had mostly salvage and roadside hazard while the other activity center had mostly fuels treatments. Regardless of the treatment type, the estimate of risk to reproduction is based on the effects to habitat within each activity center.

Changes to Critical Habitat

The change to critical habitat in the analysis area is 698 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres increased to 387 acres while the fire affected critical habitat was reduced by 3,047 acres.

Cumulative Effects
Risk to Reproduction

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will not change the risk level for any of the activity centers.

Changes to Critical Habitat

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will result in 924 acres of nesting/roosting and foraging habitat being downgraded or removed and a net increase of 613 acres of dispersal habitat. However, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle

Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The cumulative effect to the Dona nest site is the same as described in the draft EIS (page. 152).

Risk to Future Potential Nest Trees

The cumulative effect to the Dona nest site is the same as described in the draft EIS (page. 152).

Northern Goshawk
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

There are seventeen, fourteen and five watersheds with moderate, low and very low connectivity respectively. Alternative 4 has 4 fewer watersheds (China, Horse, Upper Elk, and Grider) that had a reduced level of connectivity when compared to Alternative 2.

These four watersheds will remain at a moderate level of connectivity despite the treatment.

Change in Fisher Home Range

The direct and indirect effects of Alternative 4 resulted in the same effects as described in Alternative 2 for this analysis area.

Cumulative Effects
Level of Habitat Connectivity

Like Alternative 2, the direct, indirect, and cumulative effects for Alternative 4 resulted in one watershed (Big Ferry-Swanson) to have a reduced level of connectivity. The rest of the watersheds did not change the level of connectivity.

Change in Fisher Home Range

The cumulative effects are the same as Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Direct Effects and Indirect Effects
Risk of Disturbance

There are four, five and nineteen potential hibernacula with high, moderate and low risk of disturbance. Compared to Alternative 2, this alternative leads to one potential hibernacula moving from a high to a moderate risk of disturbance, and one that moves from a moderate to a low risk.

Cumulative Effects
Risk of Disturbance

Cumulatively there are six, five and seventeen potential hibernacula with a high, moderate and low risk of disturbance. The private lands salvage and other timber harvest plans move many of the potential hibernacula from a moderate risk to a high risk. The majority of this effect is because of the uncertainty of mitigations occurring on private land. Therefore, the cumulative effects may be an overestimate, especially if private lands are implementing mitigation to minimize the negative effects on roost sites.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects to willow flycatcher are the same as for alterative 2.

Cumulative Effects
Level of Habitat Alteration

The cumulative effects to willow flycatcher are the same as for alterative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The effects of this alternative are the same as for Alternative 2.

Cumulative Effects
Risk of Habitat Disturbance

The cumulative effects of this alternative are the same as for Alternative 2.

Tehama Chaparral Snail
Direct Effects and Indirect Effects

Likelihood of Dispersal

The effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative effects are the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 4 varies between individual species but about 13 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 4 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of Alternative 4 are 18,732 acres of snag habitat will be affected by the project; 217 acres will be affected by actions considered for cumulative effects. This is a total of 18,949 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Alternative 4 will affect 442 acres of hardwood habitat. This is about 11 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 4 are 442 acres of hardwood habitat will be affected by the project; 10 acres will be affected by actions considered for cumulative effects. This is a total of 452 acres affected.

Survey and Manage

Direct Effects and Indirect Effects

Habitat Protection

The effects are the same as for Alternative 2.

Cumulative Effects

The cumulative effects are the same as for Alternative 2.

Migratory Birds

Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game

Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Project Area C: Whites Fire

Wildlife Biological Evaluation

Northern Spotted Owl

Direct Effects and Indirect Effects

Risk to Reproduction

Like Alternative 2, Alternative 4 will result in an increase in risk to reproduction for two activity centers (1030 and 99912); both activity centers are estimated to go from low risk to moderate risk.

Changes to Critical Habitat

The change to critical habitat in the analysis area is 329 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres increased to 292 acres while the fire affected critical habitat was reduced by 784 acres.

Cumulative Effects

Risk to Reproduction

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will not change the risk level for any of the activity centers.

Changes to Critical Habitat

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will result in 552 acres of nesting/roosting and foraging habitat being downgraded or removed and a net increase of 515 acres of

dispersal habitat. However, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle
Direct Effects/Indirect and Cumulative Effects

There are no known eagle nest sites in the Whites project area so there are no effects to bald eagles from this alternative.

Northern Goshawk
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

Alternative 4 resulted in the same level of connectivity for each of the associated watersheds as Alternative 2. Even though Alternative 4 resulted in fewer number of affected habitat acres in several of the watersheds, the level of connectivity is the same as Alternative 2.

Change in Fisher Home Range

The direct and indirect effects of Alternative 4 resulted in the same effects as described in Alternative 2 for this analysis area.

Cumulative Effects
Level of Habitat Connectivity

The direct, indirect, and cumulative effects resulted in the same level of connectivity as described in Alternative 2.

Change in Fisher Home Range

The cumulative effects are the same as Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Risk of Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The cumulative effects are the same as for Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects

Level of Habitat Alteration

The effects to willow flycatcher are the same as for alterative 2.

Cumulative Effects
Level of Habitat Alteration

The cumulative effects to willow flycatcher are the same as for alterative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The Whites fire area is outside of the Siskiyou Mountain Salamander's range and, therefore, there will be no direct or indirect effects on the species or habitat from this alternative.

Cumulative Effects
Risk of Habitat Disturbance

There are no direct or indirect effects to Siskiyou Mountain Salamander as a result of the treatments in the Whites fire area so there are no cumulative effects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative effects are the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 4 varies between individual species but about 9 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 4 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of Alternative 4 are 4,236 acres of snag habitat will be affected by the project; 217acres will be affected by actions considered for cumulative effects. This is a total of 4,453 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Alternative 4 will affect 23 acres of hardwood habitat. This is about 3 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 4 are 23 acres of hardwood habitat will be affected by the project; 4 acres will be affected by actions considered for cumulative effects. This is a total of 27 acres affected.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

The effects are the same as for Alternative 2.

Cumulative Effects

The cumulative effects are the same as for Alternative 2.

Migratory Birds
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Alternative 5

Project Area A: Beaver Fire
Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

Like Alternative 2, Alternative 5 didn't change the level of risk for the activity centers in the Beaver analysis area. This result is likely related to the dispersed habitat distribution and dispersed proposed activities.

Changes to Critical Habitat

The change to critical habitat in the analysis area is 188 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres increased to 102 acres while the fire affected critical habitat was reduced by 190 acres.

Cumulative Effects
Risk to Reproduction

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will change the risk level for one (0283) of the activity centers. The additional fuels treatments (compared to Alternative 2) in the Beaver project area increase the level of risk from moderate to high. The other activity centers in the Beaver project area didn't increase in risk level as a result of the cumulative effects.

Changes to Critical Habitat

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will result in the same acres of critical habitat being downgraded or removed as presented in the direct and indirect effects. Additionally, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The risk to future potential nest trees is low for Dona nest site.

Cumulative Effects
Level of Disturbance to Nest Sites

The cumulative effects are the same as Alternative 2.

Risk to Future Potential Nest Trees

The cumulative effects are the same as for Alternative 2.

Northern Goshawk
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

Alternative 5 overall affects less area than Alternative 2, but the Beaver project area contained similar amount of treatment as alterative 2. Therefore, the watersheds and the associated level of connectivity is the same as Alternative 2.

Change in Fisher Home Range

The direct and indirect effects of Alternative 5 resulted in the same effects as described in Alternative 2 for this analysis area.

Cumulative Effects
Level of Habitat Connectivity

The direct, indirect, and cumulative effects resulted in the same level of connectivity as presented in Alternative 2.

Change in Fisher Home Range

Just as in Alternative 1, none of the cumulative actions considered in the fire area (private land salvage and timber harvest plans) reduce the habitat enough move any watersheds from meeting the home range potential criteria to not meeting the criteria.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Risk of Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The cumulative effects are the same as for Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects to willow flycatcher are the same as for alterative 2. The additional prescribed fire in this alternative in the Beaver fire area increases the percent of habitat disturbed in Doggett Creek and Soda Creek by less than 2 percent; this is not enough to increase the level of habitat alternation. The two watersheds remain in the low habitat alteration category.

Cumulative Effects
Level of Habitat Alteration

The cumulative effects to willow flycatcher are the same as for alterative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The Beaver fire area is outside of the Siskiyou Mountain Salamander's range and, therefore, there are no direct or indirect effects on species or habitat from this alternative.

Cumulative Effects
Risk of Habitat Disturbance

There are no direct or indirect effects to Siskiyou Mountain Salamander as a result of the treatments in the Beaver fire area so there are no cumulative effects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative effects are the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 5 varies between individual species but about 8 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 5 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of “good” snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of Alternative 5 are 1,875 acres of snag habitat will be affected by the project; 2,786 acres will be affected by actions considered for cumulative effects. This is a total of 4,661 acres affected..

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Alternative 5 will affect 158 acres of hardwood habitat. This is about 4 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 5 are 158 acres of hardwood habitat will be affected by the project; 327 acres will be affected by actions considered for cumulative effects. This is a total of 485 acres affected.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

The effects are the same as for Alternative 2.

Cumulative Effects

The cumulative effects are the same as for Alternative 2.

Migratory Birds
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Project Area B: Happy Camp Complex

Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

There are two, eleven, thirty-nine, and five activity centers with a very low, low, moderate, and high risk to reproduction respectively. Three activity centers (0239, 1214, and 4099) increased in risk level from low to moderate level and one activity center (9992) went from moderate to high level of risk. However, compared to Alternative 2, Alternative 5 has four fewer activity centers going from low risk to moderate risk and one fewer activity center going from moderate to high risk.

Changes to Critical Habitat

The change to critical habitat in the analysis area is 505 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres increased to 580 acres while the fire affected critical habitat was reduced by 1,056 acres.

Cumulative Effects
Risk to Reproduction

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will not change the risk level for any of the activity centers.

Changes to Critical Habitat

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will result in 731 acres of nesting/roosting and foraging habitat being downgraded or removed and a net increase of 806 acres of dispersal habitat. However, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The level of disturbance to the Fryingpan, Muck-a-Muck and Caroline Creek nest sites are mitigated by a limited operating period and will be low.

Risk to Future Potential Nest Trees

The risk to future potential nest trees is low for Fryingpan, Muck-a-Muck and Caroline Creek nest sites.

Cumulative Effects

Level of Disturbance to Nest Sites

The cumulative effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The cumulative effects are the same as for Alternative 2.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effects are the same as Alternative 2.

Risk to Reproduction

The effects are the same as Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The effects are the same as Alternative 2.

Risk to Reproduction

The effects are the same as Alternative 2.

Fisher, Marten, and Wolverine

Direct Effects and Indirect Effects

Level of Habitat Connectivity

There are twenty, twelve, and four watersheds with moderate, low and very low connectivity respectively. Alternative 5 has less salvage harvest in the Happy Camp project area when compared to Alternative 2; consequently, this alternative has 7 fewer moderate level connectivity watersheds being reduced to low or very low habitat connectivity.

Change in Fisher Home Range

The direct and indirect effects of Alternative 5 resulted in the same effects as described in Alternative 2 for this analysis area.

Cumulative Effects

Level of Habitat Connectivity

The direct, indirect, and cumulative effects from private land Timber Harvest Plans resulted in reduced connectivity for one watershed (Big Ferry – Swanson).

Change in Fisher Home Range

The cumulative effects are the same as for Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Risk of Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The cumulative effects are the same as for Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects to willow flycatcher are the same as for alterative 2.

Cumulative Effects
Level of Habitat Alteration

The cumulative effects to willow flycatcher are the same as for alterative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

There are twelve known Siskiyou Mountains Salamander sites in the project area that are in treatment units with the potential for ground disturbance. There are two fewer known sites in site preparation units with mechanical preparation proposed than in Alternative 2. However, the same project design feature used to mitigate effects to known sites is included in this alternative so the effects to the twelve sites are the same as for Alternative 2; the risk of habitat disturbance of known sites low.

Cumulative Effects
Risk of Habitat Disturbance

Adding the direct and indirect effects of this alternative to the effects of actions on private land that may affect talus habitat will result in four known sites potentially being cumulatively affected. The level of risk of disturbing a known site is cumulatively low and the cumulative effects may be overestimated if mitigations to reduce effects are used on private land projects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

There are eighteen watersheds with potential Bumble Bee habitat that will have a low level of disturbance as a result of this alternative. Lower East Fork Elk, Middle Creek, Rancheria, Tom Martin and Upper Grider will have moderate levels of disturbance. China, Cliff Valley and Tompkins Creeks will have a high level of disturbance as a result of this alternative.

Cumulative Effects
Level of Habitat Disturbance

None of the levels of disturbance change as a result of the actions considered for cumulative effects in the fire area so there are no cumulative effects of this alternative.

Management Indicator Species
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 4 varies between individual species but about 13 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 4 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of Alternative 4 are 18,732 acres of snag habitat will be affected by the project; 217 acres will be affected by actions considered for cumulative effects. This is a total of 18,949 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Alternative 4 will affect 442 acres of hardwood habitat. This is about 11 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 4 are 442 acres of hardwood habitat will be affected by the project; 10 acres will be affected by actions considered for cumulative effects. This is a total of 452 acres affected.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

The effects are the same as for Alternative 2.

Cumulative Effects

The cumulative effects are the same as for Alternative 2.

Migratory Birds
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Project Area C: Whites Fire

Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

There will be ten and five activity centers with low and moderate risk to reproduction respectively. Like Alternative 2, Alternative 5 will result in an increase in risk to reproduction for one activity center (1030) which is estimated to go from low risk to moderate risk. However, unlike Alternative 2, this is the only activity center that has a change in the level of risk to reproduction.

Changes to Critical Habitat

The change to critical habitat in the analysis area is 320 acres of nesting/roosting and foraging being downgraded or removed. The net number of dispersal habitat acres increased to 320 acres while the fire affected critical habitat was reduced by 743 acres.

Cumulative Effects
Risk to Reproduction

The direct and indirect effects of this alternative and the effects resulting from other projects are not expected to cumulatively increase the risk to reproduction for any of the activity centers in the Whites analysis area.

Changes to Critical Habitat

The direct and indirect effects of this alternative plus cumulative effects resulting from other actions within the analysis area will result in 543 acres of nesting/roosting and foraging habitat being downgraded or removed and a net increase of 543 acres of dispersal habitat. However, the fire affected critical habitat didn't change from the acres presented in the direct and indirect effects.

Bald Eagle
Direct Effects/Indirect and Cumulative Effects

There are no known eagle nest sites in the Whites project area so there are no effects to bald eagles from this alternative.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effects are the same as Alternative 2.

Risk to Reproduction

The effects are the same as Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The effects are the same as Alternative 2.

Risk to Reproduction

The effects are the same as Alternative 2.

Fisher, Marten, and Wolverine

Direct Effects and Indirect Effects

Level of Habitat Connectivity

There will be seven, six and five watersheds with moderate, low and very low connectivity respectively. Alternative 5 has one less watershed that had a reduced level of connectivity when compared to Alternative 2.

Change in Fisher Home Range

The direct and indirect effects of Alternative 3 resulted in the same effects as described in Alternative 2 for this analysis area.

Cumulative Effects

Level of Habitat Connectivity

The cumulative effects are the same as Alternative 2.

Change in Fisher Home Range

The cumulative effects are the same as for Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis

Direct Effects and Indirect Effects

Risk of Disturbance

There are three, two and eight potential hibernacula with a high, moderate and low risk of disturbance respectively. Compared to Alternative 2, this alternative would result in one potential hibernacula moving from a moderate to a low risk.

Cumulative Effects

Risk of Disturbance

The private lands salvage and other timber harvest plans move many of the potential hibernacula from a moderate risk to a high risk. The majority of this effect is because of the uncertainty of mitigations occurring on private land. Therefore, the cumulative effects may be an overestimate, especially if private lands are implementing mitigation to minimize the negative effects on roost sites.

Willow Flycatcher

Direct Effects and Indirect Effects

Level of Habitat Alteration

The effects to willow flycatcher are the same as for alterative 2.

Cumulative Effects
Level of Habitat Alteration

The cumulative effects to willow flycatcher are the same as for alterative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The Whites fire area is outside of the Siskiyou Mountain Salamander's range and, therefore, there will be no direct or indirect effects of this alternative on species or habitat.

Cumulative Effects
Risk of Habitat Disturbance

There are no direct or indirect effects to Siskiyou Mountain Salamander as a result of the treatments in the Whites fire area so there are no cumulative effects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effects to the Tehama Chaparral Snail are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative effects are the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by Alternative 5 varies between individual species but about 9 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 5 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards

for snag retention. The cumulative effects of Alternative 5 are 4,236 acres of snag habitat will be affected by the project; 194 acres will be affected by actions considered for cumulative effects. This is a total of 4,430 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Alternative 5 will affect 23 acres of hardwood habitat. This is about 3 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of Alternative 5 are 23 acres of hardwood habitat will be affected by the project; 4 acres will be affected by actions considered for cumulative effects. This is a total of 27 acres affected.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

The effects are the same as for Alternative 2.

Cumulative Effects

The cumulative effects are the same as for Alternative 2.

Migratory Birds
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Modified Alternative 2

Project Area A: Beaver Fire
Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

The proposed activities in the Beaver project area for this alternative will result in the same distribution of activity centers in each risk level as Alternative 2, but the effects would be much less for one activity center located in Doggett Creek. Even though the

actual acres of affected habitat are not the same as Alternative 2, Alternative 2 Modified have much less salvage in the core of the Doggett Creek activity center which reduces the amount of disturbance and the amount of fire affected habitat being removed. However, the level of risk didn't change for any of the activity centers in the Beaver analysis area.

Changes to Critical Habitat

Modified Alternative 2 affects the same amount of Northern Spotted Owl critical habitat as in Alternative 2 in the Beaver project area. Modified Alternative 2 represents a reduced amount of treatment of modification of treatment prescription from Alternative 2. However, the changes to treatments reflected in modified Alternative 2 occurred outside of KLE6 or KLE7 critical habitat subunits (KLE6 and KLE7 are the only critical habitat subunits occurring in the Beaver analysis area). Therefore, the modified Alternative 2 treatment that occurred in the critical habitat in the Beaver analysis area resulted in the same number of acres of habitat being affected as in Alternative 2.

Cumulative Effects

Risk to Reproduction

The cumulative effects in the Beaver project area are extensive. The Beaver Fire burned many acres of Northern Spotted Owl habitat and the resulting salvage occurring on private land cover a large area. These cumulative effects are far reaching because of the size of the fire and the alternating land ownership (also known as checkerboard pattern ownership). This combination of land ownership and fire conditions created large scale salvage that resulted in islands of habitat. These islands present a challenge for Northern Spotted Owl to find sufficient resources given the low amount of habitat located in the islands on the Forest. However, private land management occurring in Beaver doesn't affect all 23 activity centers analyzed in this document; there are about 8 activity centers that contain large portions of possible salvage. Alternative 2 Modified has proposed treatment within these same 8 activity centers that are likely to receive salvage on private land thus the combination of treatment of this alternative plus private land salvage will further increase the amount of salvage and reduce the quality of habitat.

The cumulative effects resulted in two activity centers with an increased level of risk in the Beaver analysis area: 1) Doggett Creek (0283), and 2) Fishtrap Creek (4143). The Doggett Creek core is mostly located on Forest land but the home range is mostly located on private land that has been salvaged or is likely to be salvaged. The Doggett Creek activity center also had a male detected in the core from 2015 surveys (surveys are not complete at the time of writing this document). Consequently, Alternative 2 Modified has the salvage removed in the core of Doggett Creek activity center, but the cumulative effects still resulted in the activity center going from moderate risk to high risk. In addition, Fishtrap Creek activity center increased in risk from low to moderate. There are other activity centers that have many acres of habitat affected as result of the fire followed by salvage and the proposed activities of this alternative but these activity centers have a high risk and the additional effects are not reflected in the risk level since there is no level beyond high.

Changes to Critical Habitat

The Beaver project area contains small portion of Northern Spotted Owl critical habitat subunit KLE6 but the analysis area which is a larger area than the project area includes a small portion of KLE7, but this portion of KLE7 doesn't contain any proposed activities

in the Beaver portion of the project. In addition, critical habitat doesn't occur on private land thus activities occurring on private land are not counted in the critical habitat analysis. Therefore, cumulative effects of this alternative are about 87 acres of critical habitat and about 152 acres of fire affected critical habitat for the Beaver analysis area. The cumulative effects are the same number of acres presented in Alternative 2.

Bald Eagle

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effect is the same as for Alternative 2.

Risk to Future Potential Nest Trees

The risk to future potential nest trees is the same as for Alternative 2, which is low.

Cumulative Effects

Level of Disturbance to Nest Sites

The cumulative effect on levels of disturbance is the same as for Alternative 2.

Risk to Future Potential Nest Trees

The cumulative effect on the risk to future potential nest trees is the same as for Alternative 2.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine

Direct Effects and Indirect Effects

Level of Habitat Connectivity

Effects of modified Alternative 2 are the same as for Alternative 2.

Change in Fisher Home Range

The watersheds not meeting the home range potential criteria are the same as for Alternative 2.

Cumulative Effects

Level of Habitat Connectivity

There are six watersheds that move from a moderate or low connectivity to a very low connectivity when private land salvage is added to the effects of the alternative.

Change in Fisher Home Range

Just as in Alternative 1, none of the cumulative actions considered in the fire area (private land salvage and timber harvest plans) reduce the habitat enough move any watersheds from meeting the home range potential criteria to not meeting the criteria.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Direct Effects and Indirect Effects
Risk of Disturbance

The risk of disturbance is the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The cumulative risk of disturbance is the same as Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The level of willow flycatcher habitat altered is the same as for Alternative 2.

Cumulative Effects
Level of Habitat Alteration

The cumulative level of willow flycatcher habitat altered is the same as for Alternative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The Beaver fire area is outside of the Siskiyou Mountain Salamander's range and, therefore, there are no direct or indirect effects on the species from this alternative.

Cumulative Effects
Risk of Habitat Disturbance

There are no direct or indirect effects to Siskiyou Mountain Salamander as a result of the treatments in the Beaver fire area so there are no cumulative effects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effect to the Tehama Chaparral Snail is the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effect to the Tehama Chaparral Snail is the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The level of habitat disturbance as a result of the alternative is the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative level of habitat disturbance as a result of the alternative is the same as for Alternative 2.

Management Indicator Species

Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by modified Alternative 2 varies between individual species but about 8 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, modified Alternative 2 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of modified Alternative 2 are 1875 acres of snag habitat will be affected by the project; 2786 acres will be affected by actions considered for cumulative effects. This is a total of 4661 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Modified Alternative 2 will affect 158 acres of hardwood habitat. This is about 4 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of modified Alternative 2 are 158 acres of hardwood habitat will be affected by the project; 327 acres will be affected by actions considered for cumulative effects. This is a total of 485 acres affected.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

The effects are the same as for Alternative 2.

Cumulative Effects

The cumulative effects are the same as for Alternative 2.

Migratory Birds
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game

Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Project Area B: Happy Camp Complex

Wildlife Biological Evaluation

Northern Spotted Owl

Direct Effects and Indirect Effects

Risk to Reproduction

Alternative 2 Modified reduced the amount of salvage scattered over most of the Happy Camp project area. There are three Northern Spotted Owl activity centers located in the Walker, Grider, and Louie drainages that were mostly affected by moderate and high severity fire in the cores, but the home range contains habitat that may be more capable of supporting Northern Spotted Owl. Even though we don't know how Northern Spotted Owl will respond to the extensive fire effects in these three activity center cores, it is possible that these Northern Spotted Owl may move to an area in their home range that has better habitat. Given this possibility, we identified areas that provide more contiguous and higher quality habitat within the home range and dropped salvage in those areas. In addition, several small salvage units were removed from this alternative because these units occurred in Northern Spotted Owl cores that were identified as having "moderate level of habitat fitness" which is discussed in the Biological Assessment (the salvage occurring in the core of the activity center discovered during 2015 surveys is an exception to the design of this alternative because this activity center wasn't discovered until after this alternative design was completed; however, this newly discovered activity center was included in the Alternative 3 Modified design). However, despite the reduction of salvage in the core and home range in several activity centers compared to Alternative 2, the level of risk to reproduction is the same

Changes to Critical Habitat

The Happy Camp analysis area contains portions of KLE6, KLE7, and KLW8 critical habitat subunits, but only KLE7 and KLW8 contain treatment. The change in critical habitat in this alternative is similar to Alternative 2. Alternative 2 Modified effects about 135 fewer acres of foraging and 189 fewer acres of fire affected critical habitat fewer than Alternative 2. Most of the foraging habitat affected by this alternative occurs in KLW8, but most of the effects to fire affected critical habitat occurs in KLE7.

Cumulative Effects

Risk to Reproduction

The cumulative effects of the proposed activities in this alternative plus other projects within the analysis area will result in two activity centers with increased levels of risk to reproduction. activity center 1130 increased from "low" to "moderate" level of risk while activity center 4133 increased from "moderate" to "high".

Changes to Critical Habitat

The cumulative effects of modified Alternative 3 resulted in fewer acres (about 135 fewer acres of critical habitat and 189 fewer acres of fire affected critical habitat) of critical habitat being affected when compared to Alternative 2.

Bald Eagle

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The risk to future potential nest trees is the same as for Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The cumulative effect on levels of disturbance is the same as for Alternative 2.

Risk to Future Potential Nest Trees

The cumulative effect on the risk to future potential nest trees is the same as for Alternative 2.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine

Direct Effects and Indirect Effects

Level of Habitat Connectivity

There will be fourteen, seventeen and five watersheds respectively with moderate, low and very low connectivity. There is one more watershed with moderate connectivity, therefore one less watershed with a low connectivity, compared to Alternative 2.

Change in Fisher Home Range

The effects are the same as for Alternative 2.

Cumulative Effects

Level of Habitat Connectivity

The direct, indirect, and cumulative effects resulted in reducing the habitat connectivity of one watershed (Big Ferry – Swanson) from “low” to “very low” habitat connectivity. Private land Timber Harvest Plans are the reason for the downgrade in connectivity.

Change in Fisher Home Range

The cumulative effects are the same as for Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Direct Effects and Indirect Effects
Risk of Disturbance

The risk of disturbance is the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The cumulative risk of disturbance is the same as Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The level of willow flycatcher habitat altered is the same as for Alternative 2.

Cumulative Effects
Level of Habitat Alteration

The cumulative level of willow flycatcher habitat altered is the same as for Alternative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The effects of the alternative are the same as for Alternative 2.

Cumulative Effects
Risk of Habitat Disturbance

The cumulative effects of the alternative are the same as for Alternative 2.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effect to the Tehama Chaparral Snail is the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effect to the Tehama Chaparral Snail is the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The level of habitat disturbance as a result of the alternative is the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative level of habitat disturbance as a result of the alternative is the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by modified Alternative 2 varies between individual species but about 13 percent of snag-associated species habitat will be

affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, modified Alternative 2 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects

Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of modified Alternative 2 are 18,732 acres of snag habitat will be affected by the project; 217 acres will be affected by actions considered for cumulative effects. This is a total of 18,949 acres affected.

Hardwood Species Association

Direct Effects and Indirect Effects

Changes in Hardwood Habitat Abundance

Modified Alternative 2 will affect 442 acres of hardwood habitat. This is about 11 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects

Changes in Hardwood Habitat Abundance

The cumulative effects of modified Alternative 2 are 442 acres of hardwood habitat will be affected by the project; 10 acres will be affected by actions considered for cumulative effects. This is a total of 452 acres affected.

Survey and Manage

Direct Effects and Indirect Effects

Habitat Protection

The effects are the same as for Alternative 2.

Cumulative Effects

The cumulative effects are the same as for Alternative 2.

Migratory Birds

Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game

Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Project Area C: Whites Fire

Wildlife Biological Evaluation

Northern Spotted Owl

Direct Effects and Indirect Effects

Risk to Reproduction

Modified Alternative 2 proposed activities have similar effects to the activity centers in the Whites project area. Despite the less salvage occurring in this alternative, the level of risk to reproduction is the same as Alternative 2.

Changes to Critical Habitat

The effects are the same as described in Alternative 2.

Cumulative Effects

Risk to Reproduction

The cumulative effects for this alternative resulted in the same level of risk for the activity centers within the Whites analysis areas as described in Alternative 2.

Changes to Critical Habitat

The cumulative effects are the same as for Alternative 2.

Bald Eagle

Direct Effects/Indirect and Cumulative Effects

There are no known eagle nest sites in the Whites project area so there are no effects to bald eagles from this alternative.

Northern Goshawk

Direct Effects and Indirect Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine

Direct Effects and Indirect Effects

Level of Habitat Connectivity

The effects to connectivity are the same as for Alternative 2.

Change in Fisher Home Range

The effects of this alternative are the same as Alternative 2.

Cumulative Effects

Level of Habitat Connectivity

The cumulative effects are the same as for Alternative 2.

Change in Fisher Home Range

The cumulative effects are the same as in Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Direct Effects and Indirect Effects
Risk of Disturbance

The risk of disturbance is the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The cumulative risk of disturbance is the same as Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The level of willow flycatcher habitat altered is the same as for Alternative 2.

Cumulative Effects
Level of Habitat Alteration

The cumulative level of willow flycatcher habitat altered is the same as for Alternative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The Whites fire area is outside of the Siskiyou Mountain Salamander's range; therefore, there are no direct or indirect effects of this alternative on the species.

Cumulative Effects
Risk of Habitat Disturbance

There are no direct or indirect effects to Siskiyou Mountain Salamander as a result of the treatments in the Whites fire area so there are no cumulative effects.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effect to the Tehama Chaparral Snail is the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The cumulative effect to the Tehama Chaparral Snail is the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The level of habitat disturbance as a result of the alternative is the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The cumulative level of habitat disturbance as a result of the alternative is the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by modified Alternative 2 varies between individual species but about 9 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, modified Alternative 2 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of modified Alternative 2 are 4,236 acres of snag habitat will be affected by the project; 217 acres will be affected by actions considered for cumulative effects. This is a total of 4,453 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Modified Alternative 2 will affect 23 acres of hardwood habitat. This is about 3 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of modified Alternative 2 are 23 acres of hardwood habitat will be affected by the project; 4 acres will be affected by actions considered for cumulative effects. This is a total of 27 acres affected.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

The effects are the same as for Alternative 2.

Cumulative Effects

The cumulative effects are the same as for Alternative 2.

Migratory Bird
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Modified Alternative 3

Project Area A: Beaver Fire

Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

Modified Alternative 3 further reduced the effects to Northern Spotted Owl than those reductions presented in Alternative 3. When compared to Alternative 2, modified Alternative 3 resulted in the same level of risk for each activity center as Alternative 2 despite the removal of salvage from the Beaver project area.

Changes to Critical Habitat

Compared to Alternative 2, about 103 more acres of nesting/roosting and foraging critical habitat and 4 more acres of fire affected critical habitat will be affected in modified Alternative 3. However, modified alternative will affect fewer acres of dispersal habitat. Although salvage was removed from the Beaver project area for this alternative, several fuel treatments were added that resulted in a net increase in the number of critical habitat acres affected.

Cumulative Effects
Risk to Reproduction

The cumulative effects resulted in one less activity center going from “moderate” to “high” level of risk when compared to Alternative 2. However, Fishtrap Creek did change in risk level from “low” to ‘moderate” as a result of the cumulative effects. All the other activity centers in the Beaver analysis area didn’t change in risk level as a result of cumulative effects.

Changes to Critical Habitat

Compared to Alternative 2 cumulative effects, about 103 more acres of nesting/roosting and foraging critical habitat and 4 more acres of fire affected critical habitat will be affected in the cumulative effects for modified Alternative 3.

Bald Eagle
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The effects are the same as for Alternative 2.

Cumulative Effects

Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The effects are the same as for Alternative 2.

Northern Goshawk
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

The effects are the same as for Alternative 2.

Change in Fisher Home Range

The watersheds not meeting the home range potential criteria are the same as for Alternative 1.

Cumulative Effects
Level of Habitat Connectivity

The cumulative effects are the same as for Alternative 2.

Change in Fisher Home Range

Just as in Alternative 1, none of the cumulative actions considered in the fire area (private land salvage and timber harvest plans) reduce the habitat enough move any watersheds from meeting the home range potential criteria to not meeting the criteria.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Direct Effects and Indirect Effects
Risk of Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The effects are the same as for Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Alteration

The effects are the same as for Alternative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Habitat Disturbance

The effects are the same as for Alternative 2.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The effects are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by modified Alternative 3 varies between individual species but about 5 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 2 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of “good” snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of modified Alternative 3 are 1,182 acres of

snag habitat will be affected by the project; 2,786 acres will be affected by actions considered for cumulative effects. This is a total of 3,968 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Modified Alternative 3 will affect 106 acres of hardwood habitat. This is about 2 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of modified Alternative 3 are 106 acres of hardwood habitat will be affected by the project; 327 acres will be affected by actions considered for cumulative effects. This is a total of 433 acres affected.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Migratory Bird
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Project Area B: Happy Camp Complex

Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

There are two, nine, forty-one and five activity centers with very low, low, moderate and high risk to reproduction respectively. The reduction of treatment in modified Alternative 3 did reduce the number of activity centers changing in the level of risk. Compared to Alternative 2, modified Alternative 3 had 2 fewer activity centers changing in the risk level from “low” to “moderate” and one less activity center changing in risk level from “moderate” to “high”.

Changes to Critical Habitat

Compared to Alternative 2, about 68 fewer acres of nesting/roosting and foraging critical habitat and 721 fewer acres of fire affected critical habitat will be affected in modified Alternative 3.

Cumulative Effects
Risk to Reproduction

The cumulative effects didn't result in any of the activity centers changing in the level of risk within the Happy Camp analysis area.

Changes to Critical Habitat

Compared to Alternative 2 cumulative effects, about 68 fewer acres of nesting/roosting and foraging critical habitat and 721 fewer acres of fire affected critical habitat will be affected in the cumulative effects for modified Alternative 3.

Bald Eagle
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Future Potential Nest Trees

The effects are the same as for Alternative 2.

Northern Goshawk
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

There are twenty watersheds with moderate level of connectivity. This is seven more watersheds with moderate connectivity compared to Alternative 2. There is fifteen watersheds with low connectivity. This is 3 more watersheds with low connectivity

(compared to very low connectivity) compared to Alternative 2. There is just one watershed with very low connectivity.

Change in Fisher Home Range

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Connectivity

The direct, indirect, and cumulative effects resulted in reducing the habitat connectivity of one watershed (Big Ferry – Swanson) from "low" to "very low" habitat connectivity. Private land Timber Harvest Plans are the reason for the downgrade in connectivity.

Change in Fisher Home Range

The cumulative effects are the same as for Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Direct Effects and Indirect Effects
Risk of Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The effects are the same as for Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Alteration

The effects are the same as for Alternative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Habitat Disturbance

The effects are the same as for Alternative 2.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The effects are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Disturbance

The effects are the same as for Alternative 2.

Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by modified Alternative 3 varies between individual species but about 9 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, Alternative 2 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of modified Alternative 3 are 12,551 acres of snag habitat will be affected by the project; 217 acres will be affected by actions considered for cumulative effects. This is a total of 12,768 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Modified Alternative 3 will affect 236 acres of hardwood habitat. This is about 6 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of modified Alternative 3 are 236 acres of hardwood habitat will be affected by the project; 10 acres will be affected by actions considered for cumulative effects. This is a total of 246 acres affected.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Migratory Bird
Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game
Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Project Area C: Whites Fire

Wildlife Biological Evaluation
Northern Spotted Owl
Direct Effects and Indirect Effects
Risk to Reproduction

Modified Alternative 3 will result in the number of activity centers within each level of risk as Alternative 2 in the Whites analysis area. The Whites analysis area had the least amount of change to treatment that would affect Northern Spotted Owl habitat thus these activity centers weren't expected to change in risk level.

Changes to Critical Habitat

The effects are the same as described in Alternative 2.

Cumulative Effects

Cumulative Effects
Risk to Reproduction

The cumulative effects will not result in a change in the level of risk to reproduction in the Whites analysis area.

Changes to Critical Habitat

The cumulative effects are the same as for Alternative 2.

Bald Eagle
Direct Effects/Indirect and Cumulative Effects

There are no known eagle nest sites in the Whites project area so there are no effects to bald eagles from this alternative.

Northern Goshawk
Direct Effects and Indirect Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Disturbance to Nest Sites

The effects are the same as for Alternative 2.

Risk to Reproduction

The effects are the same as for Alternative 2.

Fisher, Marten, and Wolverine
Direct Effects and Indirect Effects
Level of Habitat Connectivity

The effects are the same as for Alternative 2.

Change in Fisher Home Range

The effects of the alternative are the same as Alternative 2.

Cumulative Effects
Level of Habitat Connectivity

The cumulative effects are the same as Alternative 2.

Change in Fisher Home Range

The cumulative effects are the same as Alternative 2.

Pallid Bat, Townsend's Big-eared Bat, and Fringed myotis
Direct Effects and Indirect Effects
Risk of Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Disturbance

The effects are the same as for Alternative 2.

Willow Flycatcher
Direct Effects and Indirect Effects
Level of Habitat Alteration

The effects are the same as for Alternative 2.

Cumulative Effects
Level of Habitat Alteration

The effects are the same as for Alternative 2.

Siskiyou Mountain Salamander
Direct Effects and Indirect Effects
Risk of Habitat Disturbance

The effects are the same as for Alternative 2.

Cumulative Effects
Risk of Habitat Disturbance

The effects are the same as for Alternative 2.

Tehama Chaparral Snail
Direct Effects and Indirect Effects
Likelihood of Dispersal

The effects are the same as for Alternative 2.

Cumulative Effects
Likelihood of Dispersal

The effects are the same as for Alternative 2.

Western Bumble Bee
Direct Effects and Indirect Effects
Level of Habitat Disturbance
Cumulative Effects
Level of Habitat Disturbance
Management Indicator Species
Snag Species Association
Direct Effects and Indirect Effects
Changes in Snag Habitat Abundance

The percent of snag-associated species habitat affected by modified Alternative 3 varies between individual species but about 8 percent of snag-associated species habitat will be affected by roadside hazard and salvage treatments. The other treatments in this alternative are likely to have minor effects on snag-associated species habitat. With implementation of project design features, salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre averaged over 100 acres. Therefore, modified Alternative 3 is likely to provide a sufficient number of snags of varying decay classes to provide a habitat level of "good" snag-associated habitat.

Cumulative Effects
Changes in Snag Habitat Abundance

All of the removal will occur on private lands where snag retention is likely to be incidental. The actions considered for cumulative effects are assumed to downgrade snag habitat but not remove it because of the requirements to meet the Forest Plan standards for snag retention. The cumulative effects of modified Alternative 3 are 3708 acres of snag habitat will be affected by the project; 194 acres will be affected by actions considered for cumulative effects. This is a total of 3,902 acres affected.

Hardwood Species Association
Direct Effects and Indirect Effects
Changes in Hardwood Habitat Abundance

Modified Alternative 3 will affect 22 acres of hardwood habitat. This is about 3 percent of the hardwood habitat in the project area. Estimates of effects are likely overestimated because roadside hazard treatments are likely to retain most of the hardwoods and the hardwoods in the salvage units may be damaged but are likely to remain in the units after treatment. The treatments are focused on conifer removal and maintaining hardwoods were possible but they may be damaged during implementation.

Cumulative Effects
Changes in Hardwood Habitat Abundance

The cumulative effects of modified Alternative 3 are 22 acres of hardwood habitat will be affected by the project; 4 acres will be affected by actions considered for cumulative effects. This is a total of 26 acres affected.

Survey and Manage
Direct Effects and Indirect Effects
Habitat Protection

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Migratory Bird

Direct Effects and Indirect Effects

This is the same as described in Alternative 2.

Cumulative Effects

This is the same as described in Alternative 2.

Big Game

Direct Effects and Indirect Effects

The effects are the same as for Alternative 2.

Cumulative Effects

The effects are the same as for Alternative 2.

Compliance with Law, Regulation, Policy and the Forest Plan

All alternatives comply with the Endangered Species Act and other relevant laws, policies and regulations. Alternatives also comply with the Forest Plan as displayed on the Forest Plan consistency checklist, available on the project website.

Botany and Non-Native Invasive Species

The Project Botany Biological Assessment, Biological Evaluation, Survey and Manage Review, Noxious Weed Risk Assessment, and Pre-field documents: Appendices A-1, A-2, and A-3 are summarized in this section and are available in the Project Record and on the Project website. The purpose of this document is to evaluate the Project in sufficient detail to determine its effects on Endangered, Threatened, Proposed, Candidate, Sensitive, and Survey and Manage plant species as well as determine the risk of introducing or spreading Noxious Weed species. Unique botanical areas of concern are also addressed.

Methodology

An office pre-field review was conducted to determine if the Project is within the range of any Threatened, Endangered, Proposed, Candidate, Sensitive, or Survey and Manage botanical species for the Forest, and if suitable habitat is present within the proposed Project area. This review also indicated whether any known populations of species of concern are present within the Project area. All species listed for the Forest were considered in this review (USFWS 2104, USDA 2013).

Threatened, Endangered, and Proposed or Candidate Species

Suitable habitat within the project area will be surveyed for Threatened, Endangered, and Proposed or Candidate species prior to any Project implementation. Any populations of Threatened, Endangered, and Proposed or Candidate species that are located will be protected through the implementation of project design features.

Sensitive Species

Surveys to evaluate the status of known populations within Project activity areas will be conducted in the spring and summer of 2015, during appropriate times for identification.

If additional populations are located within treatment areas and the habitat in its current state is likely to be negatively impacted by the proposed action, a project design feature intended to protect Sensitive species populations from a declining trend in viability will be implemented. If suitable habitat is present at known locations but known occurrences cannot be found, habitat elements will be protected to maintain the viability of the site.

Due to the expedited Project time frame, need to conduct surveys during appropriate times for identification (typically when blooming), and the obligation to assess the condition of known populations, it was unfeasible to conduct unit surveys in search of unknown populations of Sensitive species at the time of this document. Forest plan Standard and Guideline 6-8 (page 4-23) states that "if surveys (for Sensitive species) cannot be conducted, project areas should be assessed for the presence and condition of Sensitive species habitat." A preliminary field review was conducted to determine the presence and condition of suitable habitat for Sensitive species within project activity units. Past surveys have occurred in all fire areas which have helped build the Forest's database of known occurrences and were used when determining where suitable habitat may still be present after the 2014 fires. Additionally, aerial photographs, Rapid Assessment of Vegetation Condition after Wildfire (RAVG) data, treatment unit selection criteria, site visits, and species distribution information were used to determine if suitable habitat for Sensitive species is present within treatment units.

Units identified for salvage harvest and site preparation and planting activities had high to moderate vegetation mortality due to the 2014 fires. These areas burned at such intensities that they no longer offer adequate canopy cover to provide the shade, moisture, humidity, and temperature characteristics required by most Sensitive species (this finding is currently being field verified).

Fuels treatment units are prescribed for areas that have a mosaic of burn intensities due to the 2014 fires and may contain areas that provide suitable habitat for Sensitive species. These activities are anticipated to have an overall beneficial effect to suitable habitat by reducing excessive fuel loading and the potential for another high severity wildfire in the future that would result in habitat loss. The beneficial effect would potentially result in an increasing trend in population viability through the maintenance and protection of suitable habitat. If fuels treatment activities are anticipated to negatively impact population viability (e.g. pile burning), then project design features will be implemented in order to protect Sensitive botanical populations and their surrounding habitat.

Roadside hazard tree units may provide habitat or support viable populations of Sensitive species. Once roadside hazard tree units are identified, viable Sensitive plant populations and their surrounding habitat will be protected through the implementation of project design features.

Due to the ephemeral and unpredictable appearance of fruiting structures, and the expedited time frame of the Project, surveys for unknown Sensitive fungal populations were not practical. Habitat assessments will be conducted in areas previously known to host Sensitive fungal species and if suitable habitat is still present it will be protected through the implementation of project design features. Additionally, large woody debris and soil cover characteristics of Sensitive fungi habitat in the Project area would be protected through the incorporation of project design features associated with Forest Plan Standards and Guidelines for the Aquatic Conservation Strategy and woody material

retention associated with wildlife habitat and soil stability and productivity. See the summary of the Aquatic Conservation Strategy Report at the end of this chapter of the EIS.

Survey and Manage Species

The Bureau of Land Management and Forest Service adopted standards and guidelines for the management of known sites, site-specific pre-habitat disturbing surveys, and/or landscape scale surveys for about 400 rare and/or isolated species in the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (2001 ROD). These rare or isolated species are grouped into six categories based on level of rarity, ability to reasonably and consistently locate occupied sites during pre-disturbance surveys, and the level of information known about the species or group (Table 3-21). The standards and guidelines for these mitigation measures are known as Survey and Manage.

Table 3-21: Requirements for Survey and Manage categories.

Category	Relative Rarity	Pre-disturbance surveys	Manage all known sites	Strategic surveys
A	Rare	Yes	Yes	Yes, not required for NEPA
B	Rare	No	Yes	Yes, NEPA requirement
C	Uncommon	Yes	High-priority only	Yes, not required for NEPA
D	Uncommon	No	High-priority only	Yes, not required for NEPA
E	Rare	No	Yes	Yes, not required for NEPA
F	Uncommon	No	No	Yes, not required for NEPA

To be in compliance with Survey and Manage direction, pre-disturbance surveys will be conducted for Category A and C species in project activity units where known sites and suitable habitat are still present after the 2014 fires. Pre-disturbance surveys are not required for routine maintenance which includes the falling of roadside hazard trees (2001 Survey and Manage Standards and Guidelines and Management Recommendations, page 22). Regardless, every effort will be made to protect suitable habitat and known populations occurring along roads being assessed for roadside hazard tree removal. Known occurrences within the Project area of Category B, D, and E species will be protected for continued persistence at the site. If suitable habitat is present at known locations but known occurrences cannot be found, habitat elements will be protected to maintain the viability of the site. Project design features incorporated into the Project for the protection of botanical species can be found in Chapter 2.

Non-Native Invasive Species (NNIS)

The Forest has a list of weeds that are being tracked and managed (Appendix B of the Botanical Resources and Non–native Invasive Species report). There are a total of 30 high priority weeds on the list and 15 species of moderate and low priority. A high priority weed species is one that is of important local management concern because of its currently limited distribution on the Forest, highly invasive nature, and demonstrated potential to displace large geographic areas of native plant communities. For this Project, the risk analysis will only evaluate the likelihood for introducing and spreading high and moderate priority species. The low priority species present in the Project area will not be

considered in the analysis because it is of lesser concern on the Forest and is not considered an issue locally.

The invasive species risk assessment was completed to determine the risk of introducing and/or spreading non-native invasive species associated with the Project. For projects having a moderate to high risk of introducing or spreading noxious weeds, the Project decision document must identify noxious weed control measures that must be undertaken during project implementation (FSM 2903.04).

Based on site visits and RAVG data, the following assumptions about habitat condition are made:

- areas characterized by high severity burns experienced 75 percent or greater vegetation mortality, loss of canopy and understory cover, and loss of duff layers and large woody debris;
- areas characterized by moderate severity burns experienced 50-75 percent vegetation mortality, substantial reduction in canopy and understory cover, as well as duff layers and large woody debris; and
- areas characterized by no or low severity burns experienced 0-50 percent vegetation mortality and a reduction in fuel loading.

Analysis Indicators

- Threatened, Endangered, Proposed, and Candidate Species: Likelihood of jeopardizing the continued existence of Threatened, Endangered, Proposed, or Candidate species populations.
- Sensitive Species: Trend of Sensitive species population viability measured as increasing, declining, or static.
- Survey and Manage Species: Compliance with Survey and Manage guidelines as defined by the 2001 Record of Decision.
- Non-native Invasive Species: Risk of introducing and/or spreading non-native invasive species measured by a rating of high, moderate or low risk.

Assumptions specific to Botanical Species of Concern

- Analysis is based on spatial population records only, field visits to known sites were not conducted prior to analysis;
- Botanical species of concern located in areas with moderate to high vegetation mortality, as indicated by RAVG data and salvage and site preparation and planting unit selection criteria, are assumed to be extirpated (assumption being field verified);
- Habitat located in areas with moderate to high vegetation mortality, as indicated by RAVG data and salvage unit criteria, are no longer expected to support viable populations of botanical species of concern (except *Thermopsis robusta* which prospers following disturbance);
- Strategic surveys for Survey and Manage Category B fungi are assumed to be complete (pending acceptance of the Draft Document by the Regional Ecosystem Office); and
- Survey and Manage guidelines will be used to analyze effects on botanical species that fall under both Sensitive and Survey and Manage categories because they provide for a more protective management strategy.

Assumptions specific to Non-native Invasive Species (NNIS)

- Analysis is based on spatial population records only, field visits to known sites were not conducted prior to analysis;
- Not all existing NNIS infestations are currently mapped;

- Existing NNIS infestations were spread during the 2014 fires and associated suppression efforts;
- It's likely that new NNIS infestations were introduced during the 2014 fires and associated suppression efforts that are presently undetected;
- Roadside NNIS infestations are expected to continue to spread along road systems regardless of Project activities;
- Inclusions of privately owned lands within the project boundary may contain infestations of NNIS that will spread to National Forest System lands regardless of Forest actions and/or efforts at prevention and control; and
- Once established, NNIS infestations are likely to persist long term.

Spatial and Temporal Context

The analysis area for botanical species of concern and non-native invasive species is the Project area because it is the most relevant to changes to population viability and the risk of spread within the Project area. The temporal bounding for botanical species of concern and non-native invasive species will be less than the eight years during which the project will be implemented for the short-term and greater than eight years for long-term effects. Temporal bounding was chosen to account for species recovery times, seed dormancy and germination requirements, and the difficulty of identifying biennial and perennial vegetative life stages (rosettes) in year one post-burn.

Affected Environment

The Project area is composed of the Beaver Fire (Subpart A), Happy Camp Complex (Subpart B), and Whites Fire of the July Complex (Subpart C) which all occurred on the Forest during the summer of 2014.

Modification of the Forest structure and composition as a result of fire intensity, duration, and suppression efforts has had a profound effect on microclimate characteristics such as air temperature, relative humidity, and soil temperature and moisture, which could, in turn, result in adverse impacts to native plant communities. In areas that experienced high to moderate vegetation mortality, microclimate characteristics commonly associated with habitat for species of concern have likely been lost. However, these areas also provide the opportunity for the unique and less frequent elements of the California flora, known as fire followers, to come to life and establish a seed bank that will persist while waiting for the next event. These areas are also more vulnerable to invasion by noxious weeds due to the lack of ground cover that often acts as a barrier to establishment of non-native invasive species. Areas that experienced no or low burn severity may provide refugia for native species, and act as a seed source from which dispersal into the more intensely burned areas can occur.

Project Area A: Beaver Fire

The Beaver fire area was severely burned during the 2014 fires, and large sections of private land within the boundary have been salvage logged.

Project Area B: Happy Camp Complex

The Happy Camp Complex fire area is characterized by a mixed severity burn due to the mixed vegetative conditions. Some areas, such as Grider and Walker Creek drainages, were severely burned during the 2014 fires.

Project Area C: Whites Fire

The Whites fire area is characterized by a mixed burn severity and is primarily within Late Successional Reserve management areas.

Species of Concern

Detailed species accounts can be found in the Botany and Non-native Invasive Species Report available in the Project Record and on the Project website.

Threatened, Endangered and Proposed Species

Project Area A: Beaver Fire

There are no known populations of any Threatened, Endangered, Proposed, or Candidate species present in the Beaver fire area. Suitable oak-chaparral habitat was surveyed for the Endangered *Fritillaria gentneri*; however, no populations were located.

Project Area B: Happy Camp Complex

There are no known populations of or suitable habitat present for any Threatened, Endangered, Proposed, or Candidate species in the Happy Camp Complex fire area.

Project Area C: Whites Fire

There are no known populations of or suitable habitat present for any Threatened, Endangered, or Proposed species in the Whites fire area.

Sensitive Species

Project Area A: Beaver Fire

No known sensitive botanical species are present in this fire area (excepting *Cypripedium fasciculatum* and *C. montanum* which are being analyzed following Survey and Manage guidelines) (Table 3.12).

Project Area B: Happy Camp Complex

There are three Sensitive botanical species known to occur in the Happy Camp Complex fire area. These include: *Eriogonum hirtellum* (6 populations), *Erythronium hendersonii* (2 populations), and *Thermopsis robusta* (1 population) (*Cypripedium fasciculatum* and *Cypripedium montanum* are also present in this fire area but are being analyzed following Survey and Manage guidelines) (Table 3.12).

Project Area C: Whites Fire

No known sensitive botanical species are present in the Whites fire area (excepting *Cypripedium fasciculatum* and *C. montanum* which are being analyzed following Survey and Manage guidelines) (Table 3.12).

Survey and Manage Species

Project Area A: Beaver Fire

There are five Survey and Manage botanical species that are known to occur in the Beaver fire area. These include: *Alpova olivaceotinctus* (1 population), *Choiromyces alveolatus* (1 population), *Cypripedium fasciculatum* (3 populations*), Cypripedium montanum* (2 populations*),* and *Ptilidium californicum* (1 population) (Table 3.13).

Project Area B: Happy Camp Complex

There are 11 Survey and Manage botanical species that are known to occur in the Happy Camp Complex fire area. These include: *Cantharellus subalbidus* (2 populations), *Cypripedium fasciculatum* (20 populations), *Cypripedium montanum* (14 populations), *Gomphus clavatus* (1 population), *Otidea leporina* (2 populations), *Phaeocollybia fallax* (1 population), *Phaeocollybia gregaria* (1 population), *Phaeocollybia olivacea* (2 populations), *Ptilidium californicum* (2 populations), *Ramaria abientina* (1 population), and *Tremiscus helvelloides* (2 populations) (Table 3.13).

Project Area C: Whites Fire

There are eight Survey and Manage botanical species that are known to occur in the Whites fire area. These include: *Albatrellus flettii* (1 population), *Cypripedium fasciculatum* (seven populations), *Cypripedium montanum* (seven populations), *Marasmius applanatipes* (1 population), *Mycena tenax* (1 population), *Phaeocollybia californica* (1 population), *Phaeocollybia olivacea* (1 population), and *Ptilidium californicum* (1 population) (Table 3.13).

Unique Botanical Areas of Concern

Project Area B: Happy Camp Complex

Lake Mountain Special Interest Area

This special interest area is composed of 100 acres and is the northern most known location of Foxtail pine. It is home to at least six different conifer species including western white pine, foxtail pine, Shasta red fir, white fir, mountain hemlock, and Jeffrey pine. Such assemblages of high-elevation conifers are rare throughout California and are restricted to the Klamath-Siskiyou Mountains. Project design features have been incorporated into this EIS to maintain foxtail pine snags within this Special Interest Area. The retention of foxtail pine snags is important in order to protect the unique features for which this Special Interest Area was designated.

Cultural Plant Collecting Area

The maintenance and perpetuation of cultural botanical resource is required by Forest Standard and Guidelines (6-21). The Cold Creek springs area within subpart B of the Project area (the Happy Camp Complex) is an important resource for *Adiantum aleuticum* which is frequently used by local tribes for basket weaving and botanical remedies (Lloyd 1964). There are six proposed treatment units located in the Cold Creek springs area that may affect the continued viability of this resource. Project design features have been incorporated into this EIS in order to continue to ensure its preservation and continuation.

Beargrass leaves are harvested by many tribal groups for basketry and other crafts. Beargrass is scattered across the Project area and may overlap proposed Project activity units along ridge tops, and in areas characterized by patches of open canopy and rocky ultramafic soils. Although beargrass responds favorably to low to moderate fire, high-intensity, duff-consuming fires will destroy the meristematic region, subsequently killing the plants (Crane 1990). Salvage and site preparation and planting units are proposed in areas that experienced moderate to high vegetation mortality, and, in general, the complete consumption of duff layers; therefore, these activities are not anticipated to

affect beargrass populations since they have likely been lost in these areas. Fuels treatments are aimed at reducing hazardous fuel loads and thinning dense stands while maintaining adequate duff layers and canopy cover. Beargrass responds favorably to low intensity fires which have historically been used by tribal groups to maintain optimum leaf strength for basketry (Hummel et al. 2012). Subsequently, fuel treatments are anticipated to have a positive effect on the viability of beargrass populations. On the Forest, beargrass can also be found growing in young plantations and along skid roads indicating that it responds favorably to disturbances that open canopy cover. Roadside hazard treatments are not anticipated to impact the continuation of beargrass populations in the Project area. However, minor impacts to individual beargrass plants may occur from roadside hazard treatments due to mechanical disturbance to the bulb and potential soil compaction.

Non-native Invasive Species

Project Area A: Beaver Fire

There are five NNIS that are known to occur in the Beaver fire area. These include: *Cardaria chalapensis* (four infested sites), *Cardaria draba* (1 infested site), *Centaurea solstitialis* (six infested sites), *Isatis tinctoria* (six infested sites), and *Tribulus terrestris* (one infested site, river access site) (Table 3.14).

Project Area B: Happy Camp Complex

There are eight NNIS known to occur in the Happy Camp Complex fire area. These include: *Centaurea maculosa* (nine infested sites), *Centaurea pratensis* (two infested sites, mainly river bar), *Centaurea solstitialis* (ten infested sites), *Centaurea squarrosa* (five infested sites, mainly river bar), *Cytisus scoparius* (eight18 infested sites), *Euphorbia esula* (55 infested sites, mainly river bar), *Isatis tinctoria* (38 infested sites), and *Lepidium latifolium* (11 infested sites) (Table 3.14).

Project Area C: Whites Fire

There are four NNIS known to occur in the Whites fire area. These include: *Centaurea maculosa* (13 infested sites, 12 of which have had no plants for over 10 years), *Centaurea solsitialis (*one infested site), *Cytisus scoparius* (three infested sites), and *Isatis tinctoria* (nine infested sites) (Table 3.14).

Environmental Consequences

Interactions between the Project activities and the potential effects to botanical resources are discussed in detail in the Project Botanical Resources and Non-native Invasive Species report (available on the Project website) and summarized here.

Table 3-22: Number of Sensitive botanical species populations that have the potential to be affected by project activities for each alternative.

Fire Area	Species	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 2 Mod	Alt 3 Mod
Beaver	NA	0	0	0	0	0	0	0
Happy Camp	Eriogonum hirtellum	6	5	5	3	5	5	2
	Erythronium hendersonii	2	2	2	2	2	2	2
	Thermopsis robusta	1	1	1	1	1	1	1
Whites	NA	0	0	0	0	0	0	0

Table 3-23: Number of Survey and Manage botanical populations that have the potential to be affected by project activities for each alternative.

Fire Area	Species	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 2 Mod	Alt 3 Mod
Beaver	*Alpova olivaceotinctus*	1	0	0	0	0	0	0
	Choiromyces alveolatus	1	0	0	0	0	0	0
	Cypripedium fasciculatum	3	2	2	2	3	2	2
	Cypripedium montanum	2	1	1	1	1	1	1
	Ptilidium californicum	1	1	1	1	1	1	0
Happy Camp	*Cantharellus subalbidus*	2	0	0	0	0	0	0
	Cypripedium fasciculatum	20	10	10	10	10	10	9
	Cypripedium montanum	14	7	7	7	7	7	7
	Gomphus clavatus	1	0	0	0	0	0	0
	Otidea leporina	2	1	1	1	1	1	1
	Phaeocollybia fallax	1	0	0	0	0	0	0
	Phaeocollybia gregeria	1	0	0	0	0	0	0
	Phaeocollybia olivacea	2	1	1	1	1	1	1
	Ptilidium californicum	2	1	1	1	1	1	1
	Rameria abientina	1	0	0	0	0	0	0
	Tremiscus helvelloides	2	1	1	1	1	1	1
Whites	*Albatrellus flettii*	1	1	1	1	1	1	1
	Cypripedium fasciculatum	7	6	6	6	6	6	6
	Cypripedium montanum	7	6	6	6	6	6	5
	Marasmius applanatipes	1	0	0	0	0	0	0
	Mycena tenax	1	0	0	0	0	0	0
	Phaeocollybia californica	1	1	1	1	1	1	1
	Phaeocollybia olivacea	1	1	1	1	1	1	1
	Ptilidium californicum	1	0	0	0	0	0	0

Table 3-24: Number of Non-native Invasive species populations that have the potential to be affected by project activities for each alternative.

Fire Area	Species	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 2 Mod	Alt 3 Mod
Beaver	*Cardaris chalapensis*	4	0	0	0	0	0	0
	Cardaria draba	1	1	1	1	1	1	0
	Centaurea solstitialis	6	6	6	6	6	6	5
	Isatis tinctoria	6	6	6	6	6	6	5

Fire Area	Species	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 2 Mod	Alt 3 Mod
	Tribulus terrestris	1	1	1	1	1	1	0
Happy Camp	*Centaurea maculosa*	9	5	5	5	5	5	2
	Centaurea pratensis	2	1	1	1	1	1	1
	Centaurea solstitialis	10	9	9	9	9	9	9
	Centaurea squarrosa	5	2	2	2	2	2	2
	Cytisus scoparius	18	14	14	14	14	14	11
	Euphorbia esula	55	24	24	24	24	24	6
	Isatis tinctoria	38	33	33	33	33	33	28
	Lepidium latifolium	11	4	4	4	4	4	1
Whites	*Centaurea maculosa*	13	13	13	13	13	13	12
	Centaurea solstitialis	1	1	1	1	1	1	1
	Cytisus scoparius	3	3	3	3	3	3	3
	Isatis tinctoria	9	9	9	9	9	9	8

Threatened, Endangered, Proposed and Candidate Plant Species

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

There will be no direct or indirect effects to Threatened, Endangered, Proposed, or Candidate species because no populations are currently known within the Beaver fire area. Suitable oak-chaparral habitat is present within the Beaver fire area and was surveyed for the Endangered *Fritillaria gentneri*; however, no populations were located.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

There are no known populations of, or suitable habitat present for, any Threatened, Endangered, Proposed, or Candidate species in the Happy Camp Complex fire area. Therefore, there will be no direct or indirect effects to Threatened, Endangered, Proposed, or Candidate species in this subpart.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

There are no known populations of or suitable habitat present for any Threatened, Endangered, Proposed, or Candidate species in the Whites fire area. Therefore, there will be no direct or indirect effects to Threatened, Endangered, Proposed, or Candidate species in this subpart.

Sensitive Vascular Plant Species

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

No known sensitive vascular plant species are present in the Beaver fire area (excepting *Cypripedium fasciculatum* and *C. montanum* which are being analyzed following Survey and Manage guidelines). Therefore, there will be no direct or indirect effects to Sensitive Botanical Species in this subpart.

Project Area B: Happy Camp Complex Fire

Direct Effects and Indirect Effects

There would be no direct effect to the three Sensitive vascular plant species located in the Happy Camp Complex fire area: *Eriogonum hirtellum, Erythronium hendersonii*, and *Thermopsis robusta* (*Cypripedium fasciculatum* and *C. montanum* are being analyzed following Survey and Manage guidelines).

Indirect effects to *E. hirtellum* would be the adverse effects of increased competition from early-seral species that were stimulated to germinate by the fire. Added competition in the short term would cause a declining trend in population viability; however, the long-term trend in population viability would likely remain static as competition balances out.

Erythronium species have been reported to benefit from wildfire. An increase in size and vigor was recorded for populations of *E. hendersonii* located in burned areas during surveys in spring 2015. Populations located in unburned areas may be indirectly affected by not receiving the benefits fire provides this genus. The short-term trend in population viability would be increasing in areas that received fire and static in those that did not. Without a future disturbance event, stable environmental conditions may cause a declining trend in population viability in the long-term.

Disturbance is necessary for the spread and continued vigor of *T. robusta* populations. Specifically, disturbance that may scarify the seed coat and/or create openings can increase germination and vigor of *T. robusta* seedlings. Unfortunately, the known population in the Happy Camp Complex fire area received little disturbance during the 2014 fires. Indirect negative effects may occur from the further development of canopy cover and a stable environmental condition which would hinder seed germination and decrease suitable habitat in the short term. However, future human-caused or natural disturbance, especially fire in areas of fuel accumulation, would allow for the creation of new habitat in the long-term. Subsequently, there would be a declining trend in population viability until the next disturbance event which could create conditions that would allow for an increasing trend in population viability.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

No known sensitive vascular plant species are present in the Whites fire area (excepting *Cypripedium fasciculatum* and *C. montanum* which are being analyzed following Survey and Manage guidelines). Therefore, there will be no direct or indirect effects to Sensitive Botanical Species in this subpart.

Sensitive Bryophytes, Lichens, and Fungi

Project Area A, B, and C: Beaver Fire, Happy Camp Complex Fire, and Whites Fire

Direct Effects and Indirect Effects

No known sensitive bryophyte, lichens, and fungi species are present in the three fire areas. Therefore, there will be no direct effects to Sensitive bryophyte, lichens, and fungi species in this subpart. Suitable habitat within none to moderately burned areas may be present. Indirect effects to suitable habitat for Sensitive bryophytes, lichens, and fungi are described below.

Sedimentation of springs and headwater streams may have a negative indirect effect on the aquatic habitat for the sole Sensitive Lichen species causing a declining trend in potential population viability (see Hydrology report).

Heavy fuel loading from the accumulation of dead, burned snags and debris from the 2014 fires is likely to have an indirect negative effect on potential habitat for Sensitive bryophyte, lichen, and fungal species by creating conditions conducive to high severity wildfire in the future.

Sensitive ectomycorrhizal fungi rely on the presence of a live host trees for their continued existence; forest re-establishment in severely burned areas may be delayed due to the loss of cone-bearing trees, thereby indirectly postponing Sensitive ectomycorrhizal fungal re-colonization. This would cause a decline in potential population viability because the recovery time for suitable habitat would be hindered.

Survey and Manage Vascular Plants, Bryophytes, Lichens and Fungi

Project Area A, B and C: Beaver Fire, Happy Camp Complex Fire, and Whites Fire

Direct Effects and Indirect Effects

There would be no direct effects to Survey and Manage vascular plant, bryophyte, lichen and fungi species or habitat therefore the project would be in compliance with Survey and manage regulations.

Suitable habitat and known populations may be indirectly affected under Alternative 1; however, these indirect effects will not affect compliance with Survey and Manage regulations. Downed woody debris would provide protected safe site for seed germination indirectly benefiting plant community composition. Standing burned trees would provide perches for seed dispersing birds, but these trees may fall on populations, damaging them and blocking germinating seeds and emerging seedlings. Natural forest regeneration could be delayed in severely burned areas due to the loss of cone-bearing trees, thereby indirectly postponing Survey and Manage mycorrhizal fungal recolonization. Accumulation of dead trees would generate high fuel loads creating conditions conducive to high severity wildfire which would cause a negative indirect effect to Survey and Manage species.

Non-native Invasive Species

Project Area A, B and C: Beaver Fire, Happy Camp Complex Fire, and Whites Fire

Direct Effects and Indirect Effects

There would be no direct effect to Non-native Invasive species from Alternative 1.

Existing NNIS populations would continue to spread at their current or higher rates due to the disturbance from the 2014 fire and suppression efforts, the subsequent habitat vulnerability, and the numerous non-project dependent vectors that are present in or utilize the Project area.

The risk of introduction and/or spread of NNIS under this alternative is high due to the numerous NNIS populations present in and adjacent to the project area, the high level of disturbance from the 2014 fires which created habitat conditions that are extremely vulnerable to NNIS invasion, and the probability that the substantial use of the project area for recreation, wood-cutting, and hunting will vector NNIS propagules into these vulnerable areas.

Cumulative Effects

There are no cumulative effects for Threatened, Endangered, Proposed, or Candidate species, because there will be no direct or indirect effects.

All activities and factors listed in Appendix C could have additional effects to Sensitive, Survey and Manage, and Non-native invasive species populations in the project area when added to Alternative 1. On-going and future foreseeable Forest projects have been and will be evaluated for effects to Sensitive, Survey and Manage and Non-native Invasive species. Project design features have been incorporated into these past projects to limit their effects on Sensitive, Survey and Manage and Non-native Invasive species populations. It is expected that because of these evaluations and the inclusion of project design features, cumulative effects from Forest projects will have a neutral effect on population viability trends for Sensitive species, on Forest compliance with Survey and Manage regulations, and on the risk of introducing and/or spreading NNIS.

Projects on private lands are not required to protect Sensitive botanical species, and subsequently actions on private lands may lead to a localized downward trend in population viability for these species. If that is the case, on-going and future foreseeable projects on private lands would have a declining cumulative effect on population viability trends for Sensitive species. However, without knowing how many species and/or populations are present, how many may be effected, and how project activities will affect habitat conditions, it is difficult to determine how potential effects from private actions would cumulatively influence population viability trends for Sensitive botanical species.

Forest compliance with Survey and Manage regulations requires pre-disturbance surveys for habitat-disturbing projects (Category A and C species only), and the management of known and high-priority sites for continued persistence. On-going and future foreseeable Forest projects would not cumulatively affect Survey and Manage botanical species and would comply with regulations if project design features structured to protect Survey and Manage populations and associated habitats are implemented. Additionally, on-going and future foreseeable projects on private land that affect Survey and Manage botanical species would have no effect on whether the Project is in compliance with these regulations since they pertain only to Forest occurrences and lands. Therefore, the Project would continue to comply with Survey and Manage regulations regardless of cumulative actions on Forest or private lands.

There are eight grazing allotments that overlap treatment units and may contribute to the long-distance dispersal of NNIS infestations in the project area. Livestock mainly transport NNIS propagules on their fur or through ingestion. Many NNIS have barbed or prickly seeds that readily adhere to animal fur and may potentially be transported long-distance and/or fall off in areas that are currently weed-free. Since many NNIS seeds can pass through the stomach unaffected, ingested seeds may also introduce NNIS to new areas once they are expelled. The added cumulative effects of grazing to Alternative 1 would likely increase the risk of NNIS introduction and spread.

Projects on private lands are not required to mitigate for the spread and/or introduction of NNIS species which could also increase negative cumulative effects to NNIS populations and subsequently raise the risk rating.

The BAER team analyzed the Project area and prescribed emergency treatments to help limit the introduction and spread of NNIS from the 2014 fires and suppression activities. Emergency treatments will take place in the first year following the fires (2015) and will include additional surveys for NNIS within the fire footprints and contingency areas as well subsequent hand removal of newly located infestations. These treatments will help

control the introduction and spread of annual NNIS species, such as *Centaurea solstitialis.* Unfortunately, biennial and perennial species that have a rosette life stage are difficult to locate in the first year because of their short stature, and may not be found during these surveys. The Forest Noxious Weed Detection and Treatment program would also continue to survey for and treat new populations that may be introduced or spread onto Forest lands through on-going and future foreseeable Forest and Private land projects. However, the cumulative risk for the introduction and spread of NNIS would remain high due to the particularly vulnerable condition of the habitat.

Alternative 2

Threatened, Endangered, Proposed and Candidate Plant Species

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

There will be no direct or indirect effects to Threatened, Endangered, Proposed, or Candidate species because no populations are currently known within the Beaver fire area. Suitable oak-chaparral habitat is present within the Beaver fire area and was surveyed for the Endangered *Fritillaria gentneri*, however; no populations were located. If populations are located later, there would still be no direct or indirect effects because flag and avoid project design features will be incorporated that would protect newly discovered populations. Subsequently, there is no likelihood of jeopardizing the continued existence of TEPC species.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

There are no known populations of or suitable habitat present for any Threatened, Endangered, Proposed, or Candidate species in the Happy Camp Complex fire area. Therefore, there will be no direct or indirect effects to Threatened, Endangered, Proposed, or Candidate species in this subpart.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

There are no known populations of or suitable habitat present for any Threatened, Endangered, Proposed, or Candidate species in the Whites fire area. Therefore, there will be no direct or indirect effects to Threatened, Endangered, Proposed, or Candidate species in this subpart.

Sensitive Vascular Plants

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

No known sensitive vascular plant species are present in the Beaver fire area (excepting *Cypripedium fasciculatum* and *C. montanum* which are being analyzed following Survey and Manage guidelines). Therefore, there will be no direct or indirect effects to Sensitive Botanical Species in this subpart.

Project Area B: Happy Camp Complex Fire

Direct Effects and Indirect Effects

There are three Sensitive vascular plant species located in the Happy Camp Complex fire area: *Eriogonum hirtellum, Erythronium hendersonii*, and *Thermopsis robusta* (*Cypripedium fasciculatum* and *C. montanum* are being analyzed following Survey and Manage guidelines) that may be affected by project activities. Effects to Sensitive vascular plants species known to be present in this subpart are described below.

Eriogonum hirtellum:

E. hirtellum populations within activity units occur in rocky, open serpentine outcroppings near Tom Martin Peak in the Happy Camp Complex fire area. Populations slightly overlap with roadside hazard tree removal, salvage, and site preparation and planting activities. These project activities are almost exclusively focused on the removal of conifers. Suitable habitat for *E. hirtellum* is characterized by open, rocky outcroppings that are often lacking in conifer cover, subsequently project activities are unlikely to occur in areas that currently support or may provide suitable habitat for *E. hirtellum.* Additionally, the proposed use of helicopter salvage yarding in the overlapping unit would limit the likelihood of damage to suitable habitat from equipment entry. Therefore, direct effects to these populations are anticipated to be extremely minimal in the short and long-term.

Indirect effects to *E. hirtellum* populations may occur due to increased competition from early seral species that were stimulated to germinate by the fire. In the short-term, this may have a declining effect on population viability as individuals are impacted. However, because effects would be minimal and to individuals and not the population as a whole, the long term trend in population viability would remain static.

Erythronium hendersonii:

Direct effects to *E. hendersonii* populations would be both beneficial and negative to population persistence. The removal of excess understory vegetation would provide a beneficial effect by opening up habitat and reducing light competition; and negative effects would occur to specific individuals and portions of the habitat where piles are burned. Project design features will mitigate effects to underground bulbs from pile burning; subsequently, this alternative would result in an increasing trend in population viability due to the beneficial impacts of fuels treatments on suitable habitat.

Thermopsis robusta:

Effects to this population would be both beneficial and negative. Use of the gravel pullout where this population occurs would provide a short term benefit by creating disturbance necessary for the creation of new suitable habitat and increased germination and subsequent population expansion by scarifying seed. However, vegetation recovery and encroachment would cause negative long-term effects on population viability. While there would be a short-term increasing trend in population viability due to use of the gravel pullout, overall there would be a declining trend in population viability until the next disturbance event that would again allow for an increasing trend in population viability.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

No known sensitive vascular plant species are present in the Whites fire area (excepting *Cypripedium fasciculatum* and *C. montanum* which are being analyzed following Survey

and Manage guidelines). Therefore, there will be no direct or indirect effects to Sensitive Botanical Species in this subpart.

Sensitive Bryophytes, Lichens and Fungi

Project Area A, B and C: Beaver Fire, Happy Camp Complex Fire, and Whites Fire

Direct Effects and Indirect Effects

There would be no direct or indirect effects to Sensitive bryophyte, lichen or fungi species as a result of Alternative 2 because none are known within the three fire areas. Suitable habitat within unburned to moderately burned areas may be present. Indirect effects to suitable habitat for Sensitive bryophytes, lichens, and fungi are described below.

Fuels treatments would provide an indirect, long-term benefit to suitable habitat by reducing excessive fuel loading and the potential for another high severity wildfire in the future which would cause an increasing trend in potential population viability through the maintenance and protection of suitable habitat.

Conifer planting associated with this alternative may indirectly benefit sensitive ectomycorrhizal fungi by increasing the speed at which severely burned areas are reforested. This would cause an increasing trend in potential population viability through the creation and restoration of suitable habitat.

Sedimentation of springs and headwater streams may have a negative indirect effect on the aquatic habitat for the sole Sensitive Lichen species. The risk of sedimentation would increase under this alternative in comparison to Alternative 1, causing a more precipitous decline in potential population viability because suitable habitat would have a higher risk of degradation. However, legacy site restoration will reduce the risk of sedimentation in the Elk creek watershed resulting in a static trend in potential population viability in that specific watershed (see the Hydrology report).

Survey and Manage Vascular Plants Species

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

There are two Survey and Manage vascular plant species located in the Beaver fire area:

Cypripedium fasciculatum and Cypripedium montanum:

Two *C. fasciculatum* and one *C. montanum* population are present within proposed activity units. These are both Category C species, and thus to be in compliance with Survey and Manage guidelines populations deemed high priority must be protected. No high priority sites have been designated on the Forest and therefore all populations (still assumed alive) within project activity units and on the Forest will be considered high priority and subsequently protected for site persistence. Implementation of flag and avoid protection measures would result in very minimal direct effects to *C. fasciculatum* and *C. montanum* populations as well as compliance with required guidelines. This alternative is expected to provide a long-term benefit to *C. fasciculatum* and *C. montanum* populations and suitable habitat by reducing excessive fuel loading and the potential for a high severity wildfire.

Project Area B: Happy Camp Complex Fire

Direct Effects and Indirect Effects

There are two Survey and Manage vascular plant species located in the Happy Camp Complex fire area:

Cypripedium fasciculatum and Cypripedium montanum:

Ten *C. fasciculatum* and seven *C. montanum* populations are present within proposed activity units. These are both Category C species, and thus to be in compliance with Survey and Manage guidelines populations deemed high priority must be protected. No high priority sites have been designated on the Forest and therefore all populations (still assumed alive) within project activity units and on the Forest will be considered high priority and subsequently protected for site persistence. Implementation of flag and avoid protection measures would result in very minimal direct effects to *C. fasciculatum* and *C. montanum* populations as well as compliance with required guidelines. This alternative is expected to provide a long-term benefit to *C. fasciculatum* and *C. montanum* populations and suitable habitat by reducing excessive fuel loading and the potential for a high severity wildfire.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

There are two Survey and Manage vascular plant species located in the Whites fire area:

Cypripedium fasciculatum and Cypripedium montanum:

Six *C. fasciculatum* and six *C. montanum* populations are present within proposed activity units. These are both Category C species, and thus to be in compliance with Survey and Manage guidelines populations deemed high priority must be protected. No high priority sites have been designated on the Forest and therefore all populations (still assumed alive) within project activity units and on the Forest will be considered high priority and subsequently protected for site persistence. Implementation of flag and avoid protection measures would result in very minimal direct effects to *C. fasciculatum* and *C. montanum* populations as well as compliance with required guidelines. This alternative is expected to provide a long-term benefit to *C. fasciculatum* and *C. montanum* populations and suitable habitat by reducing excessive fuel loading and the potential for a high severity wildfire.

Survey and Manage Bryophytes

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

There is one Survey and Manage Bryophyte species located in the Beaver fire area:

Ptilidium californicum:

There is one population of *P. californicum* located in a roadside hazard activity unit. *Ptilidium californicum* is a Category A species, and thus to be in compliance with Survey and Manage guidelines all known sites must be protected. Implementation of flag and avoid protection measures would result in no direct effects to populations ensuring compliance with required guidelines.

Roadside treatments may indirectly affect *P. californicum* by creating small canopy openings adjacent to the population that could increase air temperature and diminish shade. This would be a short-term effect as larger canopy elements would be maintained and shading to the habitat would not be significantly reduced for a long period. The

reduction in excessive fuels may indirectly benefit populations by reducing the risk of a future high severity wildfire.

Project Area B: Happy Camp Complex Fire

Direct Effects and Indirect Effects

There is one Survey and Manage Bryophyte species located in the Happy Camp Complex fire area:

Ptilidium californicum:

There is one population of *P. californicum* located in a roadside hazard activity unit. *Ptilidium californicum* is a Category A species, and thus to be in compliance with Survey and Manage guidelines all known sites must be protected. Implementation of flag and avoid protection measures would result in no direct effects to populations ensuring compliance with required guidelines.

Roadside treatments may indirectly affect *P. californicum* by creating small canopy openings adjacent to the population that could increase air temperature and diminish shade. This would be a short-term effect as larger canopy elements would be maintained and shading to the habitat would not be significantly reduced for a long period. The reduction in excessive fuels may indirectly benefit populations by reducing the risk of a future high severity wildfire.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

No known Survey and Manage Bryophyte species are present in the Whites fire area. Therefore, there will be no direct or indirect effects to Sensitive Bryophyte Species in this subpart.

Survey and Manage Fungi

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

No known Survey and Manage Fungi species are present in the Beaver fire area. Therefore, there will be no direct or indirect effects to Survey and Manage fungal species in this subpart.

Project Area B: Happy Camp Complex Fire

Direct Effects and Indirect Effects

There are three Survey and Manage Fungi species located in the Happy Camp Complex fire area:

Otidea leporina:

There is one *O. leporina* population located in an activity unit. *Otidea leporina* is a Category D species, and thus to be in compliance with Survey and Manage guidelines populations deemed high priority must be protected. Little is known about this species making it difficult to designate whether it is a high-priority population. If appropriate habitat components are present to support mycorrhizal and saprophytic fungi this population will be designated high-priority. Implementation of flag and avoid protection measures will result in no direct effects to this population as well as compliance with required guidelines.

Phaeocollybia olivacea:

There is one population of *P. olivacea* located in an activity unit. *Phaeocollybia olivacea* is a Category E species which requires the protection of all known sites in order to be in compliance with Survey and Manage guidelines. Implementation of flag and avoid protection measures would result in no direct effects to this population ensuring compliance with required guidelines. Project activities would beneficially affect suitable habitat by reducing excessive fuels, thereby decreasing the risk of a future high severity fire event that would kill host trees and moisture requirements necessary for survival.

Tremiscus helvelloides:

There is one population of *T. helvelloides* located in an activity unit. *Tremiscus helvelloides* is a Category D species and thus to be in compliance with Survey and Manage guidelines high-priority populations must be protected. No high priority sites have been designated on the Forest and therefore all populations (still assumed alive) within project activity units and on the Forest will be considered high priority and subsequently protected for site persistence. Implementation of flag and avoid protection measures will result in no direct effects to this population as well as compliance with required guidelines. Prescribed burn treatments would have a beneficial indirect effect on these populations by reducing excessive fuels, thereby decreasing the risk of a future high severity fire event.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

There are three Survey and Manage Fungi species located in the Whites fire area:

Albatrellus flettii:

There is one *A. flettii* population located in an activity unit. *Albatrellus flettii* is a Category B species, and thus to be in compliance with Survey and Manage guidelines all known sites must be protected. Implementation of flag and avoid protection measures would result in no direct effects to this population ensuring compliance with required guidelines. Subsequently, there would be no likelihood of effecting this population. However, there is the likelihood that project activities would beneficially affect suitable habitat by reducing excessive fuels, thereby decreasing the risk of a future high severity fire event that would kill host trees and moisture requirements necessary for survival.

Phaeocollybia californica

There is one population of *P. californica* located in an activity unit. *Phaeocollybia californica* is a Category B species which require the protection of all known sites in order to be in compliance with Survey and Manage guidelines. Implementation of flag and avoid protection measures would result in no direct effects to this population ensuring compliance with required guidelines. Project activities would beneficially affect suitable habitat by reducing excessive fuels, thereby decreasing the risk of a future high severity fire event that would kill host trees and moisture requirements necessary for survival.

Phaeocollybia olivacea:

There is one population of *P. olivacea* located in an activity unit. *Phaeocollybia olivacea* is a Category E species which requires the protection of all known sites in order to be in compliance with Survey and Manage guidelines. Implementation of flag and avoid

protection measures would result in no direct effects to this population ensuring compliance with required guidelines. Project activities would beneficially affect suitable habitat by reducing excessive fuels, thereby decreasing the risk of a future high severity fire event that would kill host trees and moisture requirements necessary for survival.

Non-native Invasive Species

Project Area A: Beaver Fire

There are two moderate priority NNIS, *Centaurea solstitialis* and *Isatis tinctoria*, located within or adjacent to activity units in the Beaver fire area. These species are common across the Forest, and because of their widespread distribution they are typically given a lower priority than less common weeds and thus there is a high likelihood that there are populations of both *C. solstitialis and I. tinctoria* within the Project area that have not been mapped. Because these species are both located in activity units and along haul routes there is potential for spread through the disturbance of existing populations, activation of seed banks, and transport on equipment and vehicles. There is a **high** risk of spread of these two species within this subpart.

Project Area B: Happy Camp Complex Fire

There are seven non-native invasive species known to be present in or adjacent to project activity units within the Happy Camp Complex fire area. Of these, five are considered high priority species on the Forest: *Centaurea maculosa, Centaurea squarrosa, Cytisus scoparius, Euphorbia esula,* and *Lepidium latifolium*. Two are considered moderate priority species: *Centaurea solstitialis* and *Isatis tinctoria*.

Centaurea pratensis, Euphorbia esula and *Lepidium latifolium* populations occur in riparian areas located along river and stream banks and thus have a **very low** likelihood of being disturbed by Project activities, unless water drafting sites are located within known populations.

Because *Centaurea maculosa, Centaurea squarrosa, Cytisus scoparius, Centaurea solstitialis* and *Isatis tinctoria* are located in activity units and along haul routes there is potential for spread through the disturbance of existing populations, activation of seed banks, and transport on equipment and vehicles. There is a **high** risk of introduction and spread of these non-native invasive species within this subpart.

Project Area C: Whites Fire

There are three non-native invasive species present in or adjacent to project activity units within the Whites fire area. Of these, two are high priority species, *Centaurea maculosa* and *Cytisus scoparius*, and1 is a moderate priority species, *Isatis tinctoria*.

Because these species are located in activity units and along haul routes there is potential for weed spread through the disturbance of existing populations, activation of seed banks, and transport on equipment and vehicles. There is a **high** risk of introduction and spread of NNIS within this subpart.

All Project Areas (Project Area A, B, and C)

Direct Effects and Indirect Effects

The three fire-related project areas are already highly susceptible to NNIS infestation regardless of project activities due to the numerous NNIS infestations already present, the

vulnerability of the project area from the 2014 fires, and the high recreational use of the area. Project activities are not expected to increase invasion potential through the removal of canopy cover or duff layers because these elements were already lost during the 2014 fires.

In this alternative, the five risk factors combined have a **higher** potential for NNIS introduction and spread within the project area when compared to Alternative 1, due to the higher level of ground disturbing activities and increased vectors. Ground disturbance that includes the movement of soils contaminated with NNIS propagules, such as road and landing construction, grading, and treatment of watershed legacy sites (Happy Camp Complex fire area), would directly contribute to the spread of these infestations. With extensive infestations occurring along roadways, dispersal distance may be increased through transport on recreational or project related vehicles and equipment. Helicopter logging in areas infested with NNIS would increase the rate of spread because down drafts from rotor blades could displace weed seeds and disperse them over large distances. Water-tenders could also spread NNIS propagules through waterways when filling their tanks, allowing new infestations to establish downstream.

Project design features and mitigation measures would minimize these effects; however the risk would remain high due to the pre-existing condition. Continuation of the existing Forest weed monitoring and treatment would detect any new high-priority weed sites that may become established within the project area. Quickly treating these sites will limit new NNIS establishment.

Cumulative Effects

There are no cumulative effects for Threatened, Endangered, Proposed, or Candidate species, because there will be no direct or indirect effects.

All activities and factors listed in Appendix C of this EIS could have additional effects to Sensitive, Survey and Manage, and Non-native invasive species populations in the project area when added to Alternative 2. On-going and future foreseeable Forest projects have been and will be evaluated for effects to Sensitive, Survey and Manage and Non-native Invasive species. Project design features have been or will be incorporated into ongoing and future foreseeable Forest projects to limit their effects on Sensitive, Survey and Manage and Non-native Invasive species populations.

Sensitive species viability and persistence may be both beneficially and negatively affected by cumulative Forest projects. Project design features have been or will be incorporated into all on-going and future foreseeable Forest projects to limit negative effects on population viability trends. Consequently, the cumulative effect of Forest projects on Sensitive species would be expected to cause a short-term declining trend in population viability as individuals are lost, but would create a long-term increasing trend in population viability from the beneficial impacts of management activities on suitable habitat (i.e. fuel treatments, conifer planting, habitat creation, etc.).

Projects on private lands are not required to protect Sensitive botanical species, and subsequently actions on private lands may lead to a localized downward trend in population viability for these species. If that is the case, on-going and future foreseeable projects on private lands would have a declining cumulative effect on population viability trends for Sensitive species. However, without knowing how many species and/or populations are present, how many may be effected, and how project activities will affect

habitat conditions it is difficult to determine how potential effects from private actions would cumulatively influence population viability trends for Sensitive botanical species.

Forest compliance with Survey and Manage regulations requires pre-disturbance surveys for habitat-disturbing projects (Category A and C species only), and the management of known and high-priority sites for continued persistence. On-going and future foreseeable Forest projects would not cumulatively affect Survey and Manage botanical species and would comply with regulations if project design features structured to protect Survey and Manage populations and associated habitats are implemented. Additionally, on-going and future foreseeable projects on private land that affect Survey and Manage botanical species would have no effect on whether the Project is in compliance with these regulations since they pertain only to Forest occurrences and lands. Therefore, the Project would continue to comply with Survey and Manage regulations regardless of cumulative actions on Forest or private lands.

The five risk factors combined have a high potential for NNIS introduction and spread within the project area for Alternative 2, due to the high level of ground disturbing activities and increased vectors. Project design features and mitigation measures would minimize these effects; however the risk would remain high due to the pre-existing condition. On-going and future foreseeable projects would also implement mitigation measures aimed at reducing NNIS introduction and spread. Unfortunately, project design features cannot eliminate risk and it is expected that new NNIS infestations may still become established despite these mitigation measures. Consequently, on-going and future foreseeable Forest projects have the potential to elevate the cumulative risk of NNIS introduction and spread, resulting in a continued risk rating of high.

There are eight grazing allotments that overlap treatment units and may contribute to the long-distance dispersal of NNIS infestations in the project area. Livestock mainly transport NNIS propagules on their fur or through ingestion. Many NNIS have barbed or prickly seeds that readily adhere to animal fur and may potentially be transported long-distance and/or fall off in areas that are currently weed-free. Since many NNIS seeds can pass through the stomach unaffected, ingested seeds may also introduce NNIS to new areas once they are expelled. The added cumulative effects of grazing to Alternative 2 would likely increase the risk of NNIS introduction and spread. Projects on private lands are not required to mitigate for the spread and/or introduction of NNIS species which could also increase negative cumulative effects to NNIS populations and subsequently raise the risk rating.

The BAER team analyzed the project area and prescribed emergency treatments to help limit the introduction and spread of NNIS from the 2014 fires and suppression activities. Emergency treatments will take place in the first year following the fires (2015) and will include additional surveys for NNIS within the fire footprints and contingency areas as well subsequent hand removal of newly located infestations. These treatments will help control the introduction and spread of annual NNIS species, such as *Centaurea solstitialis.* Unfortunately, biennial and perennial species that have a rosette life stage are difficult to locate in the first year because of their short stature, and may not be found during these surveys. The Forest Noxious Weed Detection and Treatment program would also continue to survey for and treat new populations that may be introduced or spread onto Forest lands through on-going and future foreseeable Forest and Private land

projects; however, the cumulative risk for the introduction and spread of NNIS would remain high due to the particularly vulnerable condition of the habitat.

Alternative 3

Threatened, Endangered, Proposed and Candidate Plant Species

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 3 will have the same direct, indirect, and cumulative effects to Threatened, Endangered, Proposed, and Candidate botanical species as Alternative 2 and the same project Design Features would be incorporated to mitigate those effects.

Sensitive Vascular Plants, Bryophytes, Lichens, and Fungi

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 3 will have the same direct, indirect, and cumulative effects to Sensitive botanical species as Alternative 2 and the same project Design Features would be incorporated to mitigate those effects. Additionally, the added retention of snag clumps and coarse woody debris under this Alternative would indirectly benefit habitat for Sensitive bryophytes and fungi by mitigating effects to microclimate and providing substrate.

Survey and Manage Vascular Plants, Bryophytes, and Fungi

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 3 will have the same direct, indirect, and cumulative effects to Survey and Manage species as Alternative 2 and will incorporate the same project Design Features to mitigate those effects. Additionally, the added retention of snag clumps and coarse woody debris under this Alternative would indirectly benefit habitat for Survey and Manage bryophytes and fungi by mitigating effects to microclimate and providing substrate.

Non-native Invasive Species

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Direct, indirect, and cumulative effects from these alternatives to the spread and introduction of NNIS infestations would be the same as for Alternative 2 and the same Project Design Features would be incorporated to mitigate those effects.

Alternative 4

Threatened, Endangered, Proposed and Candidate Plant Species

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 4 will have the same direct, indirect, and cumulative effects to Threatened, Endangered, Proposed, and Candidate botanical species as Alternative 2 and the same project Design Features would be incorporated to mitigate those effects.

Sensitive Vascular Plants, Bryophytes, Lichens, and Fungi

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Fewer populations of *E. hirtellum* would be located within project activity units under this Alternative. Remaining populations will have the same direct, indirect, and cumulative effects as Alternative 2 and the same project Design Features would be incorporated to mitigate those effects.

Alternative 4 will have the same direct, indirect, and cumulative effects to Sensitive bryophytes, lichens, and fungi as Alternative 2 and the same project Design Features would be incorporated to mitigate those effects. Additionally, the added retention of snag clumps and coarse woody debris under Alternative 4 would indirectly benefit habitat for Sensitive bryophytes and fungi by mitigating effects to microclimate and providing substrate.

Survey and Manage Vascular Plants, Bryophytes, and Fungi

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 4 will have the same direct, indirect, and cumulative effects to Survey and Manage species as Alternative 2 and will incorporate the same project Design Features to mitigate those effects. Additionally, the added retention of snag clumps and coarse woody debris under Alternative 4 would indirectly benefit habitat for Survey and Manage bryophytes and fungi by mitigating effects to microclimate and providing substrate.

Non-native Invasive Species

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Direct, indirect, and cumulative effects from these alternatives to the spread and introduction of NNIS infestations would be the same as for Alternative 2 and the same Project Design Features would be incorporated to mitigate those effects.

Alternative 5

Threatened, Endangered, Proposed and Candidate Plant Species

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 5 will have the same direct, indirect, and cumulative effects to Threatened, Endangered, Proposed, and Candidate botanical species as Alternative 2 and the same project Design Features would be incorporated to mitigate those effects.

Sensitive Vascular Plants, Bryophytes, Lichens, and Fungi

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 5 will have the same direct, indirect, and cumulative effects to Sensitive botanical species as Alternative 2 and will incorporate the same Project Design Features to mitigate those effects.

Survey and Manage Vascular Plants, Bryophytes, and Fungi

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 5 will have the same direct, indirect, and cumulative effects to Survey and Manage botanical species as Alternative 2 and will incorporate the same Project Design Features to mitigate those effects.

Non-native Invasive Species

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Direct, indirect, and cumulative effects from this alternative to the spread and introduction of NNIS infestations would be slightly less than for Alternative 2, because of the reduction in acres treated, resulting in less disturbed ground and chance of introduction of new species. The decrease in risk is very minimal and not enough to lower the risk rating from high. The same Project Design Features would be incorporated to mitigate effects.

Alternative 2 Modified

Threatened, Endangered, Proposed and Candidate Plant Species

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 2 Modified will have the same direct, indirect, and cumulative effects to Threatened, Endangered, Proposed, and Candidate botanical species as Alternative 2 and the same project Design Features would be incorporated to mitigate those effects.

Sensitive Vascular Plants, Bryophytes, Lichens, and Fungi

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 2 Modified will have the same direct, indirect, and cumulative effects to Sensitive botanical species as Alternative 2 and will incorporate the same Project Design Features to mitigate those effects.

Survey and Manage Vascular Plants, Bryophytes, and Fungi

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 2 Modified will have the same direct, indirect, and cumulative effects to Survey and Manage botanical species as Alternative 2 and will incorporate the same Project Design Features to mitigate those effects.

Non-native Invasive Species

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 2 Modified will have the same direct, indirect, and cumulative effects on the risk of spread and introduction of non-native invasive species (NNIS) as Alternative 2 and the same Project Design Features will be incorporated to mitigate effects.

Alternative 3 Modified

Threatened, Endangered, Proposed and Candidate Plant Species

All Project Areas (Project Area A, B, and C)

Direct, Indirect, and Cumulative Effects

Alternative 3 Modified will have the same direct, indirect, and cumulative effects to Threatened, Endangered, Proposed, and Candidate botanical species as Alternative 2 and the same project Design Features would be incorporated to mitigate those effects.

Sensitive Vascular Plants, Bryophytes, Lichens, and Fungi

Project Area A: Beaver Fire

Direct, Indirect, and Cumulative Effects

Alternative 3 Modified will have the same direct, indirect, and cumulative effects to Sensitive botanical species as Alternative 2 and will incorporate the same Project Design Features to mitigate those effects.

Project Area B: Happy Camp Complex Fire

Direct, Indirect, and Cumulative Effects

Alternative 3 Modified will have the same direct, indirect, and cumulative effects to *Erythronium hendersonii* and *Thermopsis robusta* populations as Alternative 2 and will incorporate the same Project Design Features to mitigate those effects. The likelihood of effects from Alternative 3 Modified to *Eriogonum hirtellum* populations will be reduced because fewer populations are located within activity units (

Table 3-22). The direct, indirect, and cumulative effects to populations still located within activity units will be the same as for Alternative 2 and the same Project Design Features will be incorporated to protect species viability.

Project Area C: Whites Fire

Direct, Indirect, and Cumulative Effects

Alternative 3 Modified will have the same direct, indirect, and cumulative effects to Sensitive botanical species as Alternative 2 and will incorporate the same Project Design Features to mitigate those effects.

Survey and Manage Vascular Plants, Bryophytes, and Fungi

Project Area A: Beaver Fire

Direct, Indirect, and Cumulative Effects

There would no longer be any effects to *Ptilidium californicum* populations in the Beaver Fire area under Alternative 3 Modified (Table 3-23). The direct, indirect, and cumulative effects to Survey and Manage botanical populations still located within activity units will be the same as for Alternative 2 and the same Project Design Features will be incorporated to protect species viability.

Project Area B: Happy Camp Complex Fire

Direct, Indirect, and Cumulative Effects

The likelihood of effects from Alternative 3 Modified to *Cypripedium fasciculatum* populations would be reduced in the Happy Camp Complex fire area because fewer populations are located within activity units (Table 3-23). The direct, indirect, and cumulative effects to Survey and Manage botanical populations still located within activity units will be the same as for Alternative 2 and the same Project Design Features will be incorporated to protect species viability.

Project Area C: Whites Fire

Direct, Indirect, and Cumulative Effects

The likelihood of effects from Alternative 3 Modified to *Cypripedium montanum* populations would be reduced in the Whites fire area because fewer populations are located within activity units (Table 3.13). The direct, indirect, and cumulative effects to Survey and Manage botanical populations still located within activity units will be the same as for Alternative 2 and the same Project Design Features will be incorporated to protect species viability.

Non-native Invasive Species

Project Area B: Beaver Fire

Direct, Indirect, and Cumulative Effects

Direct, indirect, and cumulative effects from Alternative 3 Modified on the risk of spread and introduction of NNIS infestations within the Beaver fire area would be the same as for Alternative 2, except fewer populations of *Centaurea solstitialis* and *Isatis tinctoria* would be located within project activity units (Table 3-24). The decrease in risk will be very minimal and not enough to lower the risk rating from **high** due to the highly vulnerable condition of the habitat**.** The same Project Design Features will be incorporated to mitigate effects.

Project Area B: Happy Camp Complex Fire

Direct, Indirect, and Cumulative Effects

Direct, indirect, and cumulative effects from Alternative 3 Modified on the risk of spread and introduction of NNIS infestations within the Happy Camp Complex fire area would be the same as for Alternative 2, except fewer populations of *Euphorbia esula* (leafy spurge) would be located within project activity units (Table 3-24). The decrease in risk will be very minimal and not enough to lower the risk rating from **high** due to the highly vulnerable condition of the habitat. The same Project Design Features will be incorporated to mitigate effects.

Project Area C: Whites Fire

Direct, Indirect, and Cumulative Effects

Direct, indirect, and cumulative effects from Alternative 3 Modified on the risk of spread and introduction of NNIS infestations within the Whites fire area would be the same as for Alternative 2, except fewer populations of *Centaurea maculosa* and *Isatis tinctoria* would be located within project activity units (Table 3-24). The decrease in risk will be very minimal and not enough to lower the risk rating from **high** due to the highly vulnerable condition of the habitat. The same Project Design Features will be incorporated to mitigate effects.

Comparison of Effects

Table 3-25: Summary of Effects by analysis indicator for the Beaver Fire Area

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt. 3
Likelihood of jeopardizing the continued existence of Threatened, Endangered, Proposed, or Candidate species populations	No likelihood of jeopardizing continued existence	No likelihood of jeopardizing continued existence	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Trend of Sensitive species population viability	Static trend, no known populations present	Static trend, no known populations present	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Compliance with Survey & Manage guidelines as defined by the 2001 ROD	Compliant	Compliant following implementation of project design feature's	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Risk of introducing and/or spreading non-native invasive species	High	High	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2

Table 3-26: Summary of Effects by analysis indicator for the Happy Camp Fire Area

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt. 3
Likelihood of jeopardizing the continued existence of Threatened, Endangered, Proposed, or Candidate species populations	No likelihood of jeopardizing continued existence	No likelihood of jeopardizing continued existence	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Sensitive species viability: *Eriogonum hirtellum*	Static trend in population viability	Static trend in population viability	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Sensitive species viability: *Erythronium hendersonii*	Declining trend in population viability	Increasing trend in population viability	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Sensitive species viability: *Thermopsis robusta*	Declining trend in population viability	Short term increasing trend in population viability	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Compliance with Survey & Manage guidelines as defined by the 2001 ROD	Compliant	Compliant following implementation of project design feature's	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Risk of introducing and/or spreading non-native invasive species	High	High	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2

Table 3-27: Summary of Effects by analysis indicator for the Whites Fire Area

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt. 3
Likelihood of jeopardizing the continued existence of Threatened, Endangered, Proposed, or Candidate species populations	No likelihood of jeopardizing continued existence	No likelihood of jeopardizing continued existence	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Trend of Sensitive species population viability	Static trend, no known populations present	Static trend, no known populations present	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Compliance with Survey & Manage guidelines as defined by the 2001 ROD	Compliant	Compliant following implementation of project design feature's	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Risk of introducing and/or spreading non-native invasive species	High	High	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2

Determination of Effects

Alternative 1

Under Alternative 1, it is my determination that the Project **will not affect** the Sensitive plant species: *Eriogonum hirtellum, Erythronium hendersonii, and Thermopsis robusta.*

Alternative 2

Under Alternative 2, it is my determination that the Project **may affect individuals, but is not likely to result in a trend toward federal listing or a loss of viability** *for* the Sensitive plant species: *Eriogonum hirtellum, Erythronium hendersonii, and Thermopsis robusta.*

Alternative 3

Under Alternative 3, it is my determination that the Project **may affect individuals, but is not likely to result in a trend toward federal listing or a loss of viability** *for* the Sensitive plant species: *Eriogonum hirtellum, Erythronium hendersonii, and Thermopsis robusta.*

Alternative 4

Under Alternative 4, it is my determination that the Project **may affect individuals, but is not likely to result in a trend toward federal listing or a loss of viability** *for* the Sensitive plant species: *Eriogonum hirtellum, Erythronium hendersonii, and Thermopsis robusta.*

Alternative 5

Under Alternative 5, it is my determination that the Project **may affect individuals, but is not likely to result in a trend toward federal listing or a loss of viability** *for* the Sensitive plant species: *Eriogonum hirtellum, Erythronium hendersonii, and Thermopsis robusta.*

Alternative 2 Modified

Under Modified Alternative 2, it is my determination that the Project **may affect individuals, but is not likely to result in a trend toward federal listing or a loss of viability** *for* the Sensitive plant species: *Eriogonum hirtellum, Erythronium hendersonii, and Thermopsis robusta.*

Alternative 3 Modified

Under Modified Alternative 3, it is my determination that the Project **may affect individuals, but is not likely to result in a trend toward federal listing or a loss of viability** *for* the Sensitive plant species: *Eriogonum hirtellum, Erythronium hendersonii, and Thermopsis robusta.*

Compliance with Law, Regulation, Policy, and the Forest Plan

Threatened, Endangered, and Sensitive Botanical Species:

The Project complies with the Endangered Species Act of 1973, as amended, in the preparation of a Biological Assessment; Forest Service Policy (FSM 2670), and Forest Plan Standards and Guidelines for Sensitive plant species have been met by managing populations for continued viability (see the Forest Plan consistency checklist in the project record for compliance with the Forest Plan).

Survey and Manage Plants:

The Project complies with the 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines by preparing an assessment and documenting effects (USDA 2014a).

Non-native Invasive Species:

The Project complies with Forest Service Manual 2900 and Forest Plan Standards and Guidelines for Non-native invasive species by preparing the Noxious Weed Risk Assessment, and providing Project Design Features to minimize effects.

Range

The purpose of this section is to describe the condition of range resources in the Project area and how rangeland resources may be affected by the proposed action and alternatives for this project.

Methodology

The method used to determine effects on rangeland resources included a qualitative comparison of each alternative's likelihood of affecting the amount of forage available for livestock use and rangeland condition. Existing rangeland conditions were determined through field visits, monitoring data, and historical records for each allotment.

To describe the rangeland resources in the project area and analyze alternatives, the following Klamath National Forest Geographic Information System data files were used:

- Allotment and unit/pasture boundaries;
- Fire intensity; and
- Project alternative maps.

Condition and trend of rangelands is determined by monitoring "key areas" on upland, meadow, and riparian rangeland areas. Key areas are a small ecological site or plant community that is responsive to management actions and indicative of the larger ecological site or plant community they are intended to represent (USDI 1999b). Condition and trend monitoring protocols employed include Best Management Practices Effectiveness Program (BMPEP), Photo Point Monitoring, and Rooted Frequency.

Following the 2014 fires, ocular observations were made to ground truth the fire intensity maps, assess condition of key areas, and estimate vegetation regrowth potential for forage.

Analysis Indicators

The effects of the project on rangeland resources are evaluated using two analysis indicators:

- Amount of Available Forage
- Rangeland Condition

Amount of forage and rangeland condition are the biggest impact to allotment viability. Adequate forage is needed to sustain cattle grazing without exceeding rangeland

standards and guidelines and rangeland condition can indicate if grazing is a proper use of the land.

Spatial and Temporal Context

The spatial limits of this analysis are limited to the grazing allotments which fall within the project area. This allows for analysis of the total effect to all rangeland resources associated with the project. Due to the nature of grazing permits, effects are measured in the short term of 10 years or less and long term of 20 years to consider trend of the rangeland resource.

Affected Environment

The project encompasses portions of the East Beaver, Dry Lake, Horse Creek, Johnny/Seiad, South Klamath, Big Ridge, Scott Bar Mountain, Marble Valley, Etna Creek, and South Russian allotments and includes all areas on the Lake Mountain and Middle Tompkins allotments. Allotment names, status, use period, and permitted cow/calf pair numbers are provided in Table 3-28.

Table 3-28: Allotments within the project boundary

Area	Allotment Name	Status	Use Period and Permitted Number
Beaver Fire	East Beaver	Active	4/1-6/15, 44 pairs 6/16-10/30, 250 pairs
Beaver Fire	Dry Lake	Active	4/15-5/09, 116 pairs 5/10-10/15, 170 pairs
Beaver Fire	Horse Creek	Active	4/15-10/15, 101 pairs
Beaver Fire	Johnny/Seiad	Vacant	N/A
Beaver Fire	South Klamath	Vacant	N/A
Happy Camp Complex	Scott Bar Mountain	Vacant	N/A
Happy Camp Complex	Lake Mountain	Active	7/15-10/15, 25 pairs
Happy Camp Complex	Middle Tompkins	Vacant	Currently being analyzed
Happy Camp Complex	Big Ridge	Active	7/15-10/15, 120 pairs
Happy Camp Complex	Marble Valley	Active	7/15-10/15, 35 pairs
Whites Fire	Etna Creek	Active	7/15-10/15, 54 pairs
Whites Fire	South Russian	Active	7/15-10/15, 40 pairs

Seiad/Johnny, South Klamath, and Scott Bar Mountain will not be discussed further as they are vacant and are not expected to be restocked within the next 10 years. Middle Tompkins is also vacant; however, it is included because it is currently undergoing analysis to update the allotment management plan. Although Big Ridge is within the project boundary, it will not be discussed further as all grazing activities are in wilderness and therefore treatments will not overlap with rangeland resources.

Allotment Monitoring

Rangeland condition assessment methods most commonly used on the Forest are Rooted Frequency Plots (USDI, 1999a) in key areas. Table 3-29 shows the most current reading of rooted frequency plots within the affected allotments.

Table 3-29: Condition based on Rooted Frequency Plots

Allotment	Plot Name	Year of Last Reading	Vegetation Type	Vegetation Condition[1]	Overall Condition[2]	Ecological Condition[3]
Dry Lake	KLA1402-Dead Cow*	2014	Moist Meadow	Fair	Good	Satisfactory
East Beaver	KLA9904-Trapper Creek*	2009	Wet Meadow	Moderate	Moderate	Satisfactory
East Beaver	KLA0202-Trapper Creek*	2007	Dry Meadow	Moderate	Moderate	Satisfactory
Horse Creek	No Frequency Plots Established					
Lake Mountain	KLA1301-Kuntz Creek	2013	Dry Meadow	Moderate	Moderate	Satisfactory
Middle Tompkins	KLA1302-Tyler Meadows	2013	Moist Meadow	Moderate	High	Satisfactory
Middle Tompkins	KLA1201-Middle Creek Meadows	2012	Moist Meadow	Moderate	Moderate	Satisfactory
Marble Valley	KLA0103-Big Rock*	2006	Moist Meadow	Moderate	Low	Unsatisfactory
Etna Creek	KLA1401-Meeks Meadow*	2014	Moist Meadow	Good	Good	Satisfactory
South Russian	No Frequency Plots Established					

*Plot is not within the Westside Project boundary but is the nearest key area within the allotment that is representative of rangeland conditions.

[1]Vegetation condition: There are two ranking scales displayed in the Table because region 5 recently changed their scoring system for rangeland plots. High, Moderate, and Low refer to high seral, mid seral, and early seral respectively. The terms poor, fair, and excellent are the current classifications for rangeland condition.

[2]Overall condition is based upon hydrologic, vegetative, and soil conditions

[3]Ecological condition simply summarizes overall condition as either satisfactory or non-satisfactory

As outlined in Table 3-29, most rangeland key areas are in satisfactory condition. Marble Valley is in unsatisfactory condition due to shallow rooting depth and bare soil, which can put rangeland at risk of undesirable plant invasion. However, the vegetation in the Marble Valley area had been maintaining mid-seral species since 2001 and reevaluation of this site is expected to occur in 2015. Conditions within the South Russian and Horse Creek areas have been measured by other methods, thus no frequency plots have been established to date.

Riparian conditions on the Forest allotments are assessed through the BMPEP (Table 3-30). The grazing protocol for the Pacific Southwest Region (Region 5) of the Forest Service records herbaceous and woody utilization levels, stream-bank disturbance, ground cover, bank angle, riparian and upslope erosion, and riparian vegetation condition.

Table 3-30: Most current BMPEP rating for each allotment within the project area

Allotment Name	Key Area	Year Evaluated	Met Implementation Standards?	Met Effectiveness Criteria?
Dry Lake	Dead Cow*	2009	Yes	Partial
East Beaver	West Long John*	2008	Yes	Yes
Horse Creek	Salt Creek*	2012	Yes	Yes
Lake Mountain	Lookout Spring	2013	Partial	Partial
Middle Tompkins	Tyler Meadows	2008	Yes	Yes
Marble Valley	South Fork Kelsey	2009	Yes	Yes
Etna Creek	Meeks Meadow	2010	Partial	Partial
South Russian	Lees Meadow	2013	Yes	Yes

Allotments that met both implementation and effectiveness BMPEP criteria demonstrate that grazing is not degrading water resources in the allotment. Changes in grazing management are recommended and implemented for sites that partially meet the criteria. In the three allotments that partially met effectiveness criteria, trampling had caused stream-bank vulnerabilities or exposed soil at the edges of ponds. These disturbances were localized and did not cause impacts to beneficial uses such as fisheries and wildlife use.

2014 Wildfire

During the summer of 2014, the Beaver, Happy Camp Complex, and Whites fires burned about 200,000 acres of land. As a result, the project was developed in response to landscape-level changes to forested habitat resulting from the 2014 wildfires on the Forest. Table 3-18 outlines the levels of burn mortality by acre for each allotment as a result of these fires.

Table 3-31: Fire intensity in Allotments

Allotment Name	Total Allotment Acres	1-10 %	10-25 %	25-50 %	50-75 %	75-90 %	>90 %	Total Burned Acres	Percentage of allotment acres burned
Dry Lake	41,501	2962	1704	2031	1633	1046	7890	17,266	42 %
East Beaver	67,042	1941	982	920	685	399	2567	7,494	11 %
Horse Creek	37,055	401	191	188	147	94	1017	2,038	6 %
Lake Mountain	9,655	1334	724	838	686	455	2735	6,772	70 %
Middle Tompkins	14,736	3204	1471	1344	795	420	1759	8993	61 %
Marble Valley	8,136	7	2	2	0	0	0	11	<1 %
Etna Creek	18,903	351	112	94	63	48	253	921	5 %
South Russian	13,200	647	275	269	215	149	796	2351	18 %
Total	210,228	10,847	5,461	5,686	4,224	2,611	17,017	45,846	21 %

Field visits performed after the fire revealed that burning was patchy and irregular throughout the allotments. The fire severity drifted toward the extreme with most acres either being in the 1-10 percent mortality category or over 90 percent mortality category. The most intense burning occurred where dense closed canopy forest dominated the landscape. Herbaceous forest understory and shrublands were burned in a patchy manner, but because this forage component is widely scattered and separated, effects could not be comprehensively assessed at time of inspection. Direct effects of the burn on meadows were minimal. Most meadows were either unburned or lightly burned in some areas. In general, the fire did not produce serious mortality on primary rangeland to the point of altering existing conditions.

To allow for post-fire recovery of vegetation, livestock grazing areas will be modified within the project area where necessary. For the Middle Tompkins allotment, livestock grazing permits will not be authorized until 2016 or later. Lake Mountain and Dry Lake allotments will be monitored prior to the 2015 grazing season to determine if vegetation has recovered enough to support grazing and grazing won't hinder tree establishment. If grazing is allowed, animals may be turned out at a later date and/or the season may be shortened in the fall to allow for optimal vegetation recovery and the most beneficial use of livestock grazing. These modifications for post-fire livestock use of rangelands will be variable based to rangeland conditions and climate as observed by rangeland managers.

Environmental Consequences

Many of the proposed activities overlap spatially so the footprint on the landscape will be less than the acres proposed under each individual treatment: this is displayed as the number of "dissolved" acres. (For the individual acres proposed for each allotment, please see the Rangeland Resource Report.) Table 3-32 displays an updated Table for the percentage of allotment acres being treated under Alternative 2, as this alterative proposes the greatest number of acres under treatment. Percentage of allotment acres for the Alternative 2 Modified and Alternative 3 Modified has also been included as a comparison.

Table 3-32: Approximate acres of proposed activity with allotment boundaries for Alternative 2

Allotment Name (Fire area)	Forest Service Acres within allotment	Total dissolved acres	Percentage of allotment acres being treated
Dry Lake (Beaver Fire)	37,457	4,285	11%
East Beaver (Beaver Fire)	41,607	1,157	3%
Horse Creek (Beaver Fire)	23,224	504	2%
Total for Beaver Fire Allotments	102,288	5,946	6%
Lake Mountain (Happy Camp Complex)	9,655	3,150	33%
Marble Valley (Happy Camp Complex)	8,136	103	1%
Middle Tompkins (Happy Camp Complex)	14,736	4,528	31%
Total For Happy Camp Complex Allotments	32,527	7,781	24%
Etna Creek (Whites Fire)	17,254	188	1%

Allotment Name (Fire area)	Forest Service Acres within allotment	Total dissolved acres	Percentage of allotment acres being treated
South Russian (Whites Fire)	12,277	34	0.3%
Total for Whites Fire Allotments	29,531	222	0.8%

Table 3-33: Approximate acres of proposed activity with allotment boundaries for Alternative 2 Modified

Allotment Name (Fire area)	Forest Service Acres within allotment	Total dissolved acres	Percentage of allotment acres being treated
Dry Lake (Beaver Fire)	37,457	3,993	11%
East Beaver (Beaver Fire)	41,607	1,157	3%
Horse Creek (Beaver Fire)	23,224	504	2%
Total for Beaver Fire Allotments	102,288	5,654	6%
Lake Mountain (Happy Camp Complex)	9,655	2,939	30%
Marble Valley (Happy Camp Complex)	8,136	103	1%
Middle Tompkins (Happy Camp Complex)	14,736	4,487	30%
Total For Happy Camp Complex Allotments	32,527	7,529	23%
Etna Creek (Whites Fire)	17,254	188	1%
South Russian (Whites Fire)	12,277	34	0.3%
Total for Whites Fire Allotments	29,531	222	0.8%

Table 3-34: Approximate acres of proposed activity with allotment boundaries for Alternative 3 Modified

Allotment Name (Fire area)	Forest Service Acres within allotment	Total dissolved acres	Percentage of allotment acres being treated
Dry Lake (Beaver Fire)	37,457	4091	11%
East Beaver (Beaver Fire)	41,607	1198	3%
Horse Creek (Beaver Fire)	23,224	478	2%
Total for Beaver Fire Allotments	102,288	5767	6%
Lake Mountain (Happy Camp Complex)	9,655	2562	27%
Marble Valley (Happy Camp Complex)	8,136	0	0%
Middle Tompkins (Happy Camp Complex)	14,736	3366	23%
Total For Happy Camp Complex Allotments	32,527	5928	18%
Etna Creek (Whites Fire)	17,254	168	1%
South Russian (Whites Fire)	12,277	34	0.3%
Total for Whites Fire Allotments	29,531	202	.07%

Alternative 1

Direct Effects and Indirect Effects

Under Alternative 1, no treatments are proposed within the Project area. As a result, there will be no direct effects to rangeland resources, and rangelands will slowly heal from wildfire effects. New areas of transitory rangeland will likely be available for livestock and wildlife where moderate or low severity burns occurred. Not implementing project activities such as salvage harvest, hazardous fuels treatments, roadside hazard treatments,

and site preparation, planting and release may have the indirect effects of limiting livestock access to forage in the short term and could make livestock management (turnout, moving, and gathering cattle) dangerous for permittees. Areas that were severely burned will be susceptible to weed invasion which may have the indirect effect of lower productive rangeland conditions in the long term. However, the burn may also allow rangelands to flourish and expand with more water and sunlight available to vegetation.

Project Area A: Beaver Fire

The effects of Alternative 1 for the Beaver Fire area are the same as for the other fire areas as described in the environmental consequences section of the Rangeland Resource report.

Project Area B: Happy Camp Complex

The effects of Alternative 1 for the Happy Camp Fire area are the same as for the other fire areas as described in the Rangeland Resource report.

Project Area C: Whites Fire

The effects of Alternative 1 for the Whites Fire area are the same as for the other fire areas as described in the Rangeland Resource report.

Cumulative Effects

This alternative will not add project-related incremental effects to the effects of current or future grazing projects, because no management activities are proposed. Grazing, projects on private lands and recreational activities will not adversely affect the availability of rangeland forage, and rangeland conditions will continue to fluctuate in response to climatic conditions, wildfire, and grazing management. The stated effects apply to each of the fire areas: Beaver Fire, Happy Camp Complex, and Whites Fire

Alternative 2

The description of treatments for all alternatives is provided in Chapter 2.

Salvage harvest, hazardous fuels treatment, roadside hazard treatments, and site preparation, planting, and release activities are planned as proposed treatments within the allotment boundaries. The proposed activities have been reviewed and the will have minimal effects on rangeland resources because the proposed activities do not often overlap the same areas where cattle graze. Most salvage harvest and planting activities take place on steeper slopes which cattle rarely, if ever, use. Capable rangeland, or areas that are accessible to cattle and produce forage, are generally limited to a 40 percent or less slope during rangeland capability analysis on the Forest (Holechek 1989; USDA Forest Service 2001). Project activities are also planned in timbered vegetative communities that are not likely to be able to produce substantial forage because of heavy canopy cover and lack of a seedbank.

Efforts will be taken to schedule grazing in areas that are not actively being treated so as to minimize stress to livestock and protect young seedlings. Permittees will be notified through Annual Operating Instructions of areas where harvesting, burning activity, and/or grazing restrictions will occur that could affect their permit. Additionally, Range project

design features have been created to protect rangeland improvements such as cattle guards and corrals.

For a description of alternatives and a list of project design features, see Table 2-42 of Chapter 2.

Direct Effects and Indirect Effects

Where capable rangeland overlaps with salvage logging or fuels treatments, the Project will likely provide new areas of transitory range. This will temporarily (5-10 years) increase the amount of forage available for livestock and wildlife; encourage animals to disperse on the landscape, and decrease grazing pressure on primary rangelands. Heavy equipment operations during treatment will likely increase the chance of weed dispersal; however; noxious weed project design features (NNIS-1 through NNIS-5) will be in place and provide for proper mitigation. Livestock management will also be safer for permittees after hazardous trees have been removed. Rangeland conditions in the Beaver Fire Area should not be negatively affected as a result of Alternatives 2, 3, and 4, as a Range project design feature (Range-3) protects allotment meadows.

Project Area A: Beaver Fire

Between the draft and final EIS there were dropped units and modifications to fuels and harvest units which slightly reduces the potential new transitory forage available for permitted cattle. Much of the treated area will be replanted so that reduces the available forage even more. Since treatments are limited to six percent or less of the allotment acres, only a small portion of the allotments will produce additional forage. All other effects are similar to those stated above.

Project Area B: Happy Camp Complex

Very little has changed in the unit boundaries for the Happy Camp Complex allotments. Harvest and fuels treatments will open up forest areas and potentially increase forage within 24 percent or less of the allotment acres. All other effects will be similar to those stated above.

Project Area C: Whites Fire

About 30 acres of fuels treatments have been removed but the number of acres being treated in the allotment areas as a whole are negligible at less than one percent. In addition, most work will be done around pre-existing roads, where there are few rangeland resources. Treatments will only produce a minimal amount of open areas which may produce additional forage. Rangeland condition will be largely unaffected as there is little overlap between rangelands and units that will require heavy equipment. Mitigation measures for weeds and rangelands will continue to pertain to this alternative to further ensure rangeland condition is protected.

Cumulative Effects

Adding the effects of this alternative to the ongoing and reasonably foreseeable future actions identified in Alternative 1 will not have substantial cumulative effects to range. There will be a slight increase of transitory range available for livestock and wildlife foraging and rangeland conditions will continue to fluctuate in response to climatic conditions, wildfire, and grazing management. The stated effects apply to each of the fire areas: Beaver Fire, Happy Camp Complex, and Whites Fire.

Alternative 3

Direct Effects and Indirect Effects

Project Area A: Beaver Fire

Alternative 3 does not propose any salvage units which would slightly decrease the amount of available forage within the allotment areas. Other effects would be similar to those in Alternative 2.

Project Area B: Happy Camp Complex

Effects are similar to that of Alternative 2.

Project Area C: Whites Fire

Effects are similar to those identified for Alterative 2.

Cumulative Effects

The cumulative effects are similar to those stated for Alternative 2

Alternative 4

Direct Effects and Indirect Effects

Project Area A: Beaver Fire

Effects are similar to that of Alternative 2.

Project Area B: Happy Camp Complex

Effects are similar to that of Alternative 2.

Project Area C: Whites Fire

Effects are similar to those identified for alterative 2.

Cumulative Effects

The cumulative effects are similar to those stated for Alternative 2

Alternative 5

Direct Effects and Indirect Effects

Project Area A: Beaver Fire

Alternative 5 proposes approximately 1,000 more acres of fuels treatments in the Beaver Fire area than the other alternatives. This would open up forest understory and renew herbaceous and shrubby growth which would provide more forage for cattle and wildlife. Other effects would be similar to those described for Alternative 2.

Project Area B: Happy Camp Complex

As compared to Alternative 2, there are more than 1,000 acres less proposed for both salvage logging and site preparation and planting. These effects seem to have a cancellation effect on each other as the logging would leave standing timber in an area that would otherwise be a potential forage source; however, the decrease in planting units would leave openings in the forest that may be available as forage in the future. There would be fewer disturbances from heavy equipment which may reduce the potential spread of weeds into rangeland areas.

Project Area C: Whites Fire

Effects of Alternative 5 are identical to that described for Alternative 2.

Cumulative Effects

Cumulative effects will be identical to those of Alternative 2.

Alternative 2 Modified

Direct Effects and Indirect Effects

Project Area A: Beaver Fire

Alternative 2 Modified will reduce proposed harvesting treatments to 333 acres, less than half of what Alternative 2 proposes. Acres of fuels treatments, site preparation and planting acres, and roadside hazard treatment areas will remain at similar levels which will slightly increase the amount of available forage, but not as much as Alternatives 2, 4, and 5. Less salvage units may mean some rangelands are harder to access as they will not be easily traversed by cattle when trees have fallen and will be a hazard for permittees. Rangeland Condition will not be affected as mitigation measures are in place that will protect meadows and reduce the risk of week spread.

Project Area B: Happy Camp Complex

Effects are similar to that of Alternative 2.

Project Area C: Whites Fire

Effects are identical to that of Alternative 2.

Cumulative Effects

Cumulative effects will be similar to those of Alternative 2.

Alternative 3 Modified

Direct Effects and Indirect Effects

Project Area A: Beaver Fire

Alternative 3 Modified will reduce proposed harvesting treatments to zero acres within allotment boundaries, and reduce the amount of open canopy that could potentially offer transitory range. Fuels treatments would be increased by over 1,000 acres as compared to Alternative 2. Rangeland will respond favorably to fuels treatments by allowing sparse herbaceous vegetation to grow within the understory but will produce fewer pounds per acre than opening the canopy through salvage harvesting. Site preparation and planting acres and roadside hazard treatment areas will remain at similar levels. No salvage units may mean some rangelands are harder to access as they will not be easily traversed by cattle when trees have fallen and will be a hazard for permittees. Rangeland condition will not be affected as mitigation measures are in place that will protect meadows and reduce the risk of week spread.

Project Area B: Happy Camp Complex

Both roadside hazard treatments and salvage harvest are proposed to be reduced by 1,000 acres, when compared to Alternative 2. Fuels treatments site preparation and planting units are similar to what was proposed for Alternative 2. The reduction in salvage harvest

and roadside hazard treatments means this alternative will not have the potential for transitory range that Alternative 2 does. Additionally, reduction in salvage harvest will make permittee travel and cattle management more difficult and dangerous within the allotments. Rangeland condition will not be affected as mitigation measures are in place that will protect meadows and reduce the risk of week spread.

Project Area C: Whites Fire

Effects will be similar to those of Alternative 2, with the exception that a 20-acre unit of salvage harvesting would not occur. This will be only a negligible change to the amount of forage available.

Cumulative Effects

Effects are similar to those identified under Alternative 2

Comparison of Effects

Fire Area A: Beaver Fire

Alternative 1 will add no additional forage to rangeland resources within the Beaver Fire Area and will be more dangerous for permittees managing cattle in allotments as a result of no treatment activities. Alternative 3, Modified Alternative 2, and Modified Alternative 3 will slightly increase forage availability and reduce hazards to permittees, as compared to Alternative 1. Alternatives 2, 4, and 5 will benefit rangeland resources the most as the treatments proposed will increase the amount of forage available, decrease grazing pressure on primary rangelands, and reduce hazards for permittees who maintain rangeland conditions.

Table 3-35: Summary of Effects by analysis indicator for the Beaver Fire Area

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt 3
Availability of Forage	No additional increase of forage	Increase	Small increase	Increase	Increase	Small increase	Small increase
Rangeland Condition	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral

Fire Area B: Happy Camp Fire

Alternative 1 will add no additional forage to rangeland resources within the Happy Camp Fire Area and will be more dangerous for permittees managing cattle in allotments as a result of no treatment activities. Alternatives 2, 3, 4, 5, and Modified Alternative 2 will benefit rangeland resources the most as the treatments proposed will increase the amount of forage available, decrease grazing pressure on primary rangelands, and reduce hazards for permittees who maintain rangeland conditions. Modified Alternative 3 will slightly increase forage availability and reduce hazards to permittees, as compared to Alternative 1.

Table 3-36: Summary of Effects by analysis indicator for the Happy Camp Fire Area

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt 3
Availability of Forage	No additional increase of forage	Increase	Increase	Increase	Increase	Increase	Small increase

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt 3
Rangeland Condition	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral

Project Area C: Whites Fire

Alternative 1 will add no additional forage to rangeland resources within the Whites Fire Area Alternatives 2,3,4,5, Modified Alternative 2, and Modified Alternative 3 will provide a negligible benefit to rangeland resources as the treatments proposed will slightly increase the amount of forage available, and slightly reduce hazards for permittees who maintain rangeland conditions.

Table 3-37: Summary of Effects by analysis indicator for the Whites Fire Area

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt 3
Availability of Forage	No additional increase of forage	Negligible increase	Negligible increase	Negligible increase	Negligible increase	Negligible increase	Negligible increase
Rangeland Condition	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral

Compliance with law, regulation, policy, and the Forest Plan

All Project alternatives are in compliance with law, policy, and regulation related to rangeland resources, and is in compliance with the standards of the Forest Plan as displayed in the Forest Plan consistency checklist, available on the project website.

Hydrology

This section compares potential impacts and benefits to hydrologic function and water quality of project alternatives. Results of the analysis are used to verify that project alternatives adhere to existing law, regulation, and policy such as the Clean Water Act (specified by Total Maximum Daily Load requirements for the Klamath, Salmon, and Scott Rivers) and Forest Plan requirements including those related to the Aquatic Conservation Strategy. See Aquatic Conservation Strategy Report in project record.

Methodology

The effects of project alternatives on hydrologic function and water quality are analyzed based on existing Forest ecosystem analysis documents, recent watershed field surveys, and Geographic Information System (GIS) reports and modeling. Ongoing stream channel monitoring to meet North Coast Region Water Quality Control Board (Water Board) waiver requirements, and field surveys during and after the 2014 fires provided current data. Data were synthesized to define existing watershed conditions for comparison with Total Maximum Daily Load requirements for the Klamath, Salmon, and Scott Rivers, Aquatic Conservation Strategy objectives and desired watershed conditions from the Forest Plan. See Aquatic Conservation Report in project record.

The Forest uses standardized Cumulative Watershed Effects (CWE) models (Equivalent Roaded Area, Universal Soil Loss Equation, and mass-wasting) to assess effects of past, present, and reasonably foreseeable activities as described further in the body of the Hydrology resource report and relevant supporting references. Cumulative watershed effects models were used to index watershed disturbance (Equivalent Roaded Acres –

ERA), evaluate the effects of soil erosion (Universal Soil Loss Equation – USLE) and evaluate the potential for mass-wasting (landsliding).

Models were updated to incorporate effects of the 2014 fires and road improvements identified in BAER assessments. The updates provide a picture of post-fire watershed conditions. The potentially ground-disturbing activities and events that are included in the CWE modeling for both US Forest Service lands and private lands in the project area are:

- Vegetation removal (timber harvest, thinning, fuels reduction);
- Roads used for temporary access;
- Log landing construction and enlargement;
- Effects of wildfires and suppression efforts (including fire lines);
- Prescribed burning;
- Road improvements (outsloping, rocking and crossing upgrades) (results shown as negative numbers); and
- Road decommissioning (results shown as negative numbers).

Ground-disturbing activities are assigned coefficients of disturbance in the Equivalent Roaded Area (ERA) model to represent the disturbance created by a road segment of equal size in area (Haskins 1986). Effects from vegetation management, wildfire, and prescribed fire show naturally reduced disturbance over time for all three models (ERA, universal soil loss equation (USLE) and mass-wasting (GEO)). Recovery curves are displayed in figures 1, 2 and 3 for the three models. Sediment yield (cubic yards/acre/year) estimated by the USLE occurs in the first winter season, requires a 2-year, 6-hour storm, and recovers to background rates within seven years (USDA Forest Service 2004). Sediment yield (cubic yards/acre/decade) estimated by the mass-wasting model depends on a ten-year storm event, and yield recovers to background rates in 50 years (USDA Forest Service 2004). The models make assumptions regarding the rates of recovery for the processes represented by the models. As site re-vegetation provides increased interception, evapotranspiration, ground cover, and mechanical strength, the effects of ground disturbing activities lessen (see Figures 3-1, 3-2 and 3-3). Road and landing areas do not recover naturally over time; however, their coefficients of disturbance can be reduced if the areas are improved by decommissioning, outsloping, rocking, or crossing upgrades.

Model results fall on a continuum. The models are indexed using a “risk ratio.” The threshold of concern for the risk ratio for both models is 1.0. The threshold of concern does not represent the exact point at which adverse cumulative effects will occur. Rather it serves as a “yellow flag” indicating increasing susceptibility for adverse effects to beneficial uses in a watershed (Bell 2012).

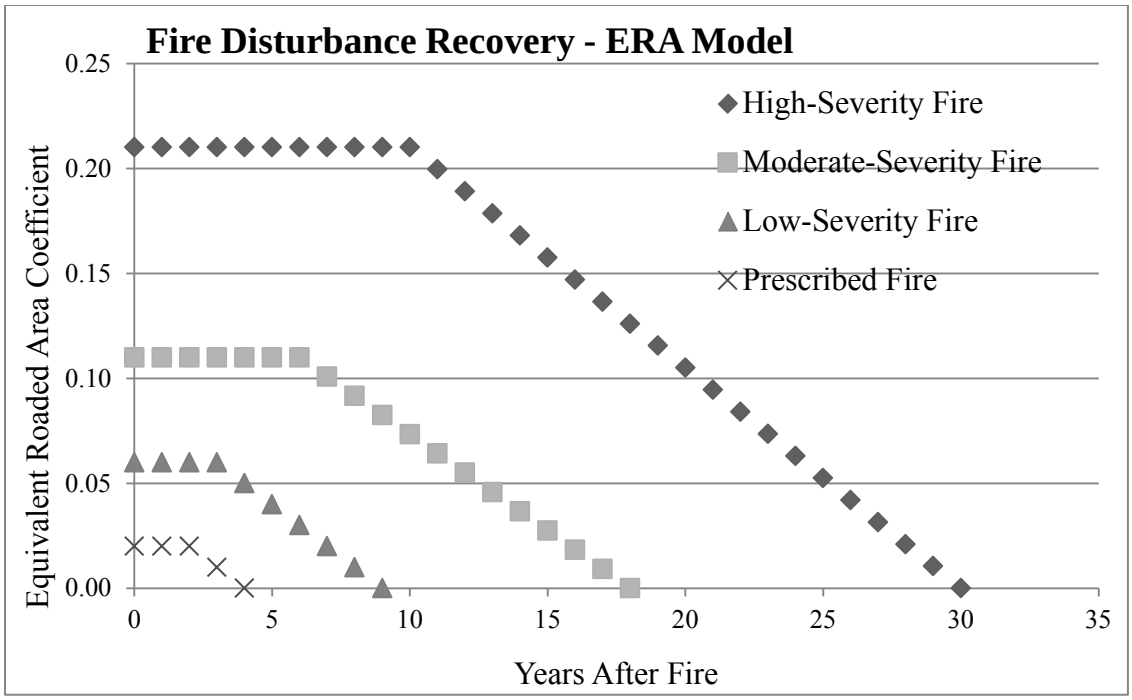

Figure 3-14: Fire disturbance recovery curves for the Forest cumulative watershed effects ERA model

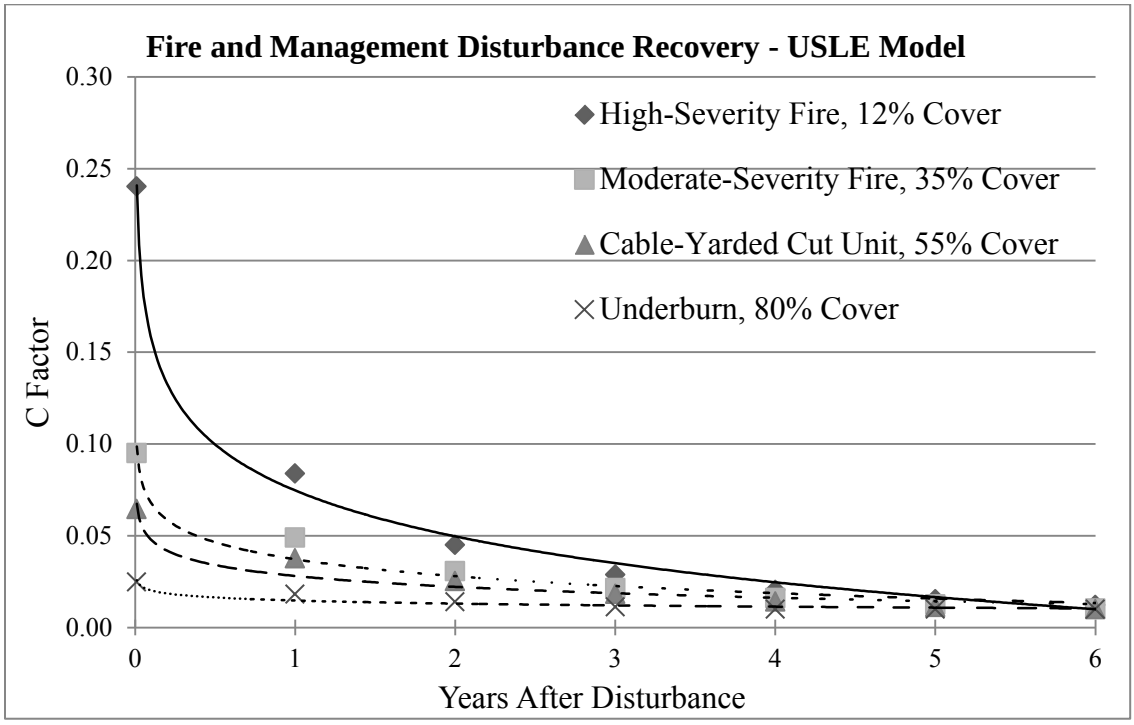

Figure 3-15: Fire and vegetation management recovery curves for the Forest cumulative watershed effects USLE model

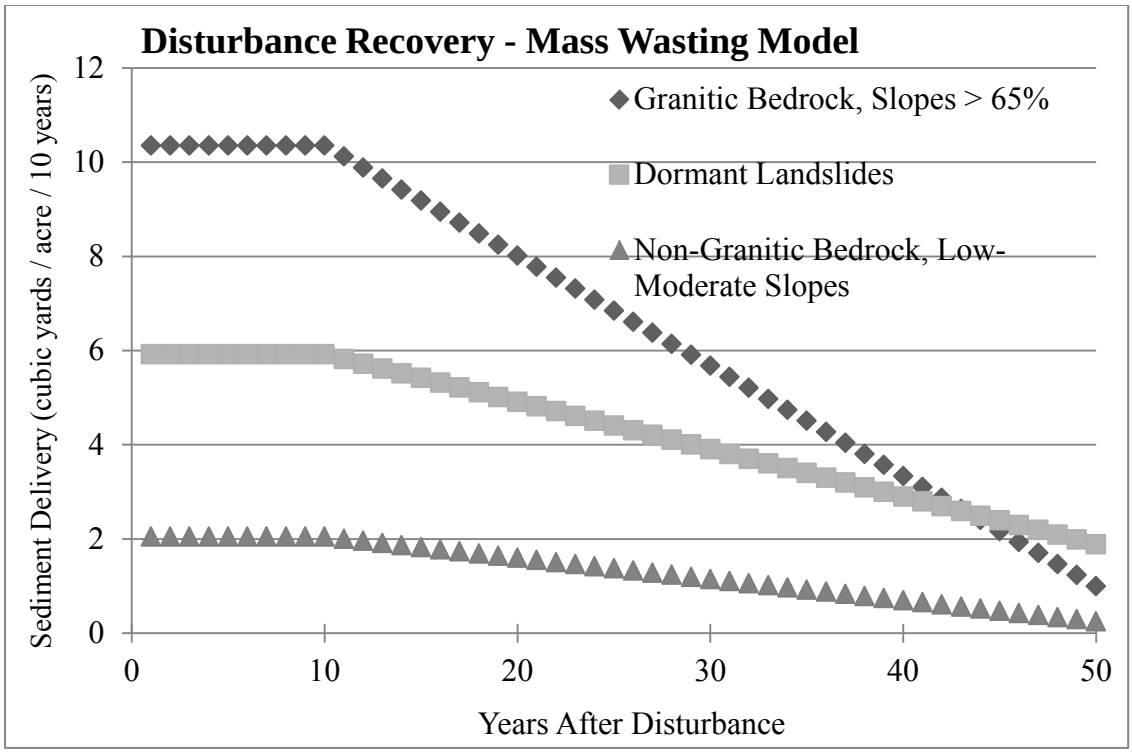

Figure 3-16: Recovery curves for the Forest cumulative watershed effects mass-wasting model

Analysis Indicators

Analysis indicators are chosen to be responsive to Total Maximum Daily Load (Clean Water Act) requirements and the Forest Plan (including Aquatic Conservation Strategy objectives), and to demonstrate potential differences between project alternatives with respect to hydrologic function and water quality.

Risk to Channel Morphology

There are two processes that the project might affect that could influence the risk to channel morphology. The first is an increase in peak flow which can lead to modifications of channel bed, banks and floodplain (where it exists). Loss of ground vegetation, ground cover and canopy from high severity fires may cause increases in the magnitude of peak flow (flood) events. In other words, the loss of vegetation allows more precipitation to reach the ground, increasing the amount of water transported in stream channels. Peak flows following large fires are often increased from pre-fire flows that would result from a storm of the same magnitude. Based on results from the 2014 BAER analysis, post-fire unit peak stream flows (cubic feet per second/square mile) are not expected to increase sufficiently to increase risk to existing channel morphology. This is because project area streams are predominantly steep with channel beds and banks armored by coarse substrate (cobble, boulder, bedrock). Based on ERA model (which can be used as a proxy for peak flow changes) results potential effects of Alternative 2 are indiscernible from fire effects (Alternative 1) at both the 5th and 7th field watershed scale. In other words, the conditions created by the Westside Fires are driving watershed conditions with respect to peak flow, and project impacts are not likely to be discernible. This does not mean that peak flows will not increase; it means the Proposed Action would not be the cause of that increase. The evidence suggests that there is no change to

peak flow as a result of the wildfire or in the ERA model due to the proposed activities so peak flow will not be used in this analysis.

The second process that can affect channel morphology is debris flow events. Landslide likelihood is analyzed in the Geology report and the Geology section of Chapter 3 of this Environmental Impact Statement. The landslide likelihood encompasses all landsliding processes not just debris flow events. The cross walk below (Table 3-38) was developed to provide a more accurate depiction of the debris flow likelihood associated with a given landslide likelihood description.

Table 3-38: Crosswalk of depiction of debris flow likelihood associated with landslide likelihood description

Landslide Descriptor	Debris Flow Descriptor
Almost Certain	Highly Likely
Highly Likely	Likely
Likely	Unlikely

Risk of Sediment Regime Alteration

The sediment regime analysis uses all three cumulative watershed effects models because they all represent some process that can introduce sediment into a stream channel from the hillslope. Watersheds with one model risk ratio over the threshold of concern (1.0) have an elevated risk of adverse effects to beneficial uses. Watersheds with risk ratios of less than 1.0 have a low risk of adverse effects to beneficial uses.

The duration of elevated risk is estimated based on CWE model recovery curves presented in the draft EIS. Elevated risk of surface erosion as assessed by the Universal Soil Loss Equation (USLE) model is expected to reduce quickly, approaching the pre-fire levels after 2 years. Elevated risk as assessed by the ERA model is expected to remain constant for up to 10 years post-fire and then recover quickly over the next approximately 10 years. Elevated risk of mass wasting is expected to remain constant for 10 years post-fire and then recover gradually over the subsequent approximately 80 years. The geology report assesses all types of landsliding in the landslide risk assessment and the duration of elevated risk. In that analysis the Forest Geologist determined that the landslide risk will be elevated for more than 80 years in watersheds with more than 10 percent high and moderate vegetation severity. This can be mitigated by artificial regeneration. If 25 percent or more of the moderate and high severity areas are planted in a watershed the duration of elevated risk is expected to be about 30 years. Watersheds at elevated risk that are subject to project activities that increase risk ratios are interpreted as having negative cumulative effects.

Trend of Riparian Function

The trend of Riparian Function is analyzed at the project scale. It is intended to give an overall look at how the Riparian Reserves are functioning and whether the function is improving (positive trend), declining (negative trend) or staying the same (neutral trend). The information from the indicators above is used to determine the magnitude and direction of the trend. The analysis includes effect to temperature regime via debris flow events and shade reduction not related to debris flows along stream channels. The trend will also consider effects to large wood recruitment in the short and long term.

Spatial and Temporal Context

The spatial context for the hydrologic analysis is the project area that includes portions of the following eight 5th field watersheds: Beaver Creek; Humbug Creek-Klamath River; Horse Creek-Klamath River; Seiad Creek-Klamath River; Lower Scott River; Thompson Creek-Klamath River; Elk Creek; and North Fork Salmon River. The 5th field watersheds are the analysis area for broad scale effects analysis. The 7th field watersheds are considered small scale for a project area of this size. There are seventy-five 7th field watersheds that intersect portions of the three fire-related areas (Happy Camp Complex, Beaver, and Whites fires). In addition to the analysis of broad- and small-scale watersheds, the effects of proposed new infrastructure are analyzed. Effects to water quality of proposed temporary roads, stream crossings, and landings are assessed. The long-term temporal bounding for this analysis is up to 10 years because recovery of the fire-disturbed hydrologic function (from ERA modeling) and surface erosion (from USLE modeling) is appreciable in the first decade. The short-term is between 2 and 4 years after implementation.

Affected Environment

Desired Conditions

Desired conditions for water and Riparian Reserves are provided in the Forest Plan and summarized in this section. For Riparian Reserves, desired vegetation is an overstory of coniferous vegetation providing shade and thermal cover and understory vegetation providing further thermal regulation, nutrient regulation, and bank stability (Forest Plan pg. 4-106). Riparian vegetation is diverse and dense enough such that it stabilizes stream banks and hillslopes, promotes sediment trapping, and contributes downed large wood (Forest Plan pg. 4-107). These riparian conditions maintain and promote water quality and reduce potential stress from sediment and temperature loading. Desired conditions for stream flows (including peak flow) are such that they provide adequate protection to semi-aquatic and aquatic habitat and maintain natural hydrologic processes (Forest Plan pg. 4-107). Desired flow conditions promote and maintain channel function and resulting morphology. These flow conditions support beneficial uses such as cold freshwater habitat and associated fish migration, fish spawning, and preservation of rare and endangered species.

Existing Condition

Post Fire Debris Flows: Over 50,000 acres of the Westside Fires burned with moderate to high severity, killing most of the trees. Because of the extreme fire conditions, ground vegetation, down woody debris and tree crowns were completely consumed in large areas of the fire. Lack of ground cover and crown interception exposes soils to raindrop impacts, and increases the amount of precipitation that reaches the ground. Moderate to high severity fires can also cause a loss of soil hydrologic function by sealing pores and degrading soil structure. Under high severity fire conditions, soils become resistant to water infiltration because burned organic material soaks into empty pore spaces in the soils, making the soil surface impervious to water, or “hydrophobic”. Also, silica in the soil can fuse at high temperatures contributing to hydrophobicity. Once soils become hydrophobic, surface runoff and erosion can increase dramatically because rainfall cannot infiltrate the soil. Hydrophobicity rarely persists beyond the first season following a fire.

During mid-July, 2015 high intensity rainfall events over severely burned portions of the West Side Fire area caused surface erosion that triggered a number of debris flows. As much as 1.5 inches of rain fell in less than an hour in many parts of the fire area during these storms causing localized flash flooding. The high-intensity rainfall event on hydrophobic soils that had been denuded of vegetation in the 2014 Westside Fires caused rapid delivery of water and sediment to stream channels by rills and small gullies. This slurry of water and debris is what formed the debris flows. Water, rocks, mud and trees were swept downslope in the Music Creek, Beaver Creek, Grider Creek, and Walker Creek drainages.

Debris flows in a post-fire environment are a natural phenomenon that is common especially where there are large areas of high severity burn such as the 2014 Westside Fires (Everest and Reeves, 2007). These debris flows were surface erosion events related primarily to loss of ground vegetation, loss of forest canopy and hydrophobic soil conditions rather than landslides caused by loss of root strength.

As noted elsewhere in this report, and in the Geology Report, events like this were predicted to occur in the Draft EIS as a result of the conditions created by the 2014 fires. The surface erosion event and associated debris flows do not alter the findings of this assessment. See tables 3-25, 3-26 and 3-27 for a display of landslide and debris flow risk by watershed.

CWE Analysis Area and Projects: The analysis of the Affected Environment for the CWE models includes the Eddy Late Successional Reserve, Elk Thin, Fish Meadows, Glassups Timber Sale, Happy Camp Fire Protection Phase 2, Johnny O'Neil Late Successional Reserve Habitat Restoration and Fuels Reduction, Lake Mountain Foxtail Pine, Lower Scott Roads, North Fork Roads Storm-proofing, Oak Flat Thin, Singleton, Thom Seider Vegetation Management and Fuels Reduction, and Two Bit Vegetation Management projects. Work done under the Burned Area Emergency Response (BAER), grazing allotments, Private Timber Harvest Plans since 2005, and Private Land Salvage (Emergency Timber Harvest Plans) are on-going activities and the CWE models include them in the "current" portion of the results.

Legacy Sites: One cause of impairment on National Forest System lands has been attributed to *legacy sediment sites* from past management including historic mining, road building, and silviculture (NCRWQCB 2010, NCRWQCB 2005). A majority of the legacy sediment sites are associated with the road system, most of which was constructed in the 1960s and 1970s prior to modern best management practices (best management practicess). Culverts were commonly designed to pass a 25-year flood rather than the 100-year flood required by current road standards. Road construction often did not avoid unstable slopes or riparian areas that are protected by today's best management practicess. As a result, some of the current road system is not resilient to natural disturbance by fire and floods. A flood in 1997 caused road failures which triggered debris torrents that traveled miles downstream. Some of the impact to water quality occurred when landslides and debris flows removed riparian vegetation, reduced stream shade, and increased water temperatures (De La Fuente and Elder 1998, NCRWQCB 2010). To minimize or eliminate water quality impacts by future floods the Total Maximum Daily Loads for the Klamath, Scott, and Salmon Rivers set load allocations that require road stream crossings to pass a 100-year flood without diverting or failing.

The Forest has completed legacy sediment site inventories for most roads on the Forest (USDA Forest Service 2012). A total of 953 legacy sediment sites were inventoried in the project boundary (Table 3). Most of the legacy sediment sites are associated with undersized culverts, stream diversion potential at road crossings, or roads located on unstable slopes. Legacy sediment site inventories have not yet been completed for non-road sediment sources such as abandoned mines, historic hydraulic mining, past harvest units, or dredge tailings. In some watersheds these non-road legacy sediment sites could be a substantial source of additional stream sediment and reduced stream shade.

Table 3-39: Summary of legacy sediment site inventory data on roads in the project area by 5th field watershed

Watersheds	Number of Legacy Sediment Sites
Beaver Creek	557
Elk Creek	203
Horse Creek – Klamath River	417
Humbug Creek – Klamath River	153
Lower Scott River	155
North Fork Salmon River	323
Seiad Creek – Klamath River	188
Thompson Creek – Klamath River	125
Project Area	953

Project Area A: Beaver Fire

Risk to Channel Morphology

The debris flow likelihood is elevated due to the 2014 fire effects. There is a likelihood of highly likely for Lumgrey Creek, Soda Creek, Lower West Fork Beaver Creek, Dutch Creek, Buckhorn Gulch, Doggett Creek, Dona Creek and Kohl Creek. This means that a debris flow will probably occur during an average storm event.

Table 3-40: Beaver Fire 7th field watersheds with the greatest likelihood of experiencing debris flows as inferred from landslide likelihood.

		Alt 2	
7th-Field Watershed Name	2014 Fire	Landslide Likelihood	Inferred Debris Flow Likelihood
Lumgrey Creek	Beaver	Highly Likely	Likely
Soda Creek-Beaver Creek	Beaver	Highly Likely	Likely
Lower West Fork Beaver Creek	Beaver	Highly Likely	Likely
Dutch Creek	Beaver	Highly Likely	Likely
Buckhorn Gulch-Beaver Creek	Beaver	Highly Likely	Likely
Doggett Creek	Beaver	Highly Likely	Likely
Dona Creek-Klamath River	Beaver	Highly Likely	Likely
Kohl Creek	Beaver	Highly Likely	Likely

Risk to Sediment Regime

Lumgrey Creek, Soda Creek, Lower West Fork Beaver Creek, Buckhorn Gulch, Doggett Creek, Dona Creek and Kohl Creek are over the threshold of concern for the mass wasting model. These watersheds have an elevated risk to channel geomorphology for about 10 years and will be back to pre-fire risk in about 30 years. Jaynes Creek and Dutch

Creek have a risk ratio over the threshold of concern which means they will have an elevated risk for about 10 years before it recovers to pre-fire risk.

Trend of Riparian Reserve Condition

In Riparian Reserves that had high or moderate vegetation burn severity there is on average little to no shade from large over story conifers as is the desired condition described in the Forest Plan (4-106). The deciduous understory will likely re-sprout and provide some shade on stream channels over the next two to five years. The 2014 wildfire have increased the risk to channel geomorphology or sediment regime alteration nine watersheds in the Beaver fire area. These watersheds will recover slowly over the next 10 to 30 years to pre-fire conditions.

Project Area B: Happy Camp Complex

Risk to Channel Morphology

The landslide likelihood is elevated due to the 2014 fire effects. There is a likelihood of almost certain in Lower Grider, O'Neil, Walker, Caroline, Granite and Middle Elk Creek. These watersheds have a probability of debris flow even in a below average storm event. Rancheria Creek, Tom Martin Creek, Schutts Gulch, Middle Creek, Deep Creek, Big Ferry Swanson, Bear Creek, Bishop Creek and Doolittle Creek have a likely probability of a debris flow event. This means that there is a probability of debris flow events in an average storm event.

Table 3-41: Happy Camp Complex Fire 7th field watersheds with the greatest likelihood of experiencing debris flows as inferred from landslide likelihood in Alternative 2.

7th-Field Watershed Name	2014 Fire	Landslide Likelihood	Inferred Debris Flow Likelihood
Lower Grider Creek	Happy Camp	Almost Certain	Highly Likely
O'Neil Creek	Happy Camp	Almost Certain	Highly Likely
Walker Creek	Happy Camp	Almost Certain	Highly Likely
Caroline Creek-Klamath River	Happy Camp	Almost Certain	Highly Likely
Granite Creek	Happy Camp	Almost Certain	Highly Likely
Middle Elk Creek	Happy Camp	Almost Certain	Highly Likely
Rancheria Creek	Happy Camp	Highly Likely	Likely
Tom Martin Creek-Klamath River	Happy Camp	Highly Likely	Likely
Schutts Gulch-Klamath River	Happy Camp	Highly Likely	Likely
Middle Creek	Happy Camp	Highly Likely	Likely
Deep Creek-Scott River	Happy Camp	Highly Likely	Likely
Big Ferry-Swanson	Happy Camp	Highly Likely	Likely
Bear Creek	Happy Camp	Highly Likely	Likely
Bishop Creek-Elk Creek	Happy Camp	Highly Likely	Likely
Doolittle Creek	Happy Camp	Highly Likely	Likely

Risk to Sediment Regime

Lower Grider Creek, O'Neil Creek, Schutts Creek, Walker Creek, Caroline Creek, Middle Creek, Deep Creek, Granite Creek, Middle Creek, Bear Creek, and Bishop Creek all have risk ratios over the threshold of concern for mass wasting model. These watersheds will have an elevated risk to sediment regime alteration for 10 years and slowly recovery to pre-fire conditions in aobut 30 years. Big Ferry-Swanson Creek has a risk ratio over the threshold of concern for the ERA model and will recovery to pre-fire

conditions in about 10 years. Horse Creek, Fryingpan creek, and Upper Elk Creek are over the threshold of concern for the USLE model and will have an elevated risk to sediment regime alteration for about 2 years and will quickly recover to per-fire conditions.

Trend of Riparian Reserve Condition

In Riparian Reserves that had high or moderate vegetation burn severity there is on average little to no shade from large over story conifers as is the desired condition described in the Forest Plan (4-106). The deciduous understory will likely resprout and provide some shade on stream channels over the next two to five years. The 2014 wildfire has increased the risk to channel geomorphology or sediment regime alteration 15 watersheds in the Happy Camp Complex area. These watersheds will recover slowly over the next 10 to 30 years to pre-fire conditions.

Project Area C: Whites Fire

Risk to Channel Morphology

The landslide likelihood is elevated due to the 2014 fire effects. Music Creek, Upper North Russian Creek, Lower North Russian Creek, Whites Gulch, and Robinson Gulch have a likely probability of a debris flow event. This means that there is a probability of debris flow events in an average storm event.

Table 3-42 Whites Fire 7th field watersheds with the greatest likelihood of experiencing debris flows as inferred from landslide likelihood in Alternative 2.

7th-Field Watershed Name	2014 Fire	Landslide Likelihood	Inferred Debris Flow Likelihood
Music Creek	Whites	Highly Likely	Likely
Upper North Russian Creek	Whites	Highly Likely	Likely
Lower North Russian Creek	Whites	Highly Likely	Likely
Whites Gulch	Whites	Highly Likely	Likely
Robinson Gulch-North Fork Salmon River	Whites	Highly Likely	Likely

Risk to Sediment Regime

Music Creek has risk ratios over the threshold of concern for mass wasting model. These watersheds will have an elevated risk to sediment regime alteration for 10 years and slowly recovery to pre-fire conditions in about 30 years. Lower North Russian Creek and Whites Gulch are over the threshold of concern for the USLE model and will have an elevated risk to sediment regime alteration for about 2 years and will quickly recover to per-fire conditions.

Trend of Riparian Reserve Condition

In Riparian Reserves that had high or moderate vegetation burn severity there is on average little to no shade from large over story conifers as is the desired condition described in the Forest Plan (4-106). The deciduous understory will likely resprout and provide some shade on stream channels over the next two to five years. The 2014 wildfire has increased the risk to channel geomorphology or sediment regime alteration five watersheds in the Happy Camp Complex area. These watersheds will recover slowly over the next 10 to 30 years to pre-fire conditions.

Environmental Consequences

Alternative 1

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

There are no direct effects to channel morphology, water quality (sediment and temperature regimes), or channel function resulting from Alternative 1. Recovery curves can be viewed as a timeline of the magnitude and duration of indirect effects on hydrologic function and hillslope sediment production of the 2014 wildfires and Alternative 1.

Over the long-term, the fuel load conditions created by fire-killed trees that break or fall and become surface fuels will lead to fire intensity and flame lengths that are conducive to major fire runs, crown fires, and spotting. The large fuels component (greater than 3 inches) will lead to an elevated fire intensity and duration of fire on the landscape if it should re-burn. In 10 years, the conditions under Alternative 1 will lead to nine percent of the area having flame lengths greater than 11 feet. Sixty percent of the treatment area is likely to experience flame lengths between 4 and 11 feet and thirty-one percent is likely to have flame lengths of less than 4 feet. (See fire and fuels report). High flame lengths are associate with high severity fire and will contribute to accelerated sediment delivery(DeBano et al. 2005), increased stream temperatures (Pabst and Spies 2001)and stream flows (Neary, et al. 2005a)and increased potential for the introduction of toxic chemicals from fire retardant application during future fire suppression efforts (Neary, et al. 2005b).

Risk to Channel Morphology

Alternative 1 will allow for passive recovery of vegetation in the watersheds which will be slower than if treatment, including planting, would occur. The extended duration of decreased interception, use of water by plants, and ground cover will extend the risk to channel morphology over the long-term.

Risk of Sediment Regime Alteration

The risk to sediment regime alteration will passively recover from current condition toward pre-fire conditions over the next four to five years for surface erosion. The recovery for landslide-related sediment will start in about 10 years and could take up to 80 years to be reduced to pre-fire levels because of the length of time required to re-establish forest vegetation without artificial regeneration (see Geology report).

Trend of Riparian Function

The watersheds with a high risk of temperature regime alterations, without artificial regeneration, will have an extended duration of elevated risk. Natural regeneration will occur, but in general it will more than 80 years to get trees with 10 inch diameters at breast height in areas burned with high and moderate severity (personal communication, Project Silviculturist).Large-wood loading to riparian zones and stream channels that is expected to occur under this alternative is widely regarded as beneficial for sediment retention, channel function, habitat complexity, cover, and nutrient cycling (Keller and Swanson 1979; Nakamura and Swanson 1994; Grant and Swanson 1995). Given the relatively small acreage of Riparian Reserve that burned at moderate- and high-severity

in 2014, and the small length of stream channels affected, negative fire effects are not expected to channel function resulting from burned Riparian Reserve areas. Where fire impacts increase large wood loading to stream channels, effects will be positive for channel sediment metering and other functions. However, the elevated likelihood of landsliding (see geology report) will take more than 80 years to recover under Alternative 1. Debris flows can have substantial effects on channel function. The overall trend of riparian function is positive but has a gentle slope (long-term recovery).

Cumulative Effects

McCollins Late Successional Reserve Enhancement project is the only action considered for cumulative effects that is not included in the affected environment. This project does not increase the risk ratio for any model above 1.0 or increase the landslide likelihood in the fire area.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Effects of Alternative 1 in the Happy Camp Complex Fire area are the same as those described in the Hydrology report for all indicators.

In the longer-term, legacy sediment sites will continue to have a high risk of failing in future floods and impacts will be similar to the channel scour, loss of stream shade, increased stream temperatures, and sedimentation that occurred in the 1997 flood as described by De La Fuente and Elder (1998). These impacts will adversely affect beneficial uses and violate the Waiver and water quality standards in the Basin Plan (State of California Water Board 2011). The risk of road failures is greater at sites located below high-severity burns due to increased runoff and peak flows.

Cumulative Effects

Lovers Canyon and Scott Mountain Fuels Reduction projects are the only actions considered for cumulative effects that are not already included in the affected environment. These projects do not increase the risk ratio for any of the models over 1.0 or increase the landslide likelihood in the fire area.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Effects of Alternative 1 in the Whites fire area are the same as described for the Beaver fire area.

Cumulative Effects

The Jess project is the only project considered for cumulative effects that is not already incorporated into the affected environment. This project does increase the risk ratio in the Jessups Gulch watershed over 1.0 leading to an elevated risk of adverse effects for sediment regime alteration. The landslide risk is not increased so the risk to channel morphology remains the same as in the affected environment for Jessups Gulch. The Jess project is expected to improve Riparian Reserve conditions through treatments intended to increase the number of large trees in the Riparian Reserves and the fuels loading in Riparian Reserves. The trend in Riparian Reserve condition in this watershed will be a slow upward trend as a result of the Jess project.

Alternative 2

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Risk to Channel Morphology

Based on results from the 2014 BAER analysis, post-fire unit peak stream flows (cubic feet per second/square mile) are not expected to increase sufficiently to increase risk to existing channel morphology via non-bulked flows. This is because project area streams are predominantly steep with channel beds and banks armored by coarse substrate (cobble, boulder, bedrock). Based on ERA model results none of the 5th field watersheds are at elevated risk for adverse hydrologic effects as a result of implementation of Alternative 2 (Appendix A). For 7th field watersheds Alternative 2 increases the number of watersheds at elevated risk from eight to twelve out of seventy seven watersheds for all fires (Table 1). Only Buckhorn Gulch-Beaver Creek moves in to the elevated risk category (ERA model) in the Beaver Fire area as a result of Alternative 2.

Mass wasting and potential associated debris flows are and have been (pre-settlement) fundamental mechanisms of channel change in the Klamath Mountains. The landslide likelihood derived for the amendment to the project geology report is employed here to infer likelihood of debris flows and potential effects to the *risk to channel morphology* indicator. Analysis in the project geology report indicates that landslides are *likely* in five and *highly likely* in eight Beaver Fire area 7th field watersheds due to fire effects (Table 8). There are no 7th field watersheds in the Beaver Fire area with almost certain likelihood of landslides. Neither Alternative 2 nor any other action alternative increases the landslide likelihood in the fire area (see geology report for details), and thus there is no effect on the likelihood of debris flows or risk to channel morphology. These results are interpreted to indicate that debris flow alteration of channel morphology and effects to hydrologic function and water quality is likely as a result of conditions created by the 2014 fire along at least some reaches of the channel network in the Lumgrey, Soda, Lower West Fork Beaver, Dutch, Buckhorn Gulch, Doggett, Dona, and Kohl Creek 7th field watersheds. This likelihood is not increased by implementation of Alternative 2. Effects on channel morphology from debris flow alteration, should a debris flow occur in a channel, are expected to persist for at least a decade as riparian vegetation recovers along debris flow tracks.

Risk of Sediment Regime Alteration

Risk of sediment regime alteration is assessed with all three CWE models. Nearly all 5th field watershed risk ratios are unchanged under Alternative 2 for each model (Appendix A). The exception is that Humbug Creek-Klamath River, Seiad Creek-Klamath River, and North Fork Salmon ERA risk ratios increase nominally with the largest increase (0.06 or 6%) still considered to be essentially within the model margin of error.

For 7th field watersheds Alternative 2 increases the number of watersheds at elevated risk from eight to twelve for the ERA model. For three of the four watersheds the largest risk elevation is 0.09 (9%) which falls near the margin of error. In other words, the change in risk is small ranging from no change to a slight change up to 9% (see Appendix B - CWE Model Results). The ERA serves as a proxy for peak flow and by deduction the small change will result in small to no changes in peak flow conditions. There is less than or

equal to a 9% change in the ERA model (see description above) for all watersheds in the Beaver fire area.

The four watersheds moved in to elevated risk as determined by the ERA model are Buckhorn Gulch-Beaver Creek (5% elevated risk), Walker Creek (9%), Music Creek (4%), and Jessups Gulch-North Fork Salmon River (32%). Jessups Gulch-North Fork Salmon River is the highest change in risk. Jessups Gulch overlaps the project area, but there are no parts of the Proposed Action occur in that watershed. (See cumulative effects discussion.) However, it is important to note that this elevated risk may remain unrealized without a triggering event. Additionally, watershed project design features such as watershed-4, which precludes mechanical equipment in hydrologic Riparian Reserves will reduce the risk of sediment regime alteration and sediment production to water bodies.

While risk of sediment regime alteration is undetectable to minor at 5th and 7th field watershed scales, some project activities are expected to produce site scale effects. Appendix C displays ground disturbing activities in hydrologic and geologic Riparian Reserves under Alternatives 2 and 3 Modified. The use of reopened decommissioned roads and temporary roads (these segments sum to 2.6 miles under Alternative 2) has potential to alter site-scale sediment regimes over the short-term, particularly where stream crossings and new landings would be constructed. Alternative 2 proposes eleven stream crossings along reopened decommissioned roads or temporary roads in Riparian Reserves and 22 new landings. However project design feature watershed-5 and watershed-23 will reduce risk of sediment production to water courses from these activities.

The treatment of legacy sediment sites under Alternative 2 (and any action alternative) will reduce the risk of sediment regime alteration resulting from road-related erosion and sedimentation. Table 11 displays legacy sediment site repairs proposed within hydrologic and geologic Riparian Reserves as part of the application to the North Coast Regional Water Quality Control Board for enrollment of the WFR project in the waiver program. Please note that some of these sites have already been analyzed under previous National Environmental Policy Act (NEPA) projects. Approximately seventy road-related legacy sediment sites are identified for treatment in the Beaver Fire area for the waiver application.

Table 3-43: Alternative 2 road-related legacy sediment site repairs proposed for hydrologic and geologic Riparian Reserves as part of the application to the North Coast Regional Water Quality Control Board for waiver coverage. Tallied sites do not include work done under 2014 BAER assessments.

Road Legacy Sediment Sites	Beaver Fire	Happy Camp Complex	Whites Fire	Total
Highly Risk Stream Crossings	4	85	13	102
Stream Diversion Potential	37	160	63	260
Diversion Potential, Undersized Culvert	21	80	21	122
Undersized Culvert	12	90	44	146
Total	74	415	141	630

Trend of Riparian Condition

For Beaver Fire 5th field watersheds post-fire increased peak flow is not expected to negatively affect channel morphology. Alternative 2 has no effect on the debris flow likelihood (see geology report for details) at the 7th field scale and there is no change from the existing condition for risk to channel morphology in this alternative. The indirect effects to shade not related to debris flow events as a result of Alternative 2 will be small in the Beaver Fire area because no planting will occur in the Riparian Reserves. However, recruitment of large wood to stream channels in the first decade post-fire may produce increases in stream shading where mature Riparian Reserve conifers were fire killed and fall across channels. Reforestation outside of the Riparian Reserves will have a small indirect effect on stream shading, but not enough to improve the trend of riparian conditions in any watershed overall.

Cumulative Effects

In the Beaver Fire area the only project analyzed as future or on-going is McCollins. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Risk to Channel Morphology

There is a high probability of debris flows and landslides in watersheds affected by the 2014 Happy Camp fires because the fires killed trees and consumed nearly all of the ground vegeation and cover over large areas. Alternative 2 however does not increase the landslide or debris flow likelihood in the fire area because removal of dead trees does not affect landslide processes (see Geology report for details). The risk of debris flow alteration of channel morphology as a result of the fire is highly likely along at least some reaches of the Lower Grider, O'Neil, Walker, Caroline, Granite, Middle Elk Creek 7th field watersheds (Table 9). Proposed reforestation reduces the duration of elevated landslide risk to approximately 30 years for Upper Grider, Cliff Valley, Lower Grider, O'Neil, Walker, Caroline, Middle, Tompkins, Horse, Upper East Fork Elk, Upper Elk and Lower East Fork Elk Creeks (see Table 1 in the Amendment to the Geology report for details).

Peak flow alteration was estimated in the ERA model for the affected watersheds. As a result of a slight increase in potential peak flow events as estimated by the ERA model, in Alternative 2, the Walker Creek 7th field watershed is moved from low to moderate risk

with an elevation of 9% for Alternative 2 (ERA model) in the Happy Camp Complex Fire area. This moderate risk will persist for approximately a decade before declining.

Risk of Sediment Regime Alteration

CWE model outputs show that none of the 5th field watersheds in the Happy Camp Complex Fire area are at elevated risk for adverse effects to hydrologic function and water quality from implmentation of Alternative 2.

Surface erosion (USLE) and mass wasting risk categories are not changed by the alternative for any of the 7th field watersheds in the fire area with the exception of Lower East Fork Elk Creek which is reduced from elevated to low risk (USLE model) as a result of proposed road-related legacy sediment site treatments. Legacy site treatments in the Elk Creek watershed will reduce road-related erosion and sedimentation potential long term. Proposed legacy site repairs in Elk Creek will remove an estimated approximately 140,000 yards^3 of sediment from risk of impacting water quality in the Elk Creek watershed (G. Bousefield, personal communication).

The hand treatments and planting in the Riparian Reserves will increase their ability to buffer sediment delivery to the stream channel by increasing ground cover and encouraging vegetation in the short term.

Trend of Riparian Condition

Alternative 2 does not increase the debris flow likelihood (see geology report for details) at the 7th field scale and there is a reduction in the duration of elevated landslide likelihood in 12 watersheds as a result of reforestation from planting. Reforestation from planting in Riparian Reserves will decrease the time needed to regain effective shade on intermittent and perennial channels. Areas where the decrease in duration of landslide risk is juxtaposed with Riparian Reserve treatments will have a steeper positive trend when compared with areas where just one or the other will occur.

Cumulative Effects

Lovers Canyon and Scott Bar Fuels Reduction are the only projects considered as present or future activities in the Happy Camp Complex Fire area for this analysis. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Risk to Channel Morphology

Alternative 2 has no effect on landslide likelihood in the fire area (see geology report for details). The risk to channel morphology is similar in magnitude and scale as that described for the Beaver Fire area. Music Creek, Upper North Russian Creek, Lower North Russian Creek, Whites Gulch, and Robinson Gulch 7th field watersheds are likely to experience debris flows along at least some reaches of their channel networks.

Risk of Sediment Regime Alteration

Four 7th field watersheds in the Whites Fire area are over the TOC (risk ratio $\geq$ 1.0) for at least one of the three CWE models under Alternative 2: Music Creek (ERA and mass wasting), Jessups Gulch (ERA), Lower North Russian Creek (USLE), and Whites Gulch

(USLE). This evelvated risk will persists from about 2 years for surface erosion (USLE) rate recovery to at least three decades for recovery of mass wasting erosion rates. Music Creek and Whites Gulch were pushed in to the elevated risk category by Alternative 2 because a slight increase in peak flows will result in raising the risk level. This means that under Alternative 2 and Modified Alternative 2 the risk ratio for Music Creek is increased by 4% (Alternative 2) and 2% (Modified Alternative 2).

The treatment of legacy sediment sites under Alternative 2 will reduce the risk of sediment regime alteration resulting from road-related erosion and sedimentation. Approximately one hundred and forty road-related legacy sediment sites are identified for treatment in the Whites Fire area as part of the waiver application (Table 11) required for any action alternative. Please note that these sites have already been analyzed under previous NEPA projects.

The hand treatments and planting in the Riparian Reserves will increase the Riparian Reserves ability to buffer sediment delivery to the stream channel by increasing ground cover and encouraging vegetation on the short term.

Trend of Riparian Condition

Debris flows are considered likely in the Music, Upper North Russian, Lower North Russian, Whites Gulch, and Robinson Gulch 7th field watersheds in the Whites Fire Area. Alternative 2 does not increase the debris flow likelihood (see geology report for details) at the 7th field scale and there is no change from the existing condition for risk to channel morphology in this alternative. The reforestation in Riparian Reserves will increase the time needed to regain effective shade on intermittent and perennial channels. The trend in Riparian Reserves receiving treatment will be steeper compared to the areas where no treatment will occur.

Cumulative Effects

The only project modeled for cumulative effects in the Whites Fire area was the Jess project. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Alternative 3

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2. Only the Buckhorn Gulch-Beaver Creek 7th field watershed is pushed in to the elevated risk category (ERA) under Alternative 3. There is no effect to the debris flow likelihood for the Beaver Fire area from Alternative 3, and no fire salvage in the Beaver Fire area in this alternative.

Cumulative Effects

In the Beaver Fire area the only project analyzed as future or on-going is McCollins. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2. Only the Walker Creek (ERA) is pushed in to the elevated risk category while Lower East Fork Elk Creek moves to the low risk category (USLE model) due to legacy sediment site treatments. There is no effect to the debris flow likelihood and the duration of elevated risk will not be reduced for Lower Grider Creek in this alternative. There is less salvage in the Happy Camp Complex Fire area under Alternative 3 than Alternative 2, so there may be a decreased risk of sediment regime alteration. However, CWE models were not sensitive to these fewer salvage acres at 5th and 7th field watershed scales. There is no hand treatment in Riparian Reserves so the benefit of increased shade and sediment buffering due to production of ground cover will not occur.

Cumulative Effects

Lovers Canyon and Scott Bar Fuels Reduction are the only projects considered as present or future activities in the Happy Camp Complex Fire area for this analysis. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2. Music Creek and Jessups Gulch-North Fork Salmon River 7th field watersheds are pushed in to the elevated risk category (ERA) under Alternative 3 There is no effect to debris flow likelihood or duration of elevated landslide risk in this alternative. There is less salvage in the Whites Fire area under Alternative 3 than Alternative 2, so there may be a decreased risk of sediment regime alteration. However, CWE models were not sensitive to these fewer salvage acres at 5th and 7th field watershed scales. There is no hand treatment in Riparian Reserves proposed so the benefit of increased shade and sediment buffering due to increase ground cover will not occur.

Cumulative Effects

The only project modeled for cumulative effects in the Whites Fire area was the Jess project. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Alternative 4

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2. Only the Buckhorn Gulch-Beaver Creek 7th field

watershed is pushed in to the elevated risk category (ERA) under Alternative 4. There is no effect to the debris flow likelihood for the Beaver Fire area from Alternative 4.

Cumulative Effects

In the Beaver Fire area the only project analyzed as future or on-going is McCollins. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2. Only the Walker Creek (ERA) is pushed in to the elevated risk category while Lower East Fork Elk Creek moves to the low risk category (USLE model) due to legacy sediment site treatments. There is no effect to the debris flow likelihood and the duration of elevated risk will not be reduced for Lower Grider Creek in this alternative. There is less salvage in the Happy Camp Complex Fire area under Alternative 4 than Alternative 2, so there may be a decreased risk of sediment regime alteration. However, CWE models were not sensitive to these fewer salvage acres at 5th and 7th field watershed scales.

Cumulative Effects

Lovers Canyon and Scott Bar Fuels Reduction are the only projects considered as present or future activities in the Happy Camp Complex Fire area for this analysis. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are similar to Alternative 2 with the exception being that the Music Creek 7th field watershed is not pushed in to the elevated risk category (ERA) under Alternative 4. There is no effect to debris flow likelihood or duration of elevated landslide risk in this alternative.

Cumulative Effects

The only project modeled for cumulative effects in the Whites Fire area was the Jess project. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Alternative 5

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2. Only the Buckhorn Gulch-Beaver Creek 7th field watershed is pushed in to the elevated risk category (ERA) under Alternative 5.

Cumulative Effects

In the Beaver Fire area the only project analyzed as future or on-going is McCollins. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2. Only the Walker Creek (ERA) is pushed in to the elevated risk category while Lower East Fork Elk Creek moves to the low risk category (USLE model) due to legacy sediment site treatments.

Cumulative Effects

Lovers Canyon and Scott Bar Fuels Reduction are the only projects considered as present or future activities in the Happy Camp Complex Fire area for this analysis. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2. Music Creek and Jessups Gulch-North Fork Salmon River 7th field watersheds are pushed in to the elevated risk category (ERA) under Alternative 5.

Cumulative Effects

The only project modeled for cumulative effects in the Whites Fire area was the Jess project. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Alternative 2 Modified

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) as determined by the three CWE models are the same as Alternative 2 (see Tables 1-3 this report). Only the Buckhorn Gulch-Beaver Creek 7th field watershed is pushed in to the elevated risk category (ERA) under modified Alternative 2.

Cumulative Effects

In the Beaver Fire area the only project analyzed as future or on-going is McCollins. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) as determined by CWE models are the same as Alternative 2 (Tables 1-3). Only the Walker Creek (ERA) is pushed in to the elevated risk category while Lower East Fork Elk Creek moves to the low risk category (USLE model) due to legacy sediment site treatments.

Cumulative Effects

Lovers Canyon and Scott Bar Fuels Reduction are the only projects considered as present or future activities in the Happy Camp Complex Fire area for this analysis. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) as determined by the CWE models are the same as Alternative 2. Music Creek and Jessups Gulch-North Fork Salmon River 7th field watersheds are pushed in to the elevated risk category (ERA) under modified Alternative 2.

Cumulative Effects

The only project modeled for cumulative effects in the Whites Fire area was the Jess project. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Alternative 3 Modified

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2 (Tables 1-3). Only the Buckhorn Gulch-Beaver Creek 7th field watershed is pushed in to the elevated risk category (ERA) under modified Alternative 3. Under modified Alternative 3 twenty eight 7th field watersheds exceed the model threshold of concern and of those thirteen have risk ratios that are increased by this alternative's activities.

Site-scale effects are anticipated to be different than Alternative 2. Appendix C demonstrates that fewer miles of temporary roads and associated stream crossings and landings (none in the Beaver Fire area) in Riparian Reserves are proposed anticipated under modified Alternative 3. This reduced ground disturbance will result in reduced risk

of sediment regime alteration, and thus reduced the risk to water quality. In addition, reduced disturbance may be expected to have less effect on the trend of post-fire riparian conditions.

Cumulative Effects

In the Beaver Fire area the only project analyzed as future or on-going is McCollins. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2 (Tables 1-3). Only the Walker Creek (ERA) is pushed in to the elevated risk category while Lower East Fork Elk Creek moves to the low risk category (USLE model) due to legacy sediment site treatments.

Site-scale effects are anticipated to be different than Alternative 2. Appendix C demonstrates that fewer miles of temporary roads and associated stream crossings and landings in Riparian Reserves are proposed anticipated under modified Alternative 3. This reduced ground disturbance will result in reduced risk of sediment regime alteration, and thus reduced the risk to water quality. In addition, reduced disturbance may be expected to have less effect on the trend of post-fire riparian conditions.

Cumulative Effects

Lovers Canyon and Scott Bar Fuels Reduction are the only projects considered as present or future activities in the Happy Camp Complex Fire area for this analysis. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Potential effects to hydrologic function and water quality at the watershed scale (5th and 7th fields) are the same as Alternative 2 (Tables 1-3). Music Creek and Jessups Gulch-North Fork Salmon River 7th field watersheds are pushed in to the elevated risk category (ERA) in modified Alternative 3.

Site-scale effects are anticipated to be different than Alternative 2. Appendix C demonstrates that fewer miles of temporary roads and associated stream crossings and landings (none in the Whites Fire area) in Riparian Reserves are proposed anticipated under modified Alternative 3. This reduced ground disturbance will result in reduced risk of sediment regime alteration, and thus reduced the risk to water quality. In addition, reduced disturbance may be expected to have less effect on the trend of post-fire riparian conditions.

Cumulative Effects

The only project modeled for cumulative effects in the Whites Fire area was the Jess project. Watershed risk ratios displayed in Appendices B and C account for these projects. Livestock grazing is not included in the CWE model assessments but grazing effects are assumed to be minor in the context of the 2014 wildfires.

Compliant with Law, Policy and the Forest Plan

All alternatives are complaint with applicable law, regulation, and policy. The project will be enrolled in the North Coast Regional Water Quality Control Board waiver program prior to implementation of the selected alternative.

Aquatic Resources (includes fisheries)

This section describes the environment for aquatic resources in the analysis area and discloses the effects to these resources. For a full description of the analysis of effects to these resources refer to the Aquatic Resources Report and Amendment; Fisheries Biological Assessment; and aquatic section of the Project Management Indicator Report.

Methodology

Analysis is based on three components: (1) a review of existing information for streams in the analysis area; (2) post-fire field review of proposed treatment units, Riparian Reserves and stream channels; and (3) a review of best available information related to aquatic resources present and potential impacts of the various actions proposed. Existing information came from the Forest Plan, watershed analysis conducted by the Forest, existing stream survey data and reports, and other environmental analyses completed for projects within the analysis area. These sources provide information on watershed histories and land uses, aquatic species distribution and habitat use within the analysis area, and aquatic habitat conditions.

The analysis area 5th field and 7th field watersheds provide habitat for the special status aquatic species listed under analysis indicators.

Analysis Indicators

Threatened and Endangered Species/Forest Service Sensitive Species

There are no endangered species in the analysis area and the Southern Oregon/Northern California Coast (SONCC) Coho Salmon is the only threatened species; critical habitat has been identified for SONCC Coho Salmon. Three key habitat indicators form the *Analytical Process for Developing Biological Assessments for Federal Actions Affecting Fish within the Northwest Forest Plan Area* (USDA-USDOC-USDI 2004) are used for the analysis of effects to Coho Salmon. This allows standardization of evaluations of actions and effects for conferencing/consultations under Section (§) 7(a)(2) of the Endangered Species Act (ESA). The same analysis indicators are used to evaluate effects on Forest Service sensitive species: Upper Klamath-Trinity River (UKT) Chinook Salmon; Klamath Mountains Province (KMP) steelhead; Pacific lamprey; Klamath River lamprey; southern torrent salamander; foothill yellow-legged frog; cascade frog; and western pond turtle. These indicators are: water temperature; sediment (fine sediment in substrates and substrate embeddedness); and large wood. Essential fish habitat (EFH) has been determined for the SONCC Coho Salmon and the UKT Chinook Salmon as required

by the Magnuson-Stevens Fishery Conservation and Management Act; effects on EFH are also measured by effects on these indicators.

Management Indicator Species

Management indicator species associations are identified in the Forest Plan as associations that may be affected by management activities. Analysis of effects of actions on these associations involves examining the impacts of the project on habitat associations for management indicator species. Species associations related to aquatic species are the river/stream association and the marsh/lake/pond association. For this analysis, the following analysis indicators will be used to determine the level of effects for each habitat association.

River/Stream Associated Species (steelhead, resident rainbow trout, tailed frog, and cascades frog):

Change in Water Quality (WQ), physical barriers, substrate, refugia, stream-bank condition, disturbance history/regime, flows, drainage network, and Riparian Reserves.

Aquatic species included in this association are steelhead and resident trout, tailed frog, and Cascades frog. For purposes of the management indicator species association analysis, river/stream habitat is degraded where the project may result in impacts to the near stream environment, water quality, and/or aquatic habitat to the point that the quality of the habitat is lessened. River/stream habitat is removed if the habitat is affected by the project such that it is no longer suitable habitat for the indicator species.

Marsh/Lake/Pond Associated Species (western pond turtle):

Change in low gradient, open water habitat quality, including streamside vegetation and large wood.

Western pond turtle is the only species for this association. The analysis of this habitat association is the same as for river/stream associated species except with an emphasis on perennial low gradient streams, ponds and other lentic waterbodies.

Spatial and Temporal Context

The aquatic resources analysis area is comprised of the 5th field watersheds and their 7th field drainages that were affected by the 2014 fires and in which activities are proposed for this project (see list of these watersheds in Chapter 1).

The temporal bounding of the analysis includes effects during implementation, short-term effects expected to occur within the first year following implementation, and long-term effects (greater than one year).

Affected Environment

The affected environment describes the 5th field watersheds in the 2014 burned area, the special status aquatic resources that are likely to be present, and the pre-project condition of the key indicators of habitat quality for aquatic species (temperature, sediment, and large wood).

Overall, the water quality in the project area is impaired and is on the 303(d) Clean Water Act list due to temperature and other constituents (Table 3-44).

Table 3-44:Clean Water Act 303(d) listed reaches of the Middle Klamath River (NCRWQCB 2008).

Waterbody	Pollutant
Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Nutrients, Organic Enrichment/Low Dissolved Oxygen, Temperature
Middle Klamath River HA, Iron Gate Dam to Scott River Reach, mainstem Klamath	Microcystin
Middle Klamath River HA, Beaver Creek, Cow Creek, Deer Creek, Humgry Creek, West Fork Beaver Creek	Sediment
Middle & Lower Klamath River HAs, Scott River to Trinity River Reach	Nutrients, Organic Enrichment/Low Dissolved Oxygen, Temperature
Middle & Lower Klamath River HAs, Scott River to Trinity River Reach, mainstem Klamath River	Microcystin
Middle & Lower Klamath River HAs, China Creek, Fort Goff Creek, Grider Creek, Portuguese Creek, Thompson Creek, Walker Creek	Sediment
Salmon River HA	Temperature
Scott River HA	Sedimentation/Siltation, Temperature

Table 3-28 displays the miles of stream that were affected by moderate or high severity fire in 2014. Wildfires result in increased runoff and sediment yield commensurate with burn severity. Due to the nature of fire salvage, project actions and effects are likely within or near streams that were affected by the fires. Within the riparian areas that were heavily affected by moderate and high severity effects from the fires, riparian and aquatic habitat are currently degraded in terms of loss of shade/canopy cover and soil cover, as well as potential for hydrophobic soils in areas that burned hot (see the Soil section of this chapter and the Soil Resources Report). These changes led to a reduced capacity of some riparian areas to provide shade and cover for aquatic organisms and to reduced capacity to slow overland flow and filter out sediment before it reaches stream channels

Table 3-45: Summary of stream channel burn severity data from BAER Reports (USFS 2014a-2014f) for the 2014 fires.

Fire Area	Stream Type	Moderate miles (%)	High miles (%)	Total (miles)
Beaver Fire	Intermittent	37 (28%)	10 (8%)	47
	Perennial	5 (14%)	<1 (0%)	5
Happy Camp Complex	Intermittent	50 (18%)	2 (1%)	52
	Perennial	27 (11%)	<1 (0%)	27
Whites Complex	Intermittent	21 (24%)	4 (5%)	25
	Perennial	9 (14%)	2 (3%)	11
Total (miles)	Intermittent	108	16	124
	Perennial	41	2	43

Project Area A: Beaver Fire

The Beaver Fire burned approximately 43,327 acres in the following 5th field watersheds (and their 7th field subwatersheds which are discussed in detail in the Aquatic Resources Report):

- Beaver Creek (16,303 acres burned)
- Horse Creek-Klamath River (21,244 acres burned)
- Humbug Creek-Klamath River (5,780 acres burned)

Aquatic Resources

Beaver Creek is a tributary to the Klamath River and the watershed provides approximately 31 miles of designated critical habitat for SONCC Coho salmon, as well as for Klamath Mountains Province steelhead and Upper Klamath-Trinity Rivers Chinook salmon. Resident trout occur in Beaver Creek, as well as within most tributary streams higher up in the drainages than salmon occur. Beaver Creek also provides habitat for Pacific and Klamath River lamprey and other special status aquatic species including foothill yellow legged frog, and western pond turtle. The Beaver Fire area does not provide suitable habitat for Cascade frogs and this species is not likely to occur in aquatic habitat potentially affected by actions in this area. The Beaver Creek Ecosystem Analysis (USFS 1996) contains more detailed watershed information.

Sediment

The Beaver Creek watershed is on the 303(d) Clean Water Act list as impaired for sediment. Approximately 36% of the watershed is privately owned and managed for timber production. Intensive management on private lands and high road density contributes to the high pre-project risk ratios in the Beaver Creek 5th field watershed. Additionally, Long John, Grouse Creek, and Hungry Creek subwatersheds all have large proportions of granitic soils and are recognized as heavy sediment contributors to Beaver Creek. Dutch Creek was the most severely affected tributary of the Beaver Fire in 2014; approximately 93% of this subwatershed burned and had a large area of moderate to high soil burn intensity. Burned Area Emergency Response (BAER) teams reported that the highest changes in peak runoff potential are in the Dutch Creek and Kohl Creek. Decreased interception of rainfall as a result of wildfire as well as increased sediment and runoff delivered to streams can lead to increased debris flow probability in the affected watersheds compared to pre-fire conditions. The duration of impacts is likely to be intermediate between short- and long-duration depending on the location until regrowth of vegetation reduces sediment source areas and high gradient channels flush stored sediments. Post-fire, the sediment habitat indicator in the Beaver Creek watershed is considered as “at risk” or “not properly functioning” based on modeled high risk ratios and impacts on sediment observed or documented in KNF BAER reports. As a result of storms during the winter and summer following the 2014 wildfires, elevated sediment conditions were observed in Doggett, Kohl, Dutch, and Beaver Creeks.

Water Temperatures

Tributaries and upper reaches of Beaver Creek have low summer water temperatures and are considered “Properly Functioning”. Thus, the Beaver Creek provides thermal refugia for salmonids and other aquatic species. Relative to stream shade, the percent of perennial streamside areas that were burned is the primary indicator of the potential effects to shade and water temperatures post-fire. Approximately 3% of perennial streamside areas were burned at high severity and 14% of perennial streamside areas were burned at moderate severity. This represents an impact to riparian function in burned area, at the site-scale, but is not expected to affect water temperatures in Beaver Creek to a measurable extent. However, these fire related impacts to stream shade and water temperature are additive to those of ongoing timber harvest activities on private land in this watershed which have affected shade over streams.

Large Wood

In general, streams within the Beaver Fire area are considered deficit in desired large wood loading. This is mostly due to the legacy of past management actions which included large tree removal from riparian areas as well as 'stream cleaning' operations in the 1980's that removed wood from streams with the intention of protecting infrastructure such as roads. These actions that resulted in large wood removal from near stream areas on Forest lands ended when the current Forest Plan and its Aquatic Conservation Strategy was put in place in 1994. Timber harvest on private lands most likely continues to have some negative effect on large wood in near stream areas.

Pre-fire wood loading in Beaver Creek was determined to be "Properly Functioning". The Beaver Fire had no effect on instream wood levels in mainstem Beaver Creek, but it did increase short-term wood loading in streams. Long-term large wood recruitment from areas burned at moderate and high severity in 2014 will remain high on Forest lands, and low on private lands because most of these have or will be salvage harvested. Relative to perennial streams, the percent of streamside areas that burned at high severity in this watershed is limited (less than 3 percent) indicating that overall effects to large wood loading and recruitment in fish-bearing streams will be minor. Approximately 14% of perennial streamside areas were burned at moderate severity which means that an estimated 50% of the vegetation was burned. Thus, in high and moderate severity areas, an increase in large wood loading is expected in the short-term, and a reduction in large wood recruitment is expected over the long-term until mature forests are reestablished. Currently for the Beaver Creek watershed, large wood recruitment is considered to be "properly functioning".

Project Area B: Happy Camp Fire

The Happy Camp Complex Fire burned approximately 131,313 acres within the following 5th field watersheds (and their 7th field watersheds described in detail in the Aquatic Resources Report):

- Lower Scott River (43,108 acres)
- Elk Creek (34,633 acres)
- Seiad Creek-Klamath River (50,897 acres)
- Thompson Creek-Klamath River (11,243 acres)

Approximately 1% of the area burned at high severity in the Happy Camp Complex and approximately 22% at moderate severity.

Aquatic Resources

Grider and Elk creek watersheds are identified as Key Watersheds in the Forest Plan. The Scott and Klamath Rivers in the project area provide habitat for known populations of SONCC Coho salmon, Chinook salmon, steelhead and resident trout, Pacific and Klamath River lamprey, and other native and non-native fish species. Other special status aquatic species present in these mainstem rivers include foothill yellow legged frog and western pond turtle. Resident rainbow trout occur upstream of the distribution of salmon in most fish-bearing tributaries of the project area. Cascade frogs are known to occur in upper watershed areas in Wilderness lakes; this species is assumed to occur in lakes and stream habitat above 2500 feet in elevation. Southern torrent salamanders are typically

found nearer to the coast than the project area, however this species may occur in the western-most parts of the project area in Elk Creek watershed.

Main tributaries of the Middle Klamath River occurring in the project area include Elk, Grider, and Walker Creeks as well as the Scott River. These streams provide critical thermal refugia to salmonids in the Klamath River and contain spawning, rearing, and holding habitat for salmon and trout and other special status aquatic species. Tompkins Creek, tributary to the Scott River, also provides valuable habitat for salmonids and other special status aquatic species. Much of the Walker and Grider Creek watersheds were heavily affected by 2014 wildfires; post fire impacts to fish habitat during winter and summer storms in 2015 likely affected fish distribution in these drainages at least in the short term. In the project area, other smaller tributary streams that provide critical salmonid habitat include Kelsey, O'Neil, China, (Little) Horse, Cougar, and East Fork Elk Creeks. Most of these streams also provide habitat for Pacific and Klamath River lamprey and other native fish species.

Sediment

Soils in the Happy Camp Fire area are in general highly erodible, and in combination with the steep terrain, recent large wildfires, and a legacy of past timber harvest and road building activities, fine sediment loading contributes to impaired aquatic habitat conditions. The Scott River and Middle/Lower Klamath River including Walker, Grider, and China Creeks are 303(d) Clean Water Act-listed for sediment; excessive sediment loads and associated elevated water temperatures in these streams have resulted in degraded water quality conditions that impair salmon production.

Relatively low amounts of intermittent and perennial Riparian Reserves burned at high severity during 2014 fires, however post fire sediment related impacts to fish habitat depend heavily upon weather and timing and location of other stochastic events such as localized intense precipitation and rain on snow events. KNF BAER teams documented conditions in these watersheds after the 2014 fires, it was noted that many of the intermittent and ephemeral channels in the affected watersheds were full of sediment. A significant storm event was expected to mobilize this sediment and send it downstream including to Tompkins, Walker, Grider, and East Fork Elk Creek. As a result of storms during the winter and summer following the 2014 wildfires, elevated sediment conditions were observed in Walker, Grider, and Elk Creeks; as well as smaller fish bearing and non-fish bearing streams.

Water Temperatures

Overall, the water quality in the Klamath River is impaired and is on the 303(d) Clean Water Act list due to temperature and other constituents. Use of mainstem river habitat by salmonids is most limited by water quality during the summer months (June through September) when water temperatures are high throughout the day. Salmonids seek, and are dependent upon, thermal refugia habitat in tributaries and other off-channel areas where cooler water can be found.

Water temperatures in the Scott River are also limiting for salmonids, particularly in dry years. While the mainstem Scott River stream temperatures are "not properly functioning", many tributaries including French, Tompkins, and Canyon Creeks are considered "properly functioning" relative to stream temperatures and provide important

thermal refugia to aquatic species in this watershed. The percent of streamside areas that burned in 2014 is an indication of impacts to riparian function including stream shade along perennial streams. The percent impact to streamside areas is relatively low, and is not expected to measurably change stream temperatures. However, stream temperatures would be affected where/if channel-altering debris flow events occur that remove streamside vegetation.

Peak summer temperatures have been higher than optimal for salmonids in the lower mainstem reaches of Elk Creek. However, habitat in Elk creek provides some of the highest quality spawning and rearing habitat for Coho salmon in the Middle Klamath River. Recent temperature monitoring data indicates that Walker, Grider and Elk creeks stream temperatures are "at risk". These creeks provide important high quality habitat that serves as important thermal refugia for salmonids in the Middle Klamath River during warm periods; smaller project area tributaries such as Tom Martin, O'Neil, (Little) Horse, China, Cougar, and East Fork Elk creeks also provide important thermal refugia with capacity to support less fish.

Large Wood

In general, streams within the Happy Camp Fire area are considered deficit in desired large wood loading. This is mostly due to the legacy of past management actions which included large tree removal from riparian areas as well as 'stream cleaning' operations in the 1980's that removed wood from streams with the intention of protecting infrastructure such as roads. Actions that remove large wood from near stream areas on Forest lands, for the most part, ended when the current Forest Plan and its Aquatic Conservation Strategy was put in place in 1994; currently only the removal of hazard trees in administrative and recreation sites, in limited circumstances, results in the loss of any large wood from near stream areas.

The 2014 fires affected large wood near streams only where high burn severity occurred along perennial streams. Approximately 11% of perennial stream Riparian Reserves were burned at moderate severity, and less than 1% at high severity, in the Happy Camp Complex. In localized near stream high burn severity areas, large wood was actually consumed and therefore the fire caused negative short and long term effects to large wood recruitment. In other moderate or mixed severity burns, near stream areas will experience an increase wood loading in the short-term, and potentially a reduction (or little change, depending on the burn) in large wood available for recruitment in the long-term. Overall, the main tributaries of the Happy Camp Fire area are considered either "at risk" in the case of Elk and Grider Creeks, or "not properly functioning" in Walker and Tompkins Creeks.

Project Area C: Whites Fire

The Whites Fire area burned a total of 38,916 acres in the North Fork Salmon River and its 7th field drainages, as described in detail in the Aquatic Resources Report and Amendment.

Aquatic Resources

The Salmon River is a Key Watershed. The basin provides approximately 175 miles of salmon and trout habitat distributed within the main stem, Wooley Creek, and North Fork

and South Fork Salmon River. This habitat supports populations of SONCC Coho salmon, Upper Klamath-Trinity River Chinook salmon, and Klamath Mountains Province steelhead; as well as Pacific and Klamath River lamprey, and western pond turtle. Cascade frogs are known to occur in upper watershed areas in Wilderness lakes, and are assumed to occur in stream habitat of the Whites Fire area as well.

The Salmon River spring-run Chinook salmon are the last and largest wild population of this run in the Klamath Basin, and one of the last remaining the State. Steelhead trout are the most widely-distributed of salmonids in the Salmon River watershed.

Sediment

The 2014 wildfires affected tributaries to the North Fork Salmon River that provide habitat for anadromous salmonids (Cow Creek, North Russian and Whites Gulch) as well as tributaries that provide habitat for resident and steelhead trout, and the other special status aquatic species.

Post-fire mapping indicated that burn intensity along fish-bearing streams was predominantly low, or unburned. The primary exception was East Fork Whites Gulch, as well as a small segment of the North Fork Salmon River. The North Fork Salmon River post-fire 5th field watershed risk ratio for both ERA and USLE is at 0.3, well below 1.0 indicating that disturbance resulting from roads, vegetation management, and wildfire is sufficiently below the threshold of concern; these results are interpreted to mean that effects related to sedimentation and increased peak flow will not be significant at this scale. However, given the post-fire condition, sediment delivery to streams as a result of near term storms and other stochastic events is likely.

Water Temperatures

The Salmon River is impaired and is listed under the 303(d) Clean Water Act for temperature (Table X). Due primarily to past intense mining practices, shade is lacking along the entire North Fork of the Salmon with the exception of the upper-most reaches. Tributary temperatures are typically below lethal levels for salmonids and therefore provide thermal refugia. The North Fork Salmon River stream temperatures ranged from “Properly Functioning” to “Not Functioning” in 2014 relative to salmonid criteria.

The percent of stream channel burned in 2014 is an indication of the fire-related impacts to riparian function, including stream shade along perennial streams. Approximately 3% of perennial streamside areas were burned at high severity, these areas will provide little to no shade to stream channels post-fire until trees re-establish. Approximately 14% of perennial streamside areas burned at moderate severity, which means these areas experienced an estimated 50% reduction in streamside vegetation. The relative percentage of reduction in vegetation along streams due to the fire is low and not expected to measurably increase stream temperatures. However, stream temperature would be affected where/if channel-altering debris flow events occur and temporarily remove streamside vegetation.

Large Wood

In general, streams within the Whites Fire area are considered deficit in desired large wood loading. This is mostly due to the legacy of past management actions which included in channel mining and large tree removal from riparian areas as well as ‘stream

cleaning' operations in the 1980's that removed wood from streams with the intention of protecting infrastructure such as roads. Actions that remove large wood from near stream areas on Forest lands, for the most part, ended when the current Forest Plan and its Aquatic Conservation Strategy was put in place in 1994; currently only the removal of hazard trees in administrative and recreation sites, in limited circumstances, results in the loss of any large wood from near stream areas.

Indirect effects from the 2014 fires include increases in short-term wood loading and reductions in large wood available for recruitment in the long-term for areas that burned at high severity. Particularly high burn severity areas along perennial streams will experience an increase in wood loading in the short-term and a reduction in large wood available to streams in the long-term. The percentage of perennial stream channels that burned in the Whites Fire at high severity is limited (3%) indicating that effects to large wood loading and recruitment at the watershed scale will be minor. Approximately 14% of perennial streamside areas were burned at moderate severity in the Whites Fire, which means an estimated 50% percent of the vegetation was burned in these areas. Collectively, these high and moderate burn severity areas will increase large wood loading in the short-term and in some areas there may be a reduction in the available sources of large wood for recruitment in the long-term.

Environmental Consequences

All alternatives include Project Design Features (project design features) that were developed for this project by watershed specialists to minimize impacts to soils and riparian/aquatic resources (see Table 2-42 in Chapter 2 for project design features). Particularly for in stream actions such as stream crossing work, project BMPs and project design features include those methods agreed upon during interagency ESA consultation to sufficiently minimize negative effects to salmonids (Facilities Maintenance and Watershed Restoration programmatic Biological Assessment 2004).

Implementation of these project design features as part of the project is critical to ensure that actions meet Forest Plan direction and compliance with all other applicable law, regulation, and policy.

Potential direct effects to each special status aquatic species are disclosed below. Because these species have some overlapping habitat requirements, potential impacts to their habitat (indirect effects) are discussed together using key habitat indicators that reflect the quantity and quality of suitable habitat for these species pre- and post-project, as well as the trend of aquatic/riparian condition in the area potentially affected by this project.

Alternative 1

Threatened/Endangered and Forest Service Sensitive Species

Direct Effects

Under Alternative 1, there would be no action taken to meet the purpose and need for the project and desired future conditions within the project area (see Chapter 1).

This alternative is not a baseline condition, but rather a description of future circumstances without implementation of the project. This alternative is a continuation of the current level of management including road maintenance, hazard tree removal, dispersed recreation, mining, watershed restoration, appropriate management and fire

suppression against the back-drop of about 160,000 acres of Forest lands in the project area that burned in 2014. No direct effects will occur under this alternative since no activities will be implemented as a result of the project.

Indirect Effects

For the sediment and temperature indicators, watershed conditions will recover over time from the impacts of the 2014 fires. In the moderate and high burn severity areas surrounding stream channels, an increase in large wood loading is expected in the short-term from falling snags, and a reduction in large available for recruitment is expected over the long-term unless and until these areas naturally recover with large conifers.

Salvage Harvest and Reforestation

Alternative 1 will not remove burned trees or help to restore forests including in moderate and high fire intensity areas. Without salvage, site preparation, and replanting severely burned stands (such as Walker Creek) will likely be replaced by shrublands (Skinner et al. 2006, page 174) and restoration to conifer stands may take decades or even longer. Planting without site preparation would likely result in the loss in conifer plantations before they mature given the median five to 25-year fire return interval predicted within the analysis area. Failing to salvage and reforest moderate to high severity stands in subsequent years increases the potential for a future wildfire to spread and cause adverse impacts to Riparian Reserves (including sediment, stream temperature, and large wood) because it will be unsafe to fight the fire directly. This alternative can indirectly affect sediment regimes in the analysis area when a future wildfire occurs because there will be an increased potential for severe fire effects if fuels are not reduced and because the abundance of burned trees within the fire areas will make fire suppression difficult if not impossible. With this alternative, short-term negative impacts of post-fire salvage logging on aquatic resources will be eliminated.

Fuels Reduction

Immediate post-fire conditions in the analysis include reduced surface fuel loading across the landscape. Thus, over the next one to five years, if a fire occurs there is a low potential for fire spread and fire intensity that would add to the ongoing watershed impacts to aquatic species and their habitat. Fire suppression would be effective in containing new fire ignitions. Within five to ten years, the potential for future wildfire to spread and cause adverse impacts to watershed processes and fish bearing habitat increases. Within moderate to high severity burn areas, enormous amounts of dead trees will remain standing and some will fall, creating high fuel loads across the burned landscape. If a fire does not occur within this time, these areas will likely be covered with shrubs and dead and down snags, making the area susceptible to high severity fire. Where stand-replacing fire intensity occurs on hillslopes and in streamside zones, adverse impacts to habitat indicators and aquatic species are expected to be negligible in the short-term (due to current low surface fuel loading) and moderate or more sizeable when/if the next wildfire occurs in the long-term.

Hazard Tree Abatement

Hazard tree reduction as described for this project will not occur under this alternative. Hazard tree removal will continue where it is part of ongoing actions, or where proposed in future project.

Temporary Roads, Landings, and Water Drafting

Since no project activities, including construction of temporary roads and landings or water drafting will occur under this alternative, there will be no effects on habitat indicators or aquatic species associated with these activities. With Alternatives 2,3, and 5 there are several sites (along tributaries of Doggett and Grider) where project temporary road actions involve using roads that currently have legacy sediment sites, or areas that are at risk of erosion (and therefore a threat to water quality) due to past land use. When/if the project uses these roads they will be hydrologically stabilized and any active erosion, or risk of erosion will be addressed. For the drainages where this would occur with the action alternatives, the opportunity to improve/protect water quality would be foregone with Alternative 1.

Legacy Sites

None of the treatments to address roughly 150 legacy sediment sites in the Elk Creek watershed will occur in this alternative; there will be no treatment to address undersized culverts, diversion potential, fill removal on abandoned roads, or aquatic organism passage. Also, road storm-proofing treatments on about 33 miles of system road in the Elk Creek watershed will not be covered by this alternative.

Cumulative Effects

Alternative 1 will not add project-related direct effects to the effects of past, present/ongoing or future projects because no management activities are proposed.

There will be minimal impacts on aquatic species from reasonable future action in other projects. Where there is spatial or temporal overlap of projects currently undergoing implementation, they have already been accounted for in the existing environment. Where future actions do overlap with the project, cumulative effects will be minor because adding the indirect effects of Alternative 1 to the effects of other projects is not expected to cumulatively produce measurable effects to aquatic species.

Management Indicator Species

Direct Effects

Because there would be no action taken, there would be no direct effects.

Indirect Effects

An important indirect effect of the Alternative 1, relative to riparian and aquatic resources, is the missed opportunity for the legacy site treatments included in all of the action alternatives.

Failing to salvage and reforest moderate to high severity burned stands would have no effect on stream temperature, sediment, or large wood over the next one to five years as post-fire conditions include reduced surface fuel loading across the landscape. From five to 10 years out, failing to salvage and reforest moderate to high severity burned stands, and conduct fuels treatments, increases the potential for a wildfire that spreads and is likely to cause adverse impacts to Riparian Reserves and aquatic habitat. As large trees fall and brush accumulates, it becomes more unsafe to fight fires directly and, therefore, fires are likely to burn across more drainages, causing more negative effects to aquatic habitat.

Cumulative Effects

Cumulative effects to management indicator species associations are similar to the cumulative effects to threatened and Forest Service sensitive species.

Alternative 2

Project Area A: Beaver Fire

Threatened/Endangered and Forest Service Sensitive Species

Direct Effects

Water drafting and stream crossing work associated with near stream temporary road actions are the only actions proposed within streams of the Beaver Fire area, and therefore the actions that with potential for directly affecting aquatic resources. Special status aquatic species that may be directly affected in the Beaver Fire area include: SONCC Coho salmon, Chinook salmon, steelhead and resident rainbow trout, Pacific lamprey, Klamath River lamprey, Foothill yellow legged frog, and western pond turtle.

Water Drafting

During water drafting, aquatic species present could experience direct effects associated with rapid changes or sustained reductions in flow, reduced dissolved oxygen, and/or increased water temperature. In order to reduce or eliminate these potential effects, the Forest Service follows Best Management Practice guidance described in Region 5 Forest Service Handbook 2509.22, Chapter 10-Water Quality Management Handbook (2011). Specifically Best Management Practice (best management practices) 2.5 Water Source Development and Utilization provides direction specific to water drafting.

These best management practices protection measures ensure that water drafting may only occur when bypass stream flows can be sustained of 1.5 cubic feet per second for fish bearing streams, or 10 gallons per minute for non-fish bearing streams; drafting rate is not to exceed 20% of surface flows in fish bearing streams and 50% of surface flows in non-fish bearing streams. When in Coho salmon Critical Habitat (CH), in addition Project water drafting will be implemented according to NOAA water drafting specifications (2001). These NOAA water drafting specifications require that pumping rates during drafting do not exceed 10% of the stream flow, and that drafting does not result in obvious draw-down of either upstream or downstream pools. Both best management practices and NOAA specifications require that water drafting operations use a fish screen appropriate to protect aquatic species present at the site; NOAA specifications require specific size of screen mesh (maximum 3/32 inch diameter for round or square openings).

Water drafting typically overlaps the Coho salmon lifecycle when young fish (0+ and 1+ years old) are utilizing summer rearing habitat, which is limiting in general in the mid Klamath River. Protection of cold water habitat is critical to promote the survival of juvenile Coho salmon in this area. The potential effects of water drafting were further minimized between draft EIS and final EIS by updating project design feature Watershed-34 with National Marine Fisheries Service and Karuk Tribe specifically to avoid potential impacts drafting could have on salmonids that are dependent upon thermal refugia areas in summer and early fall. This project design feature specifies that certain areas (lower reaches of cold tributaries) across the project area and several specific creeks are to be avoided during summer and fall water drafting (generally June

through September). None of the specific creeks identified in the project design feature occur in the Beaver Fire area; however, the increased protection of flows in lower reaches of all cold tributaries reduces the chance that water drafting would have measurable negative impacts to fish that are relying upon thermal refugia. Implementation of this project design feature requires that lower reaches of cold water tributaries to, and including, Beaver Creek would be avoided during water drafting; water needed for dust abatement in this area will primarily come from the Klamath River at drafting site(s) outside of any cold-water tributary inputs. Protection of cold aquatic habitat is incredibly important to aquatic species in this area including SONCC Coho salmon, especially as extended drought conditions persist.

Relative to Pacific and Klamath River lamprey, Chinook salmon, and steelhead trout; because these species occur primarily within Coho salmon CH they will be protected from impacts of water drafting as described for Coho salmon. Especially for steelhead trout, the overlap in typical timing of water drafting operations and fish life cycle results in more potential exposure of vulnerable life history forms (eggs and alevins which are still dependent upon gravel nests/redds) to water drafting impacts, especially when dust abatement is needed early during dry spring and early summer months. As described in project design feature Watershed-35, minor instream modifications are only allowed outside of CH which is mostly equivalent to steelhead trout spawning distribution. This reduces the chance that water drafting operations would directly affect steelhead redds or young fish. Required screening in all fish bearing streams eliminates the chance of direct impacts to all fish species.

In many drainages, the distribution of resident rainbow trout and other aquatic species extend beyond/above Coho salmon CH. According to current water drafting site information, there are not water drafting sites in resident trout only fish-bearing creeks in Beaver Fire area. However, if one was to be identified and designated for use by the Forest Service, best management practices described above would protect flows in these creeks by allowing drafting only up to 20% of surface flows and providing for at least 1.5 cubic feet per second bypass flows in the creek. Required screening in all fish bearing streams eliminates the chance of direct impacts to all fish species.

Foothill yellow legged frog and Western pond turtle, in the Beaver Fire area, are likely to occur along Beaver Creek and the Klamath River. Because these areas are also Coho salmon CH, there will be no modification of drafting sites that could impact these species. Screening requirements, and maintenance of surface flows as described above for fish species, will also protect foothill yellow legged frogs and Western pond turtles. It is possible that these species also occur in upper watershed areas in small spring ponds or wetlands. These water sources are subject to the same best management practices that protect flows and require screening (and require coordination with fish biologists on drafting locations); these areas often do not provide the conditions suitable to non-emergency water drafting per best management practices. Also, the timing of typical water drafting operations is when frogs and turtles are mobile and able to avoid areas of disturbance. If water drafting per best management practices occurs in upper watershed ponds or springs, there would be some impact to these species if they occur there. The impact would be a result of losing up to 50% of surface flow, or reducing flowing water to 10 gallons per minute. In this case, individuals may be temporarily harassed or

displaced, however essential functions such as breeding, feeding, and sheltering would not be meaningfully affected.

Stream crossing work

Several temporary stream crossings will be required as part of temporary road actions; these crossings are outside/above the range of fish, therefore potential effects to fish associated with temporary stream channel crossings are disclosed below under indirect effects. Special status aquatic species that may be present and therefore directly affected by stream crossing work associated with these temporary road actions are foothill yellow legged frog and western pond turtle. There are two locations where crossing work may involve work in an active stream channel, reopening/use/hydrologic stabilization on existing road beds:

- Existing temp 8 – This old road bed has several legacy sediment sources along it related to drainage problems and one perennial stream crossing on non-fish-bearing tributary to Doggett Creek.
- Existing temp 39 and 40 – This old road bed has several legacy sediment sources related to drainage problems and two intermittent stream crossings on non-fish-bearing tributary to Beaver Creek.

Potential effects would be minimized by implementation of project design features and best management practices; only temporary disturbance/displacement of individual frogs or turtles would occur and these effects are not likely to reduce population levels or reduce distribution of these species.

Indirect Effects

Potential indirect effects were evaluated based on three main indicators of aquatic habitat: sediment, stream temperature, and large wood/riparian function.

Salvage Harvest and Reforestation

In large part because salvage harvest is proposed only outside of stream course Riparian Reserves including inner gorges, this analysis concludes that proposed salvage and reforestation actions are likely to result in neutral or discountable effects to aquatic species and their habitat. These conclusions are based on field reviews, CWE analysis and professional judgement. Given the substantial landscape-level effects of the 2014 Beaver Fire, and the slight incremental increase in disturbance that salvage harvest would cause, any negative effect of proposed salvage and reforestation to aquatic habitat would be minor and discountable. In addition, removing dead trees and brush (fuels for future fires) and planting conifers as described in this EIS is likely to allow for quicker development of large trees and sustainable forests in these areas.

Site preparation and planting activities are proposed within salvage units and separate site preparation and planting units. Site preparation and planting units are mostly relatively young plantations that burned at high or moderate severity. As with salvage harvest, stream course Riparian Reserves and inner gorges, are excluded from activities in site preparation and planting units with Alternative 2 therefore these actions are likely to have little to no effect on aquatic habitat. Alternative 2 does not include the Beaver Fire area for hand treatments within Riparian Reserves. The beneficial effects of this treatment, as described for Modified Alternative 3, would be foregone in the Beaver Fire area with Alternative 2.

Fuels Reduction

Although fuels reduction actions will occur within Riparian Reserves, project design features were developed to sufficiently protect riparian and aquatic system functions including sediment, stream temperature and large wood. Therefore, these actions are likely to have only discountable short term effects on habitat indicators and minor effects on aquatic species. Project fuels treatments are designed to reduce the adverse effects of future wildfires and, therefore, would provide some protection for future watershed condition and function especially if/when the future fire is greater than five years in the future.

Hazard Tree Abatement

In the Beaver Fire area, a total of 4 miles of perennial stream and 8 miles of intermittent stream may be exposed to the effects of roadside hazard tree removal with Alternative 2. Streams affected that contain habitat for SONCC Coho salmon and most other special status aquatic species include sections of the Klamath River and Beaver Creek, as well as Dutch Creek and several non-fish bearing reaches of Doggett and Kohl Creeks.

The potential effects of roadside hazard tree removal on aquatic resources includes ground disturbance associated with felling trees and yarding up to roads, and localized loss of woody debris and potentially shade. Equipment restrictions that prohibit ground based equipment from leaving roads when implementing roadside hazard tree removal within RR minimizes near stream ground disturbance (Watershed-4 which was updated between draft EIS and final EIS) so that these actions are not likely to cause stream sedimentation. Risk of impacts to other aquatic habitat indicators is associated mostly with removal of trees near stream channels, particularly live trees and groups of hazard trees along roads that parallel streams or have many road/stream crossings. Project design feature Watershed-12 specifies that hazard trees equal to or greater than 26 inches DBH that are within one site tree distance from all stream channels, including perennial non-fish bearing and intermittent stream channels will be retained even if they need to be felled for safety. Considering that the probability of wood entering an active stream channel from greater than one tree height is generally low (FEMAT 1993), this project design feature is likely to ensure that roadside hazard tree removal (the only action that would remove trees from Riparian Reserves) would have discountable effects to large wood recruitment. Another project design feature restricts hazard tree removal to only fire-injured or killed trees, which further decreases the likelihood that trees that currently provide shade to streams would be removed. Based on inclusion of watershed project design features, and project specific Best Management Practices (see Appendix D for details), field review of hazard tree removal areas, and consideration of the proportion of drainages that would be affected, this analysis concludes that hazard tree abatement along roadsides will have discountable effects to habitat indicators and minor effects to aquatic species and habitat.

Roads, Landings and Water Drafting

New temporary roads, particularly temporary road stream crossings, have a high risk for affecting aquatic habitat indicators at the site scale because of their impacts on sediment regimes and drainage networks. As describe above in Direct Effects, Alternative 2 includes temporary road actions that overlap non fish bearing reaches of Doggett and Beaver Creeks. Aquatic habitat in these drainages would experience temporary short-

term impacts related to sediment while existing roads are opened, used and hydrologically stabilized; also there would be long term benefits from fixing the current legacy sediment sources on these old road beds. Due to inclusion of project design features and best management practices the short term negative effects would be localized near crossing sites and limited to during actions and the first several storms after. See the Aquatic Resources Report and Amendment for detailed analysis.

Landings located within Riparian Reserves have a high risk of effects to habitat indicators and aquatic species because landings will disturb soils and vegetation in close proximity to stream channels. There are no new landings in Riparian Reserves proposed in the Beaver Fire area. Use of existing landings in Riparian Reserve may result in localized sediment related impacts, but these will be sufficiently reduced by implementation of project design features and best management practices.

All action alternatives will require water drafting at the same locations designated by the Forest Service. Water drafting temporarily disrupts aquatic habitat and can result in short term and localized increases in turbidity, particularly when the water hose is set into and pulled from the water. As described in project design features Watershed-34 and 35, vegetation providing stream shade will not be removed, and there will be no modification of drafting sites within Coho Salmon critical habitat. These protective measures will minimize effects of water drafting to aquatic habitat so that a measurable increase in turbidity is not expected beyond the immediate drafting area. Water drafting is likely to result in only discountable effects to sediment and minor effects to aquatic species.

Cumulative Effects

Current and future foreseeable actions considered for analysis within the twenty-nine 6th field watersheds (Table F-1) that intersect the WSFR Project boundary are provided in Appendix F. The activities listed in F-1 were accounted for in the project CWE analysis and interpretation. The Forest uses standardized Cumulative Watershed Effects (CWE) models (Equivalent Roaded Area, Universal Soil Loss Equation, Mass Wasting) to assess effects of past, present, and reasonably foreseeable future activities. In addition to other current actions, models were updated to incorporate effects of the 2014 fires and road assessment of post-fire existing conditions, as well as an initial assessment of the project *No Action* alternative. Subsequently, effects of project *action alternatives* were modeled based on proposed actions. These model results reflect that there will be minimal cumulative impact from adding the effects of Alternative 2 to the past, present, and reasonably foreseeable future actions.

The site level analysis found that short term negative effects to aquatic habitat may occur in several stream reaches due to the project. Ongoing and future actions in these drainages where site level effects are expected include grazing and private timber harvest (green and salvage timber harvest plans). Additive effects related to sediment delivery to streams are likely only as a result of effects of private timber harvest, particularly in Doggett Creek. These effects to habitat are likely restricted to within the first year post project and will contribute to elevated sediment inputs to Doggett Creek, Beaver Creek, and Klamath River.

Management Indicator Species (River/Stream Association)

Direct Effects

Project actions that occur in streams could directly impact aquatic habitat. Within the Beaver Fire Area for Alternative 2, these actions are water drafting and temporary road crossings.

As discussed above in effects to Threatened, Endangered, and Sensitive species, water drafting actions would have only temporary effects and due to implementation of National Marine Fisheries Service and FS best management practices, these actions are not likely to meaningfully reduce the quantity or quality of river/stream habitat.

Temporary roads used by the project include stream crossings. Direct effects to aquatic habitat would occur while crossings on temporary roads are being constructed, or reconstructed, used, and hydrologically restored after use. Due to these actions river/stream habitat for management indicator species may be affected at several discrete sites on non-fish-bearing tributaries of Doggett Creek and Beaver Creek within the Beaver Fire Area.

Indirect Effects

Vegetation treatments proposed for Beaver Fire area with Alternative 2 only include Riparian Reserve treatment within fuels treatment units. These treatments will reduce fuel accumulations, provide ground cover, and encourage natural regeneration in Riparian Reserves. Equipment and activities such as handline construction are restricted within Riparian Reserves so that additional ground disturbance from these activities is not likely to result in any effect to aquatic habitat. Temporary road actions may affect the quality of river/stream habitat over a total of about 2.6 miles of stream above fish-bearing habitat; Cascade and tailed frog are the only special status aquatic species that may occur in this habitat and thus be indirectly affected. Because the project would address existing legacy sediment sources on temporary road beds, long term benefits of reduced erosion and protection of water quality in Doggett and Beaver Creeks are expected.

Cumulative Effects

Project effects to river/stream management indicator species habitat will not reduce the quantity of habitat available. The quality of management indicator species habitat is expected to be temporarily reduced for several years along stream reaches associated with the temporary road crossings. Long term site level habitat improvement and protection of water quality is expected due to legacy sediment site fixes. While the project would allow for some long term improvement of river/stream habitat, these would be relatively minor in light of ongoing impacts on private land impacts.

Project Area B: Happy Camp Complex

Threatened/Endangered and Forest Service Sensitive Species

Direct Effects

Water drafting and stream crossing work associated with temporary road actions and legacy site treatments are the only actions proposed within streams, and therefore the actions with the potential for directly affecting aquatic resources. Special status aquatic species that may affected by these actions in the Happy Camp Fire area include: SONCC Coho salmon, Chinook salmon, steelhead and resident rainbow trout, Pacific lamprey, Klamath River lamprey, Foothill yellow legged frog, western pond turtle, Cascade frog, and southern torrent salamander.

Water drafting

For effects of water drafting, much of the effects discussion above for the Beaver Fire area applies to effects of water drafting in the Happy Camp Fire area. Creeks that will be avoided during project water drafting include Tom Martin Cr, O'Neil Cr, (Little) Horse Cr, and China Cr; aquatic species and habitat in these creeks would not be affected by Project water drafting. The increased protection of salmonid rearing habitat in these creeks, as well as flows in lower reaches of all cold tributaries reduces the chance that water drafting would have measurable negative impacts to fish that are relying upon thermal refugia. Protection of cold aquatic habitat is incredibly important to aquatic species in this area including SONCC Coho salmon, especially as extended drought conditions persist.

In many drainages, the distribution of resident rainbow trout and other aquatic species extend beyond/above Coho salmon CH. Especially during the current extended drought, in late summer and fall, project area streams above mainstem rivers and several tributaries (Tompkins, Grider, and Elk Creeks), are likely to be dry or have flows too low to allow for drafting in accordance with best management practices described above. Project water drafting will most likely be occurring at mainstem rivers (Scott and Klamath River). However, if drafting sites above CH in the mainstem rivers and tributaries are identified and designated for use by the Forest Service, best management practices allow for drafting only up to 20% of surface flows and providing for at least 1.5 cubic feet per second bypass flows in fish bearing creeks. Required screening in all fish bearing streams eliminates the chance of direct impacts to all fish species. These protection measures are likely to ensure that Project water drafting will not negatively affect the distribution or viability of special status aquatic species populations in the project area.

Foothill yellow legged frog and Western pond turtle, in the Happy Camp Fire area, are likely to occur along Scott and Klamath Rivers and potentially Tompkins, Grider, Walker, and Elk Creeks. Because these areas are also Coho salmon CH, there will be no modification of drafting sites that could impact these species. Screening requirements, and maintenance of surface flows as described above for fish species, will also protect other aquatic species that may be present. It is possible that these species also occur in upper watershed areas in small spring ponds or wetlands. However, these areas often do not provide the conditions suitable to non-emergency water drafting per best management practices, and use of them are subject to the same best management practices that protect flows and require screening (and require coordination with fish biologists on drafting locations). Also, the timing of typical water drafting operations is when frogs and turtles are mobile and able to avoid areas of disturbance. If water drafting per best management practices occurs in upper watershed ponds or springs, there would be some impact to these species if they occur there. The impact would be a result of losing up to 50% of surface flow, or reducing flowing water to 10 gallons per minute. In this case, individuals may be temporarily harassed or displaced, however the ability to carry out essential functions such as breeding, feeding, and sheltering would not be meaningfully affected.

Special status aquatic species that are less likely to occur where water drafting occurs, and are therefore less likely to be affected include Cascade frog and southern torrent salamander.

Because upper watershed spring ponds or wetlands, where Cascade frogs may occur, do not often provide the flows necessary for non-emergency water drafting per best

management practices, it is not likely that this species would be exposed to the impacts of Project water drafting. If water drafting does occur in these upper watershed areas, it is subject to the same best management practices that protect flows and require screening (and require coordination with fish biologists on drafting locations). Southern torrent salamanders are typically found in relatively undisturbed stream environments nearer to the coast than the project area, however this species may occur only in the western-most parts of the project area in Elk Creek watershed. While it is possible that this species may occur where water drafting occurs in Elk Creek watershed, it is not likely because water drafting sites are typically along roads in stream reaches that are regularly disturbed by human activities and are not well-shaded. Therefore water drafting is not likely to occur within suitable habitat for southern torrent salamanders. Water drafting may affect Cascade frogs and southern torrent salamanders. The impact would be a result of disturbance and loss of up to 50% of surface flow, potentially reducing flowing water to 10 gallons per minute. In this case, individuals may be temporarily harassed or displaced, however the ability to carry out essential functions such as breeding, feeding, and sheltering would not be meaningfully affected.

Stream crossing work

Several temporary stream crossings will be required as part of temporary road actions; these crossings are outside/above the range of fish, therefore effects to fish habitat and species associated with temporary stream channel crossings are disclosed below under indirect effects. The only special status aquatic species that may be present and therefore directly affected by crossing work associated with these temporary road actions is Cascade frog. Potential effects would be minimized by implementation of project design features and best management practices; only temporary disturbance/displacement of individuals would occur and these effects are not likely to reduce population levels or reduce distribution of this species. There are two locations where crossing work may involve work in an active stream channel, reopening the following decommissioned roads:

- 46N62 – Caroline Creek road involves one perennial stream crossing and several intermittent and ephemeral channel crossings.
- 46N41YA – This road crosses a non-fish-bearing perennial stream twice, the first crossing is a legacy sediment site that would be addressed if the road is used by the project.

Legacy sediment site crossing work

In channel actions would be involved during culvert upgrades at 48 sites, including three culvert upgrades to open bottom arch structures (see project maps for locations). Most culvert upgrade locations are well above the distribution of Coho salmon CH and Chinook salmon, however six culvert upgrade sites are near CH (within 300 feet) on tributaries of Elk Creek and East Fork Creek. Special status aquatic species that may be present at these sites and therefore potentially directly affected include: rainbow trout, Pacific and Klamath River lamprey, foothill yellow legged frog, western pond turtle, Cascade frog, and southern torrent salamander.

Timing of the instream work will be targeted for late summer or fall when most of the sites will be dry; relevant project design features (Watershed-17 through 21) and best management practices will be integrated into design and erosion control plans to minimize effects to aquatic resources. Potential direct effects to aquatic species present

include temporary harassment and displacement during the in channel work period (late summer or fall). Due to the timing of activities and implementation of project design features, these temporary negative effects to individuals are not likely to have meaningful direct impacts on reproduction or distribution of aquatic species.

Indirect Effects

Indirect effects of Alternative 2 within the Happy Camp Fire area are much the same as described for the Beaver Fire Area with the addition of the exceptions described below.

Salvage Harvest and Reforestation

In large part because salvage harvest is proposed only outside of stream course Riparian Reserves including inner gorges, this analysis concludes that proposed salvage and reforestation actions are likely to result in neutral or discountable effects to aquatic species and their habitat. These conclusions are based on field reviews, CWE analysis and professional judgement. See Aquatics Resource Report and Amendment for more detailed analysis of the effects of these actions.

Site preparation and planting activities are proposed within salvage units and within separate site preparation and planting units which are mostly plantations that burned at high or moderate severity. Alternative 2 includes hand treatments within Riparian Reserves that are within site preparation and planting units in the Happy Camp Fire Area, unless safety of forest workers prohibits implementation. These treatments target plantations that were heavily burned during recent fires and are within units where actions are proposed. The hand treatment would cause a low level of disturbance (no ground based equipment off roads in Riparian Reserves) and is likely to provide for near-term soil cover and fuels reduction activities in these areas where the natural buffering capacity of the Riparian Reserves has been temporarily lost. With no action, as vegetation naturally regenerates in these areas fire-killed trees and brush are likely to lead to undesirable fuels accumulations. Riparian Reserve hand treatments are designed to address these fuels accumulations by providing for maintenance burning and fuels reduction while promoting conditions for natural regeneration and soil recovery as well as increased fire resiliency in Riparian Reserves.

Fuels Reduction

The effects of fuels reduction within the Happy Camp Fire area for Alternative 2 are the same as described for the Beaver Fire Area for Alternative 2. These actions are likely to result in neutral short term effects and long term beneficial effects to aquatic resources including overall watershed condition.

Hazard Tree Abatement

In the Happy Camp Fire area, a total of 24 miles of perennial stream and 22 miles of intermittent stream may be exposed to the effects of roadside hazard tree removal with Alternative 2. Streams affected that contain habitat for SONCC Coho salmon and most other special status aquatic species include sections of the Klamath River and Scott River, as well as Kelsey Creek, Tompkins Creek, O'Neil Creek, Walker Creek, Grider Creek, China Creek, (Little) Horse Creek, Cougar Creek, Elk Creek and East Fork Elk Creek. As described above for Beaver Fire area, fisheries biologists have been monitoring the hazard tree marking near fish-bearing habitat to ensure it is consistent with the description in this EIS. Because only a relatively small proportion of near stream areas

may be affected by roadside hazard tree removal and potential effects to soils and loss of large wood have been minimized by project design features and best management practices, these actions are likely to have only minor and discountable impacts to aquatic habitat.

Roads, Landings and Water Drafting

Temporary road actions in the Happy Camp Fire area for Alternative 2 include near stream actions along a face drainage to Grider Creek, Cliff Valley Creek, China Creek, O'Neil Creek, Kuntz Creek and Gard Creek (face drainage to Klamath River near Caroline Creek).

Alternative 2 would have short-term negative effects to habitat indicators (particularly sediment) and aquatic species within these drainages, due to construction/reconstruction of temporary roads, installation and removal of stream crossings, and new landings in Riparian Reserves. Scale and intensity of temporary road effects increase to moderate in the case of the long road segment traversing multiple mid- or upper-slope channel crossings in Caroline Creek-Klamath River drainage (46N62). This drainage experienced a debris flow in the 1997 flood event that affected road stream crossings, the largest of which is the Gard Creek crossing which involves a perennial and an intermittent channel. There is also an active landslide below the road, west of Gard Creek, which is narrowing the roadbed. Temporary re-opening of the road will require the reinstallation of stream crossings and widening the road on an active landslide. The effects of this work were incorporated into the geology risk analysis for Caroline Creek-Klamath River drainage. At the site scale the probability of re-activating the landslide by temporarily widening the road is moderate. Where the roadbed is narrowed due to road-fill related landslides, proposed re-construction of this segment could add weight to the head of the landslide which could cause it to re-activate if a landslide producing storm should occur before vegetation is re-established. Based on information presented in the geology assessment and field reviews, it was estimated that proposed reopening of 46N62 with Alternative 2 may adversely affect aquatic habitat.

All alternatives allow for six new landings in Riparian Reserves in the Happy Camp Fire area where they meet specific criteria such as not requiring the removal of any vegetation that provides stream shade, and not involving substantial ground disturbance in areas with direct hydrologic connection to a stream channel (Watershed-5). These effects could be of moderate duration (longer than temporary crossings which are pulled) and low to moderate intensity, depending on the volume of potentially unstable material as well as weather and other stochastic events. Construction and use of these landings in Riparian Reserves still has the potential to cause minor negative effects to habitat indicators and moderate effects to aquatic species at the site-scale, although with implementation of required project design features and best management practices the likelihood of sizeable effects to aquatic resources is relatively low.

Stream reaches that are likely to be negatively affected by temporary road actions and landings include portions of a perennial face drainage to Grider Creek, Cliff Valley Creek, O'Neil Creek, Kuntz Creek, China Creek, and Klamath River (due to actions in Gard Creek and Caroline Creek drainages). Long-term beneficial effects in terms of reduced erosion, and/or risk of erosion, are expected at several sites where legacy sediment sources will be addressed if the roads are used for the project: 46N41YA in

lower Grider Creek, and temporary roads on existing roadbed near the bottom of O'Neil and Kuntz Creek drainages; in addition to the legacy site treatment proposed for Elk Creek in the Happy Camp Fire area.

Legacy Sites

These activities involve upgrading culverts, including 3 sites that will be upgraded to open bottom arches, and addressing diversion potential and other road-related issues that are a potential threat to water quality (mostly sediment). Project specific design features and Best Management Practices are design to protect aquatic habitat from potential short term impacts associated with these activities. These protective measures are likely to be sufficient so that impacts to aquatic habitat and species will be minor and localized and not result in any significant effect to any special status aquatic species or habitat. These actions will also result in meaningful beneficial effects in terms of aquatic organism passage and habitat connectivity at crossings and significant reduction in potential future sediment-related impacts from roads in Doolittle, Cougar, East Fork Elk, and mainstem Elk creeks. Overall proposed legacy sediment site treatments in Elk Creek watershed would reduce risk of road-related erosion along 14 miles of stream; in addition, trout and other aquatic species would have unimpeded access to a total of about one mile of additional habitat in Malone, Twin, and Upper Elk creeks post-project.

Cumulative Effects

Cumulative Effects for the Happy Camp Fire Area are similar to those described in the Beaver Fire Area for Alternative 2. The site level analysis in the Happy Camp Fire area found that short term negative effects to aquatic habitat may occur in the following stream reaches due to the project: non fish bearing reaches of Grider, Cliff Valley, China, Gard, and Caroline Creeks. Ongoing and future actions in these drainages where site level effects are expected include grazing, private timber harvest (green and salvage timber harvest plans), and ongoing Forest Service fuels reduction actions, roadside hazard tree removal, and a vegetation projects (Thom Seider). These ongoing and future actions involve low risk of impacting aquatic habitat, therefore are not likely to have effects that are additive to those predicted to occur with this project. The potential negative effects of this project to aquatic resources would likely occur within those drainages identified in this analysis during storm events over the next several years. Some uncertainty exists related to when and where effects to aquatic habitat may occur; this is due to the inherent variability in recovery of post fire vegetation and soils conditions as well as uncertainty around predicting localized weather events that could trigger channel-altering events.

Management Indicator Species (River/Stream Association)

Direct Effects

Direct effects to Management Indicator Species habitat may occur due to water drafting, and stream crossing work associated with temporary road actions and legacy sediment site treatments. Direct effects would be minimized by implementation of project design features and best management practices, and would be much as those described for the Beaver Fire Area in Alternative 2.

Temporary road actions would affect river/stream association habitat in several discrete sites on non-fish bearing reaches of Grider Creek, Cliff Valley Creek, O'Neil Creek, Kuntz Creek, China Creek, Gard Creek, and Caroline Creek.

Indirect Effects

Indirect effects to management indicator species in the Happy Camp Fire Area are the same as described in the Beaver Fire Area for Alternative 2 with the following additions:

Temporary road actions may affect the quality of river/stream habitat over a total of about 6 miles of stream above fish-bearing habitat; Cascade and tailed frog are the only special status aquatic species that may occur in this habitat and thus be indirectly affected. Legacy sediment site treatments would result in short term site level negative effects to aquatic habitat and long term benefits by reducing road-related sediment inputs to streams. There will be beneficial effects to aquatic species, and to the connectivity of aquatic habitat, at the three sites that will have crossing upgraded to bottomless arches. Aquatic species are likely to have unimpeded access to a total of about one mile of additional habitat in Malone, Twin, and Upper Elk creeks post-project. The culvert upgrades, to occur on 45 sites, will also have beneficial effects to the passage of watershed products like coarse sediment and large wood down through the Elk Creek watershed. All action alternatives also include stormproofing 33 miles of road in the Elk Creek watershed. These actions will provide additional benefit to aquatic habitat in Doolittle, Cougar, East Fork Elk, and mainstem Elk creeks (on a total of 14 stream miles) by reducing diversion potential and chronic sediment inputs from roads.

Cumulative Effects

As described in effects to Threatened, Endangered, and Sensitive species, ongoing and future actions in the project area are not likely to negatively affect aquatic habitat. Project effects to river/stream management indicator species habitat may temporarily affect the quality of habitat over about 6 miles of stream total, but will not reduce the quantity of habitat available in the Happy Camp Fire area. The quality of management indicator species habitat is expected to be temporarily reduced along stream reaches associated with sites where temporary road crossings and landings are constructed. Due to the legacy site treatments included in the project, the quality of management indicator species habitat will be improved long-term in reaches of Elk Creek and Grider Creek because sites with active erosion, or at risk for erosion, will be hydrologically stabilized. Over the long term, the project would either have neutral effects to river/stream management indicator habitat, or beneficial effects – particularly in Elk Creek watershed.

Project Area C: Whites Fire

Threatened/Endangered and Forest Service Sensitive Species

Direct Effects

Direct effects to Threatened/Endangered and Forest Service Sensitive species are the same as described in the Beaver Fire Area for Alternative 2, with the following additions. Special status aquatic species that may be affected by project water drafting include: SONCC Coho salmon, Chinook salmon, steelhead and resident rainbow trout, Pacific lamprey, Klamath River lamprey, western pond turtle, and Cascade frog. Alternative 2 does not include any near stream temporary road actions or legacy sediment site treatments; there would be no potential effects of these actions in Whites Fire area.

Western pond turtle, in the Whites Fire area, are likely to occur only on the North Fork Salmon River. Because this river is also Coho salmon CH, there will be no modification of drafting sites that could impact this species. Screening requirements, and maintenance

of surface flows as described above for fish species, will also protect Western pond turtles. Cascade frogs are likely to occur in the project area within lakes and streams above 2500 feet in elevation (all of the Whites Fire area is above 2500 feet in elevation). Although they may occur within streams, much of the suitable habitat for Cascade frogs occurs in Wilderness lakes, where they are known to occur (i.e. Lower Russian Lake and Golden Russian Lake). As described above, Project water drafting will most likely be occurring in mainstem rivers such as the North Fork Salmon River where NOAA drafting specifications will be implemented and provide the highest level of protection for aquatic species. Because upper watershed spring ponds or wetlands, where Cascade frogs are most likely to occur, do not often provide the flows necessary for non-emergency water drafting per best management practices, it is less likely that individuals in these areas would be exposed to the impacts of Project water drafting. If water drafting does occur in these upper watershed areas, it is subject to the same best management practices that protect flows and require screening (and require coordination with fish biologists on drafting locations); potential impacts to Cascade frogs would be a result of disturbance and loss of up to 50% of surface flow, potentially reducing flowing water to 10 gallons per minute. In this case, individuals may be temporarily harassed or displaced, however the ability to carry out essential functions such as breeding, feeding, and sheltering would not be meaningfully affected.

Indirect Effects

Indirect effects within the Whites Fires Area are similar as described in the Happy Camp Fire Area for activities involving Salvage Harvest and Reforestation, Fuels Reduction, Hazard Tree Abatement, and Water Drafting for Alternative 2 with the following additions/exceptions:

In the Whites Fire area, a total of 13 miles of perennial stream and 6 miles of intermittent stream would be exposed to potential effects of adjacent roadside hazard tree removal. These actions are proposed in relatively close proximity to Coho salmon CH in mainstem reaches of North Fork Salmon River, North Russian and South Russian Creeks, and Whites Gulch. Fisheries biologists conducted field review of roadside hazard tree marking in these areas and confirmed that hazard trees along roads in close proximity to Coho salmon CH are marked according to the description in this EIS including project design features. Because potential effects to soils and loss of large wood from near stream areas have been minimized by project design features and best management practices, these actions are likely to have only minor and discountable impacts to aquatic habitat.

Cumulative Effects

Because there are no near stream temporary road actions or landings, potential effects to aquatic resources in the Whites Fires Area for Alternative 2 are expected to be neutral or minor and discountable. Ongoing actions in the project area include grazing, mining, fuels reduction and hazard tree removal. Also, the Eddy Late Successional Reserve Project is ongoing. Because the project is not likely to cause any negative effect to aquatic habitat in the Whites Fire area, no additive or cumulative effects with other actions are expected.

Management Indicator Species (River/Stream Association)

Direct Effects

The direct effects to management indicator species within the Whites Fire Area for Alternative 2 are similar to these described for the Beaver Fire Area for Alternative 2, except that water drafting is the only action that would occur in streams within Whites Fire. As described above, water drafting actions would have only temporary effects and due to implementation of National Marine Fisheries Service and FS best management practices, these actions are not likely to meaningfully reduce the quantity or quality of river/stream habitat.

Indirect Effects

The indirect effects within the Whites Fire Area to management indicator species in Alternative 2 are similar to those described in the Beaver Fire Area for Alternative 2. However, the Whites Fire area does not include any near stream temporary road actions and no negative effects to aquatic habitat are expected in Whites Fire area.

Cumulative Effects

Because there would be no negative effects to river/stream habitat in the Whites Fire area, there would be no cumulative effects.

Alternative 3

Project Area A: Beaver Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

The direct effects of Alternative 3 within the Beaver Fire Area are the same as described for Alternative 2 within the Beaver Fire Area, except as described below. Because all salvage harvest units in the Beaver Fire area are dropped with Alternative 3, stream crossing work associated with temporary road actions in Doggett Creek drainage are dropped with this alternative and potential effects of these actions would not occur. Direct effects to aquatic resources are limited to water drafting and stream crossing work in a non-fish bearing face drainage of Beaver Creek; these effects are described above for Alternative 2.

Indirect Effects

Salvage Harvest and Reforestation

Impacts to aquatic resources in the Beaver Fire Area associated with salvage harvest are eliminated under this alternative because Alternative 3 eliminates salvage harvest within the Beaver Fire Area. Effects of site preparation and planting are as described for Alternative 2.

Fuels Reduction

Fuels reduction actions, and potential effects, are the same as described in the Beaver Fire Area for Alternative 2.

Hazard Tree Abatement

Hazard tree actions, and potential effects, are the same as described in the Beaver Fire Area for Alternative 2.

Roads, Landings, and Water Drafting

Temporary road actions, landings, and water drafting actions, and potential effects, are mostly the same as described in the Beaver Fire Area for Alternative 2. The exception is

temporary road 8 has been dropped, therefore potential negative short term effects and long term beneficial effects associated with this road work in Doggett Creek drainage described for Alternative 2 would not occur with this alternative.

Cumulative Effects

Because all salvage and associated roads and landings have been dropped, effects of the project to aquatic resources would be neutral, or minor and discountable for site preparation and planting and fuels treatments within Riparian Reserve. Potential negative sediment related effects in Doggett Creek that would be additive to effects of ongoing timber harvest on private lands, as described for Alternative 2, are eliminated with Alternative 3. There is low risk that project effects would add to effects of ongoing and future actions in Beaver Fire area. The influence of actions on Federal lands in this area are minor compared to the effects of actions on private land.

Project Area B: Happy Camp Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Potential direct effects to aquatic species would be the same as described for the Happy Camp Fire Area for Alternative 2. Several temporary road actions are dropped but these are just short ridge top segments that would have neutral effects to aquatic resources.

Indirect Effects

Potential indirect effects would be the same as described for the Happy Camp Fire Area for Alternative 2. Several temporary road actions are dropped but these are just short ridge top segments that would have neutral effects to aquatic resources.

Cumulative Effects

Potential cumulative effects to aquatic species remain as described for the Happy Camp Fire Area for Alternative 2.

Project Area C: Whites Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Potential direct effects to aquatic species would be the same as described for the Whites Fire Area for Alternative 2.

Indirect Effects

There are no near stream temporary road actions in the Whites Fire Area. Because all salvage harvest has been dropped in the East Fork of Whites Gulch, and several units dropped in West Fork Whites, there will be slightly less of the discountable impacts described for Alternative 2. Otherwise, potential indirect effects to aquatic species remain as described for the Whites Fire Area for Alternative 2.

Cumulative Effects

Potential cumulative effects to aquatic species remain the same as described for the Whites Fire Area for Alternative 2.

Alternative 4

Alternative 4 includes a limitation on use and construction of near stream temporary roads (which reduces several harvest units and landings), and the six new landings in Riparian Reserve allowed for use with Alternative 2 are not included in Alternative 4. This alternative reduces the extent of proposed roadside hazard tree removal by dropping Maintenance Level 1 roads that would not be used for the project. This change results in 20 miles or 917 acres of reduced hazard tree removal in Alternative 4 relative to Alternative 2. Alternative 4 also includes hand treatment within Riparian Reserves within both site preparation and salvage units unless safety of forest workers prohibits it (dead trees less than 16 inches in diameter at breast height); Riparian Reserves in the Beaver Fire are also included for hand treatments with Alternative 4.

Project Area A: Beaver Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Because all stream crossing work has been dropped, only water drafting may have direct effects to aquatic resources; potential water drafting related effects would be the same as described for the Beaver Fire Area for Alternative 2.

Indirect Effects

Salvage Harvest and Reforestation

Salvage harvest and reforestation actions, and potential effects, are mostly the same as described for the Beaver Fire Area for Alternative 2; approximately 100 acres of salvage harvest is dropped with Alternative 4 therefore there will be a slight reduction in the discountable effects described for Alternative 2.

Riparian Reserve hand treatments are included within site preparation and salvage units in the Beaver Fire area with Alternative 4. Watershed specialists worked with Project implementers to ensure that hand treatment actions in the Beaver Fire area were feasible, and likely to occur, even though ground-based equipment would not be allowed within the Riparian Reserve. Field review by watershed specialists in the Beaver Fire area confirmed that conditions in the Riparian Reserves would be improved by including hand treatments in heavily burned areas. As represented in Figure , these areas currently have very low soil cover and in many cases are far from seed-producing trees. Proposed hand treatments would involve low level of ground disturbance and would allow for actions that would increase near term soil cover and speed the development of mature forests in Riparian Reserves. Potential effects to aquatic resources would be neutral in the short term and beneficial in the long term. Proposed hand treatments with this alternative do not include planting but would still be beneficial to aquatic habitat and watershed condition including fire resiliency and the sustainability of forests overtime. However these beneficial effects would only occur over a small proportion of the watersheds that were affected by the 2014 Beaver Fire, and continue to be affected by ongoing private industrial timber production which has a larger influence on watershed condition and aquatic habitat than actions on Federal lands.

Figure 3-17. Heavily burned riparian area in Beaver Fire area (face drainage to Beaver Creek) that would receive hand treatment in Alternative 4 and Modified Alternative 3.

Fuels Reduction

Fuels reduction actions, and potential effects, are the same as described for the Beaver Fire Area for Alternative 2.

Hazard Tree Abatement

Alternative 4, in the Beaver Fire area, proposes 274 less acres of road side hazard tree removal relative to Alternative 2 as shown in Table 3-46 below shows the potential effects of roadside hazard tree removal on aquatic resources includes ground disturbance associated with felling trees and yarding up to roads, and localized loss of woody debris and potentially shade; the potential effects to aquatic resources are reduced to minor and discountable due to adherence to project design features and best management practices, and would occur over less area with Alternative 4.

Table 3-46: Reduced extent of proposed hazard tree removal in Alternative 4, relative to Alternative 2 in the Beaver Fire.

5th field watershed	Acres of reduced hazard tree removal proposed in Alternative 4 (relative to Alternative 2)
Beaver Creek	180
Horse Creek-Klamath River	94
Total	274

Roads, Landings and Water Drafting

Water drafting actions, and potential effects, are the same as described for the Beaver Fire Area for Alternative 2. No near stream temporary road actions are proposed with

Alternative 4, therefore potential negative short-term impacts (and long-term benefits from addressing existing legacy sediment sites) in non-fish-bearing tributaries of Doggett and Beaver creeks discussed for Alternative 2 would not occur under Alternative 4.

Cumulative Effects

Cumulative effects will be less with Alternative 4 because actions that are likely to result in negative short term effects at the site scale (near stream temporary road actions) are eliminated. With Alternative 4, the project is not likely to add to the elevated sediment conditions in Doggett and Beaver Creeks, which largely result from fire effects along with private timber harvest in much of the watershed.

Project Area B: Happy Camp Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Potential direct effects to aquatic species from water drafting and stream crossings associated with legacy sediment site treatments would be the same as described for the Happy Camp Fire Area for Alternative 2. Potential direct effects from stream crossings associated with temporary road actions would be eliminated as these temporary road actions have been dropped with Alternative 4. The only near stream temporary road action included in this alternative is within Riparian Reserve associated with Kuntz Creek. There are no stream crossings associated with this road and use of it would not cause any direct effect to aquatic species.

Indirect Effects

Salvage Harvest and Reforestation

Alternative 4 reduces salvage harvest acreage by approximately 800 in the Happy Camp Fire area so there will be a slight reduction in the discountable effects described for Alternative 2. Potential sediment related effects of salvage harvest would be lessened in upper Grider Creek where much of the dropped acreage of salvage harvest occurs; to a lesser extent salvage related effects would also be reduced in lower Grider Creek and East Fork Elk Creek where units are dropped. These reductions in ground disturbance outside of Riparian Reserves are not likely to result in meaningful changes in effects to downstream fisheries habitat.

Potential effects of proposed hand treatments in Riparian Reserves are increased, as these treatments are proposed in both site preparation and salvage units with Alternative 4. Planting is not included in Riparian Reserves with this alternative. As described for Alternative 2, the short term effects of these actions relate to low levels of ground disturbance in Riparian Reserves caused by hand work and burning; these actions would cause only localized and temporary disturbance to vegetation and soils and are not likely to have negative effects to aquatic habitat. Long term benefits to watershed condition indicators are likely for drainages where these treatments occur. The long term benefits are more likely as the amount of this treatment across the post fire landscape increases, therefore Alternative 4 where most acreage of this treatment is proposed, would have the most potential beneficial effects to watershed condition including fire resiliency. However, the feasibility of implementing this treatment within Riparian Reserves of salvage units is questionable in most areas, particularly due to the presence of abundant large dead trees (overhead hazards).

Fuels Reduction

Fuels reduction actions, and potential effects, are the same as described for the Happy Camp Fire Area as for Alternative 2.

Hazard Tree Abatement

Alternative 4, in the Happy Camp Fire area, proposes 572 less acres of road side hazard tree removal relative to Alternative 2 as shown in Table 3-47 below. Potential effects of roadside hazard tree removal on aquatic resources includes ground disturbance associated with felling trees and yarding up to roads, and localized loss of woody debris and potentially shade; these effects would occur over less area with Alternative 4, as displayed in Figure 4 below.

Table 3-47: Reduced extent of proposed hazard tree removal in Alternative 4, relative to Alternative 2 in the Happy Camp Fire.

5th field watershed	Acres of reduced hazard tree removal proposed in Alternative 4 (relative to Alternative 2)
Elk Creek	1
Lower Scott River	433
Seiad Creek-Klamath River	51
Thompson Creek-Klamath River	87
Total	572

Because project design features and best management practices reduce potential effects of near stream hazard tree removal to minor and discountable levels, and areas dropped with Alternative 4 are mostly not in close proximity to fish habitat, effects of Alternative 4 are the same as described in the Happy Camp Fire Area for Alternative 2.

Roads, Landings and Water Drafting

Water drafting actions, and potential effects, are the same as described for the Happy Camp Fire Area for Alternative 2. No stream crossings on temporary roads are proposed with Alternative 4, therefore all negative site-scale impacts to the sediment regime described for Alternative 2 are avoided. Although near stream temporary road actions are still included near the bottom of Kuntz Creek, these activities do not involve stream crossings. Use of this old road bed has low risk of affecting the nearby Kuntz Creek and proper hydrologic stabilization of this road will decrease erosion and further protect water quality in this drainage. With Alternatives 2, 3, and 5 there are several sites where project temporary road actions involve using roads that currently have legacy sediment sites, or areas that are at risk of erosion (and therefore a threat to water quality) due to past land use. For the drainages where this would occur with the other action alternatives, the opportunity to improve/protect water quality in these areas would be foregone with Alternative 4.

Because the six new landings in Riparian Reserve are not included in Alternative 4, there would be no site level effects at these locations in Riparian Reserve of Grider Creek, and the Klamath and Scott Rivers.

Legacy Sites

Legacy sediment site treatments in the Elk Creek watershed and potential effects are the same as described for the Happy Camp Fire Area for Alternative 2.

Cumulative Effects

As described for Alternative 2, ongoing and future actions in this area are not likely to result in negative effects to aquatic habitat. The potential cumulative effects will be less with Alternative 4 because actions that are likely to result in adverse effects to aquatic habitat (re-opening of Caroline Creek road), or in negative short-term effects at the site scale (temporary road crossings and new landings in Riparian Reserves) are eliminated. Proposed hand treatments in Riparian Reserve, if all were feasible to implement, would have the most beneficial cumulative effect on watershed condition of all alternatives.

Project Area C: Whites Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Potential direct effects to aquatic species would be the same as described for the Whites Fire Area for Alternative 2.

Indirect Effects

Salvage Harvest and Reforestation

Reforestation actions and potential effects are the same as described for the Whites Fire Area for Alternative 2.

Fuels Reduction

Fuels reduction actions, and potential effects to aquatic species are the same as described for the Whites Fire Area for Alternative 2.

Hazard Tree Abatement

Alternative 4, in the Whites Fire area, proposes 71 less acres of road side hazard tree removal relative to Alternative 2. Potential effects of roadside hazard tree removal on aquatic resources includes ground disturbance associated with felling trees and yarding up to roads, and localized loss of woody debris and potentially shade; these effects would not occur in the non-fish-bearing China Gulch drainage which is dropped in this alternative. Otherwise effects of roadside hazard tree removal would be as described for Alternative 2.

Roads, Landings and Water Drafting

Water drafting actions and potential effects are the same as described for the Whites Fire Area for Alternative 2. There are no near stream temporary road actions in the Whites Fire Area and effects remain the same as described for the Whites Fire Area for Alternative 2.

Cumulative Effects

Cumulative effects will be the same as described for the Whites Fire Area for Alternative 4.

Alternative 5

Project Area A: Beaver Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

The direct effects of Alternative 5 are the same as described for the Beaver Fire Area for Alternative 2.

Indirect Effects

Salvage Harvest and Reforestation

The effects of salvage harvest and reforestation are the same as described for the Beaver Fire Area for Alternative 2.

Fuels Reduction

Alternative 5 includes about 1,000 more acres of fuels treatment in the Beaver Fire area than are in other action alternatives. As described for the Beaver Fire Area for Alternative 2, fuel reduction actions are likely to have only discountable negative short-term effects on habitat indicators and minor effects on aquatic species. Additionally, project fuels treatments are likely to reduce the adverse effects of future wildfires and, therefore, will provide some protection for future watershed condition and function; especially if/when the future fire is greater than five years in the future. This alternative would have increased long term benefits to aquatic resources, relative to Alternative 2.

Hazard Tree Abatement

Hazard tree actions and potential effects are the same as described for the Beaver Fire Area for Alternative 2.

Roads, Landings and Water Drafting

Near stream temporary road actions and effects would be the same as described for the Beaver Fire Area for Alternative 2.

Cumulative Effects

Cumulative effects for Alternative 5 would be the same as described for the Beaver Fire Area for Alternative 2.

Project Area B: Happy Camp Fire

Threatened/Endangered/Forest Service Sensitive/ Management Indicator Species

Direct Effects

The potential direct effects to aquatic species from water drafting and stream crossing work associated with legacy sediment site treatments would be the same as described for the Happy Camp Fire Area for Alternative 2. All temporary road actions that would involve stream crossing work are dropped with Alternative 5, therefore there would be no direct effects to aquatic resources with this alternative.

Indirect Effects

Salvage Harvest and Reforestation

Alternative 5 eliminates salvage harvest in areas designated as late successional reserve in the Forest Plan, and eliminates site preparation and planting in these areas plus in Riparian Reserves and Inventoried Roadless Areas. Compared to Alternative 2, many fewer acres in the Happy Camp Fire Area will have salvage and reforestation treatments. The potential discountable effects resulting from these treatments (described for Alternative 2) will be substantially reduced with this alternative. This alternative removes site preparation and planting on about 3,300 acres in the Happy Camp Fire Area compared to Alternative 2. The beneficial effect of site preparation and planting on

reforesting parts of the burned landscape will be foregone on these acres. This alternative does not include hand treatments in Riparian Reserves, the potential beneficial effects of these actions as described for Alternatives 2, 4, Modified 2, and Modified 3 would be foregone with this alternative.

Fuels Reduction

The potential effects of fuels reduction to aquatic species would be the same as described for the Happy Camp Fire Area for Alternative 2.

Hazard Tree Abatement

Hazard tree actions and potential effects are the same as described for the Happy Camp Fire Area for Alternative 2.

Roads, Landings and Water Drafting

Because this alternative involves substantially less salvage and site preparation and planting acreage, landings and road actions are also reduced. Most near stream temporary road actions are dropped in this alternative, only temporary roads on existing roadbed near the bottom of Kuntz and O'Neil Creeks remain in Alternative 5. The effects of these actions are as described for Alternative 2.

Of the six new landings in Riparian Reserve approved for use with the other alternatives, only two remain in Alternative 5: DZ03 near the Klamath River and DZ10 near the Scott River. Potential negative site-level effects of new landings described for Alternative 2 would be eliminated where new landings are dropped near Cliff Valley Creek (L090), and Grider Creek (DZ23, L043 and L044). The extent of water drafting needed to support implementation of this alternative will also be reduced.

Legacy Sites

Legacy site treatments and potential effects are the same as described for the Happy Camp Fire Area for Alternative 2.

Cumulative Effects

Because much of the proposed salvage harvest and associated roads and landings have been dropped in the Happy Camp Fire area for Alternative 5, effects of this alternative to aquatic resources would be substantially less than those described for Alternative 2. As described for Alternative 2, ongoing and future actions in this area are not likely to result in negative effects to aquatic resources that would be additive to the effects of this project.

Project Area C: Whites Fire

Threatened/Endangered/Forest Service Sensitive/ Management Indicator Species

Direct Effects

Potential direct effects to aquatic species would be similar as described for the Whites Fire Area for Alternative 2, however because only 30 acres would have salvage harvested the need for water drafting would be much reduced and therefore there would be very little potential for direct effects to aquatic resources.

Indirect Effects

Salvage Harvest and Reforestation

Alternative 5 eliminates salvage harvest in areas designated as Late Successional Reserve, Riparian Reserves and Inventoried Roadless Areas. In the Whites Fire area only 30 acres, contained in two units along the North Fork Salmon River near Robinson Gulch are included for salvage harvest and all site preparation units are dropped. The potential discountable effects resulting from these treatments (described in Alternative 2) will be much reduced with this alternative. This alternative does not include hand treatments in Riparian Reserves therefore the beneficial effect of these treatments, as described for Alternatives 2 and 4, would not be realized with Alternative 5.

Fuels Reduction

The potential effects of fuels reduction treatments to aquatic species would be the same as described for the Whites Fire Area for Alternative 2.

Hazard Tree Abatement

Hazard tree actions and potential effects are the same as described for the Whites Fire Area for Alternative 2.

Roads, Landings and Water Drafting

The effects of this alternative will be the same as described for the Whites Fire Area for Alternative 2. The extent of water drafting needed to support implementation of this alternative would be much reduced.

Cumulative Effects

There would be no negative site level effects to aquatic habitat with Alternative 5, with the exception of minor amounts of water drafting. Because this alternative involves only fuels treatment units, roadside hazard tree removal, and two salvage units; effects when considered along with effects of ongoing and future actions would be neutral or beneficial to aquatic resources including overall watershed condition.

Modified Alternative 2

Project Area A: Beaver Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Because all stream crossing work has been dropped in the Beaver Fire area, only water drafting may have direct effects to aquatic resources; potential water drafting related effects would be the same as described for the Beaver Fire Area for Alternative 2.

Indirect Effects

Salvage Harvest and Reforestation

Modified Alternative 2 removes approximately 300 acres of salvage harvest from the Beaver Fire Area relative to Alternative 2. The effects of Modified Alternative 2 on habitat indicators and aquatic species would be reduced from those described for the Beaver Fire Area for Alternative 2 due to less acreage proposed for treatment: effects on habitat indicators would be discountable and effects on aquatic species would be minor. Reforestation actions remain as in Alternative 2, and are likely to increase the likelihood and speed by which burned areas are develop mature forests which is considered a long-term positive effect to aquatic resources. Hand treatments in Riparian Reserve are not

included for the Beaver Fire area in this alternative, the potential beneficial effects of this treatment would be foregone with Modified Alternative 2.

Fuels Reduction

Modified Alternative 2 adds approximately 80 acres of fuels treatments within the Beaver Fire Area relative to Alternative 2. The potential effects of Modified Alternative 2 on aquatic resources are very similar to effects described for the Beaver Fire Area for Alternative 2. The discountable impacts of fuels reduction on sediment, water quality, and riparian function would be slightly increased due to the addition of 80 acres of treatment, some of which overlaps with Riparian Reserves. These effects would be short-term and discountable under Modified Alternative 2.

Hazard Tree Abatement

The amount of acreage treated in the Beaver Fire Area would not change under Modified Alternative 2 relative to Alternative 2 therefore; the effects are the same as described for the Beaver Fire for Alternative 2.

Roads, Landings and Water Drafting

Modified Alternative 2 drops 1.7 miles of temporary road construction and three landings in the Beaver Fire Area relative to Alternative 2. The temporary road actions that were dropped included existing sediment sources on old road beds that would be addressed after use of road beds in Alternative 2. There would be no short-term negative effects in Doggett Creek and Beaver Creek from use of these temporary roads; however, there would also be no long-term beneficial effects through addressing sediment sources on these road beds. Effects to Modified Alternative 2 from temporary road construction would be discountable to habitat indicators and minor to aquatic species.

Modified Alternative 2 would remove 3 landings from use in the Beaver Fire Area; as with all the alternatives, there are no new landings in Riparian Reserves proposed in the Beaver Fire Area. The effects described for landings for Alternative 2 would be reduced with Modified Alternative 2. Modified Alternative 2 is similar to Alternative 2 within the Beaver Fire Area with respect to the potential for indirect effects to aquatic resources from landings. Effects to habitat indicators would be discountable and effects to aquatic species would be minor.

Modified Alternative 2 includes water drafting, the effects of which are as described for the Beaver Fire Area for Alternative 2.

Cumulative Effects

The cumulative effects of Modified Alternative 2 would be roughly the same as described for the Beaver Fire Area for Alternative 2.

Project Area B: Happy Camp Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Direct effects to aquatic species for Modified Alternative 2 would be the same as described for the Happy Camp Fire Area for Alternative 2. Additionally, Modified Alternative 2 does not change the scope or location of legacy sediment site treatments in the Elk Creek watershed and the effects described in Alternative 2 are the same for Modified Alternative 2.

Indirect Effects

Salvage Harvest and Reforestation

Modified Alternative 2 removes about 300 net acres of salvage in the Happy Camp Fire Area relative to Alternative 2. The discountable effects of salvage and reforestation on sediment, water quality and riparian function described for the Happy Camp Fire Area for Alternative 2 would be reduced under Modified Alternative 2. Minor effects to aquatic species and discountable effects to habitat indicators are expected due to exclusion of stream source Riparian Reserves and inner gorges and implementation of project design features. Outside of Riparian Reserves, Modified Alternative 2 includes the same amount of site-preparation, planting, and release relative to Alternative 2 and the effects will be the same as described for Alternative 2.

Like Alternative 2, Modified Alternative 2 includes hand treatments in some Riparian Reserves within Happy Camp and Whites Fire areas; in Modified Alternative 2 these treatments are proposed within Riparian Reserves within salvage or site prep and plant units, and only where they occur on the upper 1/3 of slopes. Based on field reviews, Riparian Reserves in lower slope positions could also benefit from this treatment as described for Modified Alternative 3. Also, as described for Alternative 4, the feasibility of implementing these actions within Riparian Reserve of salvage harvest units is questionable due to the likelihood of substantial overhead hazards and economic and efficiency considerations. Short term effects of these actions to aquatic habitat indicators would be discountable and effects to aquatic species would be minor; long term benefits to watershed condition indicators are likely for drainages where these treatments occur. The long term benefits are more likely as the amount of this treatment across the post fire landscape increases, therefore Alternative 2, Alternative 4, and Modified Alternative 3 all of which have more acreage of this treatment proposed, would be more beneficial to watershed condition including fire resiliency.

Fuels Reduction

Modified Alternative 2 includes the same amount of fuels reduction actions relative to Alternative 2, therefore, the effects will be the same as described for the Happy Camp Fire Area for Alternative 2.

Hazard Tree Abatement

The amount of acreage treated in the Happy Camp Fire Area would not change under Modified Alternative 2 relative to Alternative 2; therefore, the effects will be the same as described for the Happy Camp Fire Area for Alternative 2.

Roads, Landings and Water Drafting

Modified Alternative 2 drops approximately 0.2 miles of new temporary road construction and drops about 5 miles of reopening of decommissioned roads in the Happy Camp Fire. Temporary road actions dropped include mostly short ridge-top segments; however, reopening the Caroline Creek road (46N62) is also dropped from Modified Alternative 2. The Caroline Creek road is a mid-slope decommissioned road that is associated with several stream crossings and active landslide features. Under Modified Alternative 2 the potential adverse impacts to aquatic habitat associated with the Caroline Creek Road are avoided. Because of the deletion of this road segment and reduction in mileage of temporary road actions, Modified Alternative 2 would have fewer impacts upon aquatic resources.

Modified Alternative 2 also drops approximately 14 landings from the Happy Camp Fire Area, however, the six new landings in Riparian Reserves proposed under Alternative 2 remained under Modified Alternative 2. The effects of landings remains as described for the Happy Camp Fire for Alternative 2. Potential effects of water drafting are as described for the Happy Camp Fire Area for Alternative 2.

Legacy Sites

Elk Creek watershed legacy sediment site treatment, and potential effects, are described in the Aquatic Resources Report and are the same across all action alternatives including Modified Alternative 2.

Cumulative Effects

Potential adverse effects to aquatic resources, as described for Alternative 2, are avoided with this alternative. As described for Alternative 2, ongoing and future actions are not likely to cause negative effects to aquatic resources that could be additive to the effects of this project.

Project Area C: Whites Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Direct effects of Modified Alternative 2 to aquatic species are the same as described for the Whites Fire Area for Alternative 2. Modified Alternative 2 does not include any near stream temporary road actions or legacy sediment site treatments; there would be no potential effects of these actions in the Whites Fire Area.

Indirect Effects

Salvage Harvest and Reforestation

Modified Alternative 2 proposes a net reduction of 20 acres of salvage harvest acres in the Whites Fire Area. Therefore, the discountable effects of salvage and reforestation on sediment, water quality and riparian function as described for the Whites Fire Area for Alternative 2 would be reduced under Modified Alternative 2. Minor effects to aquatic species and discountable effects to habitat indicators are expected due to implementation of project design features and the reduction in acres treated.

Modified Alternative 2 includes the same amount of site preparation, planting, and release outside of Riparian Reserves relative to Alternative 2 and the effects will be as described for the Whites Fire Area for Alternative 2. Like Alternative 2, Modified Alternative 2 includes hand treatments in some Riparian Reserves within Happy Camp and Whites Fire areas. As shown in Table 3, these treatments are proposed on only one acre in Modified Alternative 2 (Near the top of Applesauce Gulch in Robinson Gulch 7th field watershed). As described above for the Happy Camp Fire area, and for the other alternatives where this treatment is proposed, these actions are likely to have no short term negative effects to aquatic habitat and long term benefits to watershed condition. For Modified Alternative 2 these potential beneficial effects are foregone as the one acre of treatment would be inconsequential.

Fuels Reduction

Modified Alternative 2 includes the same fuels reduction treatments as Alternative 2 and the effects of these actions will be as described for the Whites Fire Area for Alternative 2.

Hazard Tree Abatement

The amount of acreage treated in the Whites Fire would not change under Modified Alternative 2 relative to Alternative 2 and the effects of these actions will be the same as described for the Whites Fire Area for Alternative 2.

Roads, Landings and Water Drafting

Temporary road actions in the Whites Fire Area are the same as proposed in Alternative 2. There are no near stream temporary road actions in the Whites Fire in any alternative. Effects on habitat indicators would be as described for the Whites Fire Area for Alternative 2; effects to habitat indicators would be discountable and effects to aquatic species would be minor.

Four new landings would be dropped under Modified Alternative 2 in the Whites Fire Area, and the one new landing initially proposed in Riparian Reserve (L072) is relocated to outside of the Riparian Reserve. Modified Alternative 2 further reduces the effects of landings that were described for Alternative 2 for the Whites Fire Area. Modified Alternative 2 includes water drafting, the effects of which are as described for the Whites Fire Area for Alternative 2.

Cumulative Effects

The cumulative effects of Modified Alternative 2 would be roughly the same as described for the Whites Fire Area for Alternative 2.

Modified Alternative 3

Project Area A: Beaver Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Modified Alternative 3 does not include any near stream temporary road actions or legacy sediment site treatments; there would be no potential effects of these actions in the Beaver Fire Area. Potential direct effects due to water drafting would be as described for Alternative 2. However, because all salvage harvest, temporary road actions, and landings have been dropped, there will be reduced need for water drafting and therefore less potential effect to aquatic resources relative to Alternative 2.

Indirect Effects

Salvage Harvest and Reforestation

Modified Alternative 3 removes all salvage harvest from the Beaver Fire area, eliminating salvage harvest related environmental effects. Modified Alternative 3 reduces site preparation and planting in the Beaver Fire Area by 120 acres relative to Alternative 2. Most of the reduced salvage and site preparation and planting acreage in the Beaver Fire Area is within the Doggett Creek drainage so these actions would have less potential negative short-term impacts to aquatic habitat in Doggett Creek, relative to Alternative 2. However, the beneficial long-term effects of reforestation are foregone on these 610 acres that will not be included in Modified Alternative 3. Site preparation and planting still included with this alternative would cause a low level of short-term ground disturbance and will likely speed the recovery of mature forests on treated areas.

Modified Alternative 3 includes hand treatment in some Riparian Reserves within the Beaver Fire Area. These activities are proposed in Riparian Reserves that are within site

preparation and plantation units, and burned at moderate to high severity. Proposed treatments include cutting dead brush and trees less than 10 inches in diameter by hand; equipment will not leave roads in Riparian Reserves. The material would be lopped and scattered to achieve ground cover and various methods of burning would be used if fuel loading exceeds 7 tons per acre. As described for the other fire areas where Riparian Reserve hand treatments are proposed, these actions are likely to have an overall benefit to watershed condition in the drainages where they occur. Field review in the Beaver Fire area found that conditions in the Riparian Reserves would be improved by including hand treatments in heavily burned riparian areas. Particularly when more of these treatments occur within a given drainage, it increases the likelihood that these broader scale beneficial effects to watershed condition would occur.

Because Federal lands comprise a minority of this landscape, and all salvage harvest in Beaver Fire has been dropped with this alternative, the influence of the Project on aquatic habitat and watershed condition on this landscape are minor. Overall, proposed hand treatments that may involve planting if necessary to restore conifers as a component of forests, will be beneficial to aquatic habitat and watershed condition including fire resiliency and the sustainability of forests overtime.

Fuels Reduction

Modified Alternative 3 adds approximately 1,210 acres of fuels treatments within the Beaver Fire Area relative to Alternative 2. The potential effects of Modified Alternative 3 on aquatic resources are very similar to effects of Alternative 2 for the Beaver Fire Area. The discountable impacts of fuels reduction on sediment, water quality and riparian function described for Alternative 2 would be slightly increased due to the addition of 1,210 acres of treatments in the Beaver Creek watershed, a small amount of this overlaps with Riparian Reserves. Potential negative effects are minimal due to the relatively small amount of acreage treated, implementation of project design features, and the low level of ground disturbance involved with fuels treatments. Long-term benefits from fuels reduction associated with future fire behavior are expected.

Hazard Tree Abatement

The amount of roadside hazard tree removal is reduced with Modified Alternative 3 to 48 miles, or 2,190 acres; relative to 170 miles, or 5,800 acres, with Alternative 2. About 9 miles, or just over 1% of the total stream mileage in the Beaver Fire area, may be affected by these actions.

In the Beaver Fire area, roadside hazard tree removal is proposed in relatively close proximity to Coho salmon CH in mainstem reaches of Beaver Creek and the Klamath River. Fisheries biologists conducted field review of roadside hazard tree marking in these areas and confirmed that no hazard trees are marked in Riparian Reserve associated with Coho salmon CH. Roadside hazard tree removal would occur through Riparian Reserves associated with streams outside of CH in tributaries of Beaver, Doggett, and Kohl Creeks. Potential effects of roadside hazard tree removal on aquatic resources includes ground disturbance associated with felling trees and yarding up to roads, and localized loss of woody debris and potentially shade. project design features ensure a low level of ground disturbance and impacts to shade, they also ensure that future debris flows are likely to deliver intact large woody debris downstream to fish-bearing reaches, wherever future debris flows may occur. For these reasons, effects of roadside hazard tree

removal on aquatic habitat indicators would be discountable and effects on aquatic species would be minor.

Roads, Landings and Water Drafting

Modified Alternative 3 drops all temporary road action and landing actions in the Beaver Fire area; there would be no effect of these actions on aquatic habitat or species. As described for the Beaver Fire Area for Alternative 2, there would have been short-term negative effects to aquatic resources in Doggett Creek and one face drainage to Beaver Creek from use of these temporary roads, but long-term benefits to water quality through addressing sediment sources on these road beds. Because these road actions are dropped with Modified Alternative 3, there will be less short-term negative effects related to roads and sediment production, however, the opportunity to reduce sedimentation from these old road beds long-term would be foregone.

Modified Alternative 3 includes water drafting, the effects of which would be the same as described for the Beaver Fire Area for Alternative 2.

Cumulative Effects

Cumulative effects for Modified Alternative 3 would be roughly the same as described for the Beaver Fire Area for Modified Alternative 2.

Project Area B: Happy Camp Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Direct effects to aquatic species for Modified Alternative 3 would be the same as described for the Happy Camp Fire Area for Modified Alternative 2. Additionally, Modified Alternative 2 does not change the legacy sediment site treatments in the Elk Creek watershed and the effects described in Alternative 2 are the same for Modified Alternative 2.

Indirect Effects

Salvage Harvest and Reforestation

Modified Alternative 3 reduces the net salvage harvest proposed by 510 acres relative to Alternative 2. Therefore, the discountable effects of salvage and reforestation on sediment, water quality and riparian function as described for the Happy Camp Fire Area for Alternative 2 would be reduced under Modified Alternative 3. Minor effects to aquatic species and discountable effects to habitat indicators are expected due to implementation of project design features and the reduction in acres treated.

Modified Alternative 3 proposes a net reduction of 520 acres of site preparation, planting, and release relative to Alternative 2, the effects of these actions will be as described for the Happy Camp Fire Area for Alternative 2 but on a slightly smaller scale. Like Alternative 2, Modified Alternative 3 includes hand treatments in some Riparian Reserves; in Modified Alternative 3 these treatments are proposed within Riparian Reserves within site prep and plant units in all fire areas. These treatments within Riparian Reserve would occur only where 2014 wildfires burned at moderate to high severity. These actions are designed to increase the likelihood and speed by which burned areas are reforested which is considered a positive effect to aquatic resources. Potential effects of Modified Alternative 3 are the same as those described for Alternative 2 in the

Aquatic Resources Report. Effects to habitat indicators would be discountable and effects to aquatic species would be minor. Long term beneficial effects are likely as these actions will reduce fuels and use fire to maintain and restore ecosystem function in Riparian Reserves.

Fuels Reduction

Modified Alternative 3 includes an additional 950 acres of fuels reduction treatments relative to Alternative 2. The potential effects of Modified Alternative 3 on aquatic resources are similar to effects of Alternative 2 for the Happy Camp Fire Area. The discountable impacts of fuels reduction on sediment, water quality and riparian function described for Alternative 2 would be slightly increased due to the addition of 950 acres of treatments with a small amount of overlap with Riparian Reserves. Effects are minimal due to the relatively small amount of acreage treated, implementation of project design features, and the low level of ground disturbance involved with fuels treatments. Long-term benefits from fuels reduction associated with future fire behavior are expected.

Hazard Tree Abatement

The amount of roadside hazard tree removal is reduced with Modified Alternative 3 to 215 miles, or maximum of 9,730 acres within Happy Camp Fire area; relative to 400 miles, or maximum of 14,000 acres, with Alternative 2. **Error! Reference source not found.** displays miles of stream within watersheds of the Happy Camp Fire that are within 200 feet of proposed hazard tree removal roads. About 30 miles, or just over 2% of the total stream mileage in the Happy Camp Fire area, may be affected by these actions.

In the Happy Camp Fire area, roadside hazard removal is proposed in relatively close proximity to Coho salmon CH in Tompkins Creek, Walker Creek, Grider Creek, (Little) Horse Creek, Elk Creek, East Fork Elk Creek, and Cougar Creek. Fisheries biologists conducted field reviews of roadside hazard tree marking in these areas and confirmed that hazard trees are marked according to description in this EIS including project design features. Due to the reduced extent of proposed roadside hazard tree removal, Modified Alternative 3 would have less effect on aquatic resources than Alternative 2. Areas dropped for roadside hazard removal with Modified Alternative 3 include a few reaches in close proximity to Coho salmon CH. These include reaches of the Scott River and Klamath River as well as Kelsey, China, Elk, and Doolittle Creeks. Effects of hazard tree removal along roads on habitat indicators would be discountable and effects on aquatic species would be minor; with Modified Alternative 3 these effects would not occur along roads in close proximity to the Klamath or Scott Rivers, as well as sections of China, Elk, and Doolittle Creeks.

Roads, Landings and Water Drafting

Modified Alternative 3 drops approximately 0.2 miles of new temporary road construction and drops approximately 4.2 miles of reopening of decommissioned roads in the Happy Camp Fire Area. Reopening the Caroline Creek road (46N62), as described for Alternative would likely cause adverse effects to aquatic resources, is also dropped from Modified Alternative 3. Deletion of proposed work on road 46N62, and reduction in mileage of temporary road actions contribute to reduced potential impacts of Modified Alternative 3 relative to Alternative 2. Effects would be discountable to habitat indicators and minor to aquatic species.

Other potential effects of these actions are as described for Modified Alternative 2.

Legacy Sites

Effects of these actions are as described for Alternative 2.

Cumulative Effects

Cumulative effects of Modified Alternative 3 to aquatic resources is the same as described for the Happy Camp Fire Area for Modified Alternative 2.

Project Area C: Whites Fire

Threatened/Endangered/Forest Service Sensitive/Management Indicator Species

Direct Effects

Direct effects of Modified Alternative 3 to aquatic species are the same as described for the Whites Fire Area for Alternative 2.

Indirect Effects

Salvage Harvest and Reforestation

Modified Alternative 3 adds about 40 net acres of site-preparation, planting, and release relative to Alternative 2. Like Alternative 2, Modified Alternative 3 includes hand treatments in Riparian Reserves within site prep and plant units of the Whites Fire area. These treatments within Riparian Reserve would occur only where 2014 wildfires burned at moderate to high severity. Dead trees up to 10 inches DBH and brush would be cut and scattered to achieve ground cover. If fuels loading would exceed seven tons per acre, pile burning or underburning would occur to maintain/restore desired fuel loading.

As described for Alternative 2, Riparian Reserve hand treatments are not likely to cause any negative effects to aquatic habitat and overall are likely to improve Riparian Reserve and watershed condition. These actions are designed to increase the likelihood and speed by which burned areas are reforested which is considered a positive effect to aquatic resources. Potential effects of Modified Alternative 3 are the same as those described for Alternative 2 but less acres would benefit from the treatment where site prep and plant units are dropped. Effects to habitat indicators would be discountable and effects to aquatic species would be minor. Long term beneficial effects are likely as these actions will reduce fuels and use fire to maintain and restore ecosystem function in Riparian Reserves.

In summary, the effects of salvage and reforestation on aquatic habitat indicators would be neutral or discountable and effects on aquatic species would be neutral or minor. Reforestation actions are designed to increase the likelihood and speed by which burned areas are reforested which is considered a long term positive effect to aquatic resources.

Fuels Reduction

Potential effects are the same as described for the Whites Fire Area for Modified Alternative 2.

Hazard Tree Abatement

The amount of roadside hazard tree removal is reduced with Modified Alternative 3 to 55 miles, or maximum of 2,400 acres; relative to 80 miles, or 2,700 acres, with Alternative 2. About 16 miles, or 2.4% of the total stream mileage in the North Fork Salmon River watershed, may be affected by these actions. In the Whites Fire area, roadside hazard tree

removal is proposed in relatively close proximity to Coho salmon CH in mainstem reaches of North Fork Salmon River, North Russian and South Russian Creeks, and Whites Gulch. Fisheries biologists conducted field review of roadside hazard tree marking in these areas and confirmed that hazard trees along roads in close proximity to Coho salmon CH are marked according to the description in this EIS including project design features.

Roads, Landings and Water Drafting

Potential effects are the same as described for the Whites Fire Area for Modified Alternative 2.

Cumulative Effects

The cumulative effects of Modified Alternative 3 would be roughly the same as described for the Whites Fire Area for Modified Alternative 2.

Comparison of Effects

Potential direct effects from all action alternatives are associated with water drafting and stream crossing work associated with temporary road actions and legacy sediment site repair. Indirect effects to aquatic habitat are primarily associated with stream crossing work, new landings within Riparian Reserves, as well as hazard tree removal/site preparation and planting/fuels treatments within Riparian Reserve. The implementation of project design features, in particular those developed to reduce negative impacts to watershed values, minimizes potential negative direct and indirect effects to aquatic habitat indicators (sediment, water temperature and large wood) under all action alternatives. Near stream temporary road and landing actions are proposed under all action alternatives, with the exception of Alternative 4 which limits temporary road building and eliminates stream crossings and new landings in Riparian Reserve.

Alternatives 2 and 3 involve potential adverse effects to aquatic habitat, including designated Critical Habitat for SONCC Coho salmon due to temporary road actions, particularly re-opening of road 46N62 in Caroline Creek-Klamath River drainage. These impacts are expected in large part due to the vulnerable post-fire condition and geology of project area watersheds and streams where project disturbance would occur. With Alternatives 4, 5, Modified 2, and Modified 3, these potential adverse impacts to aquatic habitat are avoided; however with all alternatives, except Alternative 4, there would be short term site level negative effects to aquatic habitat at several locations as described above. For several temporary road actions that involve current legacy sediment sources, long term benefits would occur because after use in the project these sites would be appropriately hydrologically stabilized and would no longer pose a threat to water quality. With Alternative 4, only one of these temporary roads with existing legacy sediment sources remains (temp road 16 near Kuntz Creek); potential long term benefits of reducing chronic erosion on the other sites as described in the other alternatives, would be foregone with Alternative 4. All action alternatives include legacy sediment site treatments in Elk Creek watershed; the potential short term impacts and long term benefits to aquatic resources would occur with all alternatives.

Alternatives 2, 4, Modified 2, and Modified 3 include hand treatments in Riparian Reserves, where safety allows. Given post fire conditions across the landscape, these treatments may provide meaningful benefit to downstream aquatic habitat, depending on

the proportion of any given drainage that receives the treatment; and would provide for improved watershed condition long term by allowing for maintenance underburning opportunities as well as planting if necessary to provide for more timely restoration of conifers where they were a natural component of forested stands. The long term benefits are more likely as the amount of this treatment across the post fire landscape increases, therefore Alternative 2, Alternative 4, and Modified Alternative 3 would be more beneficial to watershed condition including fire resiliency than the other alternatives.

The following tables summarize effects determinations for special status aquatic species, by fire area. More detailed tables describing effects of the alternatives to aquatic habitat indicators, by fire area, are in the Aquatics Resource Report Amendment.

Project Area A: Beaver Fire

Table 3-48: Summary of effect determination in the Beaver fire area.

Species	Special Status	BEAVER FIRE Alternative	Effects Determination
Fish			
Coho Salmon and designated Critical Habitat	Endangered Species Act Threatened	All Action Alternatives	May affect, but is not likely to adversely affect
Upper Klamath-Trinity Rivers Chinook Salmon	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Klamath Mountains Province Steelhead Trout	FS Sensitive, MIS	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Rainbow Trout	MIS	All Action Alternatives	Determinations are not applicable to MIS, effects to habitat have been disclosed
Pacific Lamprey	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Klamath River Lamprey	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Foothill yellow legged frog, and Western pond turtle	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Cascade frog and Southern torrent salamander	FS Sensitive	All Action Alternatives	No effect
Other Habitat			
Essential Fish Habitat (Coho/Chinook)	All Action Alternatives	All Action Alternatives	May adversely affect

Project Area B: Happy Camp Fire

Table 3-49: Summary of effect determination in the Happy Camp fire area.

Species	Special Status	HAPPY CAMP FIRE Alternative	Effects Determination
Fish			

Species	Special Status	HAPPY CAMP FIRE Alternative	Effects Determination
Coho Salmon and designated Critical Habitat	Endangered Species Act Threatened	Alternative 4 Alternative 5 Modified Alternative 2 Modified Alternative 3	May affect, but is not likely to adversely affect
		Alternative 2 Alternative 3	May affect, and is likely to adversely affect
Upper Klamath-Trinity Rivers Chinook Salmon	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Klamath Mountains Province Steelhead Trout	FS Sensitive, MIS	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Rainbow Trout	MIS	All Action Alternatives	Determinations are not applicable to MIS, effects to habitat have been disclosed
Pacific Lamprey	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Klamath River Lamprey	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Foothill yellow legged frog, Cascade frog, Western pond turtle, southern torrent salamander	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Other Habitat			
Essential Fish Habitat (Coho/Chinook)	All Action Alternatives	All Action Alternatives	May adversely affect

Project Area A: Whites Fire

Table 3-50: Summary of effect determination in the Whites fire area.

Species	Special Status	WHITES FIRE Alternative	Effects Determination
Fish			
Coho Salmon and designated Critical Habitat	Endangered Species Act Threatened	All Action Alternatives	May affect, but is not likely to adversely affect
Upper Klamath-Trinity Rivers Chinook Salmon	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Klamath Mountains Province Steelhead Trout	FS Sensitive, MIS	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Rainbow Trout	MIS	All Action Alternatives	Determinations are not applicable to MIS, effects to habitat have been disclosed
Pacific Lamprey	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Klamath River Lamprey	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing

Species	Special Status	WHITES FIRE Alternative	Effects Determination
Foothill yellow legged frog, Cascade frog, and Western pond turtle	FS Sensitive	All Action Alternatives	May affect individuals, but is not likely to lead to a trend towards listing
Southern torrent salamander	FS Sensitive	All Action Alternatives	No effect
Other Habitat			
Essential Fish Habitat (Coho/Chinook)	All Action Alternatives	All Action Alternatives	May adversely affect

Compliance with law, regulation, policy, and the Forest Plan

The Forest Plan consistency checklist reflects how the project meets specific standards and guidelines from the Forest Plan. Interagency consultation under Endangered Species Act section 7 is currently in progress with National Marine Fisheries Service; this will also include consultation under the Magnuson-Steven Fishery Conservation and Management Act.

Soil

This section describes the current situation and effects of the project on soil resources.

Methodology and Analysis Indicators

Analysis of the effects of individual management activities on the soil resource (soil productivity and soil ecosystem functionality) is guided by the Forest Plan Standards and Guidelines and FSM 2500, Chapter 2550, Supplement 2500-2012-1. Four indicators were chosen that address relevant issues in the Westside Fire Recovery project and measure compliance with Forest Plan Standard and Guidelines. The indicators include: soil stability, surface organic matter, soil organic matter, and soil structure.

The unit measure for each indicator is acres meeting desired conditions, partially meeting desired conditions, and not meeting desired conditions. Soil stability desired conditions are not met when Erosion Hazard Ratings are high or when soil cover is less than the values listed in Table 3-51 (Forest Plan Standard and Guideline 4-2). The percent bare soil is an important control on sediment production following timber salvage (Chase 2006). The presence of even a thin litter layer can substantially reduce soil erosion (Peterson 2009).

Table 3-51: Soil Cover Guidelines for Vegetation and Fuels Management Projects (USDA 2010)

Soil Cover Guidelines for Projects		
Soil Texture Class	**Slope (%)**	**Minimum Total Soil Cover* (%)**
Guidelines for Projects Using Tractors:		
Sandy loam or coarser	0-25	70
	26-35	80
Loam or finer	0-35	70
Guidelines for Prescribed Burning Projects:		
Sandy loam or coarser	0-25	60

Soil Cover Guidelines for Projects		
	26-45	70
	46	80
Loam or finer	0-35	50
	36-60	60
	61	70

For this project, surface organic matter is coarse wood greater than 12 inches in diameter which is either down, or standing and dead. The surface organic matter indicator does not meet desired conditions when this material averages less than 200 cubic feet per acre, and partially meets desired conditions when it averages less than 500 cubic feet per acre (these values correspond to metrics in Forest Plan Standard and Guideline 6-16).

Soil organic matter desired conditions are not met when major portions of the area have had the upper soil layer displaced or removed to a depth of 8 inches on area large enough to affect productivity for the desired plant species (100 square feet).

Soil structure desired conditions are not met when major portions of the area have reduced infiltration and permeability capacity indicated by soil structure and macro-porosity changes. Infiltration is the process by which water on the ground surface enters the soil. Soil macro-porosity is the amount of the soil that is composed of larger pores which are important for soil water movement and gas exchange.

The projected acres not meeting desired conditions for each indicator and activity type were determined from monitoring data collected from previous salvage projects, and based on scientific research.

Spatial and Temporal Context

For all four soil indicators, the analysis area is bounded by the project activity units because this is where impacts to soil could occur. The analysis is further bounded in time by the foreseeable future period during which effects of this project can persist as detectable, significant effects. Soil cover, as it affects soil stability, can recover quickly if needle-cast is available, and grasses, forbs, and shrubs re-sprout. The temporal boundary for soil stability is five years. Soil organic matter can take a long time to rebuild after it is lost through displacement or erosion. Once compacted, soil structure can remain affected for decades. The temporal boundary for soil organic matter, surface organic matter, and soil structure is 30 years.

Forest Plan Standards and Guidelines

The project is required to meet the coarse woody debris Standard and Guideline 6-16. This standard and guideline would require five to 20 pieces of coarse woody debris (CWD) per acre in various states of decay. Large logs, both sound and cull of at least 20 inches in diameter and about 40 cubic feet in volume, should be left. Logs less than 12 inches in diameter or stumps do not count as CWD. Standard and Guideline 6-16 also acknowledges that these requirements may be waived in strategic fuelbreak areas.

Affected Environment

Project Area A: Beaver Fire

Soils within the Beaver Fire analysis area consist mostly of Holland, Skalan, Clallam, and Lithic Haploxeralfs (Table 3-52). These soil types are derived mainly from granitic rock, metamorphic rock, or ultramafic rock such as serpentine. Soil textures vary from loam to sandy loam with high percentages of rock fragments.

Table 3-52: Soil families and associated properties used in analysis in the Beaver Fire area

Family	Acres	Surface Texture	Soil Depth, inches	Compaction Hazard
Beaughton	1023	Gravelly loam	10-20	Moderate
Blusprin	786	Very cobbly loam	20-40	Moderate
Clallam	3190	Gravelly ashy sandy loam	40-60	Moderate
Coboc	1208	Gravelly loam	40-60	Moderate
Dubakella	721	Stony loam	20-40	Moderate
Holland	7773	Sandy loam	60+	Moderate
Kang	1705	Gravelly sandy clay loam	20-40	Moderate
Lithic Haploxeralfs	3299	----------	-------	----------
Skalan	6612	Gravelly ashy loam	<30	Moderate
Weitchpec	1097	Gravelly sandy loam	20-40	Moderate

Soil Stability

Currently, five acres of the Beaver fire project area do not meet desired conditions for soil stability (see Table 3-53). Compared to the Happy Camp and Whites Fire areas, slopes are more gradual on the Beaver Fire area and Erosion Hazard Ratings are mostly moderate. Erosion hazard ratings were high on 30 acres after the 2014 fires; since the fire, soil cover has increased from the return of vegetation and dead needles. Therefore, erosion hazard ratings have been reduced to moderate on 25 acres, which partially meets the desired condition for soil stability.

Table 3-53: Area (acres) meeting desired condition in the Beaver Fire area

Indicator	Meets	Partially meets	Not met
1. Acres meeting or not meeting desired conditions for soil stability	4,745	1,446	5
2. Acres meeting or not meeting desired conditions for surface matter	6,196	0	0
3. Acres meeting or not meeting desired conditions for soil organic matter	3,708	1,915	573
4. Acres meeting or not meeting desired conditions for soil structure	5,838	89	269

Surface Organic Matter

Surface organic matter is currently limited in severely burned areas but will recover as dead trees fall and leaf litter from early seral plant communities accumulates. Although many areas of the project have less than 200 cubic feet per acre of large woody debris, there is a high volume of standing dead trees, greater than 12 inches in diameter.

Soil Organic Matter

The current condition is that approximately 573 acres of the project area are not meeting desired conditions for soil organic matter because the Beaver Fire resulted in high Soil Burn Severity. Moderate soil burn severity occurred on 1,915 acres and this partially

meets the desired condition for soil organic matter. Low or very low soil burn severity occurred on 3,257 acres and this meets the desired condition.

Soil Structure

It's estimated approximately 269 acres of the project area are not meeting desired conditions for soil structure and 89 acres partially meet the desired condition for soil structure. This is based on the area disturbed by mechanical equipment during the last 30 years.

Project Area B: Happy Camp Complex

Soils within the Happy Camp Fire area consist mostly of Clallam, Jayar, Woodseye, Gilligan, Deadwood and Skalan (Table 3-54). These soil types are derived mainly from metamorphic or granitic rock. Soil textures vary from loam to sandy loam with high percentages of rock fragments.

Table 3-54: Soil families and associated properties used in analysis in the Happy Camp Complex area

		Soil Properties used in Analysis		
Family	Acres	Surface Texture	Soil Depth, inches	Compaction Hazard
Buell	250	Gravelly loam	60+	Moderate
Chawanakee	2,868	Coarse sandy loam	<20	Moderate
Clallam	41,816	Gr ashy sandy loam	40-60	Moderate
Coboc	466	Gravelly loam	40-60	Moderate
Deadwood	7,300	Gr sandy loam	<20	Moderate
Dubakella	999	Stony loam	20-40	Moderate
Endlich	874	Very stony loam	20-40	Moderate
Entic Xerumbrepts	286	Gravelly loam	<20	Moderate
Gerle	572	Sandy loam	40-60	Moderate
Gilligan	8,949	Ashy silt loam	40-60+	Moderate
Goldridge	472	Fine sandy loam	60-80+	Moderate
Holland	4,151	Sandy loam	60+	Moderate
Jayar	12,174	V gr loam	<30	Moderate
Lithic Haploxeralfs	107	Loam	<20	Moderate
Lithic Ruptic	5,595	V gr loam	<20	Moderate
Nanny	530	Gravelly loam	30-60	Moderate
Olete	4,497	V gr silt loam	<20	Moderate
Parks	2,144	v gr sandy clay loam	40-60	Moderate
Rock	869	----------	-------	Low
Skalan	2,477	Gr ashy loam	<30	Moderate
Typic Haploxerolls	766	Gr Loam	20-40	Moderate
Weitchpec	201	Gravelly sandy loam	20-40	Moderate
Woodseye	9,302	V gr sandy loam	<20	Moderate

Soil Stability

Currently, approximately 633 acres of the project area are not meeting desired conditions for soil stability (see Table 3-39). The areas that are not meeting the desired condition have high erosion hazard ratings due to recent wildfires which removed soil cover on steep slopes. Soil cover has remained deficient on this area because canopy cover was combusted and unavailable to provide soil cover. On 12,543 acres, erosion hazard ratings

were high; since the Happy Camp Fire, soil cover has increased from the return of vegetation and dead needles.

Table 3-39: Area (acres) meeting desired condition in the Happy Camp Complex area

Indicator	Meets	Partially Meets	Not Met
1. Acres meeting and not meeting desired conditions for soil stability	3,413	26,824	633
2. Acres meeting and not meeting desired conditions for surface matter	30,870	0	0
3. Acres meeting and not meeting desired conditions for soil organic matter	20,750	9,478	642
4. Acres meeting and not meeting desired conditions for soil structure	29,337	1,150	383

Surface Organic Matter

Surface organic matter is currently limited in severely burned areas but will recover as dead trees fall and leaf litter from early seral plant communities accumulates. Although most of the project analysis area has less than 200 cubic feet per acre of large woody debris, there is a high volume of standing dead trees, greater than 12 inches in diameter.

Soil Organic Matter

The current condition is that approximately 642 acres of the project area are not meeting desired conditions for soil organic matter because they have high soil burn severity. Moderate soil burn severity occurred on 9,478 acres and this partially meets the desired condition for soil organic matter. Low or very low soil burn severity occurred on 18,198 acres and this meets the desired condition.

Soil Structure

It's estimated that less than 383 acres of the project analysis area are not meeting desired conditions for soil structure. This is based on the area disturbed by mechanical equipment during the last 30 years.

Project Area C: Whites Fire

Soils within the Whites Fire area consist mostly of Clallam, Holland, Woodseye, Deadwood, Skalan, and Jayar (Table 3-55). These soil types are derived mainly from metamorphic or granitic rock. Soil textures vary from loam to sandy loam with high percentages of rock fragments.

Table 3-55: Soil families and associated properties used in analysis in the Whites Fire area

		Soil Properties used in Analysis		
Family	Acres	Surface Texture	Soil Depth, inches	Compaction Hazard
Chawanakee	51	Coarse sandy loam	<20	Moderate
Clallam	10310	Gr ashy sandy loam	40-60	Moderate
Coboc	1182	Gravelly loam	40-60	Moderate
Deadwood	4049	Gr sandy loam	<20	Moderate
Endlich	1200	Very stony loam	20-40	Moderate
Entic Xerumbrepts	809	----------	--------	--------
Gerle	1618	Sandy loam	40-60	Moderate
Gilligan	377	Ashy silt loam	40-60+	Moderate
Holland	4214	Sandy loam	60+	Moderate
Jayar	2370	V gr loam	<30	Moderate
Kang	45	Gravelly sandy clay loam	20-40	Moderate

		Soil Properties used in Analysis		
Lithic Xerumbrept	30	----------	--------	--------
Nanny	1835	Gravelly loam	30-60	Moderate
Rock	1414	----------	-------	--------
Skalan	2881	Gr ashy loam	<30	Moderate
Woodseye	4061	V gr sandy loam	<20	Moderate

Soil Stability

Currently, approximately 280 acres of the project analysis area are not meeting desired conditions for soil stability (see Table 3-56). The areas that are not meeting the desired condition have high erosion hazard ratings due to recent wildfires which combusted organic matter on top of the soil surface. Soil cover has remained deficient on this area because canopy cover was combusted and unavailable to provide soil cover. On 20,545 acres, erosion hazard ratings were high after the fires; since the fires, soil cover has increased from the return of vegetation and dead needles.

Table 3-56: Area (acres) meeting desired condition in the Whites Fire area

Indicator	Met	Partially Met	Not Met
1. Acres not meeting desired conditions for soil stability	2,215	9,662	280
2. Acres not meeting desired conditions for surface matter	12,157	0	0
3. Acres not meeting desired conditions for soil organic matter	8,997	2,880	280
4. Acres not meeting desired conditions for soil structure	11,956	151	50

Soil Organic Matter

The current condition is that approximately 280 acres of the project analysis area are not meeting desired conditions for soil organic matter because they have high soil burn severity. Moderate soil burn severity occurred on 2,880 acres and this partially meets the desired condition for soil organic matter (Table 3-56). Low or very low soil burn severity occurred on 18,198 acres and this meets the desired condition.

Surface Organic Matter

Surface organic matter is currently limited in severely burned areas but will recover as dead trees fall and leaf litter from early seral plant communities accumulates. Although many areas of the project have less than 200 cubic feet per acre of large woody debris, there is a high volume of standing dead trees, greater than 12 inches in diameter.

Soil Structure

It's estimated that less than 50 acres of the project analysis area are not meeting desired conditions for soil structure.

Environmental Consequences

Alternative 1

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Immediately following the 2014 fires, erosion hazard ratings were high on less than one percent of the project analysis area. Within one year following the fire, soil cover has increased on areas with low to moderate soil burn severities. Therefore, erosion hazard

ratings have been reduced to moderate on 25 acres, which partially meets the desired condition for soil stability. Soil cover is less likely to increase on five acres with high soil burn severity because tree canopy has been consumed.

These areas would not meet the desired condition for soil stability. Based on field data collected, it is estimated that soil cover is less than 30 percent on this same area. Effective soil cover will only be fully reestablished after surface vegetation recovers. This will expose the soil to higher erosion potential over the next three to six years (Berg and Azuma 2010).

Under Alternative 1, large surface organic matter could reach sufficient levels within approximately five years and contribute to the recovery of soil productivity. It is possible that the surface organic matter indicator would not be met if material greater than 12 inches in diameter exceeds 800 cubic feet. If a wildfire occurs during the next 10 to 15 years, soils would burn with a high soil burn severity directly beneath this large woody debris. This could occur on approximately 2,500 acres of the project area and it is estimated that large wood could cover five to ten percent of this area.

Soil organic matter will remain intact unless severe storm events result in the loss of large amounts of topsoil. Soil structure conditions will remain the same in the short term, with very slow long-term natural recovery of old skid trails and landings.

Cumulative Effects

Grazing is the only reasonably foreseeable future action that would occur within the same area as the analysis area for soils resources. Although minimal amounts of grazing activities are ongoing within allotments found within the project area, most of the project activities are proposed on steeper slopes which cattle use rarely, if ever, or are largely transitory in nature. Further, annual operating instructions provided to permittees will limit permitted grazing activities as needed to minimize impacts, not only to rangeland health but also to soil conditions (see range section of this chapter and the Rangeland resource report). For these reasons, no measurable cumulative impacts to soil indicators are anticipated as a result of ongoing grazing activities when added to the activities proposed with this project.

Wildfire and forest management are an ongoing impact to soil stability, surface organic matter, soil organic matter and soil structure. The effects from the 2014 wildfires overwhelm effects from past management practices. The cumulative effects for Alternative 1 would be a continued increase in soil stability due to falling needles, branches, and eventually tree boles. This would result in decreased erosion hazard ratings and a gradual increase in soil organic matter as material decomposes. These processes would encourage the return of vegetation which would further increase soil cover and eventually soil organic matter. Soil organic matter would reach desired conditions more slowly in areas with high soil burn severity, and recovery could take several decades to a century. Surface organic matter would be expected to reach desired conditions within approximately 10 years. Damage to soil structure would continue to ameliorate, yet this process occurs slowly. The most compacted areas could take approximately 30 years to reach desired condition.

The natural falling of dead needles, branches, and eventually tree boles would continue to assist in the recovery of soil stability. Larger surface organic matter would be added from the falling of tree boles over the next five to ten years to meet the surface organic matter

indicator. The surface organic matter indicator may not be met if a wildfire occurs during the next 10 to 15 years, resulting in high soil burn severity directly beneath large woody material in contact with the soil. Soil organic matter will remain intact unless severe storm events result in the loss of large amounts of topsoil. Soil structure conditions will remain the same in the short term, with very slow long-term natural recovery of old skid trails and landings.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The effects to soil resources are the same as for the Beaver Fire area. The acres not meeting desired condition are different. Immediately following the 2014 fires, erosion hazard ratings were high on approximately 45 percent of the project analysis area. Within one year following the fires, soil cover would increase on areas with low to moderate soil burn severities. Soil cover is less likely to increase on areas with high soil burn severity because tree canopy has been consumed. Therefore, erosion hazard ratings have been reduced to moderate on 28,824 acres, which partially meets the desired condition for soil stability. Erosion hazard ratings have remained high on 633 acres which do not meet the desired condition for soil stability.

Cumulative Effects

The effects are the same as described in the Beaver fire area above.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The effects to soil resources are the same as for the Beaver fire area. Immediately following the 2014 fires, erosion hazard ratings were high on approximately 66 percent of the project analysis area. Within one year following the fires, soil cover would increase on areas with low to moderate soil burn severities. Soil cover is less likely to increase on areas with high soil burn severity because tree canopy has been consumed. Therefore, areas with high erosion hazard ratings would decrease to moderate. Erosion hazard ratings have remained high on 280 acres which do not meet the desired condition for soil stability.

Cumulative Effects

The effects are the same as described in the Beaver fire area above.

Alternative 2

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Soil Stability

Soil stability and soil organic matter would be impacted on all areas occupied by new temporary roads and new landings, most of previously decommissioned roads, and portions of existing temporary roads and landings that have since stabilized. Construction of new temporary roads, associated with ground-based harvest, would have the highest impact to soil stability and sedimentation (Rice et al. 1972). Newly constructed roads are the largest source of erosion and this is exacerbated in a burned environment because the capacity of the landscape to moderate flow and trap sediment is greatly reduced (Peterson

et al. 2009). There are no new temporary roads being constructed in the Beaver Fire area and no previously decommissioned roads are being reopened in this area.

Ground-based harvest could be conducted using conventional or mechanized logging systems. A mechanized system could harvest material generally less than 26 inches in diameter and would gently fell trees. This would minimize limb breakage and additions of soil cover, yet feller-bunchers would cut and travel over smaller, non-merchantable material to incorporate it as soil cover. Mechanized systems would generally impact a larger percentage of a unit area. Conventional logging system would yard material that has been hand felled, thereby resulting in higher additions of soil cover. Conventional harvest would likely impact a smaller percentage of unit area, yet compaction would likely be higher on skid trails.

The return of vegetation and falling dead needles have increased soil cover and decreased erosion hazard ratings to moderate and rates of erosion are decreasing. On bare soil where mechanical equipment removes cover, rates of erosion could return to post-fire levels. Soil stability and soil organic matter would be impacted on about 40 percent of units where ground-based logging equipment removes soil cover due to the operation of feller-bunchers to harvest trees, skidding of fallen trees, and construction of temporary roads or landings. This estimated effect is based on personal observations on the American and Rim Fire salvages, and research discussed in the soil specialist report. For the total Beaver Fire area, erosion rates were modeled at an average of four tons per acre (model results ranged from zero to 22 tons per acre). Fuels treatments and site preparation using mechanical equipment would also impact soil stability on percentages of units. This would vary depending on existing soil cover, slope and operator experience. Ground-based harvest would result in the highest percent of ground disturbance (Beschta 2004). **Overall, ground-based harvest would be expected to disturb soil on approximately 30 percent, and up to 40 percent where roadside hazard, machine piling and pile burning treatments also occur. Mechanical disturbance or pile burning would remove soil cover and impact new vegetation growth.** Mastication would expect to impact less than five percent of units, machine piling ten percent, and mechanical thinning 15 percent. When these percentages are multiplied for all proposed treatments, an estimated 2,049 acres or 29 percent of the fire project analysis area would temporarily not meet the soil stability indicator.[37] This represents the high end estimate of disturbance after project activities take place. The

[37] This disturbance area was calculated using the following formula which applies to all alternatives where these activities are proposed: ((100% x new landing acres) + (50% x existing landing acres) + (100% x new temporary road acres) + (100% x reopen decommissioned road acres) + (75% x existing temporary road acres) + (5% x fuel break mechanical or hand acres) + (2% x hand thin pile burn acres) + (8% x machine pile burn fuels acres) + (15% x mastication or mechanical thin fuels acres) + (8% x machine pile burn fuels acres) + (15% x ridgetop fuels acres) + (10% x roadside fuels acres) + (2% x underburn acres) + (2% x understory thin, pile burn acres) + (10% x cable yard, plant acres) + (1% x hand cut and pile burn, plant acres) + (2% x masticate acres) + (10% x masticate and subsoil, plant acres) + (1% x masticate, plant acres) + (15% x mechanical thin, pile burn, plant acres) + (20% x mechanical thin and pile, subsoil acres) + (40% x roadside ground based harvest acres) + (5% x roadside aerial harvest acres) + (35% x ground-based, hand pile, pile burn acres) + (10% x skyline harvest, hand pile, pile burn acres) + (10% x machine pile burn fuels acres) + (1% x helicopter harvest, hand pile, pile burn acres) + (15% x helicopter, machine pile, pile burn acres) = 2,054 acres affected for Alternative 2 Beaver Fire area – 5 acres currently not meeting desired condition = 2,049 acres affected by proposed project activities.)

project design features described below will take place during and after soil-disturbing activities and will result in a large reduction in acres not meeting desired conditions for analysis indicators. This affected area is much higher compared to the other fires and other alternatives because of the large number of acres proposed for ground-based harvest in Alternative 2 in the Beaver Fire area.

For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Mulching is generally the most effective treatment in reducing post-fire runoff and erosion (Robichaud 2013). Compared to undisturbed areas, ground-based harvest would result in approximately 20 to 30 times higher sediment yields on compacted, mulched areas; however, at the watershed scale, surface runoff and sediment would be trapped, leading to localized deposition and a lower sediment yield per unit area. Rapid vegetation regrowth is expected on undisturbed areas and this would reduce the potential for this sediment to be delivered to the stream network (Wagenbrenner 2014). Tractor harvest would, therefore, have a shorter-term effect on larger-scale runoff.

During site preparation, manual felling of small diameter trees could also be accomplished to add soil cover on ground-based harvest units. Project design feature Watershed-11 would require site preparation to maintain adequate soil cover to maintain soil stability by not reducing the sum of one-hour, ten-hour, and 100-hour fuels to less than less than seven tons per acre

Project design features have been revised to require decompacting soils on new temporary roads to varying depths based on their surface texture and slope for project areas on which new temporary roads will be constructed (not in the Beaver Fire area). This would improve infiltration and permeability, while avoiding greater impacts to soil stability and soil organic matter. To speed the recovery of soil cover on new temporary roads, a project design feature would require maintaining at least 50 percent effective soil cover.

With the application of these measures, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as follows:

> *Maintain 5 to 20 pieces of CWD per acre with a target size of 20 inches in diameter (or larger) and about 40 cubic feet in volume when they are available. The minimum piece size to count toward these objectives is > 15 inches diameter and 10 feet long. On upper slopes and south and west aspects, ~5 pieces > 15 inches diameter and 10 feet long would be retained. On north and east aspects and on lower slopes, up to 20 pieces >15 inches diameter and 10 feet long will be retained. Individual snags, clumps of snags, existing logs on the ground and green trees within units may count towards these targets.*

With the application of these measures, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

Approximately 383 acres, or five percent of the activity area, may not meet the desired condition for soil organic matter.[38] Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually due to accelerated erosion. Accelerated erosion would be expected where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. Mechanical displacement would occur mainly due to the construction of temporary roads, landings, and skid trails, and to a lesser extent from feller bunchers operating off of skid trails. It is anticipated that soil organic matter would not meet desired conditions on approximately 20 percent of units proposed for both ground-based harvest and mechanical fuel reduction or site preparation, 15 percent of ground-based harvest units, ten percent of skyline units, and less than one percent of proposed helicopter units for areas that have helicopter yarding (no helicopter logging is planned in the Beaver Fire area). The most severe displacement of soil organic matter is expected to occur during temporary road construction and on landings and main skid trails. Temporary road construction would result in the highest impacts to soil organic matter, especially on steeper side slopes which would require excavation of a cut slope. Ground-based skid trails would result in displacement of soil organic matter on skidder tracks, and where yarded trees dig into the mineral soil surface and wedge the surface to the side. This creates berms and piles along the edges of skid trails. Soil disturbance is greater on steeper slopes, and a project design feature would limit ground-based skidding to slopes less than 35 percent or short pitches of 100 feet on slopes less than 45 percent. Displacement caused by new skid trails and temporary road construction will be considered a long-term disturbance as no mitigations to replace displaced soil organic matter are planned. Approximately 20 percent of the proposed ground based units have forest survey site class ratings of 4 and 5, which are lower productivity on a scale of 1 to 7. On these more sensitive soils, fewer passes of mechanical equipment could result in detrimental impacts to soil organic matter and soil productivity.

On proposed harvest units, jackpot pile burning would be expected to produce enough heat to consume soil organic matter within the footprint of the piles.

[38] This disturbance area was calculated using the following formula which applies to all alternatives where these activities are proposed (100% x new landing acres) + (0% x existing landing acres) + (100% x new temporary road acres) + (0% x reopen decommissioned road acres) + (0% x existing temporary road acres) + (5% x fuel break mechanical or hand acres) + (2% x hand thin pile burn acres) + (8% x machine pile burn fuels acres) + (15% x mastication or mechanical thin fuels acres) + (8% x machine pile burn fuels acres) + (15% x ridgetop fuels acres) + (10% x roadside fuels acres) + (2% x underburn acres) + (2% x understory thin, pile burn acres) + (10% x cable yard, plant acres) + (1% x hand cut and pile burn, plant acres) + (2% x masticate acres) + (10% x masticate and subsoil, plant acres) + (1% x masticate, plant acres) + (15% x mechanical thin, pile burn, plant acres) + (20% x mechanical thin and pile, subsoil acres) + (40% x roadside ground based harvest acres) + (5% x roadside aerial harvest acres) + (35% x ground-based, hand pile, pile burn acres) + (10% x skyline harvest, hand pile, pile burn acres) + (10% x machine pile burn fuels acres) + (1% x helicopter harvest, hand pile, pile burn acres) + (15% x helicopter, machine pile, pile burn acres) = 956 acres affected for Alternative 2 Beaver Fire area – 573 acres currently not meeting desired condition = 383 acres affected by proposed project activities

With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Where underburning is proposed in areas that burned with low soil burn severity, and if a wildfire burns through the area, this treatment would provide a benefit to soil productivity by decreasing the soil burn severity of a future fire. Because this is an unpredictable event, this potential benefit has not been factored into area meeting desired conditions.

Soil Structure

The use of ground-based equipment, opening and using temporary road access and building new landings can affect soil structure. It is expected soil structure would not meet desired conditions on approximately 250 acres or four percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are five acres not meeting desired condition for soil stability; when added to the 2,049 acres not meeting desired condition there are 2,054 acres or 29 percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 674 acres or ten percent not meeting desired condition. There are currently 573 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 383 additional acres not meeting desired condition for a total of 956 acres or 14 percent. Finally, there are 269 acres not meeting desired condition when added to the 250 acres from the alternative the total acres not meeting desired condition for soil structure is 519 or seven percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described for the Beaver Fire area and would occur over the same percentages of those proposed actions. An estimated 2,001 acres or seven percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff. A loss of soil cover on this area would likely result in rates of long-term accelerated erosion similar to those modeled following the Happy Camp Fire of 18 to 109 tons per acre. Erosion could remain elevated for ten years until trees are planted, yet the success of conifers or brush vegetation could be delayed if soil productivity has declined due to soil erosion.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to this standard. If necessary the Forest Service will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described for the Beaver Fire area. Approximately 2,106 acres or seven percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter.

With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in the Beaver Fire area. It is expected soil structure would not meet desired conditions on approximately 1,346 acres or five percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 633 acres not meeting desired condition for soil stability when added to the 2,001 acres not meeting desired condition. All together there are 2,634 acres or nine percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 534 acres or two percent not meeting desired condition. There are currently 642 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 2,106 additional acres not meeting desired condition for a total of 2,748 acres or nine percent. Finally, there are 383 acres not meeting desired condition when added to the 1,346 acres from the alternative the total acres not meeting desired condition for soil structure is 1,729 or six percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in the Beaver Fire area. An estimated 519 acres or five percent of the fire project analysis area

would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in the Beaver Fire area. Approximately 385 acres or three percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in Alternative 2, Beaver Fire area. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in the Beaver Fire area. It is expected soil structure would not meet desired conditions on approximately 301 acres or three percent of the Whites Fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 280 acres not meeting desired condition for soil stability when added to the 519 acres not meeting desired condition. All together there are 799 acres or seven percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 33 acres or less than one percent not meeting desired condition. There is currently 280 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 385 additional acres not meeting desired condition for a total of 665 acres or six percent. Finally, there are 50 acres not meeting desired condition when added to the 301 acres from the alternative the total acres not meeting desired condition for soil structure is 351 or three

percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Alternative 3

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 1,134 acres or 15 percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in the Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 211 acres or three percent may not meet the desired condition for soil organic due to the same proposed actions and over the same percentages as described in the Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter.

With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 109 acres or two percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are five acres not

meeting desired condition for soil stability when added to the 1,134 acres not meeting desired condition. All together there are 1,139 acres or 15 percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 143 acres or two percent not meeting desired condition. There is currently 573 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 211 additional acres not meeting desired condition for a total of 784 acres or ten percent. Finally, there are 269 acres not meeting desired condition when added to the 109 acres from the alternative the total acres not meeting desired condition for soil structure is 378 or three percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 1,957 acres or seven percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in the Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff. A loss of soil cover on this area would likely result in rates of long term accelerated erosion similar to those modeled following the Happy Camp Fire of 18 to 109 tons per acre. Erosion could remain elevated for ten years until trees are planted, yet the success of conifers or brush vegetation could be delayed if soil productivity has declined due to soil erosion.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 2,055 acres or seven percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. With the

application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 1,322 acres or five percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 633 acres not meeting desired condition for soil stability when added to the 1,957 acres not meeting desired condition. All together there are 2,590 acres or eight percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 438 acres or less than one percent not meeting desired condition. There are currently 642 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 2,055 additional acres not meeting desired condition for a total of 2697 acres or nine percent. Finally, there are 383 acres not meeting desired condition when added to the 1,322 acres from the alternative the total acres not meeting desired condition for soil structure is 1,705 or six percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area B: Whites Fire

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 514 acres or five percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in Alternative 2 for the Beaver Fire area, tractor harvest would have a shorter term effect on larger-scale runoff. A loss of soil cover on this area would likely result in rates of long term accelerated erosion similar to those modeled following the Whites Fire of between four and 16 tons per acre. Erosion could remain elevated for ten years until trees are planted, yet the success of conifers or brush vegetation could be delayed if soil productivity has declined due to soil erosion.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 376 acres or three percent may not meet the desired condition for soil organic matter due to mechanical disturbance which could result in the displacement of soil organic matter.

With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 298 acres or three percent of the Whites fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 280 acres not meeting desired condition for soil stability when added to the 514 acres not meeting desired condition. All together there are 794 acres or seven percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 12 acres or less than one percent not meeting desired condition. There is currently 280 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 376 additional acres not meeting desired condition for a total of 656 acres or five percent. Finally, there are 50 acres not meeting desired condition when added to the 298 acres from the alternative the total acres not meeting desired condition for soil structure is 348 or three percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Alternative 4

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 1,366 acres or 18 percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in the Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 374 acres or five percent may not meet the desired condition for soil organic matter due to mechanical disturbance which could result in the displacement of soil organic matter.

With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 237 acres or three percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are five acres not meeting desired condition for soil stability when added to the 1,366 acres not meeting desired condition. All together there are 1,371 acres or 18 percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 619 acres or nine percent not meeting desired condition. There is currently 573 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 374 additional acres not meeting desired condition for a total of 947 acres or 12 percent. Finally, there are 269 acres not meeting desired condition when added to the 237 acres from the alternative the total acres not meeting desired condition for soil structure is 506 or seven percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 1,838 acres or six percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in the Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 1,999 acres or seven percent may not meet the desired condition for soil organic matter due to mechanical disturbance which could result in the displacement of soil organic matter.

With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 1,251 acres or four percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 633 acres not meeting desired condition for soil stability when added to the 1,838 acres not meeting desired condition. All together there are 2,471 acres or eight percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 418 acres or less than one percent not meeting desired condition. There is currently 642 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 1,999 additional acres not meeting desired condition for a total of 2,641 acres or nine percent. Finally, there are 383 acres not meeting desired condition when added to the 1,251 acres from the alternative the total acres not meeting desired condition for soil structure is 1,634 or five percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area B: Whites Fire

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 520 acres or five percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of

treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in the Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for Alternative 2, the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 389 acres or three percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 305 acres or three percent of the Whites fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 280 acres not meeting desired condition for soil stability when added to the 520 acres not meeting desired condition. All together there are 800 acres or seven percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 12 acres or less than one percent not meeting desired condition. There is currently 280 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 389 additional acres not meeting desired condition for a total of 669 acres or six percent. Finally, there are 50 acres not meeting desired condition when added to the 305 acres from the alternative the total acres not meeting desired condition for soil structure is 355 or three

percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Alternative 5

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 1,406 acres or 20 percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in the Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for Alternative 2, the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 435 acres or six percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 260 acres or three percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic

matter, soil organic matter and soil structure addressed there. There are five acres not meeting desired condition for soil stability when added to the 1,406 acres not meeting desired condition. All together there are 1,411 acres or 20 percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 673 acres or nine percent not meeting desired condition. There is currently 573 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 453 additional acres not meeting desired condition for a total of 1,026 acres or 14 percent. Finally, there are 269 acres not meeting desired condition when added to the 260 acres from the alternative the total acres not meeting desired condition for soil structure is 529 or seven percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 1,240 acres or four percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in the Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for Alternative 2, the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 1,529 acres or seven percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in the Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 926 acres or three percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 633 acres not meeting desired condition for soil stability when added to the 1,240 acres not meeting desired condition. All together there are 1,873 acres or six percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 182 acres or less than one percent not meeting desired condition. There is currently 642 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 1,529 additional acres not meeting desired condition for a total of 2,171 acres or seven percent. Finally, there are 383 acres not meeting desired condition when added to the 926 acres from the alternative the total acres not meeting desired condition for soil structure is 1,309 or four percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area B: Whites Fire

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 464 acres or four percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for Alternative 2, the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 326 acres or three percent may not meet the desired

condition for soil organic matter due to the same proposed actions and over the same percentages as described in Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 268 acres or three percent of the Whites fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 280 acres not meeting desired condition for soil stability when added to the 464 acres not meeting desired condition. All together there are 744 acres or six percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 12 acres or less than one percent not meeting desired condition. There is currently 280 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 326 additional acres not meeting desired condition for a total of 606 acres or five percent. Finally, there are 50 acres not meeting desired condition when added to the 301 acres from the alternative the total acres not meeting desired condition for soil structure is 351 or three percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Alternative 2 Modified

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 1,219 acres or 17 percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to

meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for Alternative 2, the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 247 acres or three percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 432 acres or six percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are five acres not meeting desired condition for soil stability when added to the 1,219 acres not meeting desired condition. All together there are 1,224 acres or 17 percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 413 acres or six percent not meeting desired condition. There is currently 573 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 247 additional acres not meeting desired condition for a total of 820 acres or 11 percent. Finally, there are 269 acres not meeting desired condition when added to the 163 acres from the alternative the total acres not meeting desired condition for soil structure is 432 or six percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 2,001 acres or six percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of

treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for Alternative 2, the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 2,098 acres or seven percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in the Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter.

With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 1,337 acres or five percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 633 acres not meeting desired condition for soil stability when added to the 2,001 acres not meeting desired condition. All together there are 2,634 acres or nine percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 476 acres or less than one percent not meeting desired condition. There is currently 642 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 2,098 additional acres not meeting desired condition for a total of 2,740 acres or nine percent. Finally, there are 383 acres not meeting desired condition when added to the 1,337 acres from the alternative the total acres not meeting desired condition for soil structure is 1,720 or six

percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area B: Whites Fire

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 519 acres or five percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in Alternative 2 in the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for Alternative 2, the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 385 acres or three percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter.

With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 301 acres or three percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 280 acres not

meeting desired condition for soil stability when added to the 519 acres not meeting desired condition. All together there are 799 acres or seven percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 12 acres or less than one percent not meeting desired condition. There is currently 280 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 385 additional acres not meeting desired condition for a total of 665 acres or five percent. Finally, there are 50 acres not meeting desired condition when added to the 301 acres from the alternative the total acres not meeting desired condition for soil structure is 351 or three percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Alternative 3 Modified

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Soil Stability

An estimated 905 acres or 16 percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

Compared to Alternative 2, long-term accelerated erosion is much less likely to continue downslope of treatments. This is because of the elimination of salvage harvest in the Beaver Fire area. Half of the impacts to soil stability would occur due to ground-based roadside hazard treatments, and half due to site preparation and fuels reduction activities. Ground-based roadside hazard treatments would occur on short lengths of less than 250 feet and at these shorter lengths lower rates of accelerated erosion would be expected, and further downslope transport of eroded soil is unlikely. Ground-based harvest during site preparation treatments would not use mortality guidelines and, therefore, retention of more trees would result in more potential soil cover. By design, fuels reduction treatments would be retain soil cover to meet Forest Plan standards for soil cover. Therefore, its likely soil stability desired conditions would return to acceptable levels on site preparation and fuels reduction treatments in less than five years.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

The surface organic matter indicator would be met or partially met on all treatment areas. Ground-based roadside hazard treatment would be expected to remove the highest amounts of surface organic matter and partially impact surface organic matter desired conditions. This would occur over on areas less than 500 feet wide, and adjacent areas would contribute large woody debris to provide nutrients and habitat for soil microorganisms.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 333 acres or five percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. As described above, soil stability desired conditions are likely to return to acceptable levels within the short term. Therefore, although soil organic matter may be displaced due to mechanical disturbance, it is more likely to remain on site and not permanently lost due to accelerated erosion.

With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 123 acres or seven percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are five acres not meeting desired condition for soil stability when added to the 905 acres not meeting desired condition. All together there are 910 acres or 16 percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will not contribute any acres not meeting desired condition. There is currently 573 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 333 additional acres not meeting desired condition for a total of 906 acres or 12 percent. Finally, there are 269 acres not meeting desired condition when added to the 123 acres from the alternative the total acres not meeting desired condition for soil structure is 392 or six percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 1,565 acres or five percent of the fire project analysis area would not meet the soil stability indicator. A loss of soil cover on this area would likely result in rates of long term accelerated erosion similar to those modeled following the Happy Camp Fire of 18 to 109 tons per acre. Erosion could remain elevated for ten years

until trees are planted, yet the success of conifers or brush vegetation could be delayed if soil productivity has declined due to soil erosion.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for Alternative 2, the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 1,675 acres or six percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 875 acres or three percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 633 acres not meeting desired condition for soil stability when added to the 1,565 acres not meeting desired condition. All together there are 2,198 acres or seven percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently for surface organic matter; the project will lead to 299 acres or less than one percent not meeting desired condition. There is currently 642 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 1,675 additional acres not meeting desired condition for a total of 2,317 acres or eight percent. Finally, there are 383 acres not meeting desired condition when added to the 854 acres from the alternative the total acres not meeting desired condition for soil structure is 1,237 or five percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Soil Stability

The effects to soil resources affected by the alternative are the same as described in Alternative 2. An estimated 443 acres or four percent of the fire project analysis area would temporarily not meet the soil stability indicator. For any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Therefore, as described in the Alternative 2 of the Beaver Fire area section, tractor harvest would have a shorter term effect on larger-scale runoff.

With the application of measures described above, it is expected the soil stability indicator desired conditions would be met and Forest Plan soil cover Standard 3-2 would be met within proposed activity areas.

Surface Organic Matter

Coarse woody debris will be retained to meet Standard and Guideline 6-16 in the Forest Plan. Standing snags in snag retention areas and Riparian Reserves may contribute to meeting this standard. If necessary, the Forest will designate additional wood during implementation to be retained to meet this standard. A project design feature (Watershed-36) has been added to clarify this standard as discussed for Alternative 2, the Beaver Fire area.

With the application of measures described above, **it is expected the surface organic matter indicator desired conditions would be met within proposed activity areas.**

Soil Organic Matter

The effects to soil resources affected by the alternative are the same as described in Alternative 2. Approximately 169 acres or one percent may not meet the desired condition for soil organic matter due to the same proposed actions and over the same percentages as described in the Alternative 2, Beaver Fire area. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter.

With the application of soil stability measures described above, **it is expected Forest Plan Standard and Guideline 3-3 would be met within the proposed activity areas.**

Soil Structure

The effects to soil resources affected by the alternative are the same as described in Alternative 2. It is expected soil structure would not meet desired conditions on approximately 285 acres or less than three percent of the fire area.

Cumulative Effects

Past effects due to forest management and the 2014 fires have been considered and discussed in the affected environment and the effects to soil stability, surface organic matter, soil organic matter and soil structure addressed there. There are 280 acres not meeting desired condition for soil stability when added to the 443 acres not meeting desired condition. All together there are 723 acres or six percent not meeting desired condition cumulatively for soil stability. All acres are meeting desired condition currently

for surface organic matter; the project will lead to 12 acres or less than one percent not meeting desired condition. There is currently 280 acres not meeting desired condition for soil organic matter as a result of past action. This project will result in 169 additional acres not meeting desired condition for a total of 449 acres or two percent. Finally, there are 50 acres not meeting desired condition when added to the 285 acres from the alternative the total acres not meeting desired condition for soil structure is 335 or three percent. Grazing is the only on-going action that could lead to cumulative effects. There are no measurable cumulative effects from grazing (as described in Alternative 1).

Compliance with law, regulation, policy, and the Forest Plan

The greatest impacts to soil productivity would occur due to impacts to soil stability and soil organic matter on approximately 30 percent of ground-based harvest units and on new temporary roads and new landings associated with proposed ground-based, skyline, and helicopter harvest units. The soil stability indicator would not be met temporarily until the project design feature is implemented to meet the soil cover requirements described in Table 4-2 of Forest Plan Standard and Guideline 3-2. Standard and Guideline 3-6 would be met by following the project design feature that clarifies this standard. A forest consistency checklist has been completed that reviews the soil standards and guidelines; this is available in the project record. Standard and Guidelines 3-3 through 3-6 would be met because project activities, including effective implementation of project design features, are not expected to result in major decreases to surface organic matter and soil organic matter. Standard and Guideline 3-7 has been met by the selection of soil plots where soils were field verified. Standard and Guideline 3-1 would be met by effectively implementing project design features described in each alternative.

Geology

Methodology

Ten days of field review were completed to validate geologic and geomorphic mapping. Unstable lands are designated as Riparian Reserves in the Forest Plan (Standard and Guideline MA 10-2, pg. 4-108). The unstable lands component of Riparian Reserves includes active landslides, inner gorges, toe zones of dormant landslides and severely weathered and dissected granitic lands. List of actions considered for cumulative effects in Appendix C (map project record). This analysis assumes that if less than one percent of the 7th field watershed is in the project boundary there will be no effect to landslide risk. So only the sixty-seven watersheds with greater than one percent of their area in the project boundary are analyzed (see Appendix B of the Geology resource report for list of watersheds analyzed).

The cumulative watershed effects GEO model is used to estimate the landslide potential. The geology analysis only uses the cumulative watershed effects model for Alternative 2 in the landslide risk assessment (Geology report page 8). The differences between alternatives are less than 0.05. This is not enough to change the landslide risk for any 7th field watershed in the analysis area. The risk ratios are for Alternatives 2, 3, 4, 5, Alternative 2 Modified and Alternative 3 Modified are not enough to change the risk ratios for any watershed (See Appendix A of the Hydrology report for model results for all alternatives).

The acres of salvage harvest on unstable lands for Alternatives 2, 3, 4, 5, Alternative 2 Modified and Alternative 3 Modified excludes stream course Riparian Reserves and inner gorges and areas where RAVG predicted less than 50 percent basal area loss. The acres of unstable lands for other treatments for all action alternatives were calculated excluded stream course Riparian Reserves and inner gorges as mapped in the corporate GIS layer

because only hand treatments of the understory are proposed in these landforms. There were exemptions made for the prohibition of salvage harvest on active landslides and toe zones of dormant landslides per field work (See project design feature Table in Chapter 2 of the final EIS). The treatments on unstable lands in discussion below include steep, weathered granitic lands, active landslides and toe zones of dormant landslides.

The detailed methods are in the methods section of the Geology report and amendment.

Unstable Lands

The model uses mapping of the geomorphology, past and present disturbances, and coefficients developed using research on the effects of the 1964 flood event on landslide rates. The output from the model is volume of sediment delivered to the mouth of the 7th field watershed during a 10-year storm event (cubic yards per decade). The volumes are converted into a risk ratio to estimate landslide potential across the Forest and among project alternatives. A threshold of concern for the risk ratio is 1.0. This is not the point at which significant effects occur but a yellow flag indicating that additional impacts need to be considered closely for resource degradation and impacts to beneficial uses of water. Mitigations to prevent unacceptable negative impacts will be considered for watersheds with proposed activities that are over the threshold of concern. A more detailed description of the cumulative watershed effects modeling process is available in a Forest-wide document *Cumulative Watershed Effects: The Abridged Version* (Bell, 2012).

The indicator used in this analysis for effects on unstable lands is landslide risk. Risk is the intersection between the potential of landsliding and the consequence of landsliding. Landslide potential is estimated from the GEO model risk ratio. Consequences analyzed include: 1) impacts to human health and safety; 2) impacts to infrastructure; and 3) impacts to natural resources. Landslide risk ranges from very high, which indicates an immediate need for mitigation of the risk, to very low, which indicates a nuisance disruption. This assessment used soil burn severity (Geology report page 9) which was finalized by the burned area emergency response team for each fire. The soil burn severity model represents the change in ground surface characteristics which is used to estimate hydrologic and erosive response of the watersheds (Parsons et al 2010). The long-term elevated risk of landslide in a 7th field watershed is related to tree root support. Areas with compromised root support (due to fire or forest management) have about 6.5 times higher landslide rate than areas with intact roots (Amarathus et al. 1985).

The duration of elevated risk used rapid assessment of vegetation condition (RAVG) to estimate where the percent of trees killed by fire is enough to compromise root support. After trees die the root support begins to decline immediately and provide almost no support after about a decade. Duration of elevated risk is analyzed using the state of vegetation in a 7th field watershed. The measure of duration of elevated risk is the percent of the watershed with moderate or high severity wildfire left to naturally regenerate (or left unplanted). So, if a 7th field watershed has more than 25 percent of the area burned at high and moderate vegetation severity and is planted the duration of elevated risk is reduced to about 30 years. If less than 25 percent of the high and moderate severity areas are planted the duration of elevated risk will be greater than 80 years. The exception is if a watershed has less than 10 percent high and moderate vegetation burn severity overall, then the landslide rate at the watershed scale will be recovered within two to five years.

The watersheds with very high landslide risk means that should a landslide event occur it could potentially put human safety and private property at risk. Watersheds with high landslide risk could have landslide events that affect essential infrastructure (power lines, municipal water supplies, major roadways, etc.). These situations call for immediate mitigation of the landslide risk where possible. The best mitigation for wildfire effects to landslide processes on this scale is reforestation.

The long-term effects to landslide processes are related to the large-scale loss of forest vegetation due to the wildfire event. In the Klamath Mountains, areas that have been deforested have about a 6.5 times higher landslide rate than areas with intact forest vegetation (Amarathus et al 1985). The roots of forest vegetation, especially trees, help stabilize slopes by providing additional strength to the soil (Ziemer 1981; Ziemer and Swanston 1977; Ammann et al. 2009). Once trees are killed, even their largest roots start to decay and lose strength within a decade (Ziemer and Swanston 1977). In the Klamath Mountains, about half of reinforcement from tree roots is lost within two to three years of death and nearly three-fourths of the strength is gone within eight years (Ziemer 1981). Brendt and Gibbon (1958) found that conifers with about a five inches diameter at breast height have roots about five feet deep and up to 20 feet lateral spread. With those dimensions in mind, 10 inch diameter at breast height trees will likely have roots with a lateral spread of at least 20 feet, which will provide nearly full-root coverage even if the trees are 40 feet apart. Finally, Reid and Page (2002) found that about 25 percent of the watershed must be reforested in order to see a 40 percent reduction in the landslide sediment rate. This supports the assumption that the landslide rate will be reduced, and thus the landslide risk, if 25 percent of the areas deforested by the wildfire are replanted.

The spatial scale for the landslide risk and cumulative effects analysis is the 7th field watershed because the models used for analysis are calibrated at the 7th field scale. The temporal scale is from the present to 10 years for short-term and 10 to 50 years for long-term. Elevated landslide rates due to forest management in Northern California have been shown to begin to decrease around 7 to 12 years after a disturbance and recover in about 50 years (Ziemer 1981).

Effects to Unique Geologic Areas

There are no treatments proposed within the boundary of the Marble Caves RNA. There is roadside treatment and underburning within the North Russian Landslide Dam Special Interest Area but no treatments on the landslide for which the special interest area was designated. There will be no effect to the character of the Geologic Research Natural Areas or the Geologic Special Interest Areas, so it is not discussed in any additional detail.

Likelihood of Effects to Cave Resources

The areas where limestone or marble bedrock overlapped with salvage, mechanical site preparation or hazard tree removal were field reviewed and assessed for the potential for cave resources to be present and the likelihood that should any caves occur in the area they would meet the requirements for significant caves.

The spatial scale for the analysis is the project boundary. Caves are non-renewable resources so once it is effected it will not recovery to pre-impact condition.

Likelihood of Effects to Groundwater Resources

Most of the vegetation being removed by the Westside Fire Recovery project is dead or dying. These trees are not using any groundwater. There is no likely to be any effect to groundwater resources from the project and it is not analyzed any further in this report.

Likelihood of Effect to Rock Material Sources

There is no proposal to use or develop rock sources in the Westside Fire Recovery project. There will be no effect to rock material sources and it will not be discussed further in the analysis.

Disturbance of Naturally Occurring Asbestos

There is one regulation that is applicable to the project regarding naturally occurring asbestos. This is the Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations (Section 93105) (http://www.arb.ca.gov/toxics/atcm/asb2atcm.htm). Timber harvest activities are explicitly exempt from this regulation (Section 3) except for new road construction. There is no new road construction in this project as defined in the regulation. This project does propose temporary access road construction to allow for timber harvest, but these roads will be used to allow for temporary access to the units for harvest activities and closed after the project is complete. Their use will be temporary (less than one to two months) and they will never be open to public use. There are no regulations on Naturally Occurring Asbestos for this project. Disturbance of ultramafic rock (proxy for naturally occurring asbestos) will be analyzed per public comment.

The acres and length of temporary access roads proposed on ultramafic rock will be reported for each alternative by fire area environmental consequences section. The temporal boundary for the effects is during the ground disturbance plus about 10 minutes for the dust to settle. The spatial boundary for the effects is the road bed plus 100 feet on either side because that is all the further the asbestiform mineral dust is likely to travel.

Affected Environment

Of the sixty-seven 7th field watersheds analyzed for this project, three currently have a very high landslide risk. These are Rancheria Creek, Walker Creek and Lower Grider Creek. The likelihood that a landslide event will occur in Lower Grider and Walker Creek is almost certain and highly likely in Rancheria Creek. These three watersheds have a catastrophic consequence if a landslide (specifically a debris flow) occurs due to the proximity to the creek of private property with residential structures. There are twenty watersheds with a high landslide risk mainly due to the susceptibility of municipal water supplies, fish habitat and access to landslide events. Thirty of the watersheds analyzed have a moderate landslide risk and twelve have a low landslide risk.

There are thirty-eight 7th field watersheds that have more than 10 percent high or moderate vegetation burn severity. These watersheds will have an elevated landslide risk of greater than 80 years. These include Rancheria Creek, Lower Grider Creek, and Walker Creek which have very high landslide risks and 13 of the watersheds with high landslide risks. The other 27 watersheds are assumed to have acute elevated landslide risk that will last about 2 to 5 years. Maps of the geomorphology and bedrock are in the Geology resource report on the project website. A list of projects that were included in the affected environment analysis for each fire area are in the Geology amendment on the project website, below is a summary of affected environment broken down by fire area.

During the week of July 6, 2015 there were rain events that, along with the fire effects, produced debris flow events and sediment laden flows in Fish Gulch, Music Creek, Grider Creek, and Walker Creek. Field observations indicate that the sediment laden flows were a result of the mobilization of the bulked sediment in the channel. The loss of tree canopy interception and water repelling (hydrophobic) soils lead to an increase in water delivered to the channel. This in combination with the increase in sediment in the channel from fire related soil erosion is the primary drivers of the debris flow event. In other words, the fire effects lead to more water and sediment in the stream channels than under pre-fire conditions. There is no evidence of landsliding (debris slide or translational/rotational landslides) associated with this event.

Project Area A: Beaver Fire

The Beaver portion of the project area is mainly underlain by Condrey Mountain Schist bedrock. The schist contains graphite (which is commonly used as a lubricant) which makes the area susceptible to large scale deep-seated landslides. The large dormant landslide deposits in the Beaver fire area are due to a combination of the graphitic schist and past climatic and seismic activity (more than 1,000 years ago). There are small portions of dormant landslide deposits that have experienced active landsliding in recent history (less than 100 years).

Project Area B: Happy Camp Complex

The Happy Camp portion of the project area has three distinct geologic types. The Elk Creek area is primarily metasedimentary and metavolcanic bedrock. These areas have few landslides and the primary landslide mechanism is debris flow of sediment stored in the stream channels. There are areas of ultramafic rock that have small dormant landslides but few have active landslides within them. The Grider/Walker Creek area is underlain by highly weathered and dissected granitic lands. The watersheds are susceptible to shallow landsliding such as debris slides and debris flows. The Tompkins Creek area is underlain by a mosaic of bedrocks including ultramafic, granitic and metasedimentary bedrock. The actual landslide rate is low with only a handful of active landslides in the area.

Project Area C: Whites Fire

The Whites portion of the project area is mainly underlain by metasedimentary and metavolcanic bedrock. These rocks are ancient ocean floor and tend to be fairly stable (low landslide potential). The headwaters of Music Creek and Taylor Creek are underlain by granitic bedrock which has been highly weathered. This led to the development of highly weathered and dissected granitic lands, susceptible to shallow landsliding such as debris slides and debris flows.

Environmental Consequences

Alternative 1

Direct Effects and Indirect Effects

There are no direct effects to landslide risk under this alternative. The area will recover naturally including the re-establishment of vegetation and ground-cover, increasing root support and intercepting precipitation which reduces landslide risk and potential.

However, prolonged hardwood and brush dominated occupancy will not provide the root support to maintain stable slopes (Jackson and Roering 2009). The landslide risk will remain the same as current conditions for about 10 to 12 years (Zeimer 1981) and slowly begin to reduce as conifer forest begins to be established. The project area may take up to 80 years to recover to a pre-fire landslide risk level. It could take longer in areas where seed sources have been eliminated due to large pockets of high and moderate severity vegetation burn such as Walker, Grider and O'Neil Creek.

Project Area A: Beaver Fire

The effects of taking no action for the Beaver Fire area are the same as for the other fire areas as described in the environmental consequences section of the Geology Resource report.

Project Area B: Happy Camp Complex

The effects of taking no action for the Happy Camp Fire area are the same as for the other fire areas as described in the Geology Resource report.

Project Area C: Whites Fire

The effects of taking no action for the Whites Fire area are the same as for the other fire areas as described in the Geology Resource report.

Cumulative Effects

The projects added to the effects of the past actions (the affected environment) and the direct and indirect effects of the project are portions of the Jess project, Scott Bar Underburn, Lovers Canyon, McCollins and Sawyers Bar Fuels Reduction Project that are in the 7th field watersheds analyzed. The Jess project and Lovers Canyon project are the only two future projects that have any effect on the risk ratio or percent watershed with high or moderate disturbance. Jess project increases the risk ratio for 0.01 and 0.07 for the Eddy Gulch and Jessups Gulch respectively. The Jess project increases the percent of the watershed with high and moderate disturbance by 1.5 percent for both watersheds. Lovers Canyon increases the risk ratios for South Fork Kelsey and Middle Creek by 0.03 and 0.02 respectively, and the percent disturbed is increased by 3.3 percent for both watersheds. The landslide risks are not increased by the addition of the effects of these projects. None of the projects affect the duration of elevated risk in the watersheds.

Project Area A: Beaver Fire

The only project analyzed as a future or on-going project is the McCollins project for the Beaver Fire area. There are no additional cumulative effects to the landslide risk or duration of elevated risk for the Beaver Fire Area.

Project Area B: Happy Camp Complex

Lovers Canyon project and the Scott Bar Fuels Reduction project are the only projects considered as on-going or future projects for this analysis. The Scott Bar Fuels Reduction has no effect on landslide risk. Lovers Canyon increases the risk ratios for South Fork Kelsey and Middle Creek by 0.03 and 0.02 respectively and the percent disturbed is increased by 3.3 percent for both watersheds. This change is not enough to increase the landslide risk in any of the 7th field watersheds. Neither of these projects have an effect on the duration of elevated risk.

Project Area C: Whites Fire

The Jess project and Sawyers Bar Fuels Reduction project are the only projects considered as on-going or future projects for this analysis. The Sawyers Bar Fuels Reduction project has no effect on landslide risk. Jess project increases the risk ratio for 0.01 and 0.07 for the Eddy Gulch and Jessups Gulch respectively. The Jess project increases the percent of the watershed with high and moderate disturbance by 1.5 percent for both watersheds. This change is not enough to increase the landslide risk in any of the 7th field watersheds. Neither of these projects have an effect on the duration of elevated risk.

Alternative 2

Direct Effects and Indirect Effects

There are about 2,500 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,275 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 385 acres of unstable lands and site preparation and planting on about 400 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 4,207 acres.

The changes between the draft EIS and the final EIS are not enough to change the landslide risk for any of the watersheds (Table 4 of the Geology Amendment). The analysis using the correctly classified RAVG changed Deep Creek and Rainy Valley Creek from a duration of greater than 80 years to 2-5 years. The new analysis shows that Tompkins Creek, Upper East Fork Elk and Lower East Fork Elk now have a 30 year duration of elevate risk, where it was greater than 80 years in the Geology report (Table 6 of the Geology Amendment).

There are three temporary access road are proposed that will likely be built directly on ultramafic bedrock. These are new temporary access road 10 (accesses unit 22), temporary access road 18 (accesses unit 510) and temporary access road 26 (accesses unit 525). Temporary access road 10 will be on about 0.09 miles or about 0.5 acres of ultramafic bedrock and is more than 0.5 miles from any sensitive receptors. Temporary access road 18 will be on about 0.06 miles or 0.3 acres of ultramafic bedrock and is about 2.5 miles from any sensitive receptors. Temporary access road 26 will be on about 0.2 miles or 0.8 acres of ultramafic bedrock and is about 4.5 miles from sensitive receptors.

Project Area A: Beaver Fire

There are about three acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 60 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 60 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 75 acres.

Alternative 2 does not change the landslide risk for any watershed in the Beaver Fire area. There is a change in the risk ratio or the percent of watersheds with high or moderate disturbance for five watersheds due to treatments. The average change in risk

ratio is 0.03 and the maximum change was 0.04. All four watersheds with a change in percent high and moderate disturbance have a change of 0.1 percent.

None of the watersheds in the Beaver Fire area have more than 75 percent of the high and moderate vegetation burn severity replanted. The expected duration of elevated risk for watersheds in the fire area with more than 10 percent of the area affected by high and moderate vegetation fire severity is greater than 80 years. This includes all of the watersheds with high landslide risk in the project area (Table 5 of the Geology Amendment). If less than 10 percent of the watershed was burned with high or moderate vegetation burn severity the elevated risk is assumed to be acute and will recover in 2 to5 years (Table 6 of the Geology Amendment).

There are two primary effects of reopening of decommissioned roads, use of temporary roads on existing roadbeds, construction of new temporary roads and the construction of new landings. The first is changes to the hillslope mass balance such as undercutting and increasing the weight in unstable areas (spoil piles) from earthwork. There are no new temporary roads or landings being constructed on toe zones of dormant landslides, active landslides or inner gorges. The slope stability in these areas is the most susceptible to the change in mass balance. Project design feature Watershed-20 restricts excess material from temporary roads, landings and other actions from being stored on active landslides. This minimizes the potential for landslide re-activation due to increased weight. The second is poor drainage on the roads and landings which concentrates water onto the hillslope which can exacerbate existing unstable lands or create new landslides. The cessation of the use of temporary roads per the Wet Weather Operations (Project Design Feature Watershed-1) will minimize any rutting or tire tracks that can concentrate water on the road and hillslope. Project design feature Watershed-22 requires the hydrologic stabilization of all temporary roads which includes control of the drainage on the roadbed. Project design feature Watershed-23 requires new landings to be configured for long-term drainage with the intention to establish natural runoff patterns. The landslide risk will remain above pre-project through the first winter after stabilization. Then they will be back to pre-project levels or below in areas were legacy sites are being addressed on temporary road access. The increase will be the most during implementation of the project and will be reduced after the hydrologic stabilization has occurred at the completion of the project.

There is not likely to be an effect to cave resources protected under the Federal Cave Resource Protection Act. There are no temporary access roads proposed directly on ultramafic rock.

Project Area B: Happy Camp Complex

There are about 2,450 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,205 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 310 acres of unstable lands and site preparation and planting on about 375 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 4,108 acres.

Alternative 2 does not change the landslide risk for any watershed in the Happy Camp Fire area. There is a change in the risk ratio or the percent watershed high or moderate disturbance for twenty-one watersheds. The average change in risk ratio is 0.03 and the

maximum change was 0.10. The average change in percent watershed with high and moderate disturbance is 0.26 percent and the maximum change is 0.9 percent (Table 5 of the Geology Amendment). The site scale effects of salvage and reforestation on active landslides and toe zones of dormant landslides is the same as for the Beaver fire area.

There are two watersheds with a very high landslide risk that will have a reduced duration of elevated risk. Watersheds with a very high landslide risk have a high potential of landsliding that may affect human life and safety. These watersheds are Lower Grider and Walker Creek. There are four watersheds with a high landslide risk that will have a reduced duration of elevated risk for Alternative 2. These watersheds have a reasonable probability of landsliding that may affect essential infrastructure and safety. They are Upper Grider, Cliff Valley, O'Neil, and Caroline Creeks. There are also six watersheds that have a moderate landslide risk that will have a reduced duration of elevate risk (Table 3-57). In this alternative, these twelve watersheds will have this elevated risk for about 30 years, as opposed to greater than 80 years under the no action alternative. All watersheds that have more than 10 percent high and moderate vegetation fire severity will have a duration of elevated risk of greater than 80 years. If less than 10 percent of the watershed was burned with high or moderate vegetation burn severity the elevated risk is assumed to be acute and will recover in 2 to5 years (Table 6 of the Geology Amendment).

There is one salvage unit underlain by limestone or marble (unit 228). This body was field reviewed for cave potential. No caves were found during field review. However should a cave be present it is not likely to meet the significance criteria outlined by the Federal Cave Resources Protection Act. There is not likely to be an effect to cave resources protected under the Federal Cave Resource Protection Act.

There are three temporary access road are proposed that will likely be built directly on ultramafic bedrock. The areas disturbed are all less than one acre. Dust mitigation is a requirement for all access in the project area (temporary or existing). The temporary access lengths are short so speeds will remain low (less than 15 miles per hour). The dust mitigation combined with the slow speeds means that the potential for naturally occurring asbestos to leave the project area is very low. Equipment is being washed before moving to new areas per the botany project design features intended to reduce weed spread and there are mitigations in place to minimize track out onto paved roads. Despite being exempt from the regulation the project will likely meet the requirements for construction in areas less than one acre.

Project Area C: Whites Fire

There are less than 0.1acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 10 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 20 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 23 acres.

Alternative 2 does not change the landslide risk for any watershed in the Whites Fire area (modified Table 4 of the Geology Amendment). There is no change in risk ratio and an average change in percent watershed with high and moderate disturbance is 0.15 percent and the maximum change is 0.2 percent. The effect of landslide risk at the site scale is the

same as for the Beaver Fire area. The site scale effects of salvage and reforestation on active landslides and toe zones of dormant landslides is the same as for the Beaver fire area.

None of the watersheds in the Whites Fire area have more than 75 percent of the high and moderate vegetation burn severity replanted. The expected duration of elevated risk for watersheds in the fire area with more than 10 percent of the area affected by high and moderate vegetation fire severity is greater than 80 years (modified Table 7 of the Geology Amendment). If less than 10 percent of the watershed was burned with high or moderate vegetation burn severity the elevated risk is assumed to be acute and will recover in 2 to 5 years (Table 6 of the Geology Amendment).

There is no limestone or marble bedrock in the White Fire area so there is not likely to be an effect to cave resources protected under the Federal Cave Resource Protection Act.

There are no temporary access roads proposed directly on ultramafic rock.

Cumulative Effects

The projects added to the effects of the past actions (the affected environment) and the direct and indirect effects of the alternative are portions of the Jess project, Salmon Reforestation, Scott Bar Underburn, Lovers Canyon, McCollins and Sawyers Bar Fuels Reduction Project that are in the 7th field watersheds analyzed. The Jess project and Lovers Canyon project are the only two future projects that have any effect on the risk ratio or percent watershed with high or moderate disturbance. Jess project increases the risk ratio for 0.01 and 0.07 for the Eddy Gulch and Jessups Gulch respectively. The Jess project increases the percent of the watershed with high and moderate disturbance by 1.5 percent for both watersheds. Lovers Canyon increases the risk ratios for South Fork Kelsey and Middle Creek by 0.03 and 0.02 respectively and the percent disturbed is increased by 3.3 percent for both watersheds. The landslide risks are not increased for any 7th field watershed by the addition of the effects of these projects. None of the projects affect the duration of elevated risk in the watersheds.

Project Area A: Beaver Fire

The only project analyzed as a future or on-going project is the McCollins project for the Beaver Fire area. There are no additional cumulative effects to the landslide risk or duration of elevated risk for the Beaver Fire Area with the addition of the effects of the McCollins project.

Project Area B: Happy Camp Complex

Lovers Canyon project and the Scott Bar Fuels Reduction project are the only projects considered as on-going or future projects for this analysis. Other projects were analyzed in the affected environment (see Geology Resource Report). The Scott Bar Fuels Reduction has no effect on landslide risk. Lovers Canyon increases the risk ratios for South Fork Kelsey and Middle Creek by 0.03 and 0.02 respectively (modified Table 3 in the Geology amendment) and the percent disturbed is increased by 3.3 percent for both watersheds (modified Table 4 in the Geology amendment). The landslide risks are not increased for any 7th field watershed by the addition of the effects of these projects. None of the projects effect the duration of elevated risk in the watersheds.

Project Area C: Whites Fire

Jess project increases the risk ratio for 0.01 and 0.07 for the Eddy Gulch and Jessups Gulch respectively (modified Table 3 in the Geology Amendment). The Jess project increases the percent of the watershed with high and moderate disturbance by 1.5 percent for both watersheds (modified Table 4 in the Geology Amendment). The landslide risks are not increased for any 7th field watershed by the addition of the effects of these projects. None of the projects effect the duration of elevated risk in the watersheds.

Alternative 3

Direct Effects and Indirect Effects

There are about 2,280 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,275 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 385 acres of unstable lands and site preparation and planting on about 400 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 3,927 acres.

The changes between the draft EIS and the final EIS are not enough to change the landslide risk for any of the watersheds. The analysis using the reclassified RAVG changed Deep Creek and Rainy Valley Creek from a duration of elevated risk of greater than eight years to two to five years. The new analysis shows that Tompkins Creek, Horse Creek, Upper East Fork Elk Creek and Lower East Fork Elk Creek now have a 30 year duration of elevated risk, where it was greater than 80 years in the Geology report. Lower Grider Creek went from greater than 80 year duration of elevated risk in the Geology report to a 30 year duration.

The temporary access roads directly on ultramafic rock are the same as for Alternative 2.

Project Area A: Beaver Fire

There are no acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 60 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 60 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 73 acres.

The indirect effects to the landslide risk and duration of elevated risk are the same as for Alternative 2. The effects to landslide risk at the site scale are the same as for Alternative 2. The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. There are no temporary access roads proposed directly on ultramafic rock.

Project Area B: Happy Camp Complex

There are about 2,280 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,205 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 310 acres of unstable lands and site preparation and planting on about 375 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 3,831 acres. The indirect effects to the landslide risk for the watershed and site scales are the same as for Alternative 2. The duration of

elevated risk will not be reduced in Lower Grider Creek, because the percent of the 7th fields planted drops below 25 percent. All other duration of elevated risks will remain the same as Alternative 2. The effects to landslide risk at the site scale are the same as for Alternative 2. The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. The temporary access roads on ultramafic rock are the same as for Alternative 2.

Project Area C: Whites Fire

There are less than 0.1 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 10 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 20 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 23 acres.

The indirect effects to the landslide risk at the watershed and site scale and duration of elevated risk are the same as for Alternative 2 (Table 5 and Table 6 of the Geology Amendment). The effects to landslide risk at the site scale are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. There are no temporary access roads proposed directly on ultramafic rock.

Cumulative Effects for All Fire Areas

The cumulative effects are the same as for Alternative 2.

Alternative 4

Direct Effects and Indirect Effects

There are about 2,360 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,260 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 385 acres of unstable lands and site preparation and planting on about 400 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 4,067 acres. The original analysis was not clear on the change in effects due to modifications to temporary road access for Alternative 4. There is no temporary road access (new temporary roads, temporary roads in existing roadbeds or re-opening of decommissioned roads) with stream crossings in this alternative. This reduces the site scale effects on debris flow volume described in the effects analysis of Alternative 2. Since temporary road crossings are not proposed for this alternative, there will be no additional volume contributed to debris flows (should they occur) from temporary road crossings. There will be some temporary road access using ridgetop roads and spurs. The probability of these roads contributing to the likelihood of landsliding is negligible.

The changes between the draft EIS and the final EIS are not enough to change the landslide risk for any of the watersheds (Table 5 of the Geology Amendment). The analysis using the reclassified RAVG changed Deep Creek and Rainy Valley Creek from a duration of elevated risk of greater than eight years to two to five years. The new

analysis shows that Cliff Valley Creek, Tompkins Creek, Horse Creek, Upper East Fork Elk Creek and Lower East Fork Elk Creek now have a 30 year duration of elevated risk, where it was greater than 80 years in the Geology report. Upper Elk Creek went from greater than 80 year duration of elevated risk in the Geology report to a 30 year duration (Table 6 of the Geology Amendment).

The temporary access roads directly on ultramafic rock are the same as for Alternative 2.

Project Area A: Beaver Fire

There are about three acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 55 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 60 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 71 acres. The indirect effects to landslide risk at the watershed and site scale and duration of elevated risk are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. There are no temporary access roads proposed directly on ultramafic rock.

Project Area B: Happy Camp Complex

There are about 2,360 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,200 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 375 acres of unstable lands and site preparation and planting on about 310 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 3,972 acres. The indirect effects to landslide risk are the same as for Alternative 2. There are nine 7th field watersheds that have a reduction in the duration of elevated risk (modified Table 6 of the Geology Amendment). Upper Grider, Lower Grider, and Upper Elk Creeks will have an elevated risk for more than 80 years under this alternative compared to 30 years in Alternative 2. All other watersheds have a duration of elevated risk that is the same as Alternative 2. The effects to landslide risk at the site scale are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. The temporary access roads on ultramafic rock are the same as for Alternative 2.

Project Area C: Whites Fire

There are less than 0.1 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 10 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 20 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 23 acres. The indirect effects to landslide risk and duration of elevated risk are the same as for Alternative 2. The effects to landslide risk at the site scale are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. There are no temporary access roads proposed directly on ultramafic rock.

Cumulative Effects for All Fire Areas

The cumulative effects are the same as for Alternative 2.

Alternative 5

Direct Effects and Indirect Effects

There are about 285 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,275 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 385 acres of unstable lands and site preparation and planting on about 40 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 1,852 acres.

The changes between the draft EIS and the final EIS are not enough to change the landslide risk for any of the watersheds (Table 5 of the Geology Amendment). The analysis using the reclassified RAVG changed Deep Creek and Rainy Valley Creek from a duration of elevated risk of greater than eight years to two to five years. The new analysis shows that O'Neil Creek, Walker Creek and Caroline Creek now have a 30 year duration of elevated risk, where it was greater than 80 years in the Geology report. Lower East Fork Elk Creek went from greater than 80 year duration of elevated risk in the Geology report to a 30 year duration (Table 6 of the Geology Amendment). There is no proposed temporary access roads construction directly on ultramafic rock in this alternative.

Project Area A: Beaver Fire

There are about three acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 60 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 60 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 77 acres. The indirect effects for landslide risk are the same as for Alternative 2. The duration of elevated risk is the same as for Alternative 2. The effects to landslide risk at the site scale are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. There are no temporary access roads proposed directly on ultramafic rock.

Project Area B: Happy Camp Complex

There are about 285 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,205 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 310 acres of unstable lands and site preparation and planting on about 30 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 1,753 acres. The indirect effects for landslide risk are the same

as for Alternative 2. Only Middle Creek and Lower East Fork Elk Creek will have a reduced duration of elevated risk of 30 years in this alternative (Table 3-57). The salvage that is underlain by the limestone body described in Alternative 2 is not included in this alternative. The effects to landslide risk at the site scale are the same as for Alternative 2.

There are no salvage activities underlain by limestone or marble and the likelihood of effecting cave resources is unlikely for this alternative. There are no temporary access roads proposed directly on ultramafic rock.

Project Area C: Whites Fire

There are no acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 10 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about20 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 22 acres. The indirect effects for landslide risk are the same as for Alternative 2. The duration of elevated risk is the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. There are no temporary access roads proposed directly on ultramafic rock.

Cumulative Effects for All Fire Areas

The cumulative effects are the same as for Alternative 2.

Modified Alternative 2

Direct Effects and Indirect Effects

There are about 2,288 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,275 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 395 acres of unstable lands and site preparation and planting on about 395 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 3,904 acres.

The indirect effects for landslide risk are the same as for Alternative 2. The duration of elevated risk is the same as Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. The temporary access roads directly on ultramafic rock are the same as for Alternative 2.

Project Area A: Beaver Fire

There are about three acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 60 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 60 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 77 acres. The indirect effects for landslide risk are the same as

for Alternative 2. The duration of elevated risk is the same as for Alternative 2. The effects to landslide risk at the site scale are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. There are no temporary access roads proposed directly on ultramafic rock.

Project Area B: Happy Camp Complex

There are about 2,285 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,205 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 310 acres of unstable lands and site preparation and planting on about 375 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 3,804 acres. The indirect effects for landslide risk are the same as for Alternative 2. The duration of elevated risk is the same as for Alternative 2 except Lower Grider will have a duration of elevated risk of greater than 80 years (Table 3-57).The effects to landslide risk at the site scale are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. The temporary access roads on ultramafic rock are the same as for Alternative 2.

Project Area C: Whites Fire

There are less than 0.1 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 10 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 20 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 23 acres. The indirect effects for landslide risk are the same as for Alternative 2. The duration of elevated risk is the same as for Alternative 2. The effects to landslide risk at the site scale are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. There are no temporary access roads proposed directly on ultramafic rock.

Cumulative Effects for All Fire Areas

The cumulative effects are the same as for Alternative 2.

Modified Alternative 3

Direct Effects and Indirect Effects

There are about 1,973 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,147 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 820 acres of unstable lands and site preparation and planting on about 400 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 3226 acres.

The indirect effects for landslide risk are the same as for Alternative 2. The duration of elevated risk is the same as Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. The temporary access roads directly on ultramafic rock are the same as for Alternative 2.

Project Area A: Beaver Fire

There are no acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 60 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 60 acres of unstable lands and site preparation and planting on about8 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 75 acres. The indirect effects for landslide risk are the same as for Alternative 2. The duration of elevated risk is the same as for Alternative 2. The effects to landslide risk at the site scale are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. There are no temporary access roads proposed directly on ultramafic rock.

Project Area B: Happy Camp Complex

There are about 1,973 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 1,077 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 741 acres of unstable lands and site preparation and planting on about 380 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 3,128 acres. The indirect effects for landslide risk are the same as for Alternative 2. The duration of elevated risk is the same as Alternative 2 except Lower Grider and Tompkins Creek 7th field watersheds will have a duration of elevated risk of more than 80 years instead of 30 years under Alternative 2. The effects to landslide risk at the site scale are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. The temporary access roads directly on ultramafic rock are the same as for Alternative 2.

Project Area C: Whites Fire

There is less than 0.1 acres of salvage harvest proposed on unstable lands as defined by the Forest Plan and considered to be Riparian Reserves. There is about 10 acres of roadside hazard tree removal on unstable lands. Fuels treatments will occur on about 20 acres of unstable lands and site preparation and planting on about 10 acres. Some of these treatments on unstable lands overlap the total footprint of treatment on unstable lands for this alternative are about 23 acres. The duration of elevated risk is the same as for Alternative 2. The effects to landslide risk at the site scale are the same as for Alternative 2.

The likelihood of effects to cave resources protected under the Federal Cave Resources Protection Act is the same as for Alternative 2. There are no temporary access roads proposed directly on ultramafic rock.

Cumulative Effects for All Fire Areas

The cumulative effects are the same as for Alternative 2.

Summary of Effects

There is no change in landslide risk compared to current conditions for any watershed in any of the three fire areas. There is no reduction in the duration of elevated risk for any of the watersheds in Beaver or Whites Fire area. There are nine watersheds in the Happy Camp fire area that have changes in duration of elevated risk for at least one alternative (Table 3-57).

Table 3-57: Comparison of Alternatives for 7th field watersheds with effects to duration of elevated risk.

7th field Watershed	Landslide Risk for all alts.	Duration of Elevated Risk Alt. 1	Duration of Elevated Risk Alt. 2	Duration of Elevated Risk Alt. 3	Duration of Elevated Risk Alt. 4	Duration of Elevated Risk Alt. 5	Duration of Elevated Risk Modified Alt. 2	Duration of Elevated Risk Modified Alt. 3
Upper Grider Creek	High	Greater than 80 years	30 years	30 years	Greater than 80 years	Greater than 80 years	30 years	30 years
Cliff Valley	High	Greater than 80 years	30 years	30 years	30 years	Greater than 80 years	30 years	30 years
Lower Grider Creek	Very High	Greater than 80 years	30 years	Greater than 80 years	Greater than 80 years	Greater than 80 years	Greater than 80 years	Greater than 80 years
O'Neil Creek	High	Greater than 80 years	30 years	30 years	30 years	Greater than 80 years	30 years	30 years
Walker Creek	Very High	Greater than 80 years	30 years	30 years	30 years	Greater than 80 years	30 years	30 years
Caroline Creek	High	Greater than 80 years	30 years	30 years	30 years	Greater than 80 years	30 years	30 years
Middle Creek	Moderate	Greater than 80 years	30 years	30 years	30 years	30 years	30 years	30 years
Tompkins Creek	Moderate	Greater than 80 years	30 years	30 years	30 years	Greater than 80 years	30 years	Greater than 80 years
Horse Creek	Moderate	Greater than 80 years	30 years	30 years	30 years	Greater than 80 years	30 years	30 years
Upper East Fork Elk Creek	Moderate	Greater than 80 years	30 years	30 years	30 years	Greater than 80 years	30 years	30 years
Upper Elk Creek	Moderate	Greater than 80 years	30 years	30 years	Greater than 80 years	Greater than 80 years	30 years	30 years
Lower East Fork Elk Creek	Moderate	Greater than 80 years	30 years	30 years	30 years	30 years	30 years	30 years

Table 3-58: Summary of effects to naturally occurring asbestos, cave resources, groundwater, unique geological area and rock material sources.

Alternative	Acres of New Temporary Road on Ultramafic Rock	Likelihood of Affecting Cave Resources	Likelihood of Affecting Groundwater Resources	Likelihood of Affecting Unique Geological Areas	Likelihood of Affecting Rock Material Sources
Alternative 2	1.6	Very Low	No Effect	No Effect	No Effect
Alternative 3	1.6	Very Low	No Effect	No Effect	No Effect
Alternative 4	1.6	Very Low	No Effect	No Effect	No Effect
Alternative 5	0.0	Very Low	No Effect	No Effect	No Effect
Alternative 2 Modified	1.6	Very Low	No Effect	No Effect	No Effect
Alternative 2 Modified	1.6	Very Low	No Effect	No Effect	No Effect
Alternative 3 Modified	1.6	Very Low	No Effect	No Effect	No Effect

Compliance with law, regulation, policy, and the Forest Plan

The project is compliant with the Klamath National Forest Plan (1995, as amended) Standards and Guidelines. A geologic investigation was completed and natural regeneration of vegetation on unstable lands will improve slope stability in portions of the project area but recovery could take between 30 and 80 years.

Air Quality

The purpose of this section is to analyze the effects of the project and its alternatives on air quality including ambient air quality standards.

Methodology

Analysis Indicators and Methodology

The Conformity Rule of the Clean Air Act applies only to Federal actions proposed in the federal non-attainment areas and makes exceptions for activities with emissions considered to be less than "*de minimis*" values. Siskiyou County is currently in attainment for all criteria pollutants including 8-hour ozone, therefore is no Conformity Rule analysis is required. The *de minimis* for nitrogen oxide emissions (a pollutant related to ozone formation) is 100 tons per year. The average emissions of nitrogen oxides are estimated through the use of the First Order Fire Effects Model (FOFEM).The nitrogen oxide analysis was remodeled for comparison purposes between the draft EIS and the final EIS only.

The analysis will include an evaluation of the estimated residence time of smoke from project activities and its impact to the worst days haze to determine compliance with the Regional Haze Rule (40 CFR Part 51). Compliance with the Regional Haze Rule requires that states make reasonable progress towards achieving natural visibility conditions in Class I areas. The reasonable progress means that the worst haze days get less hazy and that visibility does not deteriorate on the best days, when compared with the baseline period of 2000 to 2004 (California Air Resource Board 2009). Federal agencies should not prevent this progress through management activities. Methodology is discussed in detail in the Air Quality resource report, available on the project website.

The total hazardous fuels treatment acres analyzed for the final EIS is the acres of prescribed burn plus 20 percent of the acres of pile burning. Due to caveats in the emissions model the prescribed fire has to be categorized as either underburn or pile burning. The acres include any acre where underburning is prescribed either as the primary treatment (such as underburn blocks) or as a secondary treatment to reduce fuels such as in salvage units and site preparation and plant. Pile burning is also proposed in areas as a primary or secondary fuels reduction treatment in some of the wildland urban interface, fuels management zones, roadside fuels treatments, salvage units and within site preparation and planting units.

The Council on Environmental Quality recommends that Federal agencies disclose in documentation of their NEPA analyses the effects of climate change for actions that are estimated to emit more than 25,000 metric tons of carbon dioxide equivalents annually (Council on Environmental Quality 2014). This is not a threshold for adverse effects but rather a trigger point for when an analysis of greenhouse gas emissions is needed.

Fugitive dust analysis was completed per the request of the Siskiyou County Air Pollution Control District (see response to comments section of final EIS). For the purpose of this analysis fugitive dust is measured as particulate matter as either PM_{10} (particulate matter less than 10 micrometers). The primary source of fugitive dust for the Westside Fire Recovery project is hauling logs on unpaved roads. Siskiyou County is in attainment for PM_{10} so there are no conformity regulations regarding the emissions. The analysis indicator for this analysis is likelihood of conformity. A high likelihood of conformity will occur if the emissions are less than 50 percent of the *de minimis* per year. There is a moderate likelihood of conforming if the emissions are estimated to be more than 50 percent but less than 90 percent of the *de minimis*, and a low likelihood if the emissions are estimated to be more than 90 percent of the *de minimis*.

The emissions factor is taken from the USFS Desk Reference for NEPA Air Quality Analysis (USFS 1995, page 3.2.1-1:10). The analysis assumes five miles is the average haul length and that every haul is a round trip .This is an assumed total 10 miles per log load on unpaved roads.

The tons of fugitive dust can be compared to the general conformity rule *de minimis* contamination. There is no *de minimis* for attainment areas (such as Siskiyou County) but this comparison allows for a quantitative analysis of Clean Air Act compliance and a relative measure of emissions. The *de minimis* for PM_{10} is 100 tons per year.

Spatial and Temporal Context

For this project, the spatial boundary includes the project area, the local communities, and the Marble Mountain Wilderness. Temporally, emissions from mobile sources such as logging trucks and tractors, as well as from prescribed burning, are transient and the impacts are short-lived and the air quality regulations are in terms of one-year emissions. The temporal analyses are on an annual basis and considered short-term. Impacts are considered long-term if they persist for more than a year. The cumulative effects of the mobile source emissions, fugitive dust and smoke emission will be addressed on the 7th field watershed scale.

Affected Environment

The project area is primarily forested federally managed lands with no substantial human-caused emission sources within the area other than emission and fugitive dust from logging and recreation. Other emission contributions will be smoke and haze from seasonal wildland and prescribed fires from both within and outside the county. According to the California Air Resources Board (http://www.arb.ca.gov/app/emsinv/emssumcat.php) the nitrogen oxide emissions are primarily from heavy-duty diesel trucks (such as from the I-5 corridor).

The project is adjacent to the Marble Mountain Wilderness which is designated as a Class I wilderness by the Clean Air Act. The project is adjacent to the Russian Wilderness; however, this is a Class II wilderness and is not subject to the regional haze rule. The worst air quality days are dominated by organic aerosols (particulate matter associated that cause a haze in the air). Organic aerosols peak during the summer months and are strongly correlated with the incidence of wildfires (California Air Resource Board, 2009).

Naturally occurring asbestos is addressed in the Geology report addendum and Chapter 3 of the Final Environmental Impact Statement.

Environmental Consequences

The regulations and guidance for air quality analysis for nitrogen oxide and guidance for greenhouse gas emission disclosure guidance are at the project scale. The analysis of the emissions for the entire project area is described by alternative in the effects section below. For comparison purposes, the emissions are displayed in tables 2 through 4 by fire area in the summary of effects section below.

Alternative 1

Direct Effects and Indirect Effects

Under this alternative no management action will be taken that will emit nitrogen oxides, greenhouse gases, or impact the visibility in the Marble Mountain Wilderness.

Cumulative Effects

There are no direct or indirect effects for this alternative and therefore no cumulative effects.

Alternative 2

Direct Effects and Indirect Effects

There will be about 8 tons of nitrogen oxide emissions per year from prescribed fire and 26 tons per year from mobile sources for a total of 34 tons per year. This is less than the *de minimis* allowed to meet the Conformity Rule.

There will be about 45,130 metric tons of carbon dioxide equivalents from prescribed fire and 1026 metric tons of carbon dioxide equivalents from mobile sources. This is a total of 46,155 metric tons of carbon dioxide equivalents per year from this project.

There will be about 220 tons per year of fugitive dust that will be mitigated by project design features requiring dust mitigation on non-paved roadways. The mitigation will reduce the fugitive dust emissions to about 44 tons per year for the entire project area.

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 0.4 per year for the Beaver Fire area. The emissions from heavy equipment (including logging trucks) will be about 5 tons per year and there are no emissions from helicopters. The total nitrogen oxide emitted from the Beaver Fire area treatments will be 5.4 per year.

There will be no effect to any Class I wildernesses due to their absence in the Beaver Fire area.

Greenhouse gas emission will be about 2,128 metric tons of carbon dioxide equivalents per year from prescribed burning. There will be about 168 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks) and no emissions associated with helicopters for the Beaver Fire area. This is a total of 2,296 metric tons of carbon dioxide equivalent per year from the Beaver Fire area.

There would be about 13 tons per year of fugitive dust created if no mitigations were applied. The project design features requiring dust suppression on log hauling routes (Chapter 2 of the final EIS) will reduce those emissions by as much as 80 percent. This will reduce the emissions to about 2 tons per year.

Cumulative Effects

Cumulative effects are described in the Air Quality Resources report for nitrogen oxide and greenhouse gas emissions. For fugitive dust, Siskiyou County is in attainment for PM_{10} and will remain in attainment with the implementation of this project in conjunction with the future and on-going projects. It is assumed that all Forest and private lands projects have a high likelihood of conforming because of the common mitigation of watering or otherwise mitigating fugitive dust on unpaved roads. So cumulatively the project will have a high likelihood of conforming should conformity be required.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 2.8 per year for the Happy Camp Fire area. The emissions from heavy equipment (including logging trucks) will be about 15 tons per year and about 0.9 tons per year from helicopter use. The total nitrogen oxide emitted from the Happy Camp Fire area treatments will be about 19 per year.

Prescribed fire in the Happy Camp fire area may be noticeable in the Marble Mountain Wilderness which is a Clean Air Act Class I Wilderness. The prescribed fire and related smoke that will affect visibility in the wilderness will occur over a few days any given year. The likelihood of making the worst haze days worse is low. The worst haze days occur during wildfires – when implementing prescribed fire is very unlikely. If prescribed fire should overlap with the worst haze days the haze from the wildfire would overshadow the prescribed fire haze. The project will not have any permanent effect on haze in the Class I wilderness. The likelihood that prescribed burning smoke will affect the best days over an entire year is very low. The likelihood of preventing the progress of the Regional Haze rule is very low.

Greenhouse gas emission will be about 15,906 metric tons of carbon dioxide equivalent per year from prescribed burning. There will be about 504 metric tons of carbon dioxide equivalent per year from heavy equipment used for treatments (including log trucks).

There will be about 168 tons per year of carbon dioxide equivalents from helicopter use. This is a total of 16,578 metric tons of carbon dioxide equivalent per year from the Happy Camp Fire area.

There would be about 174 tons per year of fugitive dust created if no mitigations were applied. The project design features requiring dust suppression on log hauling routes (Chapter 2 of the final EIS) will reduce those emissions by as much as 80 percent or to about 35 tons per year.

Cumulative Effects

Cumulative effects are the same as for Beaver Fire area.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 4.8 per year for the Whites Fire area. The emissions from heavy equipment (including logging trucks) will be about 5 tons per year and about 0.1 tons per year from helicopter use. The total nitrogen oxide emitted from the Whites Fire area treatments will be about 10 tons per year.

The effects to Class I wildernesses and Inventoried Roadless Areas the same as described in the Happy Camp Complex analysis above.

Greenhouse gas emission will be about 27,095 metric tons of carbon dioxide equivalent per year from prescribed burning. There will be about 168 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks). There will be about 18 tons per year of carbon dioxide equivalents from helicopter use. This is a total of 27,281 metric tons of carbon dioxide equivalent per year from the Whites Fire area.

There would be about 33 tons per year of fugitive dust created if no mitigations were applied. The project design features requiring dust suppression on log hauling routes (Chapter 2 of the final EIS) will reduce those emissions by as much as 80 percent (to about 7 tons per year).

Cumulative Effects

Cumulative effects the same as for Beaver Fire area.

Alternative 3

Direct Effects and Indirect Effects

There will be about 8 tons of nitrogen oxide emissions per year from prescribed fire and 26 tons per year from mobile sources for a total of 34 tons per year. This is less than the *de minimis* allowed to meet the Conformity Rule.

There will be about 44,680 metric tons of carbon dioxide equivalents from prescribed fire and 1026 metric tons of carbon dioxide equivalents from mobile sources. This is a total of 45,706 metric tons of carbon dioxide equivalents per year from this project.

There will be about 220 tons per year of fugitive dust that will be mitigated by project design features requiring dust mitigation on non-paved roadways. The mitigation will reduce the fugitive dust emissions to about 44 tons per year for the entire project area.

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 0.3 per year for the Beaver Fire area. The emissions from heavy equipment (including logging trucks) will be about 5 tons per year and there are no emissions from helicopters. The total nitrogen oxide emitted from the Beaver Fire area treatments will be 5.3 per year.

There will be no effect to any Class I wildernesses due to their absence in the Beaver Fire area.

Greenhouse gas emission will be about 1,938 metric tons of carbon dioxide equivalents per year from prescribed burning. There will be about 168 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks) and no emissions associated with helicopters for the Beaver Fire area. This is a total of 2,106 metric tons of carbon dioxide equivalent per year from the Beaver Fire area.

Fugitive dust emissions will be the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 2.8 per year for the Happy Camp Fire area. The emissions from heavy equipment (including logging trucks) will be about 15 tons per year and about 0.9 tons per year from helicopter use. The total nitrogen oxide emitted from the Happy Camp Fire area treatments will be about 19 per year.

The effects to Class I wildernesses are the same as for Alternative 2.

Greenhouse gas emission will be about 15,680 metric tons of carbon dioxide equivalent per year from prescribed burning. There will be about 504 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks). There will be about 168 tons per year of carbon dioxide equivalents from helicopter use. This is a total of 16,352 metric tons of carbon dioxide equivalent per year from the Happy Camp Fire area.

Fugitive dust emissions will be the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 4.8 per year for the Whites Fire area. The emissions from heavy equipment (including logging trucks) will be about 5 tons per year and about 0.1 tons per year from helicopter use. The total nitrogen oxide emitted from the Whites Fire area treatments will be about 10 tons per year.

The effects to Class I wildernesses and Inventoried Roadless Areas the same as described in the Happy Camp Complex analysis section of Alternative 2 above.

Greenhouse gas emission will be about 27,062 metric tons of carbon dioxide equivalent per year from prescribed burning. There will be about 168 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks). There will be about 18 tons per year of carbon dioxide equivalents from helicopter use. This is a total of 27,248 metric tons of carbon dioxide equivalent per year from the Whites Fire area.

Fugitive dust emissions will be the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Alternative 4

Direct Effects and Indirect Effects

There will be about 8 tons of nitrogen oxide emissions per year from prescribed fire and 26 tons per year from mobile sources for a total of 34 tons per year. This is less than the *de minimis* allowed to meet the Conformity Rule.

There will be about 44,391 metric tons of carbon dioxide equivalents from prescribed fire and 845 metric tons of carbon dioxide equivalents from mobile sources. This is a total of 45,231 metric tons of carbon dioxide equivalents per year from this project.

There will be about 220 tons per year of fugitive dust that will be mitigated by project design features requiring dust mitigation on non-paved roadways. The mitigation will reduce the fugitive dust emissions to about 44 tons per year for the entire project area.

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 0.4 per year for the Beaver Fire area. The emissions from heavy equipment (including logging trucks) will be about 5 tons per year and there are no emissions from helicopters. The total nitrogen oxide emitted from the Beaver Fire area treatments will be 5.4 per year.

There will be no effect to any inventoried roadless areas or Class I wildernesses due to their absence in the Beaver Fire area.

Greenhouse gas emission will be about 2,108 metric tons of carbon dioxide equivalents per year from prescribed burning. There will be about 168 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks) and no emissions associated with helicopters for the Beaver Fire area. This is a total of 2,276 metric tons of carbon dioxide equivalent per year from the Beaver Fire area.

Fugitive dust emissions will be the same as for Alternative 2.

Cumulative Effects

Cumulative effects the same as for Alternative 2.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 2.8 per year for the Happy Camp Fire area. The emissions from heavy equipment (including logging trucks) will be about 15 tons per year and about 0.9 tons per year from helicopter use. The total nitrogen oxide emitted from the Happy Camp Fire area treatments will be about 19 per year.

The effects to Class I wildernesses are the same as for Alternative 2.

Greenhouse gas emission will be about 15,188 metric tons of carbon dioxide equivalent per year from prescribed burning. There will be about 504 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks). There will be about 168 tons per year of carbon dioxide equivalents from helicopter use. This is a total of 15,860 metric tons of carbon dioxide equivalent per year from the Happy Camp Fire area.

Fugitive dust emissions will be the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 4.8 per year for the Whites Fire area. The emissions from heavy equipment (including logging trucks) will be about 5 tons per year and about 0.1 tons per year from helicopter use. The total nitrogen oxide emitted from the Whites Fire area treatments will be about 10 tons per year.

The effects to Class I wildernesses and Inventoried Roadless Areas the same as described in the Happy Camp Complex analysis section of Alternative 2 above.

Greenhouse gas emission will be about 27,095 metric tons of carbon dioxide equivalent per year from prescribed burning. There will be about 168 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks). There will be about 18 tons per year of carbon dioxide equivalents from helicopter use. This is a total of 27,281 metric tons of carbon dioxide equivalent per year from the Whites Fire area.

Fugitive dust emissions will be the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Alternative 5

Direct Effects and Indirect Effects

There will be about 7 tons of nitrogen oxide emissions per year from prescribed fire and 8 tons per year from mobile sources for a total of 15 tons per year. This is less than the *de minimis* allowed to meet the Conformity Rule.

There will be about 38,982 metric tons of carbon dioxide equivalents from prescribed fire and 308 metric tons of carbon dioxide equivalents from mobile sources. This is a total of 39,290 metric tons of carbon dioxide equivalents per year from this project.

There will be about 60 tons per year of fugitive dust that will be mitigated by project design features requiring dust mitigation on non-paved roadways. The mitigation will reduce the fugitive dust emissions to about 12 tons per year for the entire project area.

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 0.4 per year for the Beaver Fire area. The emissions from heavy equipment (including logging trucks) will be about 1.5 tons per year and there are no emissions from helicopters. The total nitrogen oxide emitted from the Beaver Fire area treatments will be 1.9 per year.

There will be no effect to any Class I wildernesses due to their absence in the Beaver Fire area.

Greenhouse gas emission will be about 2,108 metric tons of carbon dioxide equivalents per year from prescribed burning. There will be about 50 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks) and no emissions associated with helicopters for the Beaver Fire area. This is a total of 2,158 metric tons of carbon dioxide equivalent per year from the Beaver Fire area.

There would be about 4 tons per year of fugitive dust created if no mitigations were applied. The project design features requiring dust suppression on log hauling routes (Chapter 2 of the final EIS) will reduce those emissions by as much as 80 percent. This will reduce the emissions to about 1 tons per year.

Cumulative Effects

Cumulative effects are the same as Alternative 2.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 1.8 per year for the Happy Camp Fire area. The emissions from heavy equipment (including logging trucks) will be about 4 tons per year and about 0.9 tons per year from helicopter use. The total nitrogen oxide emitted from the Happy Camp Fire area treatments will be about 6.7 per year.

The effects to Class I wildernesses are the same as for Alternative 2.

Greenhouse gas emission will be about 10,492 metric tons of carbon dioxide equivalents per year from prescribed burning. There will be about 151 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks). There will be about 51 tons per year of carbon dioxide equivalents from helicopter use. This is a total of 10,694 metric tons of carbon dioxide equivalent per year from the Happy Camp Fire area.

There would be about 52 tons per year of fugitive dust created if no mitigations were applied. The project design features requiring dust suppression on log hauling routes (Chapter 2 of the final EIS) will reduce those emissions by as much as 80 percent. This will reduce the emissions to about 10 tons per year.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The nitrogen oxide emissions from prescribed fire will be 4.8 per year for the Whites Fire area. The emissions from heavy equipment (including logging trucks) will be about 1.5 tons per year and about 0.1 tons per year from helicopter use. The total nitrogen oxide emitted from the Whites Fire area treatments will be about 6.4 tons per year.

The effects to Class I wildernesses and Inventoried Roadless Areas the same as described in the Happy Camp Complex analysis section of Alternative 2 above.

Greenhouse gas emission will be about 26,382 metric tons of carbon dioxide equivalent per year from prescribed burning. There will be about 50 metric tons of carbon dioxide equivalents per year from heavy equipment used for treatments (including log trucks). There will be about 6 tons per year of carbon dioxide equivalents from helicopter use. This is a total of 26,438 metric tons of carbon dioxide equivalent per year from the Whites Fire area.

There would be about 4 tons per year of fugitive dust created if no mitigations were applied. The project design features requiring dust suppression on log hauling routes (Chapter 2 of the final EIS) will reduce those emissions by as much as 80 percent. This will reduce the emissions to about 1 ton per year.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Alternative 2 Modified

There will be about 8 tons of nitrogen oxide emissions per year from prescribed fire and 26 tons per year from mobile sources for a total of 34 tons per year. This is less than the *de minimis* allowed to meet the Conformity Rule.

There will be about 45,163 metric tons of carbon dioxide equivalents from prescribed fire and 1026 metric tons of carbon dioxide equivalents from mobile sources. This is a total of 46,196 metric tons of carbon dioxide equivalents per year from this project.

There will be about 44 tons per year of fugitive dust that will be mitigated by project design features requiring dust mitigation on non-paved roadways. The mitigation will reduce the fugitive dust emissions to about 12 tons per year for the entire project area.

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

There will be about 0.4 tons per year of nitrogen oxide emission from prescribed burning. There will be about 5 tons per year of nitrogen oxide emissions from mobile sources. This is a total of 5.4 tons per year of nitrogen oxide emissions.

The Beaver fire area is not adjacent to a Class I Wilderness or Inventoried Roadless Areas. The activities in this area will not affect the Regional Haze Rule or roadless character.

There will be 2,175 metric tons of carbon dioxide equivalents from prescribed burning and 168 metric tons from mobile sources for a total of 2,343 metric tons of carbon dioxide equivalents for the Beaver fire area.

The effects to fugitive dust are the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

There will be about 2.8 tons per year of nitrogen oxide emission from prescribed burning. There will be about 16 tons per year of nitrogen oxide emissions from mobile sources. This is a total of 18.8 tons per year of nitrogen oxide emissions.

The effects to Class I wildernesses are the same as for Alternative 2.

There will be 15,906 metric tons of carbon dioxide equivalents from prescribed burning and 672 metric tons from mobile sources for a total of 16,572 metric tons of carbon dioxide equivalents for the Happy Camp fire area.

The effects to fugitive dust are the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

There will be about 4.8 tons per year of nitrogen oxide emission from prescribed burning. There will be about 5 tons per year of nitrogen oxide emissions from mobile sources. This is a total of 9.8 tons per year of nitrogen oxide emissions.

The effects to Class I wildernesses and Inventoried Roadless Areas the same as described in the Happy Camp Complex analysis section of Alternative 2 above.

There will be 27,095 metric tons of carbon dioxide equivalents from prescribed burning and 186 metric tons from mobile sources for a total of 27,281 metric tons of carbon dioxide equivalents for the Whites fire area.

The effects to fugitive dust are the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Alternative 3 Modified

There will be about 8.4 tons of nitrogen oxide emissions per year from prescribed fire and 26 tons per year from mobile sources for a total of 34.4 tons per year. This is less than the *de minimis* allowed to meet the Conformity Rule.

There will be about 46,984 metric tons of carbon dioxide equivalents from prescribed fire and 1026 metric tons of carbon dioxide equivalents from mobile sources. This is a total of 48,010 metric tons of carbon dioxide equivalents per year from this project.

There will be about 44 tons per year of fugitive dust that will be mitigated by project design features requiring dust mitigation on non-paved roadways. The mitigation will reduce the fugitive dust emissions to about 12 tons per year for the entire project area.

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

There will be about 0.6 tons per year of nitrogen oxide emission from prescribed burning. There will be about 5 tons per year of nitrogen oxide emissions from mobile sources. This is a total of 5.6 tons per year of nitrogen oxide emissions.

The Beaver fire area is not adjacent to a Class I Wilderness or Inventoried Roadless Areas. The activities in this area will not affect the Regional Haze Rule or roadless character.

There will be 3,578 metric tons of carbon dioxide equivalents from prescribed burning and 168 metric tons from mobile sources for a total of 3,746 metric tons of carbon dioxide equivalents for the Beaver fire area.

The effects to fugitive dust are the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

There will be about 2.8 tons per year of nitrogen oxide emission from prescribed burning. There will be about 16 tons per year of nitrogen oxide emissions from mobile sources. This is a total of 18.8 tons per year of nitrogen oxide emissions.

The effects to Class I wildernesses are the same as for Alternative 2.

There will be 15,974 metric tons of carbon dioxide equivalents from prescribed burning and 672 metric tons from mobile sources for a total of 16,646 metric tons of carbon dioxide equivalents for the Happy Camp fire area.

The effects to fugitive dust are the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

There will be about 4.8 tons per year of nitrogen oxide emission from prescribed burning. There will be about 5 tons per year of nitrogen oxide emissions from mobile sources. This is a total of 9.8 tons per year of nitrogen oxide emissions.

The effects to Class I wildernesses and Inventoried Roadless Areas the same as described in the Happy Camp Complex analysis above.

There will be 27,431 metric tons of carbon dioxide equivalents from prescribed burning and 186 metric tons from mobile sources for a total of 27,617 metric tons of carbon dioxide equivalents for the Whites fire area.

The effects to fugitive dust are the same as for Alternative 2.

Cumulative Effects

Cumulative effects are the same as for Alternative 2.

Summary of Effects

Table 3-59: Summary of Effects for the Beaver Fire Area.

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt. 3
Nitrogen Oxide Emissions (tons/year)	0	5.4	5.3	5.4	1.9	5.4	5.6
Carbon Dioxide Equivalent Emissions (metric tons/year)	0	2,296	2,106	2,276	2,158	2,343	3,746
Fugitive Dust (tons/year)	0	2	2	2	1	2	2

Table 3-60: Summary of Effects for the Happy Camp Fire Area.

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt 3
Nitrogen Oxide Emissions (tons/year)	0	19	19	19	6.7	18.8	18.8
Carbon Dioxide Equivalent Emissions (metric tons/year)	0	16,578	16,352	15,860	10,694	16,572	16,646
Fugitive Dust (tons/year)	0	35	35	35	10	35	35

Table 3-61: Summary of Effects for the Whites Fire Area.

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt 3
Nitrogen Oxide Emissions (tons/year)	0	10	10	10	6.4	9.8	9.8
Carbon Dioxide Equivalent Emissions (metric tons/year)	0	27,281	27,248	27,095	26,438	27,281	27,617
Fugitive Dust (tons/year)	0	7	7	7	2	7	7

Table 3-62: Summary of Effects for the entire project area.

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Mod Alt. 2	Mod Alt 3
Nitrogen Oxide Emissions (tons/year)	0	34	34	34	15	34	34
Carbon Dioxide Equivalent Emissions (metric tons/year)	0	46,155	45,706	45,231	39,290	46,196	48,010
Fugitive Dust (tons/year)	0	44	44	44	12	44	44

Compliance with law, regulation, policy, and the Forest Plan

All alternatives are compliant with the Clean Air Act and the Conformity Rule. The project will not prevent the progress of the State of California's Regional Haze Plan as required by the Regional Haze Rule, and will be consistent with the Forest Plan as displayed on the Forest Plan consistency checklist, available on the project website.

Heritage Resources

The purpose of this section is to outline the process for determining effects of the Westside Fire Recovery Project on properties included in or eligible for the National Register of Historic Places (NRHP). Effects analysis is required under Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended and is accomplished by the Klamath National Forest (Forest) under the *Programmatic Agreement Among*

U.S.D.A. Forest Service, Pacific Southwest Region (Region 5), California State Historic Preservation Officer, Nevada State Historic Preservation Officer, Advisory Council on Historic Preservation Regarding the Processes for Compliance with Section 106 of the National Historic Preservation Act for Management of Historic Properties by the National Forests of the Pacific Southwest Region (Region 5 PA). However, the Forest has determined that the effects of the project cannot be fully assessed prior to the issuance of the Record of Decision, and therefore the Forest proposed phased identification and evaluation pursuant to 36 C.F.R. § 800.4(b)(2) in a programmatic agreement prepared in accordance with 36 C.F.R. § 800.14(b)(3). This agreement, the *Programmatic Agreement Among the U.S.D.A. Forest Service, Klamath National Forest; the California State Historic Preservation Officer; and the Advisory Council on Historic Preservation Regarding the Westside Fire Recovery Program, Siskiyou County, California (WFR Programmatic Agreement)*, is being developed in consultation with tribes, and requires identification and evaluation of historic properties and cultural resources prior to implementing any project activities. Project activities will be implemented in phases, as a program of undertakings. The Section 106 process will be completed for each undertaking in accordance with the forthcoming WFR Programmatic Agreement's stipulations, in order to take into account the effect of the undertakings on historic properties and cultural resources.

An *historic property* is a prehistoric or historic-era district, site, building, structure, or object, included in or eligible for inclusion on the National Register including associated artifacts, remains, features, settings, and records that are over 50 years of age. The term also includes properties of traditional religious and cultural importance to an Indian tribe, so long as that property also meets the criteria for listing in the National Register. These properties may include Traditional Cultural Properties, which are tangible locations of traditional religious or cultural importance or Scared Sites, which are locations identified by tribal authorities to the agency that are specific, discrete, and narrowly delineated, e.g., locations where spiritual practices take place or sacred viewsheds. Tribal Sacred Sites may not always meet the criteria of an historic property. In these cases, agencies are directed to avoid adverse effects to the site's physical integrity under Executive Order 13007.

A *cultural resource* is an object or definite location of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, places, or objects and traditional cultural properties. Cultural resources include the entire spectrum of resources for which the Heritage Program is responsible from artifacts to cultural landscapes without regard to eligibility for listing on the National Register of Historic Places (FSM 2360.5). Cultural resources, such as traditional-use areas may be managed as an historic property when these areas are identified by tribal authorities to the agency during the planning process.

The Forest acknowledges that tribal resources encompass the full spectrum of cultural and natural resources. This section only analyzes the effects of the Westside Fire Recovery Project on cultural resources as defined above. The effects of the project on natural resources are analyzed by various specialists in other sections of Chapter 3, e.g. Botany, Fisheries, Wildlife, etc.

Detailed descriptions of the project alternatives are found in Chapter 2.

Methodology

As stated above, the National Historic Preservation Act of 1966, as amended "requires federal agencies to take into account the effects of their undertakings on historic properties." This is accomplished through a four-step process following 36 CFR Part 800, the implementing regulations for Section 106 of the NHPA, or through alternative procedures set forth in programmatic agreements.

The Region 5 PA provides definitions of terms, roles and responsibilities, general program guidance, exemptions from review and a "screened" review process for routine forest undertakings, which serve as the framework for the forthcoming WFR Programmatic Agreement. The forthcoming WFR Programmatic Agreement covers all activities proposed under the Westside Fire Recovery Project, and are collectively referred to as the "program". Because implementation of the program will occur in phases (hazard tree removal, timber harvest, fuels reduction, etc.), with each phase consisting of several undertakings (e.g. individual timber sales), the effects on historic properties and cultural resources will be analyzed for each undertaking according to the WFR Programmatic Agreement stipulations. The forthcoming WFR Programmatic Agreement includes a program specific survey protocol and a process for resolving any adverse effects, if it is determined that adverse effects may occur. It expands the Standard Resource Protection Measures and expedited ineligible determinations allowed under the Regional PA. The forthcoming WFR Programmatic Agreement also provides for robust tribal input and involvement in the identification of significant tribal cultural resources and the evaluation and assessment of effects to these resources.

There are two key parameters for analyzing effects to historic properties. The first parameter is defining an Area of Potential Effect. 36 CFR 800.16(d) defines the Area of Potential Effect, which is essentially the area within which project activities are expected to occur that may affect historic properties or cultural resources. By delineating the area within which effects are anticipated to occur, the scope of analysis is established. The second parameter is determining whether historic properties or cultural resources are present or identified within the Area of Potential Effect. Identification is a three-step process of pre-field research, consultation and field surveys.

Once the Area of Potential Effect (APE) is defined and historic properties and cultural resources within the APE identified, analyses are conducted to determine if the proposed project will directly or indirectly cause changes in the character or use of the historic properties and/or cultural resources. If no historic properties or cultural resources are present, there will be no adverse effects. If historic properties and/or cultural resources are present and any potential adverse effects can be mitigated through project design features or Standard Resource Protection Measures, historic properties and/or cultural resources will not be adversely affected. If historic properties and/or cultural resources are present, and potential adverse effects cannot be mitigated through management or Standard Resource Protection Measures, the Forest will prepare a Historic Property Treatment Plan, in consultation with the State Historic Preservation Office (SHPO) and tribes as appropriate that will stipulate the actions the Forest will take to resolve the effects and ensure those actions are implemented.

Analysis Indicators

The analysis process includes establishing indicators to measure effects. Indicators for analyzing project effects on historic properties and cultural resources are (a) the number of *at risk* historic properties and cultural resources; and (b) the degree (level) to which the integrity of historic values of these properties/resources may be diminished by the project activities.

At-risk historic properties and cultural resources are those that are significant and retain integrity, and have been identified as being susceptible to adverse effects by specific undertaking activities. The degree to which an *at-risk* property or resource's integrity is diminished by project activities is classified by relative degree within four categories – negligible, minor, moderate, or major. If the project activities would change one or more of the character-defining features and diminish the integrity of the resource to the extent that it would no longer be eligible for listing on the NRHP, the effects would be adverse (the degree of change would be moderate to major). Adverse effects must be resolved in consultation with the SHPO and tribes as applicable under the stipulations in the forthcoming WFR Programmatic Agreement.

Direct and indirect effects, as well as the effects of reasonably foreseeable future actions (cumulative effects), that may diminish the integrity of historic properties and cultural resources identified in the area of potential effects are analyzed.

Spatial and Temporal Context

Spatial boundaries for the analysis of effects are the Area of Potential Effect as defined by the National Historic Preservation Act and its implementing regulations (36 CFR Part 800). The Area of Potential Effect for this project includes areas where treatment activities are proposed and areas used in support of treatment activities. Temporal boundaries for the short term are based on the effect being anticipated to occur during or within one to eight years of implementation. Long-term effects will occur after the eight years following implementation.

Affected Environment

The affected environment for the Westside Fire Recovery (WFR) Project mainly consists of steep, rugged mountains, incised by numerous rivers and creeks. The isolating effects of this landscape have resulted in a diversity of natural resources that have been sought and used by humans for thousands of years. Evidence of past use is spread across the project area but is concentrated into those areas people used most intensively, such as terraces, benches, areas along rivers and their tributaries, and areas where resources such as plants, animals, or minerals are exploited relatively easily. A record of human presence is found across the landscape in the material remains left behind which comprise a record of irreplaceable and non-renewable resources related to past human life and land use. This record includes historic properties as well as locations of cultural importance to local Native American groups.

Although few archaeological investigations into the prehistory of the project area have been conducted, Pilot Ridge, the foundational study for the interior North Coast Ranges revealed evidence of 8,000 years of human occupation and highlighted a forager subsistence- settlement pattern that required frequent moves of entire social units to locate resources. Archaeological site distributions shifted over time, in response to

climatically induced vegetation shifts, and produced generalized artifact assemblages (Hildebrandt and Hays 2007).

The WFR Project lies within the ancestral territories of groups from the Shastean Complex, specifically the Salmon, Scott and Klamath River Shasta, as well as the Karuk Tribe. Like most tribes in California, the Shastean and Karuk people were engaged in seasonal subsistence rounds. The people would foray out from permanent village sites throughout the year as resources became available for harvesting and processing. When resources had been procured, individuals and families would return to the village sites and store the supplies for future use. The project area has numerous culturally significant plant stands (e.g. tanoaks, bear grass, hazel, huckleberry) within and adjacent to natural openings, plantations and meadow areas. Important species were often managed and enhanced by tribes through the use of fire.

Native groups in this area, like in much of California, were severely impacted when gold was discovered. Native people were crowded off their fishing and hunting grounds by Euro-American miners and subsequent settlers, and villages decimated by this disruption and European diseases. However, native cultures survive and native peoples are actively preserving their traditional knowledge and lifeways.

Euro-Americans entered into Siskiyou County in 1827, with regular forays into the area by the early 1840s. With the 1851-1852 gold strikes, the gentler-slopes/lower-elevations of the Klamath Mountain watersheds steadily became transformed into an intensively exploited and densely populated landscape. By the 1870s, large-scale hydraulic mining of the region's placer deposits began. From the 1870s into the early twentieth century, systems of high ditches, head boxes, iron-pipe penstocks, "giant" nozzles, huge sluice systems, and the other accoutrements of "hydraulicking" transformed many of the project-area's stream bottoms into a landscape of vast, linear 'washing pits' (the mined out areas of ancient alluvium) located within, adjacent, and parallel to stream courses. The project area encompasses portions of several historic mining districts.

Livestock operations arose in support of miners and later expanded as fluctuating mining populations stabilized and communities became more settled. With the creation of the National Forest Preserves in 1905, most of the project area became part of the Klamath National Forest. By the 1950s the timber industry assumed a prominent role in the use of the landscape. During its prominence, until the passage of environmental laws in the late 1960s and early 1970s, this industry extracted large volumes of timber from the Forest, the effects of which are still visible across the landscape. Recreation in the form of hunting, fishing, rafting, hiking, and camping has been and continues to be a key component of the land use within the project area.

Project Area A: Beaver Fire

There are eight recorded historic properties within the Beaver Fire Area of Potential Effect; seven are historic and one contains components of both historic and precontact time periods. There are approximately 2,600 acres that will be surveyed prior to project implementation. The Beaver Fire project area is entirely within the ancestral territory of Shastean people. At the time of publication, no Traditional Cultural Properties or Sacred Sites had been identified within this Area of Potential Effect. Once the Section 106 process is completed for an undertaking in this project area, an Archaeological Survey

Report will be prepared to document survey results, analysis of project effects and resolution of adverse effects, if needed.

Project Area B: Happy Camp Complex

There are forty-three recorded historic properties within the Happy Camp Complex Area of Potential Effect; thirty-seven are historic, four precontact, and two contain components of both historic and precontact periods. There are at least 4,300 acres that will be surveyed prior to project implementation. Approximately one third of the Happy Camp Complex project area is within the ancestral territory of the Karuk Tribe, approximately one third is within the ancestral territory of Shastean groups and about one third represents an area of overlap of the two group's ancestral territories. At the time of publication, no Traditional Cultural Properties or Sacred Sites had been identified within this Area of Potential Effect. The Karuk did bring forward a concern about an as yet unevaluated property of religious and cultural significance to the Tribe, however the Forest and the Tribe acknowledge that it is not necessary to fully identify and evaluate its eligibility under the stipulations of the forthcoming WFR Programmatic Agreement in order to project if during project implementation. Once the Section 106 process is completed for an undertaking in this project area, an Archaeological Survey Report will be prepared to document survey results, analysis of project effects and resolution of adverse effects, if needed.

Project Area C: Whites Fire

There are thirty-four recorded historic properties within the Whites Fire Area of Potential Effect; all of which date to the historic period. There are approximately 790 acres that will be surveyed prior to project implementation. Nearly three-quarters of the Whites Fire project area is within the ancestral territory of Shastean people and approximately one quarter is within Karuk ancestral territory. At the time of publication, no Traditional Cultural Properties or Sacred Sites had been identified within the Area of Potential Effect. Once the Section 106 process is completed for an undertaking in this project area, an Archaeological Survey Report will be prepared to document survey results, analysis of project effects and resolution of adverse effects, if needed.

Environmental Consequences

Using the analysis indicators outlined above, each alternative is considered based on the proposed management actions and the relative level of potential effects to historic properties and cultural resources. If an action alters in any way the characteristics that qualify the property or resource for inclusion on the National Register of Historic Places (NRHP), it is considered to have an effect. An effect can be direct or indirect, beneficial or adverse. Effects are "adverse" when the alterations diminish one or more of the seven elements of a historic property or cultural resource's integrity (location, design, setting, materials, workmanship, feeling, or association). The degree (level) to which the integrity is diminished by the proposed actions are classed into four categories that are based upon relative intensity – negligible, minor, moderate, major. A "no adverse effect" occurs when the project has an effect on the property or resource but is not harmful to the characteristics that qualify the resource for inclusion on the NRHP. A finding of "no adverse effect" may also occur if the effects of the proposed project can be reasonably predicted and project design features or Standard Resource Protection Measures can be used to avoid or minimize potential adverse effects to historic properties or cultural

resources. Standard Resource Protection Measures are provided in the Region 5 PA, Appendix E; additional project-specific Standard Resources Protection Measures are provided in the forthcoming WFR Programmatic Agreement.

Under the National Historic Preservation Act, Section 304 and the Archaeological Resources Protection Act of 1979, Section 9a, the disclosure of information revealing the location or character of historic or archaeological resources is prohibited when this information would open the resources or their settings to a substantial risk of harm, theft, or destruction. Therefore, discussion of the effects of this project is generalized into two types of historic properties and cultural resources rather than individual properties or resources. Project design features have been developed to protect these resources while not disclosing specific locations.

Alternative 1

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Historic Properties

There would be no direct effects to historic properties because no management action would be implemented. However, there would also be no actions taken in the project area to reduce fire-weakened trees from within and around historic properties. Tree mortality, such as that resulting from wildfires, often puts historic properties at risk. When trees are left to fall naturally, these trees may damage or destroy site features or displace the same when uprooting (e.g. rock walls, house pits). The effects of tree fall are often compounded by erosion, which can bury or displace cultural deposits; increased fuel loading that increases fire intensity and the potential for artifact damage, destruction or permanent alteration; and accelerated decay as previously unexposed surfaces become exposed. Tree fall may also affect linear resources through erosion, and blowouts where culverts are plugged creating negative effects to morphological features. Therefore, a possible indirect adverse effect resulting from Alternative 1 is the continued risk of damage to sites from tree fall and the resultant fuel loading, erosion and decay. At particular risk are large scale historic mining sites (tens to hundreds of acres) consisting primarily of earthen and rock features (e.g. hydraulic headwalls, ditches, raceways, waste-rock piles, processed sediment deposits, roads, etc.).

Additionally, there would be no actions taken in the APE to reduce fuel loads within and around historic properties, which increases the potential of high intensity wildfire; wildfires can adversely affect historic properties. High temperatures and prolonged exposure to heat may affect artifacts and the ability to acquire relevant data (such as obsidian hydration readings) that would affect the information potential and hence NRHP potential of any given site. Fire is especially destructive to historic resources made of wood and some metals and would essentially destroy these materials, likely rendering a site ineligible for the NRHP. Therefore, a possible indirect adverse effect resulting from Alternative 1 is the continued risk of damage to sites from wildfire. The indirect, short-term effects to archaeological resources would be negligible but indirect, long-term effects would be moderate to major (adverse).

Cultural Resources

Depending on the particular cultural resource, no action may result in no effect or adverse effects of varying degrees. If no management actions are implemented, there would be no

direct effects. However, haphazard tree fall may limit access to traditionally used cultural resources. For example, if tribal people are unable to access traditionally used plant stands, subsistence opportunities may be reduced, as well as opportunities to manage these plant stands, and practice religious and cultural traditions. Traditional-use areas and plants will become degraded, resulting in the alteration of culturally important places which could impact the ability to sustain traditions and cultures. Tree fall may also change site-specific characteristics that influence growing conditions or habitat for some culturally significant plant species; or change fuel loading that may alter habitat if the area burns again.

Furthermore, no action would be taken in the project area to reduce fuel loads within and around cultural resources. Fire-adapted plant species (those that respond positively to fire) would not be enhanced without the use of low intensity prescribed fire in the project area; this indirect adverse effect would also result in the long-term degradation or loss of these species and a gradual loss of important plant gathering areas. The results of natural tree fall and the absence of fuels treatments are indirect adverse effects; these effects are moderate to major in both the short and long term.

Cumulative Effects

Historic Properties

Cumulative effects to historic properties would result not from tree fall, which like historic properties is location specific; rather they would result from the no action alternative in combination with actions in the reasonably foreseeable future that result in higher fuel loads within the larger landscape where the historic properties are located. Through time, as fuels loads increase around historic properties, high intensity fire would likely destroy structures and features of historic sites that would result in the loss of potential NRHP eligible districts. Combining taking no action in the project area with other wildfires that have burned or are likely to burn in the surrounding areas, would result in loss of data at precontact sites and would contribute to their deterioration. This has the potential to result in ineligibility for the NRHP. Emergency fire suppression activities may also have minor to major effects on historic properties as the level of suppression activities needed for larger and more intensive fires has greater potential for adversely effecting sites. The cumulative effects to historic properties under Alternative 1, the no action alternative, in combination with the no actions in the reasonably foreseeable future that would will be moderate to major (adverse.)

Cultural Resources

No actions are planned for the foreseeable future that will improve access to specific areas or increase opportunities for managing stands and practicing religious and cultural traditions within the Area of Potential Effects. In addition, effects from high intensity wildfires would accelerate over time, resulting in the loss of culturally significant gathering areas and plants, and could result in the loss of important settings and viewsheds, rendering them unsuitable for use in spiritual practices. The cumulative effects to cultural resources under Alternative 1, the no action alternative, in combination with the actions in the reasonable foreseeable future will be moderate to major (adverse.)

Project Area B: Happy Camp Complex

The effects of taking no action for the Happy Camp Complex are the same as summarized for the Beaver Fire area.

Project Area C: Whites Fire

The effects of taking no action for the Whites Fire area are the same as summarized for the Beaver Fire area.

Alternative 2

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Salvage Harvest and Roadside Hazard Tree Removal:

Historic Properties

There would be no direct or indirect adverse effects to historic properties as the result of salvage harvest and roadside hazard tree removal because historic properties will be avoided by project activities, unless avoidance would inhibit the ability to achieve project objectives as identified in the purpose and need. In such cases, project activities may need to be conducted within site boundaries. If it is determined that project activities within sites are necessary, such activities will only be conducted in accordance with the project design features and the Standard Resource Protection Measures outlined in either the Region 5 PA or the forthcoming WFR Programmatic Agreement. For example, harvest activities within sites will be allowed when implemented from existing roads, as will the use of specific types of existing landing (e.g. located within the debris field of large hydraulic mines).

However, even when using Standard Resource Protection Measures and project design features to reduce the risk of adversely affecting historic sites, the potential for direct effects still exists if there is subsurface material present (when operating within the site boundaries). While a site locality is recorded to the archaeologist's best ability, the possibility of unrecorded material can still exist, especially if the site has not been evaluated. Limiting ground disturbance as much as possible within these sites can prevent potential subsurface artifacts, if present, from exposure, displacement, or damage.

Salvage harvest and roadside hazard tree removal from within and adjacent to historic properties benefits historic properties by reducing the hazards of natural tree fall. By salvaging trees rather than letting them fall naturally, there is more control over where a tree falls, which reduces the risk of damage and/or destruction of site features or displacement of the same when trees uproot. The removal of dead and dying trees from within and adjacent to historic properties results in direct and indirect beneficial effects; these effects are moderate to major in both the short and long term. However, when trees are removed from within historic properties, there is a risk of adverse effects due to equipment operating in the site boundaries. When trees are removed from within site boundaries, resource protection measures will be applied, which may result in negligible to minor effects over the short and long term. If protection measures will not sufficiently mitigate moderate to major adverse effects of harvesting trees within a site, then the process for resolving adverse effects will be followed as outlined in the forthcoming WFR Programmatic Agreement.

Cultural Resources

Depending on the particular cultural resource, salvage harvest and hazard tree removal may result in effects that vary in degree and may be beneficial or adverse. As with historic properties, removal of dead and dying trees from within and adjacent to cultural resources through harvest can benefit the resources by reducing the hazards of natural

tree fall by controlling where and how they fall. Trees may be removed in such a way as to influence site-specific growing conditions or habitat for culturally significant plant species; or change fuel loading that may benefit the habitat if the area burns again. Roadside salvage of hazard trees will allow continued and safer access to traditionally used cultural resources, providing opportunities for subsistence activities as well as practicing religious and cultural traditions. The results are direct and indirect beneficial effects; these effects are moderate to major in both the short and long term.

Direct or indirect adverse effects will be avoided or mitigated through the use of tribal monitors, tribal project design features and/or protection measures, and/or other methods developed through consultation. If it is determined that adverse effects cannot be avoided or mitigated through these means, then the process for resolution as specified in the forthcoming WFR Programmatic Agreement will be followed.

Fuels Reduction:
Historic Properties

There would be no direct effects to historic properties as the result of fuels reduction because actions would not be, for the most part, implemented within the boundaries of these sites. Prescribed fire will not occur within site boundaries, and other types of fuel reduction, if occurring in site boundaries will be conducted under the provisions of the Region 5 PA using Standard Resource Protection Measures. For example, brush in and around historic properties would be removed by hand, piled outside of the site boundaries and then burned.

The use of Standard Resource Protection Measures to reduce or mitigate adverse effects to historic properties may however foster conditions that result in indirect effects. By avoiding or not treating within site boundaries, a higher fuel load is left within the site compared to surrounding areas. Intense fire may damage or destroy combustible artifacts or permanently alter material susceptible to heat or flame within a site. Not only do “leave” areas increase the risk that future fires will burn with higher intensity within a site’s boundary, they direct the public’s attention to these areas which may result in increased looting and vandalism. These indirect effects to historic properties are minor in the short term but moderate to major in the long term (adverse). If adverse effects cannot be avoided or mitigated, the resolution process as specified in the forthcoming WFR Programmatic Agreement will be followed.

Cultural Resources

As with salvage harvest and hazard tree removal, project fuels treatments may result in effects to cultural resources that vary in degree and may be beneficial or adverse depending on the particular cultural resource. There will be direct beneficial effects to cultural resources when project fuels reduction occurs within or adjacent to cultural resources that respond well to low intensity prescribed fire or the removal of fuels by other means (e.g. hand, mechanical). For example, fire may reduce unwanted vegetation and stimulate the growth of useful species. As stated by the Karuk in consultation and conveyed by other tribes, “well managed fire provides gathering and food resources, provides forage for elk and cuts down on harmful bugs that damage resources important to people and animal, and provide a more productive and varied ecosystem.” Fuels reduction may occur within cultural resources identified by the tribes. To prevent adverse effects, tribal project design features or standard resource protection measures may be

developed, or tribes may request to have tribal monitors present when the fuels reduction activities are implemented within identified cultural resources. If it is determined that adverse effects cannot be avoided or mitigated through these means, then the process for resolution as specified in the forthcoming WFR Programmatic Agreement will be followed.

Site Preparation and Planting:
Historic Properties and Cultural Resources

Mechanical site preparation and planting activities create significant ground disturbance, which would result in direct adverse effects to historic properties and cultural resources, if allowed to occur within their boundaries. As such, Standard Resource Protection Measures and project design features will be used to prevent these activities from occurring within the boundaries of historic properties and any identified cultural resources. There will be no direct or indirect adverse effects as the result of site preparation and planting, in either the short or the long term to historic properties or identified cultural resources.

Cumulative Effects
Historic Properties
The cumulative effects from salvage harvest and hazard tree removal under this project, in combination with salvage harvest and hazard tree removal considered under projects in the foreseeable future will have a cumulative beneficial effects on historic properties as natural tree fall and fuel loads are reduced adjacent to and within some historic properties. Reducing fuels under this project, in combination with similar types of other projects already implemented or implemented in the reasonably foreseeable future will result in a cumulatively beneficial effect to historic properties, except in cases where properties are avoided and no treatments are implemented; in these cases there will be moderate to major cumulative effects (adverse). The adverse cumulative effects result from the increased number of historic properties that become islands of higher fuels loads where fires burn more intensely and become visual islands that attract looters and vandals. There are no cumulative effects from site prep and planting as these activities will not occur within the boundaries of historic properties.
Cultural Resources

The cumulative effects from salvage harvest and hazard tree removal under this project, in combination with salvage harvest and hazard tree removal considered under projects in the foreseeable future, will have a cumulative beneficial effects on cultural resources. As natural tree fall and fuel loads are reduced, continued and safer access to traditionally used cultural resources, opportunities for subsistence activities as well as practicing religious and cultural traditions are provided. The cumulative effects of fuels reduction to cultural resources under the proposed actions and actions in the reasonable foreseeable future will be cumulative beneficial effect to those identified cultural resources that were treated. During consultation, all tribes conveyed the benefits to their resources that result from reducing fuels. There will be no cumulative effects as a result of site prep and planting, as these activities will not occur within identified cultural resources.

Project Area B: Happy Camp Complex
Direct Effects and Indirect Effects

The effects of salvage/roadside hazard and fuels treatments in the Happy Camp Complex fire area in Alternative 2 are the same as described for the Beaver Fire area.

Site Prep and Plant:
Cultural Resources

Planting, but not site prep, may have an adverse effect on Karuk cultural resources within Karuk aboriginal territory in the Happy Camp Complex, if plantations are established in areas inconsistent with the historic forest character, and if fire is not allowed within the plantations. The Karuk have stated during consultation that they believe fire suppression and past general patterns and practices of establishing conifer plantations has increased the probability of large, uncharacteristic fires and has resulted in a homogenized forest structure. Furthermore, they have stated in consultation and in the Draft Karuk Tribe Department of Natural Resources Eco-Cultural Resources Management Plan that this forest structure is not reflective of pre-contact forests that were more diverse and perpetuated subsistence food resources, medicines, and materials critical to maintaining the integrity of Karuk Culture. As captured in consultation with the Karuk, the direct and indirect effects of planting to Karuk cultural resources are minor in the short term, but both are major in the long term and all are adverse. Adverse effects to Karuk cultural resources from all project activities are being mitigated through the forthcoming WFR Programmatic Agreement, Stipulation II. If adverse effects cannot be mitigated through these means, then the process for resolution as specified in the forthcoming WFR Programmatic Agreement will be followed.

Cumulative Effects

The cumulative effects of salvage/roadside hazard and fuels treatments in the Happy Camp Complex fire area in Alternative 2 are the same as described for the Beaver Fire area. The effects on Karuk cultural resources within Karuk ancestral territory have changed to reflect input from the Karuk during consultation on the establishment of conifer plantations. Even if the plantations considered under this project are limited, the cumulative effect of these plantations in combination with recent planting and planting considered under projects in the foreseeable future, the cumulative effects may be adverse on individual cultural resources. Adverse effects to Karuk cultural resources from all project activities are being mitigated through the forthcoming WFR Programmatic Agreement, Stipulation II. If adverse effects cannot be mitigated through these means, then the process for resolution as specified in the WFR Programmatic Agreement will be followed.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The effects of salvage/roadside hazard and fuels treatments in the Whites Fire area in Alternative 2 are the same as described for the Beaver Fire area.

Site Preparation and Planting:
Cultural Resources

The effects of site prep and planting are the same for cultural resources in the Whites Fire area as described in Alternative 2 for the Happy Camp Complex area.

Cumulative Effects

The cumulative effects of salvage/roadside hazard and fuels treatments in the Whites Fire area in Alternative 2 are the same as described for the Beaver Fire area. The cumulative effects on Karuk cultural resources within Karuk aboriginal territory in the White's Fire

area in Alternative 2 are the same as described in Alternative 2 for the Happy Camp Complex area.

Alternatives 3, 4, 5, Modified Alternative 2, and Modified Alternative 3

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

The direct and indirect effects of alternatives 3, 4, 5, modified Alternative 2, and modified Alternative 3 are essentially the same as the effects described under Alternative 2 for the Beaver Fire area.

Cumulative Effects

The cumulative effects of alternatives 3, 4, 5, modified Alternative 2, and modified Alternative 3 are essentially the same as the effects described under Alternative 2 for the Beaver Fire area.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The direct and indirect effects of alternatives 3, 4, 5, modified Alternative 2, and modified Alternative 3 are essentially the same as the effects described under Alternative 2 for the Happy Camp Complex area.

Cumulative Effects

The cumulative effects of alternatives 3, 4, 5, modified Alternative 2, and modified Alternative 3 are essentially the same as the effects described under Alternative 2 for the Happy Camp Complex area.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The direct and indirect effects of alternatives 3, 4, 5, modified Alternative 2, and modified Alternative 3 are essentially the same as the effects described under Alternative 2 for the Whites Fire area.

Cumulative Effects

The cumulative effects of alternatives 3, 4, 5, modified Alternative 2, and modified Alternative 3 are essentially the same as the effects described under Alternative 2 for the Whites Fire area.

Karuk Alternative

Project Area A: Beaver Fire

Direct Effects, Indirect Effects, and Cumulative Effects

The Karuk alternative did not propose any activities for the Beaver Fire area; therefore, the direct and indirect effects of the Karuk alternative are essentially the same as the effects described under Alternative 1, the no action alternative.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Historic Properties

The direct and indirect effects of the Karuk alternative are essentially the same for salvage harvest, roadside hazard tree removal, and site prep and planting as the effects

described under Alternative 2 for the Happy Camp Complex area. However, the amount of fuels reduction proposed under the Karuk alternative is substantial, and therefore, increases the scale of potential adverse effects on historic properties as described in Alternative 2 for the Happy Camp Complex, If adverse effects cannot be avoided or mitigated, then the process for resolution as specified in the forthcoming WFR Programmatic Agreement will be followed.

Cultural Resources

The direct and indirect effects of the Karuk alternative are essentially the same for salvage harvest and roadside hazard tree removal as the effects described under Alternative 2 for the Happy Camp Complex area. There would be no direct or indirect effects from site prep and planting, as none of these activities are proposed in the Karuk alternative. However, the amount of fuels reduction in the Karuk alternative is substantial, which would result in beneficial effects to Karuk cultural resources in Karuk aboriginal territory on the landscape level, in both the short and long term.

Cumulative Effects

The cumulative effects of salvage harvest and roadside hazard in the Happy Camp Complex fire area in the Karuk alternative are the same as described for the Beaver Fire area. No site prep and planting are proposed in the Karuk alternative, so there would be no cumulative effects. Cumulative effects from fuels reduction under this project, in combination with fuels reduction considered under projects in the foreseeable future, would have a beneficial effect on Karuk cultural resources on the landscape level. However, the number of "leave" areas resulting if historic properties are avoided under this project in combination with future projects, increases the risk of high intensity fire to more properties, and increases the risk of looting and vandalism to the same.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The direct and indirect effects of the Karuk alternative are essentially the same as the effects described under the Karuk alternative for the Happy Camp Complex area.

Cumulative Effects

The cumulative effects of the Karuk alternative are essentially the same as the effects described under the Karuk alternative for the Happy Camp Complex area.

Comparison of Effects

Under Alternative 1, there will be no direct effects to historic properties or cultural resources because no management action would be implemented. However, there would also be no actions taken in the project area to reduce fire-weakened trees or reduce fuel loads from within and around historic properties or cultural resources. The indirect, short-term effects to historic properties would be negligible but indirect, long-term effects would be moderate to major (adverse). The indirect short and long-term effects to cultural resources would be moderate to major (adverse).

Under Alternatives 2, 3, 4, 5, modified Alternative 2, and modified Alternative 3, there will be no direct adverse effects from project activities in the short or long term to historic properties; there will be direct beneficial effects (moderate to major) as the result of salvage harvest and roadside hazard tree removal. There may be indirect adverse

effects if historic properties are avoided, these effects are minor in the short term but moderate to major in the long term. Indirect beneficial effects(moderate) result in both the short and long term as the likelihood of damage and destruction to historic properties is decreased through project activities.

Under Alternatives 2, 3, 4, 5, modified Alternative 2, and modified Alternative 3, there will be *direct beneficial effects* to cultural resources that are moderate to major in both the short and long term; *direct or indirect adverse effects* will be avoided or mitigated through the use of tribal monitors, tribal project design features and/or protection measures, and/or other methods developed through consultation. If it is determined that adverse effects cannot be avoided or mitigated through these means, then the process for resolution as specified in the WFR Programmatic Agreement will be followed.

Under the Karuk alternative, in the Beaver Fire area, there will be no direct effects *to historic properties or cultural resources because no management action would be implemented. However, there will also be no actions taken in the project area to reduce fire-weakened trees or reduce fuel loads. As a result, there would be* negligible indirect effects *to historic properties in the short-term, but* adverse indirect effects *in the long-term that will be moderate to major. There would be* adverse indirect effects *to cultural resources in the short and long-term that will be moderate to major short and long-term.*

Under the Karuk alternative, in the Happy Camp Complex and White's Fire areas, there will be no *direct adverse effects* from project activities in the short or long term to historic properties; there will be *direct beneficial effects* (moderate to major) in the short and long-term as the result of salvage harvest and roadside hazard tree removal. There may be *indirect adverse effects* if historic properties are avoided, these effects are minor in the short term but moderate to major in the long term. *Indirect beneficial effects* result in both the short and long term as the likelihood of damage and destruction to historic properties is decreased through project activities.

Under the Karuk alternative, in the Happy Camp Complex and White's Fire areas, there will be *direct beneficial effects* to cultural resources that are moderate to major in both the short and long term. *Direct or indirect adverse effects* will be avoided or mitigated through the use of tribal monitors, tribal project design features and/or protection measures, and/or other methods developed through consultation. If it is determined that adverse effects cannot be avoided or mitigated through these means, then the process for resolution as specified in the forthcoming WFR Programmatic Agreement will be followed.

The *cumulative effects* to historic properties and cultural resources under Alternative 1, the no action alternative, in combination with the no actions in the reasonably foreseeable future will be moderate to major (*adverse*.)

Under Alternatives 2, 3, 4, 5, modified Alternative 2, and modified Alternative 3, *beneficial cumulative effects* (moderate to major) will result to historic properties as natural tree fall and fuel loads are reduced, except in cases where properties are avoided and no fuels treatments are implemented; in these cases there will be *adverse cumulative effects* (moderate to major). There will be *beneficial cumulative effects* on cultural resources as the result of these alternatives.

Under the Karuk alternative*, beneficial cumulative effects* (moderate to major) will result to historic properties, except in cases where properties are avoided and no fuels treatments are implemented; in these cases there will be *adverse cumulative effects* (moderate to major). There will be *beneficial cumulative effects* on cultural resources as the result of this alternative.

Compliance with law, regulation, policy, and the Forest Plan

All action alternatives adhere to applicable heritage resource laws, regulation, policy, and the Forest Plan. Documentation of the effects of each alternative in this report meets legal compliance. The Forest Plan consistency checklist, displayed on the project website, identifies the Forest Plan Standards and Guidelines that apply to this project and related information about compliance with the Forest Plan.

The Native American Graves Protection Act of 1990; Executive Order 13007, entitled Indian Sacred Sites; and Executive Order 13175, entitled Consultation and Cooperation with Indian Tribal Governments, among others, provide direction on the protection of tribal cultural resources in federal land management decisions. Both federally recognized and non-federally recognized tribes were contacted early in project planning and were engaged throughout the planning process, in accordance with the National Historic Preservation Act, NEPA and other laws, regulations, and policy. Tribal Engagement is summarized in chapter 1, *Public Involvement*. Consultation was conducted with the Karuk Tribe, Quartz Valley Indian Reservation, the Confederated Tribes of the Siletz, and the Confederated Tribes of the Grand Ronde. The Forest conferred with the Shasta Indian Nation and the Shasta Nation, Inc.

Written and verbal comments received during tribal consultation were considered when refining the proposed action and while developing project alternatives; many tribal concerns were incorporated in these alternatives. Consultation with the tribes regarding the proposed project is on-going.

Social and Economic Environment

The purpose of this section is to analyze the effects of the Westside Fire Recovery project on rural social and economic health, and identify any disproportionately high and adverse human health or environmental effects to minorities and disadvantaged groups in Siskiyou County. Safety is an important value to people in Siskiyou County; therefore, one purpose of this analysis is to gain a better understanding of how safety relates to the purpose and need of this project and its proposed actions. In particular, how safety of local residents, the recreating public, and forest workers such as firefighters and planting contractors are affected by the treatments being proposed. Social and economic analysis and effects cannot effectively be displayed by fire area (Beaver, Happy Camp and Whites) because most of the data and information are measurable and understandable only at the county level.

Methodology

Social

Information from federal data sources is used to compare the social status of Siskiyou County to the State of California and the United States to provide background information for effects of the project on minorities and disadvantaged groups. The

Economic Profile System – Human Dimensions Toolbox which compiles statistics from federal data sources is used as the source of information for this analysis.

Economic

Economic effects are analyzed using information from a customized version of an input-output model that summarizes inter-industry production and consumption for each state and county in the United States (IMPLAN). Since the data sources and methods used by IMPLAN are approximations of reality that sometimes contain substantial departures relative to actual conditions in the state or county, a customized model was developed (SCFSM) in 2012. This model customizes the standard Siskiyou County IMPLAN model to provide a more reliable representation of Siskiyou County's forest sector. It was developed primarily to support defensible analysis of the economic impacts of national forest projects in Siskiyou County and is used in the analysis of the Westside Fire Recovery project. More information on both the SCFSM and IMPLAN models is provided in the body of, and appendix to, the Socio-economic resource report.

Analysis Indicators

Social Environment

Social analysis is based on the quality of life of people affected by this project. Quality of life depends partly on the ability of people to sustain themselves and their families which is analyzed in the economic portions of this document. The indicators used for the social analysis include lifestyles, values, beliefs, and health and safety of individuals and communities. For this project, three measures are used for evaluating the effects of the project on quality of life for Siskiyou County residents:

- The value of using the resources of the Forest, and project area in particular, for the benefit of county residents (Siskiyou County Land and Resource Management Plan 1994). This will be analyzed using the estimated volume of timber products the alternatives will produce.
- Changes to the "fire-safe character of communities" in the project area. This will be analyzed using the acres of fuels treatments in each alternative. It is assumed that fuels treatments have the indirect effect of creating more fire-safe communities.
- Safety for Forest workers, firefighters and the public. This is estimated by the number of acres on which standing dead trees are removed by salvage harvest and by the number of miles and acres of roadside hazard trees removed (for those who use roads in and through the project area). Also see the discussion about resistance to control regarding fire suppression tactics in the Fire and Fuels section of this Chapter 3.

Additional assumptions made in this analysis include that it is probable that any portion of the project area will be accessed by the public, firefighters or Forest workers. Hazard trees can directly harm a person or property but can also pose an indirect hazard such as blocking access to or from portions of the Forest or to major escape routes during storms or future wildfires.

Economic Environment

The Forest Plan includes a Forest-wide goal to promote the economic stability of local communities (Forest Plan page 4-9). Economic analysis indicators for this report are:

1. total economic outputs;
2. labor income (wages and proprietor's income);

3. number of jobs created;
4. revenue generated based on the estimated volume from timber sale units; and
5. project revenue estimated to be returned to Siskiyou County.

Spatial and Temporal Context

Siskiyou County is used as the spatial analysis area for social effects and for fiscal effects (timber receipts) because the project area is entirely within the county. The model used to analyze other economic effects takes into account impacts within a four-county area including Siskiyou, Shasta and Trinity counties in California and Jackson County in Oregon because the project's direct economic effects through the veneer manufacturing, logging, log hauling and forestry support services are realized throughout this larger area. The three fire-related project areas are used as the spatial analysis area for effects to safety because treatments proposed to improve safety are entirely within these project areas.

This analysis considers one to eight years as the short-term time period for effects analysis on safety and other social and economic indicators. This temporal bounding approximates when treatments will be completed and most fire-killed trees are likely to fall, and when treatments will be completed and products from implementation will have entered the wood products market. More than ten years is the long-term time period for effects analysis on safety and other social and economic effects.

Affected Environment

Social Environment

In terms of safety, the following conditions describe the affected environment:

- Trees killed or severely burned by wildfire (i.e. snags) are often unstable and at risk for falling or snapping off, especially during winter snow, rain, and high wind events.
- Infrastructure, including utility lines, roadways, bridges, trailheads, campgrounds, and fire lookouts within the project area, are surrounded by fire-killed and damaged trees and preexisting danger trees that pose a hazard to the public and Forest workers. As a result of the 2014 fires, infrastructure, including utility lines, roads, bridges, trailheads, campgrounds, and fire lookouts within the project area are surrounded by fire-killed and damaged trees and preexisting danger trees that pose a hazard to the public and Forest workers and restrict access. About 650 miles of roadways are affected.
- Dead and dying trees within proposed salvage harvest areas present a safety hazard to firefighters (should the area burn again) or others who may recreate or work in these areas.
- A high probability of future high-intensity wildfires (due to heavy fuel loading from existing fire-killed timber) threatens structures and presents a safety hazard to nearby residents and firefighters (should the area burn again). Progressively increasing fuel loads (where potential flame lengths exceed four feet) provides conditions in which fires are resistant to suppression tactics.

The closest communities to this project are the communities of Happy Camp, Seiad Valley, Yreka, Fort Jones, Etna, Klamath River, Scott Bar, Hamburg, and Sawyers Bar. Social effects of the project, including safety concerns, will be most noticeable in these communities and the surrounding rural areas of the county.

The Siskiyou County population consists of Caucasian, African American, American Indian, Hispanic, Asian, Native Hawaiian or Pacific Islander, and other races. The

American Indian population is a greater percentage of the population in Siskiyou County than in the State of California; therefore, potential impacts of management actions on the American Indian population will be disclosed. The American Indian tribes and resources important to the tribes are described in the cultural resources section of this chapter. A larger percentage of the population of Siskiyou County is unemployed or below the poverty line than in the state of California; the impacts of the project on low-income populations in Siskiyou County will also be disclosed.

Lifestyles, attitudes, beliefs and values of Siskiyou County residents are similar to those of rural residents in other counties in the western United States. Many local residents depend on the environment to support them, and they want forest products to be used for the benefit of the county. Conditions related to safety have changed in the last few years due to high intensity wildfires that have left many acres of the Forest in an unsafe condition and are of particular concern to communities within and adjacent to the project area boundaries.

Economic Environment

Labor income in Siskiyou County has held relatively constant since 1970; non-labor income has been on a steady rise.

From 1970 to 2011, employment grew from 14,085 to 20,224 jobs, a 44 percent increase from 1970. Since 1990, the annual unemployment rate ranged from a low of 7.5 percent in 2000 to a high of 16.6 percent in 2010. Siskiyou County unemployment rates tend to be higher than the rest of the United States.

In 1998, timber represented more than seven percent of total employment of Siskiyou County but by 2011, timber represented five percent of total employment, mirroring the trend in the United States as a whole. Jobs in the timber sector in the county decreased to 410 jobs in 2011. “Although National Forests account for more than 60 percent of the county’s land base, the share of the county’s timber harvest off federal lands has decreased from roughly 50 percent to less than 20 percent since the northern spotted owl was listed as threatened in 1990. Since 1990, the number of wood products manufacturing facilities in the county has declined by half” (Dennis 2012).

Siskiyou County has limited sawmilling (i.e., lumber production) capacity compared to the other counties in the four-county region. The main log-processing facilities in Siskiyou County are veneer mills. Siskiyou County’s veneer mills typically purchase relatively low-value logs and may produce relatively high-value wood products compared to sawmills. More information on the economic environment is provided in the body of, and appendix to, the Socio-economic resource report.

Environmental Consequences

Alternative 1

Direct Effects and Indirect Effects

Social and Economic

Under this alternative no project treatment activities are proposed. The social effects of this alternative will be a continuation of the current distribution of jobs among racial and ethnic groups. Alternative 1 will not contribute to timber employment jobs and the

county's economic situation will not be improved. The effects of this alternative on traditional-use areas are disclosed in the cultural resource section of this chapter and the effects on cultural plant collecting areas are disclosed in the botany section. Although there are some effects on these populations, there will be no disproportionately high and adverse human health or environmental effects on American Indians or the poor.

The lifestyles, values and beliefs of the people in Siskiyou County will not be changed and the request that resources of the Forest be used to benefit local residents will not be fulfilled. The concern regarding the fire-safe character of the communities will not be addressed because no project-related fuels treatments will be implemented.

The effect on safety of implementing Alternative 1 will be that no burned acres will be treated and no miles of roadside hazard trees will be removed in this project at this time. If roadside hazard trees are to be treated to remove safety hazards, this will take place in the future and be dependent on future budget allocations. This delay will increase the likelihood that forest workers, firefighters, or public users of Forest land will be injured by a fire-killed or hazard tree as time goes on and the trees deteriorate and fall down. Because no roadside hazard trees will be removed in this project at this time, safe travel on roads within the fire area will be hindered year after year due to new trees falling into the roads or roads may need to be closed for various periods of time to assure public safety which will affect public access to the Forest. Fallen trees in the road may also delay the response of firefighting personnel to new wildland fires in and around the project area. Safety for Siskiyou County as a whole will decrease since the project area represents about 10 percent of the Siskiyou County land base.

Without treatment, hazards would not be abated around critical infrastructure.

- Salvage treatments would not be accomplished. Without salvage harvest, snags would continue to decay, break, and fall. This would increase surface fuel loading, which will increase the severity and intensity of future fires. Increased fire intensities and dead and decaying standing trees would inhibit the effective control of future fires and/or put fire suppression crews at increased risk. (See fuels and vegetation sections in this chapter.)
- Reforestation of burned forested areas would not be accomplished with this or any other project, since planting crews cannot safely operate in areas of dead and decaying standing trees. It is a violation of Office of Safety and Health Administration codes to plant or treat hazardous fuels under, or adjacent to, snags. Since there would also be fewer funds available from timber contract receipts, the opportunity to restore forested habitat through site preparation and reforestation work would be lost.
- In the short term, Forest workers such as firefighters, planters, researchers, and surveyors would either risk working in conditions that may subject them to injury or death from fallen snags or would not work in the areas because the areas would be deemed unsafe for work. In the long term, jack-strawed conditions from fallen snags would impede effective travel through areas of high to moderate severity burns, which would put workers at increased risk or eliminate their ability to work in the areas.
- In the short and long term, no treatment of hazard trees along roadways and nearby infrastructure would increase safety risks to forest workers and the public. The number of fallen snags along roadways would be innumerable –far too many to be addressed by fire crews and through permitted public fuelwood removal. To mitigate safety risks to the public, Forest Orders may be needed temporarily to close road access to portions of the Forest, which would impact public access (see the Recreation section of this chapter).

- In the long term, increased fire intensities and the continued existence of dead and decaying standing trees would inhibit the effective control of future fires and/or put fire suppression crews at increased risk. See the Fire and Fuels section of this chapter for details.

Cumulative Effects

Ongoing and reasonably foreseeable future actions in the project area are listed in appendix C. Some current and reasonably foreseeable future projects, including projects with hazard tree and fuels treatments, will improve safety conditions for the public and forest workers. Alternative 1 would not add to cumulative effects of other present and/or reasonably foreseeable future projects that are planned to improve safety across the landscape. Additionally, because of access issues resulting from fallen snags along roadways, difficulties may preclude future projects from either continuing or being planned due to the high density of snags within or adjacent to the project area. Using fire as a management tool in both the planned (prescribed fire) and unplanned setting may not meet desired resource objectives due to future fuel loading potential as well as the hazard, cost and time needed to remove decaying hazard trees from planned control lines. This will be a limiting factor in future prescribed fire activities.

For cumulative social and economic effects of indicators other than safety, all current and reasonably foreseeable similar actions within Siskiyou County over the next eight years were considered; for this analysis, it is assumed that actions in the four-county area will be similar to those in Siskiyou County. Future foreseeable actions on National Forest System land within Siskiyou County are available on the Forest Service Schedule of Proposed Actions website: http://www.fs.fed.us/sopa/. These projects include the Salmon Salvage, Two Bit, Jess, Hotelling Roadside Hazard, Crawford, McCollins Late Successional Reserve, Eastend, Craggy, and Lover's Canyon projects on the west side of the Forest, Big Pony, Ruffed Grouse, Butte Mountain, Little Deer, Landlord, Pumice, Six Shooter, and Harlan projects on the eastside of the Forest, and the Harris project on the Shasta Trinity National Forest. A list of planned Timber Harvest Plans for California can be found at:
http://calfire.ca.gov/resource_mgt/resource_mgt_forestpractice_thpreviewprocess.php.

Since it is difficult if not impossible to obtain detailed information on the amount of harvest expected or the economic value of such harvest, it is assumed that timber harvest on private lands will continue at a rate similar to the past. There are also a number of salvage projects on private land covered by exemptions from requiring a timber harvest plan.

Implementation of Alternative 1 will neither support nor add to the demand for timber industry jobs and its related industries employment. Adding the social and economic effects of these projects to the effects of Alternative 1 will not result in substantial social or economic cumulative effects.

Alternative 2

Direct Effects and Indirect Effects

Social

The social effects of this alternative will include more jobs available for Siskiyou county residents from the 1,236 additional jobs provided and a continuation of the current

distribution of jobs among racial and ethnic groups. The effects of this alternative on traditional-use areas are disclosed in the cultural resource section of this chapter and the effects on cultural plant collecting areas are disclosed in the botany section. Although there are some effects on these populations, there will be no disproportionately high and adverse human health or environmental effects on American Indians or the poor.

The lifestyles, values and beliefs of the people in Siskiyou County include some fulfillment of the desire that resources of the Forest be used to benefit local residents. The concern regarding the fire-safe character of the communities will be addressed through fuels treatments on ridges and near communities.

Treatments that will improve safety conditions within the project area include: roadside hazard treatments, hazardous fuels treatments, and salvage harvest treatments.

Hazard trees along almost 650 miles of roads and other infrastructure, including campgrounds, fire lookouts, trailheads, and bridges would be treated. Since roadside hazard tree treatments are buffered to 250 feet on either side of the road, these treatments incorporate bridges, campgrounds, fire lookouts, and trailheads. Treatments will abate hazard trees along roadways and other infrastructure, improving safety conditions for the public and forest workers. Hazard tree treatments along roadways are critical for providing safe and effective access for the public and forest workers. Treatments are also proposed along utility corridors where needed to protect infrastructure and improve conditions for fire suppression tactics. The removal of fire-killed trees and other hazard trees from around local communities, key infrastructure, and roads would also provide fire managers with improved options for effectively managing potential future wildfires.

Salvage harvest on 7,940 acres within 11,700 acres of salvage units would reduce safety hazards, promoting improved safety conditions for public and forest workers, including but not limited to firefighters, planters, and surveyors. Safety conditions and suppression effectiveness for firefighters are improved by removing fire-killed trees before they fall and become “jack-strawed.” Removing fire-killed trees helps make foot travel feasible and removes fuel build-up.

Hazardous fuels treatments within fuel management zones (i.e. fuel breaks) and the wildland urban interface treatments also improve safety conditions for firefighters and improve suppression tactics around local communities, improving the safety conditions of local residents. Although fire plays an important role in the ecosystem, reducing these fuel loads minimizes the intensity and severity of future fires, thus improving the likelihood of firefighting success.

Proposed treatments decrease the likelihood that forest workers, firefighters, or public users of Forest land will be injured by a fire-killed or hazard tree as time goes on and the trees deteriorate and fall down. Safety for Siskiyou County as a whole will increase since the project area represents about 10 percent of the Siskiyou County land base.

Economic

Economic effects of Alternative 2 include an economic output of $210,206,000, labor income value of $53,107,000, and employment increased by 1,236 jobs. Timber revenues from implementing this alternative are estimated at $11,892,000 and returns to Siskiyou County at $2,973,000 based on 25 percent of timber revenue receipts. Wholesale veneer value is estimated as $98,700,000, logging costs at $33,140,000 and hauling cost at

$10,515,000. Required costs to restore the project landscape through site preparation, planting and fuels reduction are estimated as $36,460,000. If all the timber revenue is used to support restoration, this revenue would provide about 33% of the funding required for the fire recovery. The rest of the costs would need to be provided through appropriated funds or other sources.

Cumulative Effects

As noted above, implementation of Alternative 2 will have measureable social and economic effects on Siskiyou County; adding the social and economic effects of the ongoing and reasonable foreseeable future projects identified in Alternative 1 to the effects of Alternative 2 will result in noticeable social and economic cumulative effects, especially in the timber sector. Since this sector is such a small part of the economy of Siskiyou County, overall cumulative effects to the county are not expected to be substantial. In terms of safety, projects will) improve safety conditions for the public and forest workers, especially those with hazard tree and fuels treatments. Treatments proposed in this project would supplement other present and/or reasonably foreseeable future projects that are planned to improve safety across the landscape. Roadside hazard treatments proposed in this project would provide access to other future projects within or adjacent to the project area, providing access for treatments. Using fire as a management tool in both the planned (prescribed fire) and unplanned settings would meet desired resource objectives due to lower future fuel loading potential and fewer hazards, providing conditions to improve the likelihood of suppression effectiveness. See the Fire and Fuels section of this chapter for details.

Alternative 3

Direct Effects and Indirect Effects

Social

Social effects will be similar to those of Alternative 2 except that (1) safety will be affected by 6,590 acres of salvage logging within 9,600 acres of salvage units; and (2) 1,067 jobs are expected to be created. Effects of this alternative to improving safety will be similar to Alternative 2 except that 5,800 acres will have large fuels removed through salvage harvest.

Economic

Economic effects of Alternative 3 include an economic output of $185,381,000, labor income value of $46,523,000, and employment increased by 1,067 jobs. Timber revenues from implementing this alternative are estimated at $9,851,000 and returns to Siskiyou County at $2,463,000 based on 25 percent of timber revenue receipts. Wholesale veneer value is estimated as $87,000,000, logging costs at $29,807,000 and hauling cost at $9,260,000. Required costs to restore the project landscape through site preparation, planting and fuels reduction are estimated as $29,310,000. If all the timber revenue is used to support restoration, this revenue would provide about 34% of the funding required for the fire recovery. The rest of the costs would need to be provided through appropriated funds or other sources.

Cumulative Effects

As noted above, implementation of Alternative 3 will have measureable social and economic effects on Siskiyou County; adding the social and economic effects of the ongoing and reasonable foreseeable future projects identified in Alternative 1 to the effects of Alternative 3 will result in noticeable social and economic cumulative effects, especially in the timber sector. Since this sector is such a small part of the economy of Siskiyou County, overall cumulative effects to the county are not expected to be substantial.

Alternative 4

Direct Effects and Indirect Effects

Social

Social effects will be similar to those of Alternative 2 except (1) safety will be affected by 6,910 acres being salvage logged within 10,200 acres of salvage units; and (2) 1,074 jobs are expected to be created. Effects of this alternative to improving safety will be similar to Alternative 2 except that 5,900 acres will have large fuels removed through salvage harvest.

Economic

Economic effects of Alternative 4 include an economic output of $189,564,000, labor income value of $47,338,000, and employment increased by 1,074 jobs. Timber revenues from implementing this alternative are estimated at $9,586,000 and returns to Siskiyou County at $2,396,000 based on 25 percent of timber revenue receipts. Wholesale veneer value is estimated as $88,900,000, logging costs at $30,940,000 and hauling cost at $9,463,000. Required costs to restore the project landscape through site preparation, planting and fuels reduction are estimated as $29,500,000. If all the timber revenue is used to support restoration, this revenue would provide about 32% of the funding required for the fire recovery. The rest of the costs would need to be provided through appropriated funds or other sources.

Cumulative Effects

As noted above, implementation of Alternative 4 will have measureable social and economic effects on Siskiyou County; adding the social and economic effects of the ongoing and reasonable foreseeable future projects identified in Alternative 1 to the effects of Alternative 4 will result in noticeable social and economic cumulative effects, especially in the timber sector. Since this sector is such a small part of the economy of Siskiyou County, overall cumulative effects to the county are not expected to be substantial.

Alternative 5

Direct Effects and Indirect Effects

Social

Social effects will be similar to those of Alternative 2 except that (1) safety will be affected by 2,360 acres being salvage logged within 3,400 acres of salvage units and an additional 1,200 acres adjacent to private property will have fuels reduced; and (2) 549 jobs are expected to be created.

Economic

Economic effects of Alternative 5 include an economic output of $83,752,000, labor income value of $21,932,000, and employment increased by 549 jobs. Timber revenues from implementing this alternative are estimated at $6,334,000 and returns to Siskiyou County at $1,583,000 based on 25 percent of timber revenue receipts. Wholesale veneer value is estimated as $39,500,000, logging costs at $11,712,000 and hauling cost at $4,214,000. Required costs to restore the project landscape through site preparation, planting and fuels reduction are estimated as $25,802,000. If all the timber revenue is used to support restoration, this revenue would provide about 24% of the funding required for the fire recovery. The rest of the costs would need to be provided through appropriated funds or other sources.

Cumulative Effects

As noted above, implementation of Alternative 5 will have reduced social and economic effects on Siskiyou County compared to Alternative 2; adding the social and economic effects of the ongoing and reasonable foreseeable future projects identified in Alternative 1 to the effects of Alternative 5 will result in minor social and economic cumulative effects. Since this sector is such a small part of the economy of Siskiyou County, overall cumulative effects to the county are not expected to be substantial.

Alternative 2 Modified

Direct Effects and Indirect Effects

Social

Social effects will be similar to those of Alternative 2 except that (1) safety will be affected by 7,070 acres of salvage logging within 9,720 acres of salvage units; and (2) 1,076 jobs are expected to be created. Effects of this alternative to improving safety will be similar to Alternative 2 except that 6,010 acres will have large fuels removed through salvage harvest.

Economic

Economic effects of Alternative 2 Modified include an economic output of $178,788,000, labor income value of $45,474,000, and employment increased by 1,076 jobs. Timber revenues from implementing this alternative are estimated at $10,820,000 and returns to Siskiyou County at $2,705,000 based on 25 percent of timber revenue receipts. Assuming all timber from the project is manufactured into veneers, wholesale veneer value is estimated as $84,510,000, logging costs at $27,166,000 and hauling cost at $9,000,000. Required costs to restore the project landscape through site preparation, planting and fuels reduction are estimated as $26,985,000. If all the timber revenue is used to support restoration, this revenue would provide about 40% of the funding required for the fire recovery. The rest of the costs would need to be provided through appropriated funds or other sources.

Cumulative Effects

As noted above, implementation of Alternative 2 will have measureable social and economic effects on Siskiyou County; adding the social and economic effects of the ongoing and reasonable foreseeable future projects identified in Alternative 1 to the

effects of Alternative 2 Modified will result in noticeable social and economic cumulative effects, especially in the timber sector. Since this sector is such a small part of the economy of Siskiyou County, overall cumulative effects to the county are not expected to be substantial.

Alternative 3 Modified

Direct Effects and Indirect Effects

Social

Social effects will be similar to those of Alternative 2 except that (1) safety will be affected by 5,760 acres of salvage logging within 6,890 acres of salvage units; and (2) 900 jobs are expected to be created. Effects of this alternative to improving safety will be similar to Alternative 2 except that 5,760 acres will have large fuels removed through salvage harvest.

Economic

Economic effects of Alternative 3 Modified include an economic output of $153,153,000, labor income value of $38,419,000, and employment increased by 887 jobs. Timber revenues from implementing this alternative are estimated at $10,133,000 and returns to Siskiyou County at $2,533,000 based on 25 percent of timber revenue receipts. Assuming all timber from the project is manufactured into veneers, wholesale veneer value is estimated as $73,342,000, logging costs at $23,360,000 and hauling cost at $7,811,000. Required costs to restore the project landscape through site preparation, planting and fuels reduction are estimated as $27,487,000. If all the timber revenue is used to support restoration, this revenue would provide about 37% of the funding required for the fire recovery. The rest of the costs would need to be provided through appropriated funds or other sources.

Cumulative Effects

As noted above, implementation of Alternative 3 Modified will have some social and economic effects on Siskiyou County; adding the social and economic effects of the ongoing and reasonable foreseeable future projects identified in Alternative 1 to the effects of Alternative 3 Modified will result in social and economic cumulative effects, including some in the timber sector. However, overall cumulative effects to the county are not expected to be substantial.

Comparison of Effects

The project's economic effects on Siskiyou County and the four-county region will be largest under the Alternative 2, about 12 percent smaller under Alternatives 3 and 4, 14 percent smaller under Alternative 2 Modified, 25 percent smaller under Alternative 3 Modified, and about 50 percent smaller under Alternative 5. The relative contributions of timber harvesting and landscape restoration to the project's economic effects are given by their relative monetary values.

Table 3-63 displays a comparison of the social and economic effects of alternatives.

Table 3-63: Comparison of Social and Economic Effects of Alternatives

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 2 Mod.	Alt. 3 Mod.
Economic Output	$0	$210,206,000	$185,381,000	$189,564,000	$83,752,000	$178,788,000	$153,153,000
Labor Income	$0	$53,107,000	$46,523,000	$47,338,000	$21,932,000	$45,474,000	$38,419,000
Employment (Jobs)	0	1,236	1,067	1,074	549	1076	887
Timber Sale Revenue	$0	$11,892,000	$9,851,000	$9,586,000	$6,334,000	$10,820,000	$10,133,000
Meets local social value for use of resources (potential revenue to county)	$0	$2,973,000	$2,463,000	$2,396,000	$1,583,000	$2,705,000	$2,533,000
Fuels Management Zone Acres	0	4,810	4,810	4,810	6,020	4,890	4,930
Roadside Fuels Treatment Acres	0	4,420	4,420	4,420	4,420	4,420	5,710
Wildland Urban Interface Treatment Acres	0	2,220	2,220	2,220	2,220	2,220	2,630
Salvage Harvest Treatment Acres	0	7,940	6,590	6,910	2,360	7,070	5,760
Maximum Roadside Hazard Treatment Acres	0	20,500	20,500	19,580	20,500	20,500	14,320

All action alternatives will address priority treatment areas for safety. Consequently, effects to safety are only incrementally different among action alternatives, differing only by the acres of salvage harvest treatments proposed.

Compliance with law, regulation, policy and the Forest Plan

Actions are consistent with the Forest Plan. Forest Plan management goals and standards and guidelines related to safety include providing:

- an economical, safe, and environmentally sensitive transportation system for the Forest. Emphasize the maintenance and restoration of existing roads over the construction of new roads where appropriate (Forest Plan, page 4-8);
- administrative sites and facilities that effectively and safely serve the public and accommodate the workforce. Provide facilities with barrier-free access (Forest Plan, page 4-8); and

- an economical, safe, and environmentally sensitive transportation system for the Forest. Emphasize the maintenance and restoration of existing roads over the construction of new roads where appropriate. Provide administrative sites and facilities that effectively and safely serve the public and accommodate the workforce. Provide facilities with barrier-free access. (Forest Plan, page 4-37).

Forest Plan management direction related to other social and economic indicators is to:

- assist rural, forest-dependent communities with efforts to enhance their economic stability and social vitality (Forest Plan, page 4-65);
- work with local community leaders and individuals to provide opportunities for the development of natural resource-based enterprises (Forest Plan, page 4-65); and
- consider rural development options and opportunities in resource decisions that may assist rural communities in achieving long-term economic development stability and quality of life (Forest Plan, page 4-66).

All alternatives will be consistent with law, regulation, and policy, including Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (1994), USDA Departmental Regulation 5600-002 on Environmental Justice, and the Forest Plan in relation to the social and economic environment as displayed in the Forest Plan consistency checklist.

Scenery

Methodology

This evaluation applies current National Forest Landscape Management methodology in conjunction with existing Forest Plan direction. It relies on geospatial information system (GIS) analysis, field studies of similar types of projects, as well as field observations from sensitive viewpoints, computer modeling to determine visibility of project activities, and consideration of public preferences for scenic quality. This evaluation relies on the following assumptions:

- ASSUMPTION 1: Wildfires are a natural ecological process that commonly occurs on the Forest, and as such their effects to scenery are perceived as natural. Associated fire suppression activities (i.e. fire breaks) could be perceived as management activities.
- ASSUMPTION 2: Project activities proposed in Modification and/or Maximum Modification Visual Quality Objective areas would typically meet their assigned visual quality objectives. Frequently activities in these visual quality objective areas are not visible from any high or moderate sensitivity viewpoints, or if they are, at middle-ground or background distances.
- ASSUMPTION 3: The North Fork Salmon River road (1C01) was used as a proxy for visibility from the North Fork Salmon River. State Highway 96 was used as a proxy for visibility from the Klamath River. The Scott River road (7F01) was used as a proxy for visibility from the Scott River. Differences in elevation, adjacent vegetation, topographic screening, slope position, and horizontal alignments were factors considered in determining visibility and effects from the river perspective.
- ASSUMPTION 4: Because of a highly accelerated timeline to complete project analysis, winter weather conditions limiting access, and a multitude of potential viewpoints to consider for scenery effects, a computer model was used to determine visibility of project activities from sensitive viewpoints. The visibility analysis has been updated with field verification.
- ASSUMPTION 5: Sensitive viewpoints which are linear in nature, such as trails, roads, or rivers did not utilize the computer model. The visibility assessment was based on previous

experience, on-the-ground knowledge, and map reviews. The visibility analysis has been updated with field verification.

- ASSUMPTION 6: Analysis was based upon professional judgment and experience of a landscape architect with 25 years of Forest Service scenery evaluation experience. Based on professional judgment, it is estimated that the project has an 85-90 percent probability of successfully meeting or exceeding Visual Quality Objectives as predicted. See the "Visual Resource Management" section in 2013 Forest Plan Monitoring Report for more information.

The general process for a scenery evaluation follows:

6. Determine high or moderate sensitivity viewpoints located within or adjacent to the project area from which the project may be visible.
7. Extensive/intensive office review of project descriptions and maps; assessing project activity locations (orientation, slope position, distance from viewer, etc.), logging systems, combined with on-the-ground knowledge of topography and vegetation.
8. Seven field reviews were conducted of project area, focusing on project activities located in Retention and Partial Retention Visual Quality Objective areas.
9. Individual project activities were evaluated for their visibility from high or moderate sensitivity routes. Noticeable changes from project activities to existing landforms and vegetation are evaluated in terms of form, line, color, and texture contrasts. Utilizing professional expertise, the overall visual dominance and degree of noticeable contrast to the existing scenic character is then compared against the Visual Quality Objectives which define levels of acceptable visual change. A judgement call of "meet," "not meet," or "exceed" the assigned visual quality objective is then made.
10. To minimize scenery effects, project design features were developed; these are in Chapter 2 of this Final Environmental Impact Statement. Recreation and scenery project design features were designed to minimize or mitigate the effects of all action alternatives on recreation and scenery resources.
11. Cumulative effects to scenery were evaluated within a larger context than the individual project activities themselves, considering the potentially affected viewsheds as a whole.

Analysis Indicators

Analysis indicators used to determine the effects of alternatives on scenery include:

Scenic Character

The overall visual impression or image that gives a geographical area its identity. Scenic character is a qualitative description of the combination of vegetative patterns, landforms, water characteristics, and cultural features. The existing scenic character description provides a basis for comparing changes from alternatives and desired scenic character.

Visual Quality Objectives

Define levels of acceptable visual change, and are identified in the Forest Plan. The visual quality objectives for the project area are defined below and listed by management area below:

- Retention visual quality objective - management activities are not visually evident to the casual Forest visitor.
- Partial Retention visual quality objective – management activities may be noticeable, but are subordinate to the characteristic landscape.
- Modification visual quality objective - management activities appear altered and dominate yet reflect nearby natural features.
- Maximum Modification visual quality objective - management activities appear strongly altered and dominate but appear as natural occurrences when viewed at distances greater than 5 miles.

Spatial and Temporal Context

The spatial scale for analysis of effects to scenery includes the viewsheds from the Forest Plan-identified sensitive viewing locations. The temporal scale is defined as three years for short-term effects, at which time projects are required to meet their assigned visual quality objectives (except Maximum Modification which is immediate). These timeframes are required by Forest Plan Standards and Guidelines. Long-term effects are defined as ten years or longer.

Affected Environment

Scenic Quality of or within National Forests is valued for the aesthetic enjoyment and physiological benefits it offers. “Viewing Natural Features” and “Viewing Wildlife” are the second and third respectively, most popular recreation activities of visitors to the Klamath National Forest (USDA 2012). Scenic quality within the project areas is important to the people who live and work in the area and to Forest visitors. Both of these groups travel through the areas, enjoying views from State, County, and Forest roads, and while recreating on National Forest lands, trails, rivers, or roads. The scenery of these areas contributes an important part to the Forest’s scenic resources.

Other recreational use in the project area consists of dispersed-type recreation such as hiking, equestrian, camping, hunting, and woodcutting (see the Recreation section of this chapter and the Recreation resource report). Scenery is an important component that affects recreation use, setting, and the recreation experience.

Viewsheds of the Project Areas

Table 3-65 displays a list of all the potential viewpoints located in/or near the three project areas that project activities could be visible from. A total of 62 potentially affected viewpoints were identified for the three project areas: Beaver Fire (9 viewpoints), Happy Camp Complex Fire (34 viewpoints), and Whites Fire (19 viewpoints). The scenery assessment of project activities uses these viewpoints. The distance zone listed identifies the closest project activity from the viewpoint. A high visual sensitivity means the visitors have a high level of interest in the scenery. Viewpoints that have a moderate visual sensitivity are usually secondary County or Forest roads with moderate use.

Existing Scenic Character

Scenic Character is the overall visual impression or image that gives a geographical area its identity. The overall scenic character consists of steep, rugged mountainous terrain which is bisected by major rivers and tributary creeks. These creeks are flanked by mid-

elevation, steep terrain with numerous side drainages. The mountains are overlain with largely continuous, mixed conifer forest canopies. There are breaks in the forest canopy from previous wildfires, rock outcrops, meadows, roads, and older harvest activities are evident. In the background, more open higher elevation ridges and peaks provide a visual backdrop.

Vegetation is diverse in both pattern and species, with the Douglas-fir/white fir mixed conifer forest being most dominant. Conifer species include ponderosa pine, sugar pine, incense cedar, and white fir. Also, common is the Douglas-fir/tanoak community where Douglas-fir dominates the overstory with hardwoods found in the understory such as canyon live oak, black oak, white oak, pacific madrone, and big leaf maple. The hardwoods are slowly being overtopped by the conifers and declining in numbers. Some forested areas are extremely dense, where wildfires have been artificially suppressed for at least 50 years. This density of vegetation not only obstructs in-canopy views to the forest floor, but provides ladder fuels thereby increasing the risk of extreme wildfire events. Streams display extremely high water clarity. Air quality is high, with coastal moisture occasionally adding clouds and haze to the typical clear views under blue skies.

The scenic character of the project areas was substantially affected by the 2014 fire season, as described in Chapter 1 of this draft EIS. The fires burned with high severity in many areas, creating standing dead trees, blackened tree boles and brush skeletons, bare soil, and dying trees with brown needles. The fire opened up views into the forest, exposing hillsides, bare soil, and rock outcrops. In many places the once green forest now looks like blackened toothpicks, while ocassionally some green trees survived the fire.

Existing Scenic Integrity

Scenic integrity is the relative degree of natural appearance displayed by a landscape. In the three project areas, current scenic integrity as viewed from inventoried sensitive viewpoints is as follows: 1) Some limited evidence of existing roads, fire breaks, plantations, and past and on-going logging units. 2) Vegetation and/or topography screen most of these management activities except when in the immediate vicinity of the activity or from distant viewpoints. Cumulatively, across the project areas as a whole, the alterations are minor, and generally a near-natural appearance dominates. Therefore the project areas have Moderate Scenic Integrity and meet a Partial Retention visual quality objective as defined in the Forest Plan.

Desired Scenic Character

The ideal, socially valued Scenic Character of the Westside project area would display a more attractive, forested condition. These conditions would include increased vegetative and spatial variety throughout a largely continuous but more open and irregular forest canopy, with more frequent small, irregular openings and edges. There would be a widepread presence of large trees as individuals and clumps, features such as outcrops, rocks and barrens, meadows, irregular patches of native shrubs, forbs and grasses in openings and forest floor understories, scattered standing snags, scattered irregular fire-killed canopy openings containing clumps of standing dead trees over a green surface of conifer seedlings. This more open forest canopy would support attractive views through the forest canopy as well as to more distant mountainous landscapes.

Management Direction

Management direction for Scenery comes from the Forest Plan primarily under Standards and Guidelines for the Visual Resource Management Program and Retention and Partial Retention visual quality objective Management Areas 11 and 15 respectively. However a visual quality objective is identified in the Forest Plan for *all* National Forest lands; hence each Management Area lists the appropriate visual quality objective in a Standard and Guideline under the "Visual Resource Management" subheading. Table 2 displays visual quality objectives of Management Areas in which activities are proposed in this project.

For the Klamath Wild and Scenic Designated Recreational River (Management Area 13), a Retention visual quality objective supersedes the Partial Retention visual quality objective because Highway 96 is an eligible State Scenic Highway.

For General Forest lands (Management Area 17), a Modification or Maximum Modification visual quality objective is utilized. The location of these visual quality objectives was determined using criteria from the Visual Resource Management System. A majority of General Forest lands have a Modification visual quality objective.

Table 3-64: Desired Visual Quality Objective by Management Area (per Forest Plan)

		Visual Quality Objective (Vqo)*				
Forest Plan Management Area		Preservation	Retention	Partial Retention	Modification	Maximum Modification
Ma-5	Special Habitat			X		
Ma-7	Special Interest Area		X[1]			
Ma-10	Riparian Reserves			X		
Ma-11	Retention Visual Quality Objective		X			
Ma-12	Designated And Recommended Scenic Rivers		X			
Ma-13	Designated And Recommended Recreational Rivers		X[2]	X		
Ma-15	Partial Retention Visual Quality Objective			X		
Ma-17	General Forest				X	X

* Visual quality objective(s) are specifically identified by a Standard and Guideline for each Management Area.

[1] Per Forest Plan "Manage these areas to meet the intent of the Forest visual quality objective map. As a minimum, manage the lands within the areas to meet a Retention visual quality objective."

[2] Retention visual quality objective designated elsewhere in Forest Plan for State Scenic Highways may supersede Partial Retention visual quality objective.

Table 3-65: Identified potential viewpoints, sensitivity level, and distance zone by project area.

Potential Viewpoint(s)	Visual Sensitivity Level	Distance Zone
Beaver Fire		
State Highway 96 (State of Jefferson Scenic Byway)	High	Foreground
Klamath Wild and Scenic River	High	Foreground
Klamath River community	High	Foreground
Gottville River Access	High	Foreground
Brown Bear River Access	High	Foreground
Beaver Creek Road (8J01/11)	Moderate	Foreground

Potential Viewpoint(s)	Visual Sensitivity Level	Distance Zone
Beaver Creek Campground	Moderate	Foreground
Pipeline Gap/Deer Camp Road* (40S01)	Moderate	Foreground
Buckhorn Bally Lookout*	Moderate	Foreground
Happy Camp Complex		
State Highway 96 (State of Jefferson Scenic Byway)	High	Foreground
Klamath Wild and Scenic River	High	Foreground
Klamath River community	High	Foreground
Hamburg	High	Foreground
Seiad	High	Foreground
Happy Camp	High	Foreground
O'Neil Creek Campground	High	Foreground
Sarah Totten Campground	High	Foreground
Curly Jack Campground	High	Foreground
Lake Mountain Lookout*	High	Foreground
Gordon's Ferry River Access	High	Foreground
Indian Creek River Access	High	Foreground
Scott River road (7F01)	High	Foreground
Scott Wild and Scenic River	High	Foreground
Johnson Bar River Access	High	Foreground
Scott Bar	High	Foreground
Sugar Pine Trail	High	Foreground
Townsend Gulch River Access	High	Foreground
Gold Flat River Access	High	Foreground
Tompkins River Access	High	Foreground
Lake Mountain Trail	Moderate	Foreground
Scott Bar Lookout*	Moderate	Middleground
Box Camp Trailhead	Moderate	Middleground
Paradise Trailhead	Moderate	Middleground
Grider Creek road (46N66, 46N24X)	High	Foreground
Grider Creek Campground	High	Foreground
Grider Creek (Recommended Wild and Scenic River)	High	Foreground
Pacific Crest Trail	High	Middleground
Cold Springs Trailhead	High	Foreground
Tyler Meadows Trailhead	High	Foreground
Elk Creek road (7C001)	Moderate	Foreground
Elk Creek (Recommended Wild and Scenic River)	Moderate	Foreground
Bear Creek Trailhead road (16N05, 15N06)	Moderate	Foreground
Bear Creek Trailhead	High	Foreground
Whites Fire		
Sawyers Bar Road (FH102)	Moderate	Foreground
Sawyers Bar	High	Foreground
South Russian Creek (recommended Wild and Scenic River)	Moderate	Foreground
Timber Camp Trailhead	Moderate	Foreground
Timber Camp Trailhead road (36N58, 36N15)	Moderate	Foreground
Pacific Crest Trail	Moderate	Middleground
Hogan Lake Trail	Moderate	Middleground
Snoozer Trail	Moderate	Foreground
Tanner Peak Trail	Moderate	Foreground
Mule Bridge Road (41N36)	Moderate	Foreground

Potential Viewpoint(s)	Visual Sensitivity Level	Distance Zone
North Fork Salmon Wild and Scenic River	Moderate	Foreground
Music Creek Trailhead	Moderate	Foreground
South Russian Creek Trailhead	Moderate	Foreground
Idlewild Campground	Moderate	Foreground
Mule Bridge Trailhead	Moderate	Foreground
Eddy Gulch Lookout*	Moderate	Middleground
Eddy Gulch Lookout road (39)	Moderate	Foreground
East Whites Gulch Trail*	Moderate	Foreground
South Russian Creek Trail*	Moderate	Foreground

* Viewpoints identified as a sensitive viewpoint post-Forest Plan and as such were not utilized in the development of Forest Plan visual quality objectives. Post-Forest Plan viewpoints are not required to meet S and G 11-1, but should be considered during project planning.

Environmental Consequences

Alternative 1

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Alternative 1 would result in direct short- and long-term adverse effects to scenic character. In the short term, evidence of the fire with standing dead trees, blackened tree boles and brush, bare soil, and dying trees with brown needles or leaves would continue to be quite noticeable. Along many viewpoints, most screening vegetation has lost all needles or leaves, opening up views into the forest of bare soils, streams, and rock outcrops. Trees with burnt roots would start falling down. In two to three years, some brushes and grasses would return to the burn areas providing some green color, texture, and ground cover.

Decay and wind disturbance would lead to the smaller diameter, fire-killed trees falling down within the first ten years, with the majority of all trees falling down within the next 20 years (Russell et al. 2006). Standing trees would provide visual clues of the past fires for decades. As dead trees fall, the scenic character of areas once-forested would change becoming much more open. Extremely high fuel loads would develop creating a landscape that is susceptible to a high intensity, high severity fire. In many areas these conditions would likely create a long term vegetation change away from a conifer-dominated vegetation type towards a shrub-dominated ecosystem.

Without both harvest and replanting treatments within the project areas, current conditions would likely result in increased growth of brush. The competing brush, combined with a limited seed source would inhibit the natural regeneration of conifer species that dominated the landscape prior to the fires. The desired scenic character of a forested canopy with large tree character, as well as increased species diversity would be adversely affected. Without management treatments, achievement of the desired condition for scenery would be set back 50 plus years or more.

Visual Quality Objectives establish acceptable levels of alteration for management activities. For Alternative 1, there would be no effects to the Visual Quality Objectives because no project activities will be implemented.

Cumulative Effects

Several other private land parcels within the project area have been or are proposed for salvage logging. Removal of all dead trees would create texture contrasts with adjacent forested lands. If trees are removed up to and along straight property boundaries, these line contrasts would likely be noticeable from some sensitive viewpoints.

Other ongoing and future foreseeable actions on the Forest include projects with vegetation treatments such as commercial thinning, pre-commercial thinning, and mastication. Most projects also include a fuels treatment component such as underburning, thinning of small diameter understory trees or brush, piling, and pile burning. All of these projects would affect scenery, creating both short- and long-term beneficial effects to scenic character. Densely forested areas would be opened up (thinned); this more open forest canopy would support attractive views through the forest canopy as well as to more distant mountainous landscapes. Fuels treatments would increase the resiliency of the areas to high intensity wildfires and help to perpetuate ecologically established scenery. These projects would create noticeable visual contrasts in the short term and likely be visible from some sensitive viewpoints. In two-three years after project completion, “greening up” these activities would appear near-natural. Adding the effects of these projects to the effects of Alternative 1 on scenic character would have minor cumulative effects.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The direct and indirect effects are the same as for the Beaver Fire area.

Cumulative Effects

The cumulative effects are the same as for the Beaver Fire area.

Project Area C: White Fire

Direct Effects and Indirect Effects

The direct and indirect effects are the same as for the Beaver Fire area.

Cumulative Effects

The cumulative effects are the same as for the Beaver Fire area.

Alternatives 2, 3, 4 and 5

Because of minor differences between alternatives, the analysis description for all four alternatives has been combined into one section. The four action alternatives propose hazardous fuels treatments, salvage harvest, roadside hazard treatments, and reforestation (site preparation, planting, and release). See the Scenery report amendment for details on the acres affected by fire area and for each alternative.

Direct Effects and Indirect Effects

Visibility Analysis

The analysis indicated most viewpoints would have visibility of two project treatments or more; three viewpoints would not have visibility of any activities.

Salvage Harvest

The removal of dead and dying trees would create large openings with line and texture contrasts with adjacent burned or forested areas. Individual larger snags and clumps with no treatment would be retained for wildlife resources. These would provide some texture to the units when viewed from sensitive viewpoints. Logging systems can further influence the noticeable visual contrasts by the disturbances they create. Helicopter creates the least visual contrasts; skyline creates linear contrasts from log skidding and cable corridors; and ground-based creates more color contrasts from soil disturbance by equipment and log skidding. The actual acres of harvest that will occur within individual salvage harvest units is reduced with the inclusion of riparian reserves. These no cut areas will benefit scenery resources by visually breaking up units and reducing their size/scale and by adding texture. The assessment of effects to scenery considers these inclusions.

Roadside Hazard Treatments

The removal of both merchantable and non-merchantable hazard trees along system roads and through treatment units, would “open up” travel corridors in those areas where a higher number of trees are removed. In other areas where only individual or isolated trees are removed, there would be little change or effect to overall scenic character. Ground disturbance, tree stumps, and trees felled and left would be noticeable in the short term. A recovery time of three years would allow seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or “greening up” to soften these effects.

Hazardous Fuels Treatments

These treatments would occur along strategic ridgelines, roads, or control lines. Trees would be removed (12 inches in diameter at breast height or less) and other understory vegetation by mechanical, machine, or hand work. Slash would be piled and burned, lop and scattered, or chipped. Remaining trees would be pruned up to seven feet. The short-term visual impacts from felling and piling dead trees and then burning would create color and texture soil contrasts. Removing understory vegetation and tree pruning would open views into the forest and of the forest floor. Fuels breaks along visible ridgelines would create longer-term linear contrasts. A recovery time of three years would allow seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or “greening up” to soften these effects.

Prescribed Fire

The short term visual impacts from underburning would create brown vegetation, red tree crowns, blackened duff layer, and scorched trunks. Scraping control lines to mineral soil would create linear disturbances. Recovery times of three years would allow revegetation or “greening up” of many of the burn effects. At that point, any residual effects from the underburn would appear as a natural occurrence, consistent with the many wildfires that have occurred throughout the Forest. Underburning would create long term positive effects such as the creation of more open stands where forest visitors can look into stands, larger trees and wildlife can be observed by travelers, greater species diversity, and increased resiliency of the stand to wildfire. This activity would easily meet all assigned visual quality objectives and help meet (Standard and Guideline 11-4) to perpetuate the Forest’s ecologically established landscape character.

Site Preparation, Planting and Release (Reforestation)

Planting in areas previously stocked (pre-fire) with conifers, combined with rocky or unplantable sites, and tree survival rates, would provide spatial variability across the project areas. This would speed up recovery of burned areas to a mostly forested condition with some openings and appear natural in the long term. This would be consistent with the Desired Scenic Character to a forested condition.

Visual Quality Objectives

Table 3-66: Preliminary Results of Meeting or Not Meeting visual quality objective by Alternative by Treatment Type.

All Alternatives and Treatment Type	Does Treatment Type Meet visual quality objective? (Yes or No)			
	Retention	Partial Retention	Modification	Maximum Modification
Fuels Treatments	Y	Y	Y	Y
Salvage Harvest	N*39	Y/N*	Y	Y
Roadside Hazard	N*	Y/N*	Y	Y
Prepare Site and Plant	Y	Y	Y	Y

Minor localized short-term direct adverse effects to visual quality objectives from management treatments would occur during project implementation with the presence of equipment, smoke, stumps, exposed soils, and cut and/or piled vegetation.

Retention visual quality objective areas

Salvage harvest and roadside hazard treatments in Retention visual quality objective areas would likely not meet the Retention visual quality objective – where management activities are not visually evident to the casual Forest visitor. However an exception is allowed under Forest Plan Standards and Guideline 11-7 which states "In the case of recovery activities after extreme catastrophic events such as intense wildland fires, time periods to achieve the visual quality objectives stated in Forest-wide and Management Area Standards and Guidelines may be extended. This would be necessary where previously unnoticed scenery alterations are exposed to view due to loss of vegetative screening, or during timber salvage activities where recovery of forest vegetation is determined to be of greater importance than achievement of visual quality objectives within the time periods established."

Partial Retention visual quality objective areas

Salvage harvest and roadside hazard treatments in the foreground distance zone along hiking trails would likely not meet the Partial Retention visual quality objective in three years – where management activities may be noticeable, but are subordinate to the characteristic landscape. The presence of high stumps and tree marking paint (if used) would be noticeable to hikers for 10 years or more. This includes units bisected by both the Lake Mountain and Bear Creek trails.

Although this appears inconsistent with Forest Plan Standards and Guidelines numbers MA15-1, MA15-5, and MA15-10, an exception is allowed under Forest Plan Standards and Guideline 11-7 which states "In the case of recovery activities after extreme catastrophic events such as intense wildland fires, time periods to achieve the visual quality objectives stated in Forest-wide and Management Area Standards and Guidelines may be extended. This would be necessary where previously unnoticed scenery alterations are exposed to view due to loss of vegetative screening, or during timber

[39] *= Not meeting a visual quality objective in the three year timeframe is inconsistent with Forest Plan Standards and Guidelines numbers MA12-7 and MA13-6. However, an exception is allowed under Forest Plan Standards and Guidelines number 11-7 which states "In the case of recovery activities after extreme catastrophic events such as intense wildland fires, time periods to achieve the visual quality objectives stated in Forest-wide and Management Area Standards and Guidelines may be extended. This would be necessary where previously unnoticed scenery alterations are exposed to view due to loss of vegetative screening, or during timber salvage activities where recovery of forest vegetation is determined to be of greater importance than achievement of visual quality objectives within the time periods established."

salvage activities where recovery of forest vegetation is determined to be of greater importance than achievement of visual quality objectives within the time periods established."

All other project activities (including salvage units not located in foreground distance zones along hiking trails) would likely meet their assigned visual quality objective of Partial Retention in three years. A recovery time of three years would allow seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or "greening up" to soften these effects. Thus project activities would appear near-natural to Forest visitors.

Thus in the long-term these project activities (salvage harvest and roadside hazard treatments in the foreground distance zone along hiking trails) and all other project activities would appear near-natural to Forest visitors and meet a Partial Retention visual quality objective. Forest Plan direction would be met.

Modification and Maximum Modification visual quality objective areas

All activities would meet their assigned visual quality objectives within Forest Plan timelines. These activities are located either in middleground or background distance zones from sensitive viewpoints and appear as a natural occurrence or not visible.

However cumulative scenic quality effects are evaluated in a larger context than the individual project activities themselves - the potentially affected viewsheds as a whole. The scenery analysis area includes the multitude of viewsheds throughout the project areas. When viewed from multiple viewpoints, proposed management activities in all viewsheds would be appear visually subordinate to the characteristic landscape. All viewsheds would be natural or near-natural appearing and meet or exceed a Partial Retentionvisual quality objective.

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Highway 96 State of Jefferson Scenic Byway: Additional field review indicates that project activities (fuels treatments, roadside hazard) visible from Highway 96 State of Jefferson Scenic Byway would not be noticeable and meet a Retention visual quality objective. Roadside hazard treatments occur primarily along County Road 8G004 located on the south side of the Klamath River 100-150 feet from Highway 96. The highway's curvilinear nature, travel speed of 55 MPH, and vegetative screening would likely limit the duration of view to a few seconds. A recovery time of three years would allow seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or "greening up" to soften these effects. Therefore travelers probably would not notice these treatments and the viewshed would not be adversely effected.

Klamath Wild and Scenic River: These same roadside hazard treatments (mentioned above), would likely be noticeable to floaters and fishermen in some locations because of their closer proximity to the disturbances and slower rate of travel. Existing riverside vegetation would screen some effects. Project treatments would still be noticeable in some locations; up to six areas totaling 3.5 miles and likely not meet a Retention visual

quality objective in the three year timeframe. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

All Other Viewsheds Listed in Table 3-67 not discussed above: There would be no adverse effects to all other viewsheds (listed below) from project treatments. All assigned visual quality objectives would be met. Treatments would either be not visible, not noticeable in Retention visual quality objective areas, or noticeable in Partial Retention/Modification/Maximum Modification visual quality objective areas. The disturbances associated with various project activities such as soil disturbance, stumps, burnt vegetation, etc. would recover in three years' time with seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or "greening up. Hence all activities would appear near natural and easily meet their assigned visual quality objectives.

In summary, the Klamath Wild and Scenic River would not meet its assigned visual quality objective within the three year timeframe and visual quality objectives would be met for the other eight viewsheds.

Table 3-67: Visibility of Project Treatments From Sensitive Viewpoints for Beaver Fire Areas.

Potential Viewpoint(s)	Visual Sensitivity Level	Project Area	Fuels Treatments	Salvage Harvest	Roadside Hazard Treatments	Site Preparation and Planting
		Is the project area or activity potentially visible from the scenic viewpoint40?				
Beaver Fire						
State Highway 96 (State of Jefferson Scenic Byway)	High	Y	Y	N	Y	N
Klamath Wild and Scenic River	High	Y	Y	N	Y	N
Klamath River community	High	Y	Y	N	N	N
Gottville River Access	High	Y	Y	N	N	N
Brown Bear River Access	High	N	N	N	N	N
Beaver Creek Road (8J01/11)	Moderate	Y	Y	N	Y	Y
Beaver Creek Campground	Moderate	Y	Y	N	N	Y
Pipeline Gap/Deer Camp Road* (40S01)	Moderate	Y	Y	Y	Y	Y
Buckhorn Bally Lookout*	Moderate	Y	Y	Y	Y	Y

Cumulative Effects

[40] Based upon a combination of computer modeling, map review, on-the ground knowledge, and field verification.

Several other private land parcels within the project area have been or are proposed for salvage logging. Removal of all dead trees would create texture contrasts with adjacent forested lands. If trees are removed up to and along straight property boundaries, these line contrasts would likely be noticeable from some sensitive viewpoints.

Other ongoing and future foreseeable actions on the Forest include projects with vegetation treatments such as commercial thinning, pre-commercial thinning, and mastication. Most projects also include a fuels treatment component such as underburning, thinning of small diameter understory trees or brush, piling, and pile burning. All of these projects would affect scenery, creating both short- and long-term beneficial effects to scenic character. Densely forested areas would be opened up (thinned); this more open forest canopy would support attractive views through the forest canopy as well as to more distant mountainous landscapes. Fuels treatments would increase the resiliency of the areas to high intensity wildfires and help to perpetuate ecologically established scenery. These projects would create noticeable visual contrasts in the short term and likely be visible from some sensitive viewpoints. In two-three years after project completion, "greening up" these activities would appear near-natural. Adding the effects of these projects to the effects of Alternative 1 on scenic character would have minor cumulative effects.The cumulative effects of grazing does not affect the overall visual quality objectives because cattle are a temporary and seasonal use and rangeland improvements are minimal and are typically limited to fencing.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Klamath Wild and Scenic River: Roadside hazard, fuels treatments, and salvage harvest units are proposed within the river corridor. These activities would likely be noticeable to floaters and fishermen in three to four locations (estimated 2 miles) because of their wider field of view and slower rate of travel (than Highway 96). Riverside vegetation would screen some effects. Project treatments would likely not meet a Retention visual quality objective in the three year timeframe. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

Grider Creek Campground: Salvage harvest units (numbers 61 and 62-1) are proposed for Alternatives 2, 3, and 4 within close proximity of the campground and are prominently located on adjacent hillsides. Roadside hazard treatments are proposed along the access road (number46N24X) and the campground loop road (Alternatives 2-5). Green trees provide substantial screening throughout most of the campground, but project treatments would be noticeable to campers in the northern loop (horse corral) area and likely not meet a Retention visual quality objective in the three year timeframe. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

Grider Creek (recommended Wild & Scenic River): Portions of salvage harvest units (numbers 61 and 62-1) and roadside hazard treatments are proposed for Alternatives 2, 3, and 4 within the river corridor near Grider Creek Campground. The PCT is also located in this area of the river corridor. Project treatments would be highly noticeable to hikers only when in the immediate vicinity of these two units, and likely not meet a Retention visual quality objective in the three year timeframe. Continued "greening up" for five –

ten years would allow additional resprouting and growth of vegetation to hide these effects.

Although several salvage harvest units located in the Grider Creek recommended Wild and Scenic river corridor were removed for Alternative 5, this was overlooked in the Draft analysis. However, the inclusion of roadside hazard treatments (7 acres) in Grider Creek for Alternative 5 would still have noticeable effects (only when in the immediate vicinity) and likely not meet the Retention visual quality objective within three years. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects. Therefore the viewshed of Grider Creek would be adversely affected for all four alternatives.

Pacific Crest Trail (between north boundary of Marble Mountain Wilderness and Forest road 45N72X): Two mapping discrepancies were discovered during field reviews for the project and are displayed in Figures 7 and 8 of the Recreation amendment.

Using the revised trail alignment data shown on Figure 7 in the Recreation Amendment, for Alternatives 2-4 the PCT bisects a roadside hazard treatment at the Cold Spring Trailhead, then skirts harvest unit number224 for approximately 50 feet (Alternatives 2-4). The trail continues and eventually bisects a roadside hazard treatment (45N78). Three years of "greening up" would soften effects, but high stumps would still be noticeable for two hundred feet along the trail and likely would not meet a Retention visual quality objective in the three year timeframe for Alternatives 2-5. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

Using the revised trail alignment data shown on Figure 88 in the Recreation Amendment, for Alternatives 2-4, the PCT would skirt unit 228-3 - not bisect this unit as shown on earlier project maps. Dead trees along the trail provide some partial screening of the unit located uphill, but it would still be noticeable to PCT hikers (for approximately 1/8 mile) and likely not meet a Retention visual quality objective in the three year timeframe. Three years of "greening up" would soften effects, but high stumps would still be noticeable and likely would not meet a Retention visual quality objective in the three year timeframe for Alternatives 2-5. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide stumps and reduce texture contrasts. This unit is not proposed in Alternative 5, hence there will be no effect.

The trail continues north and eventually bisects a roadside hazard treatment (45N72X). Three years of "greening up" would soften effects, but high stumps would still be noticeable for a hundred feet and likely would not meet a Retention visual quality objective in the three year timeframe for Alternatives 2-5. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

Tyler Meadows Trailhead: Numerous salvage harvest units (number520, 521, 522, 524, 525, 525-1, 525-2, 528-1) and temporary roads on existing roadbeds are proposed for Alternatives 2, 3, and 4 in the Faulkstein Camp/Tyler Meadows area along forest road 45N77 which accesses the Tyler Meadows Trailhead. Roadside hazard treatments are proposed for Alternatives 2-5. Units would be visible for approximately 3 miles in close proximity to the road and large in scale. When combining roadside hazard treatments with Forest visitors being able to look down from road on these treatments (when they

are most visible), the Retention visual quality objective would not be met in the three year timeframe. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects. These units are not proposed in Alternative 5, hence there will be no effect.

Grider Creek road (46N66, 46N24X): Roadside hazard treatments and salvage harvest unit 62 are proposed adjacent to the road; Harvest units 61 and 62-1 are prominently located on adjacent hillsides. These activities would be highly visible for approximately 1 mile to PCT hikers and forest visitors traveling these roads. It is unlikely these treatments would meet a Retention visual quality objective in the three year timeframe. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these these effects.

Cold Spring Trailhead: Roadside hazard treatments are proposed for Alternatives 2-5 along access road 45N78A, the trailhead, and the PCT; salvage harvest unit number224 (Alternatives 2-4) and site prep/plant unit P323 (Alternatives 2-5) are proposed immediately adjacent to the PCT. The disturbances (i.e. soils, high stumps) from these treatments would be highly visible to Forest visitors and PCT hikers. Three years of "greening up" would soften effects, but likely would not meet a Retention visual quality objective in the three year timeframe for Alternatives 2-5. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

Scott Wild and Scenic River: Roadside hazard, fuels treatments, and portions of several salvage harvest units are proposed within the river corridor. All of these treatments occur along or above County Road 7F01. The Scott River parallels the county road and is vertically separated by an estimated thirty to several hundred feet. Screening vegetation along the road and river would further limit visibility. It is unlikely that kayakers and rafters would notice any of these treatments. Hence activities would easily meet the Partial Retention visual quality objective for river segments Sc01 and Sc03, and a Retention visual quality objective for river Segment Sc02. There would be no adverse effect to the river's viewshed.

Scott River Road (County Roadnumber7F01): Numerous roadside hazard and fuel treatments, and a few harvest units and site prep/plant units are proposed along the road. The road's highly curvilinear nature, topographic and vegetative screening and steep adjacent topography severely limit the duration of view of disturbances to a few seconds. A recovery time of three years would allow seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or "greening up" to soften these effects. Hence activities would easily meet the Partial Retention visual quality objective (Kelsey Creek to McCarthy Creek, Scott Bar to Highway 96), and a Retention visual quality objective (McCarthy Creek to Scott Bar). There would be no adverse effect for travelers to the road's viewshed.

Bear Creek Trailhead: Roadside hazard treatments are proposed along access road 15N06. The trail utilizes a portion (approximately ¼ mile) of the access road. This treatment (i.e. high stumps) would be highly visible to Forest visitors and hikers and likely not meet a Partial Retention visual quality objective in three years. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

Lake Mountain Trail: As the trail bisects salvage harvest unit numbers 508-1, 508-4-1, 508-5, roadside hazard for road 45N65, Fuels treatment unit F071, disturbances (i.e. stumps) would be highly visible to hikers for approximately ¾ mile) and likely not meet a Partial Retention visual quality objective in three years. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

Other Viewsheds Listed in Table 3-68 not discussed above: There would be no adverse effects to all other viewsheds from project treatments. All assigned visual quality objectives would be met. Treatments would either be not visible, not noticeable in Retention visual quality objective areas, or noticeable in Partial Retention/ Modification/Maximum Modification visual quality objective areas. The disturbances associated with various project activities such as soil disturbance, stumps, burnt vegetation, etc. would recover in three years' time with seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or "greening up. Hence all activities would appear near natural and easily meet their assigned visual quality objectives.

In summary, the nine viewsheds discussed above would not meet their assigned visual quality objectives within the three year timeframe and visual quality objectives would be met for the other 25 viewsheds.

Table 3-68: Visibility of Project Treatments From Sensitive Viewpoints for the Happy Camp Complex area.

Potential Viewpoint(s)	Visual Sensitivity Level	Project Area	Fuels Treatments	Salvage Harvest	Roadside Hazard Treatments	Site Preparation and Planting
		Is the project area or activity potentially visible from the scenic viewpoint[41]?				
Happy Camp Complex						
State Highway 96 (State of Jefferson Scenic Byway)	High	Y	Y	Y	Y	N
Klamath Wild and Scenic River	High	Y	Y	Y	Y	N
Hamburg	High	Y	N	Y	N	N
Seiad	High	Y	Y	Y	N	Y
Happy Camp	High	Y	Y	N	Y	Y
O'Neil Creek Campground	High	Y	Y	N	Y	N
Sara Totten Campground	High	Y	Y	Y	N	N
Curly Jack Campground	High	Y	Y	N	N	N
Lake Mountain Lookout*	High	Y	Y	Y	Y	Y

[41] Based upon a combination of computer modeling, map review, on-the ground knowledge, and field verification.

Potential Viewpoint(s)	Visual Sensitivity Level	Project Area	Fuels Treatments	Salvage Harvest	Roadside Hazard Treatments	Site Preparation and Planting
Gordon's Ferry River Access	High	Y	Y	Y	Y	Y
Indian Creek River Access	High	Y	Y	N	Y	Y
Scott River road (7F01)	High	Y	Y	Y	Y	N
Scott Wild and Scenic River	High	Y	Y	Y	N	N
Johnson Bar River Access	High	Y	Y	Y	Y	N
Scott Bar	High	Y	Y	N	N	N
Sugar Pine River Access	High	Y	Y	N	Y	N
Townsend Gulch River Access	High	Y	Y	N	N	N
Gold Flat River Access	High	Y	Y	N	Y	N
Tompkins Creek River Access	High	Y	Y	N	Y	N
Lake Mountain Trail	Moderate	Y	N	Y	N	N
Scott Bar Lookout*	Moderate	Y	Y	Y	Y	Y
Box Camp Trailhead	Moderate	Y	Y	N	Y	Y
Grider Creek road (46N66, 46N24X)	High	Y	Y	Y	Y	N
Grider Creek Campground	High	Y	Y	Y	Y	N
Grider Creek (Wild and Scenic River)	High	Y	N	Y	N	N
Pacific Crest Trail	High	Y	Y	Y	Y	Y
Cold Spring Trailhead	High	Y	N	Y	Y	Y
Tyler Meadows Trailhead	High	Y	Y	Y	N	Y
Elk Creek road (7C001)	Moderate	Y	Y	N	N	N
Elk Creek (Wild and Scenic River)	Moderate	Y	Y	N	N	N
Bear Creek Trailhead road (16N05, 15N06)	Moderate	Y	N	N	Y	N
Bear Creek Trailhead	High	Y	N	N	Y	N

Cumulative Effects

The cumulative effects are the same as described for the Beaver Fire area with one addition. There is an ongoing action of removing hazard trees in the Grider Creek Campground. The purpose of this project is safety to the public within an

administration/recreation site after the 2014 wildfire went through the campground. Proposed treatments include cut, buck, limb, and move 20 hazardous trees. The cumulative effect of this action is an adverse effect to both the campground and Grider Creek (recommended Wild and Scenic River). Because the stumps will be in close proximity to visitors, it is likely the Retention visual quality objective would not be met in the three year timeframe. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

North Fork Road (FH102): Roadside hazard and fuels treatments are proposed in the Retention (first ½ mile of road within project area) and Partial Retention visual quality objective areas (rest of road in project area) along this road. The roadside hazard treatments occur along adjacent roads which are not visible from the North Fork Road. It is unlikely the fuels treatments would be noticeable to travelers because of the road's steep and winding nature and therefore meet their assigned visual quality objectives. Several harvest units are proposed along (number410, 411) or with close proximity (number409, 423, 426) of the road and are all within Partial Retention visual quality objective areas. The removal of trees would introduce some form and texture contrasts, but within three years of "greening up" these treatments would be subordinate to the characteristic landscape and easily meet a Partial Retention visual quality objective from the viewshed.

North Fork Salmon Wild and Scenic River: Roadside hazard, fuels, salvage harvest (number409, 410, 411), and site prep/plant are proposed within the river corridor with a Partial Retention visual quality objective. It is likely all or portions of each of these treatments will be visible from the river. The removal of trees would introduce some form, color, and texture contrasts, but within three years of "greening up" these treatments would be subordinate to the characteristic landscape and easily meet a Partial Retention visual quality objective from the river viewshed.

Snoozer, East Whites and Tanner Peak Trails: The Snoozer trail bisects an underburn for 2-1/2 miles; East Whites trail borders an underburn for 2 miles, Tanner Peak trail passes thru several hundred feet of a fuels treatment; all three are in a Partial Retention visual quality objective area. Within three years of "greening up" these treatments would easily meet a Partial Retention visual quality objective from these viewsheds.

All Other Viewsheds Listed in Table 6 not discussed above: There would be no adverse effects to all other viewsheds from project treatments. All assigned visual quality objectives would be met. Treatments would either be not visible, not noticeable in Retention visual quality objective areas, or noticeable in Partial Retention/ Modification/Maximum Modification visual quality objective areas. The disturbances associated with various project activities such as soil disturbance, stumps, burnt vegetation, etc. would recover in three years' time with seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or "greening up. Hence all activities would appear near natural and easily meet their assigned visual quality objectives.

In summary all viewsheds listed below would meet their assigned visual quality objectives within three year timeframe.

Table 3-69: Visibility of Project Treatments from Sensitive Viewpoints for the Whites Fire area.

Potential Viewpoint(s)	Visual Sensitivity Level	Project Area	Fuels Treatments	Salvage Harvest	Roadside Hazard Treatments	Site Preparation and Planting
		Is the project area or activity potentially visible from the scenic viewpoint[42]?				
Whites Fire						
North Fork Road (FH102)	Moderate	Y	Y	Y	Y	Y
Sawyers Bar	High	Y	Y	Y	N	Y
South Russian Creek (recommended Wild and Scenic River)	Moderate	N	N	N	N	N
Timber Camp Trailhead	Moderate	Y	Y	N	Y	N
Timber Camp Trailhead road (39N58, 39N15)	Moderate	Y	Y	Y	Y	Y
Pacific Crest Trail	Moderate	Y	Y	N	N	N
Hogan Lake Trail	Moderate	N	N	N	N	N
Tanners Peak Trail*	Moderate	Y	N	Y	Y	Y
Snoozer Trail*	Moderate	Y	N	N	N	N
Mule Bridge Road (40N47)	Moderate	Y	Y	N	Y	N
North Fork Salmon Wild and Scenic River	Moderate	Y	Y	Y	Y	N
Music Creek Trailhead	Moderate	Y	N	N	N	Y
South Russian Creek Trailhead	Moderate	Y	N	N	Y	Y
Idlewild Campground	Moderate	Y	Y	N	N	N
Mule Bridge Trailhead	Moderate	Y	Y	N	N	N
Eddy Gulch Lookout*	Moderate	Y	Y	Y	Y	Y
Eddy Gulch Lookout road (39)	Moderate	Y	Y	Y	Y	Y
East Whites Trail*	Moderate	Y	Y	N	N	N
South Russian Creek Trail*	Moderate	N	N	N	N	N

[42] Based upon a combination of computer modeling, map review, on-the ground knowledge, and field verification.

Cumulative Effects

The cumulative effects are the same as described for the Beaver Fire area.

Alternative 2 Modified

Project Area A: Beaver Fire Area

Direct Effects and Indirect Effects

The effects of Modified Alternative 2 are the same as described for Alternative 2, 3, 4, and 5.

Cumulative Effects

The effects are the same as described in Alternative 2, 3, 4 and 5.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Between Draft and Final, seven new Project Design Features (Recreation and Scenery 6-12), see Chapter 2 of final EIS for complete listing) were developed in response to Public comments to reduce negative effects to viewsheds at several locations, including along the PCT, and at the Cold Springs Trailhead. Although these project design features would greatly reduce effects, because of the close proximity (20-50 feet) of treatments to hikers, it is likely that these disturbances would be still noticeable after three years and not meet their compatible visual quality objective of Retention. Continued “greening up” for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

The use of these same project design features at both Bear Creek and Lake Mountain trails are intended to reduce negative effects (i.e. high stumps) to acceptable levels within three years from “greening up”; the low and angle-cut stumps would be noticeable but subordinate to the characteristic landscape. The viewsheds for both trails would meet their Partial Retention visual quality objectives.

In summary, seven viewsheds would not meet their assigned visual quality objectives within the three year timeframe. Visual quality objectives would be met for the other 27 viewsheds.

Cumulative Effects

The effects are the same as described in Alternatives 2, 3, 4 and 5.

Project Area C: Whites Fire Area

Direct Effects and Indirect Effects

The effects of Modified Alternative 2 are the same as described for Alternative 2, 3, 4, and 5.

Cumulative Effects

The effects are the same as described in Alternatives 2, 3, 4 and 5.

Alternative 3 Modified

Project Area A: Beaver Fire Area

Direct Effects and Indirect Effects

The effects of Modified Alternative 3 are the same as described for Alternative 2, 3, 4, and 5.

Cumulative Effects

The effects are the same as described in Alternative 2, 3, 4 and 5.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The size of riparian reserves that occur within individual salvage harvest units has been further increased (than in other alternatives) in Modified Alternative 3 with the inclusion of "additional snag retention areas" and "field and corporate riparian reserve" data. These expanded no cut areas will benefit scenery resources by visually breaking up units and reducing their size and by adding texture. Although considered for all viewpoints, the application of their use notably changes the scenery effects for two viewpoints discussed below.

Grider Creek Campground: Salvage harvest units (numbers 61 and 62-1) are proposed for Modified Alternative 3 within close proximity of the campground and are located on adjacent hillsides. The inclusion of snag retention areas and field and corporate riparian reserves, has significantly reduced the harvestable acres in unit number62-1 and resultant effects. Unit number61 also has these inclusions which reduce effects; the lower third of the unit has been dropped moving the boundary further away from the campground. Green trees provide substantial screening of these units throughout most of the campground. It is likely these units would not be noticeable to campers and meet a Retention visual quality objective in the three year timeframe. Roadside hazard treatments are proposed along the access road (number46N24X) but have been removed from the campground loop road (number46N24XA). It is likely these units will meet a Retention visual quality objective in the three year timeframe.

Grider Creek (recommended Wild & Scenic River): Portions of salvage harvest units (numbers 61 and 62-1) are proposed for Modified Alternative 3 within the river corridor near Grider Creek Campground. The PCT is also located in this area of the river corridor. As noted above, the snag inclusion areas would break up the units. Additional visual screening would be present from moving the lower unit boundary uphill away from the PCT. Combining these two factors with three years of greening up, it is likely these units would meet a Retention visual quality objective in the three year timeframe.

In summary, five viewsheds would not meet their assigned visual quality objectives within the three year timeframe. Visual quality objectives would be met for the other 29 viewsheds.

Cumulative Effects

The effects are the same as described in Alternatives 2, 3, 4 and 5.

Project Area C: Whites Fire Area

Direct Effects and Indirect Effects

The effects of Modified Alternative 3 are the same as described for Alternative 2, 3, 4, and 5.

Cumulative Effects

The effects are the same as described in Alternatives 2, 3, 4 and 5

Compliance with law, regulation, policy, and the Forest Plan

This project would help achieve the Forest Plan desired conditions to perpetuate ecologically established scenery. Reforestation would speed up recovery to a forested condition and fuels reduction treatments would reduce the likelihood of high intensity wildfires. The project would meet Forest Plan Visual Quality Objectives in the long term.

In the short term, noticeable visual disturbances from salvage harvest and roadside hazard treatments in Retention visual quality objective areas and some Partial Retention visual quality objective areas would likely not meet their assigned Visual Quality Objectives. Although this appears inconsistent with some Forest Plan Standards and Guidelines, an exception is allowed under Forest Plan Standards and Guideline 11-7 which states ”In the case of recovery activities after extreme catastrophic events such as intense wildland fires, time periods to achieve the visual quality objectives stated in Forest-wide and Management Area Standards and Guidelines may be extended. This would be necessary where previously unnoticed scenery alterations are exposed to view due to loss of vegetative screening, or during timber salvage activities where recovery of forest vegetation is determined to be of greater importance than achievement of visual quality objectives within the time periods established.” These disturbances would “green up” over time (10 years) and meet the Retention or Partial Retention visual quality objective. Integration of scenery project design features insures this project is consistent with Forest Plan scenery desired conditions and direction.

Recreation

The purpose of the section is to identify recreation use and opportunities in the project area and examine the effects of the project alternatives on these uses and opportunities.

Methodology

A recreation assessment of project activities was conducted using field and office review, professional expertise, and on-the-ground knowledge.

Analysis Indicators

Analysis indicators used to determine the effects of alternatives on recreation include:

1. Recreation Use - Will overall use increase or decrease as a result of the action?
2. Recreation Opportunities - How will the project affect existing and or new recreational opportunities?

Spatial and Temporal Context

The geographic extent for analysis of the effects for recreation is the general vicinity of the recreation feature. This unit of spatial analysis is used for determining direct, indirect, and cumulative effects. A short-term timeframe of three years allows the activities

associated with this project to be mostly completed. A long-term temporal bound of 10 years allows completed activities associated with this project to be established.

Affected Environment

Recreational use in the project areas is low and consists primarily of dispersed recreation opportunities. "Dispersed recreation is outdoor recreation that involves relatively low density use and occurs over broad expanses of land and water. Eighty percent of the Forest's recreational use is dispersed recreation. Most dispersed activity occurs during the summer and fall months. All dispersed areas are currently managed at low standard levels" (Forest Plan, page 3-11). Dispersed recreation opportunities include primitive camping, fishing, hunting, equestrian use, hiking, swimming/water play, whitewater rafting/kayaking, woodcutting, and viewing scenery.

Camping occurs at both developed campgrounds and primative dispersed campsites within the Wildernesses or along roads throughout the project areas. See Table 3-70 below for a listing of these features.

Hunting is the most popular primary activity for Forest visitors (USDA Forest Service 2012), with large numbers of people visiting the Forest primarily to hunt deer or other big game (elk, bear). During hunting seasons, developed campground occupancy increases, many primative campsites are occupied, and All-terrain Vehicles use Forest roads in the project areas.

Hiking occurs on numerous Wilderness trails, the Pacific Crest Trail and other trails. The 2014 fires burned two bridges and some trail signs. Trail treads were also damaged from burned tree roots, soil erosion from increased runoff, and increased sedimentation of water diversion features.

The replacement of fire damaged or destroyed trail bridges and signs along the Pacific Crest Trail are not part of the Proposed Action for this project. A Categorical Exclusion for trail maintenance will be used and additional funding obtained for replacements. Hazard trees associated with trails within the project areas will be addressed separately from this project as part of routine trail maintenance. Trail-side hazard trees will be prioritized and treated based on risk level including probability of tree failure and probability of a target. Selective treatment of hazard trees along trails allows for protection of scenery and the recreation setting.

Fishing occurs on rivers and high elevation lakes. Drift boats float the Klamath River for steelhead and salmon. Trout fishing occurs at high elevation lakes in the Wildernesses.

Whitewater rafting/kayaking and swimming water play occur primarily on the Klamath and Scott Rivers and to a lesser degree on the North Fork Salmon River. Use occurs from outfitter-guided trips as well as private parties. Some of these users camp at nearby river accesses, dispersed sites along the river or developed campgrounds.

Woodcutting is a popular recreation activity on the Forest; Douglas-fir, incense cedar, white oak, black oak, and madrone are preferred woodcutting species.

Scenery is an important component that affects recreation use, setting, and the recreation experience. Viewing scenery from within or outside project area boundaries occurs while driving along roadways such as the State of Jefferson Scenic Byway, floating or fishing rivers such as the Klamath or Scott Wild and Scenic Rivers, hiking on the Pacific Crest

Trail or other Wilderness trails, or overlooking the area from viewpoints such as fire lookouts.

For the Beaver Fire, there are five recreation features within the project area (one developed campground and four features related to dispersed recreation). For the Happy Camp Complex Fire, there are 24 recreation features within the project area (five developed campgrounds and 19 features related to dispersed recreation). For the Whites Fire, there are 13 recreation features within the project area (one developed campground and 12 features related to dispersed recreation). See Table 3-70 for more information.

Table 3-70: Summary of Potentially Affected Recreation Features located within Beaver Fire, Happy Camp Complex Fire, and Whites Fire Project Areas

Recreational Feature	Feature Description
Beaver Fire	
Klamath River	Designated National Wild and Scenic River
Gottville River Access	Klamath River access
Highway 96 State of Jefferson Scenic Byway	National Forest Scenic Byway
Beaver Creek Campground	Developed Campground
Dispersed Campsites (1)[43]	51D010 shown on Motor Vehicle Use Map
Happy Camp Complex Fire	
Klamath River	Designated National Wild and Scenic River
Indian Creek River Access	Klamath River access
Scott River	Designated National Wild and Scenic River
Johnson Bar River Access	Scott River access
Townsend Gulch River Access	Scott River access
Gold Flat River Access	Scott River access
Sugar Pine River Access	Scott River access
Tompkins Creek River Access	Scott River access
Bridge Flat Campground	Scott River access
Elk Creek	Recommended National Wild and Scenic River
Grider Creek	Recommended National Wild and Scenic River
Pacific Crest Trail	National Scenic Trail
Cold Spring Trailhead	Pacific Crest Trail access/Marble Mountain Wilderness access
Tyler Meadows Trailhead	Pacific Crest Trail access/Marble Mountain Wilderness access
Kelsey Creek Trail	National Recreation Trail
Bear Creek Trailhead	Kelsey Creek Trail access
Highway 96 State of Jefferson Scenic Byway	National Forest Scenic Byway
Sarah Totten Campground	Developed Campground
ONeil Creek Campground	Developed Campground (closed for 8+ years)
Grider Creek Campground	Developed Campground (currently closed by Forest Order until 05/15/15)
Curly Jack Campground	Developed Campground
Dispersed Campsites (34)[44]	As shown on Motor Vehicle Use Map

[43] Total number of dispersed campsites shown is taken from 2012 Motor Vehicle Use map and does not include campsites in Wilderness or immediately adjacent to forest roads.

Recreational Feature	Feature Description
Lake Mountain Trail	Forest Trail
Lake Mountain Lookout	Fire Lookout
Whites Fire	
North Fork Salmon River	Designated National Wild and Scenic River
South Russian Creek	Recommended National Wild and Scenic River
Pacific Crest Trail	National Scenic Trail
Mule Bridge Trailhead	Dispersed Campsites, Marble Mountain Wilderness access
Tanners Peak Trail	Forest Trail
Snoozer Trail	Forest Trail
Timber Camp Trailhead	Russian Wilderness access
South Russian Trailhead	Russian Wilderness access
East Whites Trail	Forest Trail
Music Creek Trailhead	Russian Wilderness access
Idlewild Campground	Developed Campground (currently closed by Forest Order until 05/15/15)
Robinson Flat	Dispersed campsites
Dispersed Campsites (2)[45]	54D001, 54D011 shown on Motor Vehicle Use Map

Environmental Consequences

Alternative 1

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Recreation Use

Under this alternative no project treatment activities are proposed. The roadways would be untreated and fire-killed tree hazards would pose threats to recreationist. Fallen snags along of the roadways would substantially impact access for recreational uses such as dispersed camping, scenic driving, and hunting. As fire-killed trees continue to decay and fall, public and worker safety would be threatened and the likelihood of potential injuries or death to individuals would increase. Forest Orders to restrict public access might be needed to mitigate risks to the recreating public.

With the exception of temporary closures by Forest Order, there is no reason to expect recreation use to measurably increase or decrease as a result of this alternative. Temporary closures of campgrounds, roads, rivers, or trails or portions of the burn area would displace users to other available areas within or outside of the burn affected area.

Fire-killed trees from the recent fires would greatly increase firewood availability for permitted collection; the permitted public would be most likely to collect fallen fire-killed trees and/or newly created (fire-killed) snags adjacent to roads. Firewood cutting use would likely increase in burned areas in the short term. Since re-sprouting of hardwood trees and brush in burned areas would attract deer by providing browse, if Forest Orders do not affect public access, deer hunting use in burned areas would likely increase in the short term. Recreation use is also associated with scenic vistas; see the scenery section of this chapter and the Scenery resource report for detailed information.

Recreation Opportunities

[45] Total number of dispersed campsites shown is taken from 2012 Motor Vehicle Use map and does not include campsites in Wilderness or immediately adjacent to forest roads.

The likelihood of damage to infrastructure such as campgrounds and trails would progressively increase. As fire-killed snags continue to fall, it is anticipated that maintenance work and associated costs would increase, as well as the safety hazard to Forest visitors, workers, and volunteers who use or maintain Forest trails and other recreation infrastructure.

If and where access to the recreating public is not restricted, then fire-killed snags and resultant loss of shade would create hot and dry dispersed campsites and trail sections for hikers, adversely affecting their recreational experience. Assuming no Forest Orders are issued closing public access, camping at both developed campgrounds and primitive dispersed campsites would be expected to continue at their current rates.

Cumulative Effects

In response to the 2014 wildfires, private land salvage activities are currently occurring within the Beaver Fire area and may continue into late summer 2015. The operational impacts from the project activities such as increased traffic, noise, dust, and smoke are short-term adverse impacts to recreationists; effects would be temporary in nature. Increased log truck traffic is currently most noticeable on the Beaver Creek Road and Highway 96 State of Jefferson Scenic Byway. Safety signing is posted during active logging operations in appropriate locations to advise Forest visitors.

There are three range management units within the Beaver Fire area. Cattle are a temporary and seasonal use; some recreationists may dislike their presence during hunting season because they feel the cattle affect the quality of their hunt. Others are ambivalent to their presence. Rangeland improvements are minimal and typically limited to fencing which has little or no effect on recreationists.

The cumulative effect of the project and reasonably foreseeable actions on recreational opportunities is an additional increase in the number of log trucks and extending their season of use. Other operational impacts (noise, dust, etc.) would be extended as well. These effects would be temporary and short term.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Recreation Use

Recreational use for the Happy Camp Complex area will be the same as for the Beaver Fire area described above.

Recreation Opportunities

Effects on recreational opportunities for the Happy Camp Complex area will be the same as for the Beaver Fire area described above.

Cumulative Effects

In response to the 2014 wildfires, private land salvage activities are currently occurring along the Scott River area and may continue into late summer 2015. The Thom-Seider project proposes commercial thinning and underburning. The operational impacts from these project activities such as increased traffic, noise, dust, and smoke are short-term adverse impacts to recreationists; effects would be temporary in nature. Increased log truck traffic is currently most noticeable on the Scott River Road and Highway 96 State

of Jefferson Scenic Byway. Safety signing is posted during active logging operations in appropriate locations to advise Forest visitors.

There are numerous existing range management units within the Happy Camp Complex project area. Cattle are a temporary and seasonal use; some recreationists may dislike their presence during hunting season because they feel the cattle affect the quality of their hunt. Some hikers dislike cattle in the Wilderness. Others are ambivalent to their presence. Rangeland improvements are minimal and typically limited to fencing which has little or no effect on recreationists.

The cumulative effect of the project and reasonably foreseeable actions on recreational opportunities is an additional increase in the number of log trucks and extending their season of use. Other operational impacts (noise, dust, etc.) would be extended as well. These effects would be temporary and short term.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Recreation Use

Recreational use for the Whites Fire area will be the same as for the Beaver Fire area described above.

Recreation Opportunities

Effects on recreational use for the Whites Fire area will be the same as for the Beaver Fire area described above.

Cumulative Effects

The Sawyers Underburn, Jess, and Eddy Late Successional Reserve projects are on-going or reasonably foreseeable actions occurring within the Whites Fire area. The operational impacts from the project activities such as increased traffic, noise, dust, and smoke are short-term adverse impacts to recreationists; effects would be temporary in nature. Safety signing is posted during active burning or logging operations in appropriate locations to advise Forest visitors.

There are several range management units within the Whites Fire area. Cattle are a temporary and seasonal use; some recreationists may dislike their presence during hunting season because they feel the cattle affect the quality of their hunt. Some hikers dislike cattle in the Wilderness. Others are ambivalent to their presence. Rangeland improvements are minimal and typically limited to fencing which has little or no effect on recreationists.

The cumulative effect of the project and reasonably foreseeable actions on recreational opportunities is an additional increase in the number of log trucks and extending their season of use. Other operational impacts (noise, dust, etc.) would be extended as well. These effects would be temporary and short term.

Alternatives 2, 3, 4, and 5

While visitors are recreating in these settings, they would see some evidence (visual disturbances) of management activities within various recreation settings. The effects to the naturalness of these settings are measured using Visual Quality Objectives which are compatible with Recreational Opportunity Spectrum Classes. Table 3-71 displays

compatibility between Recreational Opportunity Spectrum Classes and Visual Quality Objectives.

Table 3-71: Compatibility of Visual Quality Objectives and Recreation Opportunity Spectrum Classes.

Visual Quality Objectives					
Recreational Opportunity Spectrum Class	Preservation	Retention	Partial Retention	Modification	Maximum Modification
Primitive (P)	Norm	Inconsistent	Unacceptable	Unacceptable	Unacceptable
Semi-Primitive Non-Motorized (SPNM)	Fully Compatible	Norm	Inconsistent	Unacceptable	Unacceptable
Semi-Primitive Motorized (SPM)	Fully Compatible	Fully Compatible	Norm (1)	Inconsistent	Unacceptable
Roaded Natural (RN)	Fully Compatible	Norm	Norm	Norm	Inconsistent
Rural (R)	Fully Compatible	Fully Compatible	Norm	Norm	Inconsistent
Urban (U)	Fully Compatible	Fully Compatible	Fully Compatible	Fully Compatible	Not Applicable

1 = Norm From Sensitive Roads And Trails.

Source: USDA Forest Service. 2000. Landscape Aesthetics A Handbook For Scenery Management. Agriculture Handbook Number 701. Page F-3.

Some recreation settings would be adversely affected in the short-term from project activities not meeting the compatible Visual Quality Objectives. Salvage harvest and roadside hazard treatments may affect the quality of the recreation experience while driving, floating, hiking, or camping at the following locations: Klamath Wild and Scenic River, Tyler Meadows Trailhead, Cold Spring Trailhead, Grider Creek (recommended Wild and Scenic River), Grider Creek Campground, Grider Creek Road (46N66, 46N24X), Lake Mountain Trail, Bear Creek Trail, and the Pacific Crest Trail (between north boundary of Marble Mountain Wilderness and Forest road 45N72X).

Within Retention Visual Quality Objectives areas, salvage harvest and roadside hazard treatments would likely not meet the Retention Visual Quality Objectives in the short term – where management activities are not visually evident to the casual Forest visitor. The presence of high stumps and tree marking paint (if used) would be noticeable for five to 10 years even after “greening up.” This includes salvage and roadside hazard treatment units located in the foreground distance zone of Klamath Wild and Scenic River, Tyler Meadows Trailhead, Cold Springs Trailhead, Grider Creek (recommended Wild and Scenic River), Grider Creek Campground, Grider Creek road (46N66, 46N24X), and the Pacific Crest Trail (between north boundary of Marble Mountain Wilderness and Forest road 45N72X). A recovery time of up to ten years for “greening up” and plant growth may be required to soften these effects.

Although the action alternatives appear to be inconsistent with the assigned Retention Visual Quality Objective and certain Forest Plan Standards and Guidelines for Retention, an exception is allowed under Forest Plan Standards and Guideline11-7 which states

“In the case of recovery activities after extreme catastrophic events such as intense wildland fires, time periods to achieve the Visual Quality Objectives stated in Forest-wide and Management Area Standards and Guidelines may be extended. This would be

necessary where previously unnoticed scenery alterations are exposed to view due to loss of vegetative screening, or during timber salvage activities where recovery of forest vegetation is determined to be of greater importance than achievement of Visual Quality Objectives within the time periods established."

Within Partial Retention Visual Quality Objectives areas, salvage harvest and roadside hazard treatments in the foreground distance zone along hiking trails would likely not meet the Partial Retention Visual Quality Objectives in the short term– where management activities may be noticeable, but are subordinate to the characteristic landscape. The presence of high stumps and tree marking paint (if used) would be noticeable to hikers for 10 years or more until screening vegetation hides effects. This includes units bisected by both the Tom Martin Peak and Bear Creek trails. However, the same exception under Standard and Guideline11-7 (cited above) also applies to Partial Retention areas for this project.

Thus in the long-term project activities would appear natural or near-natural to Forest visitors and meet Visual Quality Objectives which are compatible with Recreational Opportunity Spectrum Classes. Forest Plan direction would be met. The Scenery and the Wild and Scenic Rivers sections of this chapter and related resource reports provide more information on the relationship between recreation and those resources.

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Recreation Use

Logging operations are anticipated to begin in late summer 2015. The operational impacts from the project activities such as increased traffic, noise, dust, and smoke are short-term adverse impacts to recreationists; effects would be temporary in nature. Safety signing would be posted during active logging operations in appropriate locations to advise Forest visitors. Visitor information will be provided about area/road/trail closures in news releases, on-site, and on the Forest website.

Recreation Opportunities

Additional field reviews were conducted to evaluated project effects on recreation settings. The analysis concludes Highway 96 State of Jefferson Scenic Byway would meet the compatible Retention Visual Quality Objectives, and therefore the recreation setting would *not* be adversely affected. Analysis verified the Klamath Wild and Scenic River viewshed would not meet a Retention Visual Quality Objectives within three years and the recreation setting *would* be adversely affected. See Scenery section of final EIS for detailed information and see Table 3-72 below for listing of recreation settings adversely affected from project treatments.

The disturbances associated with various project activities such soil disturbance, stumps, burnt vegetation, etc. would be noticeable to recreationists in some other recreation settings. A recovery time of three years would allow seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or "greening up" to soften these effects. Hence all activities would appear near natural and easily meet their assigned Visual Quality Objectives. There would be no adverse effects to all other recreation settings (not listed in Table 3-72 below) from project treatments.

Cumulative Effects

The effects are similar to Alternative 1. The private land salvage activities will lead to increased traffic, noise, dust, and smoke are short-term adverse impacts to recreationists; effects would be temporary in nature. Increased log truck traffic is currently most noticeable on the Beaver Creek Road and Highway 96 State of Jefferson Scenic Byway. Safety signing is posted during active logging operations in appropriate locations to advise Forest visitors. When these effects are added to the effects of the Westside Fire Recovery project, there will be no additional recreational settings not meeting Visual Quality Objectives and recreation use is not expected to decrease.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Recreation Use

Logging operations are anticipated to begin in late summer 2015. The operational impacts from the project activities such as increased traffic, noise, dust, and smoke are short-term adverse impacts to recreationists; effects would be temporary in nature. Safety signing would be posted during active logging operations in appropriate locations to advise Forest visitors. Visitor information will be provided about area/road/trail closures in news releases, on-site, and on the Forest website.

Some segments of roads, rivers, or trails would be temporarily closed for safety reasons during helicopter logging operations. These closures could be expected to last for 15-20 minutes up to several hours. Pacific Crest Trail hikers would be adversely affected by temporary closures and would likely occur on the Grider Creek road 46N66, the Pacific Crest Trail south of Cold Springs Trailhead, river rafters/fishermen on the Klamath River between Rocky Point and Sluice Box River Accesses, and hikers on the Bear Creek and Lake Mountain trails. These adverse effects from logging operations would occur in fewer locations for Alternative 5 because of less salvage harvest proposed in Grider Creek and Tyler Meadows.

Recreation Opportunities

Additional field reviews were conducted to evaluated project effects on recreation settings. Additional analysis concludes Highway 96 State of Jefferson Scenic Byway, Scott River Road, and Scott Wild and Scenic River would meet the compatible Retention Visual Quality Objectives, and therefore the recreation setting would not be adversely affected. Analysis verified that nine other viewsheds would not meet the Retention Visual Quality Objectives in the short term and the recreation setting would be adversely affected. See Scenery section of final EIS for detailed information and Table 3-72 below for listing of recreation settings adversely affected from project treatments.

The disturbances associated with various project activities such soil disturbance, stumps, and burnt vegetation would be noticeable to recreationists in some other recreation settings. A recovery time of three years would allow seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and re-sprouting of vegetation or “greening up” to soften these effects. Hence all activities would appear near natural and easily meet their assigned Visual Quality Objectives. There would be no adverse effects to all other recreation settings (not listed in Table 3-72 below) from project treatments.

Cumulative Effects

The effects are similar to Alternative 1. In response to the 2014 wildfires, private land salvage activities are currently occurring along the Scott River area and may continue into late summer 2015. The Thom-Seider project proposes commercial thinning and underburning. The operational impacts from these project activities such as increased traffic, noise, dust, and smoke are short-term adverse impacts to recreationists; effects would be temporary in nature. Increased log truck traffic is currently most noticeable on the Scott River Road and Highway 96 State of Jefferson Scenic Byway. Safety signing is posted during active logging operations in appropriate locations to advise Forest visitors. When these effects are added to the effects of the Westside Fire Recovery project, there will be no additional recreational settings not meeting Visual Quality Objectives and recreation use is not expected to decrease.

Table 3-72: List of Recreation Features with Adverse Effects to recreation settings from project activities not meeting Visual Quality Objectives for Alternatives 2, 3, 4, and 5. There are no recreation setting that do not meet Visual Quality Objectives for the Whites Fire area.

Recreational Feature
Beaver Fire
Klamath Wild & Scenic River
Happy Camp Complex
Klamath Wild & Scenic River
Cold Spring Trailhead
Grider Creek (recommended Wild & Scenic River)
Grider Creek Campground
Grider Creek road (46N66, 46N24X)
Tyler Meadows Trailhead
Lake Mountain Trail
Bear Creek Trail
Pacific Crest Trail (between north boundary of Marble Mountain Wilderness and Forest road 45N72X)

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Recreation Use

Logging operations are anticipated to begin in late summer 2015. The operational impacts from the project activities such as increased traffic, noise, dust, and smoke are short-term adverse impacts to recreationists; effects would be temporary in nature. Safety signing would be posted during active logging operations in appropriate locations to advise Forest visitors. Visitor information will be provided about area/road/trail closures in news releases, on-site, and on the Forest website.

Some segments of roads, rivers, or trails could be temporarily closed for safety reasons during helicopter logging operations. These closures could be expected to last for 15-20 minutes up to several hours and may affect kayakers on the North Fork Salmon River and Forest visitors on the North Fork Salmon River road.

Recreation Opportunities

The disturbances associated with various project activities such soil disturbance, stumps, burnt vegetation, etc. would be noticeable to recreationists in some other recreation settings. A recovery time of three years would allow seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and re-sprouting of vegetation or “greening up” to soften these effects. Hence all activities would appear near natural and

easily meet the Partial Retention Visual Quality Objectives. There would be no adverse effects to all recreation settings from project treatments (Table 3-72).

Cumulative Effects

The effects are similar to Alternative 1. The Sawyers Underburn, Jess, and Eddy Late Successional Reserve projects are on-going or reasonably foreseeable actions occurring within the Whites Fire area. The operational impacts from the project activities such as increased traffic, noise, dust, and smoke are short-term adverse impacts to recreationists; effects would be temporary in nature. Safety signing is posted during active burning or logging operations in appropriate locations to advise Forest visitors. When these effects are added to the effects of the Westside Fire Recovery project, there will be no additional recreational settings not meeting Visual Quality Objectives and recreation use is not expected to decrease.

Modified Alternative 2

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

The effects of Modified Alternative 2 are the same as described for Alternative 2, 3, 4, and 5.

Cumulative Effects

The effects are the same as Alternative 2, 3, 4, and 5.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The effects of Modified Alternative 2 are similar to Alternative 2, 3, 4, and 5.

The addition of several new project design features (Recreation and Scenery 6 through 12) would reduce negative effects to recreation settings at several locations, including along the Pacific Crest Trail, and at the Cold Spring Trailhead. However it is likely that these sites would still be adversely affected and not meet their compatible Visual Quality Objectives of Retention. See Table 3-73 below as well as Section III of the Recreation amendment for a detailed description of effects.

The use of these same project design features at both Bear Creek and Lake Mountain trails would reduce negative effects to acceptable levels; the recreation settings for both trails would meet their compatible Partial Retention Visual Quality Objectives (Table 3-73).

Cumulative Effects

The effects are the same as Alternative 2, 3, 4 and 5.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The effects of Modified Alternative 2 are the same as for Alternative 2, 3, 4, and 5.

Cumulative Effects

The effects are the same as Alternative 2, 3, 4 and 5.

Table 3-73 : List of Recreation Features with Adverse Effects to recreation settings from project activities not meeting Visual Quality Objectives for Modified Alternative 2.

Recreational Feature
Beaver Fire
Klamath Wild & Scenic River
Happy Camp Complex Fire
Klamath Wild & Scenic River
Cold Spring Trailhead
Grider Creek (recommended Wild & Scenic River)
Grider Creek Campground
Grider Creek road (46N66, 46N24X)
Tyler Meadows Trailhead
Pacific Crest Trail (between Cold Spring and Highway 96)

Modified Alternative 3

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

The effects of Modified Alternative 3 are the similar as described for Modified Alternative 2.

Modified Alternative 3 has removed the roadside hazard treatments proposed in Alternative 2 along County Road 8G004 located on the south side of the Klamath River. (These treatments would have adverse effects to the recreation setting in other alternatives.) As a result of their removal in Modified Alternative 3, there is no effect to the recreation setting of the Klamath Wild and Scenic River (Table 3-74).

Cumulative Effects

The effects are the same as Alternative 2, 3, 4, and 5.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The effects of Modified Alternative 3 are the same as described for Modified Alternative 2 except as amended in this report.

In Modified Alternative 3, the inclusion of snag retention areas and field and corporate riparian reserves, combined with unit boundary changes have significantly reduced negative effects to two recreation features. See Scenery section in the final EIS for detailed information. The recreation settings for both Grider Creek Campground and Grider Creek (recommended Wild and Scenic River) would *not* be adversely affected (Table 3-74).

Cumulative Effects

The effects are the same as Alternative 2, 3, 4 and 5.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The effects of Modified Alternative 3 are the same as described for Modified Alternative 2.

Cumulative Effects

The effects are the same as Alternative 2, 3, 4, and 5.

Table 3-74 : List of Recreation Features with Adverse Effects to recreation settings from project activities not meeting Visual Quality Objectives for Modified Alternative 3.

Recreational Feature
Happy Camp Complex Fire
Klamath Wild & Scenic River
Cold Spring Trailhead
Grider Creek road (46N66, 46N24X)
Tyler Meadows Trailhead
Pacific Crest Trail (between north boundary of Marble Mountain Wilderness and Forest road 45N72X)

Compliant with Law, Policy and the Forest Plan

This project will help achieve Forest Plan direction to maintain existing Recreation Opportunity Spectrum Classes. See the Forest Plan consistency checklist for details about applicable standards and guidelines.

Wild and Scenic Rivers

A Wild and Scenic Rivers evaluation was conducted for three designated and three recommended rivers as part of the Westside Fire Recovery Project. The evaluation used Wild and Scenic Rivers Act (P.L. 90-542, as amended) protection requirements in conjunction with existing Forest Plan direction.

Project activities were evaluated using field review, GIS analysis, and professional judgment for their potential effects to: 1) free flowing conditions; 2) water quality; 3) identified outstandingly remarkable value(s); and 4) Visual Quality Objectives (visual quality objectives).

Analysis determined that all action alternatives would protect these values and would be fully compliant with all Wild and Scenic River Act protection requirements and Forest Plan Standards and Guidelines. Select information on resource effects for outstandingly remarkable values is reiterated in this report as taken from the Aquatic Resources, Hydrology, Wildlife, and Scenery reports. For complete details see those reports.

Methodology

Project activities were evaluated for all three project areas using field review, GIS analysis, and professional judgment for their potential effects to: 1) free flowing conditions; 2) water quality; 3) identified outstandingly remarkable value(s); and 4) Visual Quality Objectives. Select information on resource effects for water quality, fisheries, geology, wildlife, scenery, and vegetation is reiterated in this report as taken from the Aquatic Resources, Hydrology, Wildlife, and Scenery reports. For complete details see those reports.

Analysis Indicators

Analysis indicators are identified for each of the values listed below to be protected or maintained:

Free Flowing Conditions:

As applied to any river or section of a river, means existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway.

- **Indicator:** Potential resource effects were evaluated to determine if project activities would be located within the bed and banks of the river and create an obstruction or modification of the free-flowing river characteristics.

Water Quality:

Water quantity and quality must be sufficient to protect river values.

- **Indicators:** Resource effects to beneficial uses, stream temperature and shading, and Cumulative Watershed Effects.

Outstandingly Remarkable Value(s):

Each river shall be managed to protect and enhance the values for which the river was designated, while providing for public recreation and resource uses which do not adversely impact or degrade those values.

- **Indicators:**
  Fisheries: sediment, stream temperatures, and large wood;
  Vegetation: treatments in either old growth or Engleman Spruce stands;
  Wildlife: (1)Bald Eagle—level of disturbance to nest/roost sites and risk to future potential nest areas; (2)Siskiyou Mountain Salamander—risk of disturbance;
  Geology: presence of treatments on Malone landslide;
  Water Quality: risk to sediment and temperature regime alteration.

Visual Quality Objectives:

Scenic Rivers

From the Forest Plan, Standard and Guideline number MA12-7: Design management activities to meet the Retention visual quality objective visual quality objective within the Wild and Scenic River Corridor. Meet the Partial Retention visual quality objective in the foreground and the middleground beyond the Corridor.

Recreational Rivers

From the Forest Plan, Standard and Guideline number MA13-6: Design management activities to meet a Partial Retention visual quality objective visual quality objective within the Wild and Scenic River corridor, in the foreground beyond the Corridor and in the middleground beyond the corridor.

- **Indicators:** Potential effects were evaluated to determine if project activities would meet either a Retention or Partial Retention quality objective as seen from the river corridor.

Spatial and Temporal Context

The spatial analysis boundary for free flowing, water quality and outstandingly remarkable value is the river area or designated corridor. This corridor is approximately

¼ mile on each side of the river. For Retention and Partial Retention visual quality objectives the analysis boundary is the river viewshed out to four miles. Temporal bounding is three years for short term effects, at which time projects are required to meet the assigned visual quality objectives of Retention or Partial Retention. This timeframe is required by Forest Plan Standards and Guidelines[46]. Long term effects would be ten years or longer.

Affected Environment

In 1968 the Wild and Scenic Rivers Act was established to protect American rivers, including free-flowing conditions, water quality and their many values "for the benefit and enjoyment of present and future generations". As of 2012, 203 rivers encompassing 12,598 miles had been included in the National Wild and Scenic River System. Rivers or sections of rivers must be free-flowing and possess at least one "outstandingly remarkable" value, such as fish, wildlife, recreation, scenery, geology, history, cultural features, or other values including ecology. Wild and Scenic Rivers displaying varying degrees of existing human alteration are assigned corresponding classification levels of Recreational, Scenic or Wild. There are six designated or recommended Wild and Scenic Rivers in the three project areas which are potentially affected by the Westside Fire Recovery Project. These are identified and described below:

Designation

The Klamath, Scott, and North Fork Salmon Rivers, which were designated by the Secretary of Interior in 1981 for their outstandingly remarkable anadromous fisheries values, are components of the National Wild and Scenic River System.

Elk, Grider, and South Russian Creeks are recommended for inclusion in the National Wild and Scenic Rivers system in the 1995 Forest Plan. This preliminary administrative recommendation to the Secretary of Agriculture is retained until such time as Congress takes action. These recommended rivers are managed under the same guidance as designated rivers.

[46] However an exception is allowed under Forest Plan Standards and Guideline 11-7 which states "In the case of recovery activities after extreme catastrophic events such as intense wildland fires, time periods to achieve the visual quality objectives stated in Forest-wide and Management Area Standards and Guidelines may be extended. This would be necessary where previously unnoticed scenery alterations are exposed to view due to loss of vegetative screening, or during timber salvage activities where recovery of forest vegetation is determined to be of greater importance than achievement of visual quality objectives within the time periods established."

Outstandingly Remarkable Values

These may include: fish, wildlife, recreation, scenery, geology, history, cultural features, or other values including ecology. Values for potentially affected Wild and Scenic Rivers are listed in Table 3-75 below.

Classification

Wild and Scenic Rivers displaying varying degrees of existing human alteration are assigned corresponding classification levels of Recreational, Scenic or Wild. The Klamath, Scott, and North Fork Salmon Rivers have segments designated with a "recreational" classification. Rivers classified as "Recreational" Wild and Scenic River segments display the most level of development, and may include roads, bridges, buildings, and agricultural or forest clearings.

The Scott River and Grider Creek have segments identified with a "Scenic" classification. The Scenic classification applies to those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but may be accessible in places by roads. River classifications are listed in Table 3-75.

Table 3-75: Summary of Potentially Affected Wild and Scenic Rivers by Segment Number, Classification, and Outstandingly Remarkable Value(s)

Fire Area	River	Segment Number	Segment Description	Classification	Outstandingly Remarkable Value	Description Of Outstandingly Remarkable Value
Beaver and Happy Camp Complex	Klamath River	Kl01	Forest Boundary Near Ash Creek Confluence To Forest Boundary With Six Rivers National Forest	Recreational	Anadromous Fisheries	Anadromous Fisheries
Happy Camp Complex	Scott River	Sc01	Shackleford Creek To McCarthy Creek	Recreational	Anadromous Fisheries	Anadromous Fisheries
Happy Camp Complex	Scott River	Sc02	McCarthy Creek To Scott Bar	Scenic	Anadromous Fisheries	Anadromous Fisheries
Happy Camp Complex	Scott River	Sc03	Scott Bar To Klamath River	Recreational	Anadromous Fisheries	Anadromous Fisheries
Happy Camp Complex	North Fork Salmon River	Nf03	Mule Bridge Campground To Forks Of Salmon	Recreational	Anadromous Fisheries	Anadromous Fisheries

Fire Area	River	Segment Number	Segment Description	Classification	Outstandingly Remarkable Value	Description Of Outstandingly Remarkable Value
Happy Camp Complex	Elk Creek	El03	Bridge In Sec 19 To Bridge In Sec 25	Recreational	Fisheries	Fish And Game Rearing Pond For Chinook, Large Bedrock Holding Ponds Present.
Happy Camp Complex	Elk Creek	El03			Geologic	The Malone Landslide Offers The Opportunity To Observe The Effects Of A Large Slump/Debris Slide On A Major Stream.
Happy Camp Complex	Elk Creek	El04	Bridge In Sec 25 To Klamath River	Recreational	Fisheries	Very Good Spawning Habitat For Salmonids.
Happy Camp Complex	Elk Creek	El04			Wildlife	Siskiyou Mountain Salamander Has Been Located Along This Segment.
Happy Camp Complex	Grider Creek	Gr03	Rancheria Creek To Forest Road 46n24x	Scenic	Fisheries	High Water Quality Supporting Coho, Chinook, And Steelhead.
Happy Camp Complex	Grider Creek	Gr03			Vegetation	Undisturbed "Old Growth" Mixed Conifer Forest Type.
Happy Camp Complex	Grider Creek	Gr03			Wildlife	Bald Eagle (T And E) And Peregrine Falcon Known To Frequent This Segment.
Whites Fire	South Russian Creek	Ru02	Wilderness Boundary To Forest Road 40n54	Recreational	Vegetation	Magnificent Stand Of "Old Growth" Engleman Spruce Along This Segment.
Whites Fire	South Russian Creek	Ru02			Water Quality	Watershed Is Largely Pristine.

Boundaries

Boundaries for Designated Wild and Scenic River corridors were established in the Forest Plan, with legal descriptions listed in Appendix J of the Forest Plan EIS. The corridor boundaries vary in width to include key river features, generally averaging about ½ mile wide (including both sides of the river) for the length of the river.

Boundaries for Recommended Wild and Scenic River corridors were identified in the Forest Plan. The corridor boundaries are a uniform ½ mile width - ¼ mile wide on each side of the river for the length of the river.

Environmental Consequences

Alternative 1

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Because there would be no management actions under Alternative 1, free flowing conditions and identified Outstandingly Remarkable Value(s) listed in Table 3-75 above would be maintained in this alternative.

The risk posed to water quality (sediment) from 950 identified legacy sediment sites is moderate to high over a ten-year period. Should a significant storm such as a 10-year event occur, there is a high risk of failure. Impacts would be similar to the channel scour, loss of stream shade, increased stream temperatures, and sedimentation that occurred in the 1997 flood as described by De La Fuente and Elder (1998). These impacts would adversely affect beneficial uses.

The risk to water quality and beneficial uses from increased stream temperature related to burnt Riparian Reserve areas is low. Additionally Elk Creek has a high risk for landsliding and perhaps a moderate risk for resulting debris flows that remove vegetation and thus negatively affect stream shade and temperature.

visual quality objectives define acceptable levels of visual disturbance or contrast from management activities. Because there would be no management actions under the Alternative 1, there would be no effect to scenery.

Cumulative Effects

There are no current or reasonably foreseeable future actions which are located in the vicinity of the Beaver Fire which propose activities to be located in the Klamath River Wild and Scenic River corridor. Therefore the additive effect from this project is not anticipated to have any cumulative effects to the Wild and Scenic River Act's "protect and enhance" standards.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The effects to the Happy Camp Complex area are the same as described for the Beaver Fire area.

Cumulative Effects

In considering current and reasonably foreseeable future projects, both the Johnny O'Neil and Thom-Seider projects propose activities in the Klamath Wild and Scenic Rivers corridor. Their analyses determined no effect to Wild and Scenic Rivers values. The additive effect from this project's lack of action in this alternative is not anticipated to have any cumulative effects to the Wild and Scenic Rivers Act's "protect and enhance" standards.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The effects to the Whites Fire area are the same as described for the Beaver Fire area.

Cumulative Effects

In considering current and reasonably foreseeable future projects, the Salmon Salvage project proposed salvage harvest in the North Fork Wild and Scenic River corridor. Analysis determined no effect to Wild and Scenic River values. The Jess project has no proposed activities in the North Fork Wild and Scenic River corridor. The additive effect from this project's No Action is not anticipated to have any cumulative effects to the Wild and Scenic River Act's "protect and enhance" standards.

Alternatives 2, 3, 4, and 5

Free Flowing Conditions

As applied to any river or section of a river, means existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. Although there are portions of harvest units proposed within the river corridor boundaries of the Klamath, Scott, and North Fork Salmon Rivers and Grider Creek, they are located several hundred feet upslope from the river and not proposed within the bed and banks of these Wild and Scenic Rivers. Therefore the Westside Fire Recovery project proposal would have *no effect* on the free flowing conditions of the Wild and Scenic Rivers, since no activities are proposed within the Wild and Scenic River's bed or banks.

Section 7 of the Wild and Scenic River Act does not apply to this project, because it is only pertinent to a "water resource project" such as a dam, water conduit, reservoir, hydropower project, powerhouse or transmission line, and does not directly affect the bed and bank of a Wild and Scenic River. In 1984 the "water resource project" definition was evaluated for its use within the Wild and Scenic River Act, and the Forest Service clarified that timber harvesting or similar activities would not be subject to Section 7 review unless it resulted in an obstruction or modification of the free-flowing river characteristics (Federal Register Vol. 49, No. 10, 1/16/84, page 1901). Therefore all four alternatives will have *no effect* to free flowing conditions.

Water Quality

All four alternatives are not expected to have direct effect on beneficial uses but should help protect water quality for Elk Creek by fixing existing legacy sites. The alternatives are not expected to increase sediment or stream temperature regimes over Alternative 1. A beneficial effect would be legacy site repair. (See Hydrology Report)

Outstandingly Remarkable Value(s)

Each river shall be managed to protect and enhance the values for which the river was designated, while providing for public recreation and resource uses which do not adversely impact or degrade those values. Alternatives 2, 3, 4, and 5 will have no direct effects to vegetation, geologic, or wildlife, values as described by fire area below.

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Fisheries (Klamath River)

There will be minor and insignificant direct effects from water drafting. Over-all effects to sediment, stream shade, and temperature from project treatments are expected to be discountable and effects to aquatic species are expected to be minor under all action alternatives. Should a severe wildfire occur, could result in cumulative impacts to fish associated with increases in sediment supply, localized increases in water temperature, and reduced long-term large woody debris recruitment. Impacts are expected to minor to moderate depending on the spatial pattern of a high intensity wildfire.

Visual Quality Objectives (Klamath River)

The roadside hazard treatments which occur primarily along County Road 8G004 located on the south side of the Klamath River, would likely be noticeable to floaters and fishermen in some locations because of their closer proximity to the disturbances and slower rate of travel. Existing riverside vegetation would screen some effects. Project treatments would still be noticeable in some locations; up to 6 areas totaling 3.5 miles and likely not meet a Retention visual quality objective in the three year timeframe . Continued "greening up" for five – ten years would allow additional re-sprouting and growth of vegetation to hide these effects.

Table 3-76: Summary of Effects by analysis indicator for the Beaver Fire Area

River By Segment Number	River Value (Indicator)	Alternative 1 River Value Protected Or Maintained - Y/N?	Alternatives 2, 3, 4, 5 River Value Protected Or Maintained - Y/N?	Modified Alternative 2 River Value Protected Or Maintained - Y/N?
KLAMATH RIVER				
KL01	Water Quality	Y	Y	Y
	Fisheries outstandingly remarkable values	Y	Y	Y
	Retention visual quality objective (river corridor)	Y	Y (long term)	Y (long term)
	Partial Retention visual quality objective (middleground)	Y	Y	Y

Cumulative Effects

The cumulative effects on Wild and Scenic Rivers is the same as described in Alternative 1.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Fisheries (Klamath, Scott, Elk, Grider)

Minor and insignificant direct effects from water drafting. Over-all effects to sediment, stream shade, and temperature from project treatments are expected to be discountable and effects to aquatic species are expected to be minor under all action alternatives. Should a severe wildfire occur, could result in cumulative impacts to fish associated with

increases in sediment supply, localized increases in water temperature, and reduced long-term large woody debris recruitment. Impacts are expected to minor to moderate depending on the spatial pattern of a high intensity wildfire.

Geologic (Elk)

There are no project activities proposed on the Malone landslide, hence no effect to geologic outstandingly remarkable values.

Wildlife (Elk)

There are no harvest treatments within the river corridor. Hence the risk to Siskiyou Mountain Salamander habitat is low.

Vegetation (Grider)

A GIS data sort using (BARC data) identified one small stand of old growth (OS tree diameter Class 1 – large to giant 30" + QMD) within the roadside hazard treatment area. This stand, which is located east of Grider Creek (across from the campground) is shown with 0 percent basal area mortality loss. It is likely only a few if any trees would be felled and left in place. Therefore, this will be a negligible effect to the old growth stands.

Wildlife (Grider)

As there are no known Bald Eagle or Peregrine nesting sites within the Grider Creek drainage, there are no direct effects to Wildlife outstandingly remarkable values.

Visual Quality Objectives (Klamath River)

The roadside hazard treatments which occur primarily along County Road 8G004 located on the south side of the Klamath River, would likely be noticeable to floaters and fishermen in some locations because of their closer proximity to the disturbances and slower rate of travel. Existing riverside vegetation would screen some effects. Project treatments would still be noticeable in some locations; up to 6 areas totaling 3.5 and miles and likely not meet a Retention visual quality objective in the three year timeframe . Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

Visual Quality Objectives (Scott River)

Roadside hazard, fuels treatments, and portions of several salvage harvest units are proposed within the river corridor. All of these treatments occur along or above County Road 7F01. The Scott River parallels the county road and is vertically separated by an estimated thirty to several hundred feet. Screening vegetation along the road and river would further limit visibility. It is unlikely that kayakers and rafters would notice any of these treatments. Hence activities would easily meet the Partial Retention visual quality objective for river segments Sc01 and Sc03, and a Retention visual quality objective for river segment Sc02. There would be no adverse effect to the river's viewshed.

Visual Quality Objectives (Elk Creek)

There would be no adverse effects from project treatments. The Partial Retention visual quality objective would be met. Treatments would either be not visible or noticeable in Partial Retention visual quality objective area but would appear near natural in three years. The disturbances associated with various project activities such as soil disturbance, stumps, burnt vegetation, etc. would recover in three years' time with seasonal leaf and

needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or "greening up.

Visual Quality Objectives (Grider)

Portions of salvage harvest units (numbers 61 and 62-1) and roadside hazard treatments are proposed for Alternatives 2, 3, and 4 within the river corridor near Grider Creek Campground. The PCT is also located in this area of the river corridor. Project treatments would be highly noticeable to hikers only when in the immediate vicinity of these two units, and likely not meet a Retention visual quality objective in the three year timeframe. Continued "greening up" for five – ten years would allow additional resprouting and growth of vegetation to hide these effects.

Table 3-77: Summary of Effects by analysis indicator for the Happy Camp Complex Area

River By Segment Number	River Value (Indicator)	Alternative 1 River Value Protected Or Maintained - Y/N?	Modified Alternative 2 River Value Protected Or Maintained - Y/N?
KLAMATH RIVER			
KL01	Water Quality	Y	Y
	Fisheries outstandingly remarkable values	Y	Y
	Retention visual quality objective (river corridor)	Y	Y (long term)
	Partial Retention visual quality objective (middleground)	Y	Y
SCOTT RIVER			
SC01	Water Quality	Y	Y
	Fisheries outstandingly remarkable values	Y	Y
	Partial Retention visual quality objective (river corridor)	Y	Y
	Partial Retention visual quality objective (middleground)	Y	Y
SC02	Water Quality	Y	Y
	Fisheries outstandingly remarkable values	Y	Y
	Retention visual quality objective (river corridor)	Y	Y
	Partial Retention visual quality objective (foreground & middleground beyond river corridor)	Y	Y
SC03	Water Quality	Y	Y
	Fisheries outstandingly remarkable values	Y	Y
	Partial Retention visual quality objective (river corridor)	Y	Y
	Partial Retention visual quality objective (foreground & middleground beyond river corridor)	Y	Y
ELK CREEK			
EL03	Water Quality	Y	Y
	Fisheries outstandingly remarkable values	Y	Y
	Geologic outstandingly remarkable values	Y	Y
	Partial Retention visual quality objective (river corridor)	Y	Y

River By Segment Number	River Value (Indicator)	Alternative 1 River Value Protected Or Maintained - Y/N?	Modified Alternative 2 River Value Protected Or Maintained - Y/N?
	Partial Retention visual quality objective (foreground & middleground beyond river corridor)	Y	Y
EL04	Water Quality	Y	Y
	Fisheries outstandingly remarkable values	Y	Y
	Wildlife outstandingly remarkable values	Y	Y
	Partial Retention visual quality objective (river corridor)	Y	Y
	Partial Retention visual quality objective (foreground & middleground beyond river corridor)	Y	Y
GRIDER CREEK			
GR03	Water Quality	Y	Y
	Fisheries outstandingly remarkable values	Y	Y
	Vegetation outstandingly remarkable values	Y	Y
	Wildlife outstandingly remarkable values	Y	Y
	Retention visual quality objective (river corridor)	Y	Y (long term)
	Partial Retention visual quality objective (foreground & middleground beyond river corridor)	Y	Y

Cumulative Effects

The cumulative effects on Wild and Scenic Rivers is the same as described in Alternative 1.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Fisheries (North Fork)

There will be minor and insignificant direct effects from water drafting. Over-all effects to sediment, stream shade, and temperature from project treatments are expected to be discountable and effects to aquatic species are expected to be minor under all action alternatives. Should a severe wildfire occur, could result in cumulative impacts to fish associated with increases in sediment supply, localized increases in water temperature, and reduced long-term large woody debris recruitment. Impacts are expected to minor to moderate depending on the spatial pattern of a high intensity wildfire.

Vegetation (South Russian)

There are no project treatments proposed in the Engleman Spruce stands. Hence there will be no direct effects to the Vegetation outstandingly remarkable values.

Water Quality (South Russian)

The alternatives have a low risk to increase stream sedimentation and water temperature and are not expected to increase sediment or stream temperature regimes over Alternative 1.

Visual Quality Objectives (North Fork, South Russian)

There would be no adverse effects from project treatments. The Partial Retention visual quality objective would be met. Treatments would either be not visible or noticeable in Partial Retention visual quality objective area but would appear near natural in three years. The disturbances associated with various project activities such as soil disturbance, stumps, burnt vegetation, etc. would recover in three years' time with seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or "greening up.

Table 3-78: Summary of Effects by analysis indicator for the Whites Fire Area

River By Segment Number	River Value (Indicator)	Alternative 1 River Value Protected Or Maintained - Y/N?	Modified Alternative 2 River Value Protected Or Maintained - Y/N?
NORTH FORK SALMON RIVER			
NF03	Water Quality	Y	Y
	Fisheries outstandingly remarkable values	Y	Y
	Partial Retention visual quality objective (river corridor)	Y	Y
	Partial Retention visual quality objective (foreground & middleground beyond river corridor)	Y	Y
SOUTH RUSSIAN CREEK			
RU02	Water Quality	Y	Y
	Vegetation outstandingly remarkable values	Y	Y
	Water Quality outstandingly remarkable values	Y	Y
	Partial Retention visual quality objective (river corridor)	Y	Y
	Partial Retention visual quality objective (foreground & middleground beyond river corridor)	Y	Y

Cumulative Effects

The cumulative effects on Wild and Scenic Rivers is the same as described in Alternative 1.

Alternative 2 Modified

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

The effects for the Beaver Fire area are the same as for Alternative 2.

Cumulative Effects

There are no current or reasonably foreseeable future actions which are located in the vicinity of the Beaver Fire which propose activities to be located in the Klamath River Wild and Scenic River corridor. Therefore the additive effect from this project is not anticipated to have any cumulative effects to the Wild and Scenic River Act's "protect and enhance" standards.

Project Area A: Happy Camp Complex

Direct Effects and Indirect Effects

Modified Alternative 2 proposes decreases from Alternative 2 in salvage harvest acres within both the Klamath River and Grider Creek corridors from 425 acres to 422 acres and 41 acres to 10 acres respectively. Even with these acreage reductions, the scenery effects are the same as Alternative 2. Both of these corridors are managed with a Retention Visual Quality Objective (visual quality objective). As stated in the Scenery Resource report (see Table 5), salvage harvest or roadside hazard treatments would not meet Retention in the short term. Therefore the Klamath River and Grider Creek would not meet Retention in the short term. All other treatment acres for all other rivers are the same as Alternative 2. Therefore there is no change to effects.

Cumulative Effects

In considering current and reasonably foreseeable future projects, both the Johnny O'Neil and Thom-Seider projects propose activities in the Klamath Wild and Scenic Rivers corridor. Their analyses determined no effect to Wild and Scenic Rivers values. The additive effect from this project's lack of action in this alternative is not anticipated to have any cumulative effects to the Wild and Scenic Rivers Act's "protect and enhance" standards.

Project Area A: Whites Fire

Direct Effects and Indirect Effects

Modified Alternative 2 proposes an increase from Alternative 2 in salvage harvest acres within the North Fork Salmon River corridor from 83 acres to 108 acres. Because the river corridor is managed with a Partial Retention Visual Quality Objective (visual quality objective) and salvage harvest would meet this objective in three years as stated in the Scenery Resource report, there is no change to effects.

All other treatment acres for both the North Fork Salmon River and South Russian Creek are the same as Alternative 2. Therefore there is no change to effects.

Cumulative Effects

The cumulative effects are the same as described in Alternative 1.

Modified Alternative 3

Project Area A: Beaver Fire

Direct Effects and Indirect Effects

Modified Alternative 3 proposes a significant decrease in total acres treated from Alternative 2; all salvage harvest has been removed from the project area and all roadside hazard removed along County Road 8G004. This has resulted in a no effect to the Klamath River viewshed. The effects to all other river values are the same as described for Alternatives 2-5.

Cumulative Effects

The cumulative effects on Wild and Scenic Rivers is the same as described in Alternative 2, 3, 4, and 5.

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

Modified Alternative 3 proposes a decrease in total acres treated for all river segments from Alternative 2; fuels treatments stayed the same or increased, harvest stayed the same or decreased, and roadside hazard acres were decreased for all river segments.

With the removal of roadside hazard in Grider Creek and the addition of snag inclusion areas in harvest units, Grider Creek would meet the Retention VQO in the short term. The effects to all other rivers and river values are the same as described for Alternatives 2-5.

Cumulative Effects

The cumulative effects on Wild and Scenic Rivers is the same as described in Alternative 2, 3, 4, and

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Modified Alternative 3 proposes a slight increase from Alternative 2 in fuels treatment acres within the South Russian Creek corridor from 84 acres to 89 acres. Because the river corridor is managed with a Partial Retention Visual Quality Objective (VQO) and fuels treatments would meet this objective in three years as stated in the Scenery Resource report, there is no change to effects. All other treatment acres for South Russian Creek are the same as Alternative 2. Therefore there is no change to effects.

Cumulative Effects

The cumulative effects on Wild and Scenic Rivers is the same as described in Alternative 2, 3, 4 and 5.

Compliance with law, regulation, policy, and the Forest Plan

All Wild and Scenic Rivers Act protection requirements will be met for this project. Free flowing conditions, water quality, and identified outstandingly remarkable value(s) will be protected. River classifications will be maintained.

The project treatments associated with the project must meet the Retention and Partial Retention Visual Quality Objectives (visual quality objectives) from within the river corridor, in the foreground beyond the corridor, and in middleground areas visible from the river corridor. For management activities to meet the Retention visual quality objective, the management activity must not be noticeable (see Scenery report). For management activities to meet the Partial Retention visual quality objective, the management activity must remain visually subordinate to the characteristic landscape (see Scenery report).

The noticeable visual disturbances within the Klamath River Scott Rivers and Grider Creek corridors would likely not meet the assigned Retention Visual Quality Objectives (visual quality objective) in the short term (3-5 years) when visible from the river corridors. Re-sprouting and growth of vegetation will green up disturbed areas to meet the Retention visual quality objective in the long term.

Not meeting a visual quality objective in the three year timeframe inconsistent with Forest Plan Standards and Guidelines numbers MA12-7 and MA13-6. However an exception is allowed under Forest Plan Standards and Guidelines number 11-7 which states ”In the case of recovery activities after extreme catastrophic events such as intense wildland fires, time periods to achieve the visual quality objectives stated in Forest-wide and Management Area Standards and Guidelines may be extended. This would be necessary where previously unnoticed scenery alterations are exposed to view due to loss of vegetative screening, or during timber salvage activities where recovery of forest vegetation is determined to be of greater importance than achievement of visual quality objectives within the time periods established.”

The desired future conditions for both scenic and recreational rivers will be met; scenic river areas and shorelines will remain largely primitive and undeveloped, and recreational river waterways will remain generally natural and riverine in appearance.

Inventoried Roadless Areas

Information on six inventoried roadless areas (IRAs) within the Westside Fire Recovery project area is analyzed in this section, and the effects of the project on these IRAs are disclosed. The detailed history of IRAs and Forest Service direction for management in IRAs is included in the body and appendices of the Inventoried Roadless Area resource report, available on the project website.

Methodology

Geographic Information System (GIS) layers provide information for the location of IRAs and proposed activities that may affect IRAs. A synopsis of the conditions of IRAs at the time the Record of Decision for the Forest Plan was published (1995) is provided in Appendix C of the Forest Plan final EIS.

Analysis indicators

Acres of IRA where roadless characteristics potentially will be affected by treatments proposed in the project, and degree of effect, are analysis indicators. Factors used to determine whether or not roadless characteristics will be affected by treatments, identified in the Roadless Area Conservation Rule of 2001 (36 CFR Part 294), are listed on

Table 3-79:

Table 3-79: Factors used to measure effects on roadless character

Roadless Area Characteristics	Roadless Character Descriptions (from 36 CFR Part 294, Special Areas; Roadless Area Conservation Rule, 2001)	Factors used to measure effects
High quality or undisturbed soil, water and air resources (See Soils, Water Quality (Hydrology), Air Quality and Aquatic Conservation Strategy sections for more information)	"These three key resources are the foundation upon which other resource values and outputs depend. Healthy watersheds catch, store, and safely release water over time, protecting downstream communities from flooding; providing clean water for domestic, agricultural and industrial uses; helping maintain abundant and healthy fish and wildlife populations; and are the basis for many forms of outdoor recreation."	Soil—acres of soil disturbance due to use of mechanical equipment Water—temperature, sediment, peak flow, channel morphology, Aquatic Conservation Strategy objectives Air—air (criteria) pollutant emissions relative to air quality standards.
Sources of public drinking water (See the Water Quality (Hydrology) section for more information)	"Maintaining [watersheds contributing to drinking water] in a relatively undisturbed condition saves downstream water filtration costs. Careful management of these watersheds is crucial in maintaining the flow and affordability of clean water to a growing population."	Existence and effects on municipal watersheds
Diversity of plant and animal communities (See the Botany and Wildlife sections for more information)	"Roadless areas are more likely than roaded areas to support greater ecosystem health, including the diversity of native and desired nonnative plant and animal communities due to the absence of disturbances caused by roads and accompanying activities. Inventoried roadless areas also conserve native biodiversity by serving as a bulwark against the spread of nonnative invasive species."	Diversity of tree species Diversity of terrestrial and aquatic wildlife species and communities Diversity of fish and aquatic species and communities Risk of introducing or spreading non-native invasive plant populations

Roadless Area Characteristics	Roadless Character Descriptions (from 36 CFR Part 294, Special Areas; Roadless Area Conservation Rule, 2001)	Factors used to measure effects
Habitat for Threatened, Endangered, Proposed, Candidate, and Sensitive species and species dependent on large undisturbed areas of land (See the Wildlife, Botany, and Evaluation, Fisheries sections for more information)	Roadless areas are biological strongholds and refuges for many species. Roadless areas support a diversity of aquatic habitats and communities, providing or affecting habitat for more than 280 TES species."	Likelihood of affecting existing Threatened, Endangered, Proposed and Candidate botanical populations Likelihood that effects to Sensitive botanical populations will result in a trend toward listing Likelihood of adversely affecting Threatened, Endangered, Proposed, and Candidate terrestrial wildlife species, especially those that are dependent on large undisturbed areas of land Likelihood that the effects to Sensitive wildlife species will result in a trend toward listing Effects to habitat for Management Indicator Species that depend on large undisturbed areas of land Likelihood of affecting Threatened, Endangered, Proposed and Sensitive species of fish and aquatic species if dependent on large undisturbed areas of land
Primitive, semi-primitive non-motorized, and semi-primitive motorized classes of recreation (See the Recreation section for more information)	"Roadless areas often provide outstanding dispersed recreation opportunities such as hiking, camping, picnicking, wildlife viewing, hunting, fishing, cross-country skiing and canoeing. These areas can also take pressure off heavily used wilderness areas by providing solitude and quiet, and dispersed recreation opportunities."	Recreation opportunities (wildlife viewing, relatively undisturbed scenery viewing, etc.)
Reference landscapes for research study or interpretation	"Reference landscapes of relatively undisturbed areas serve as a barometer to measure the effects of development on other parts of the landscape."	Existing or recommended research natural areas
Natural appearing landscapes with high scenic quality (See the Scenery section for more information)	"High quality scenery, especially scenery with natural-appearing landscapes, is a primary reason that people choose to recreate. In additional, quality scenery contributes directly to real estate values in nearby communities and residential areas."	Scenic character and integrity (Visual Quality Objectives) from Forest Plan identified scenic viewpoints

Roadless Area Characteristics	Roadless Character Descriptions (from 36 CFR Part 294, Special Areas; Roadless Area Conservation Rule, 2001)	Factors used to measure effects
Traditional cultural properties and sacred sites (See the Cultural Resources section for more information)	"Traditional cultural properties are places, sites, structures, art, or objects that have played an important role in the cultural history of a group. Sacred sites are places that have special religious significance to a group. Traditional cultural properties and sacred sites may be eligible for protection under the National Historic Preservation Act. However, many of them have not yet been inventoried especially those that occur in inventoried roadless areas."	Sites identified as eligible or potentially eligible for listing on the National Register of Historic Places or identified by tribes as traditional cultural properties and sacred sites
Other locally identified unique characteristics	"Inventoried roadless areas may offer other locally identified unique characteristics and values. Examples include uncommon geological formations, which are valued for their scientific and scenic quality, or wetland complexes. Unique social, cultural or historical characteristics may also depend on the roadless character of the landscape. Examples include ceremonial sites, places for local events, areas prized for collection on non-timber forest products or exceptional hunting and fishing opportunities."	Existing, inventoried and un-inventoried special interest areas (botanical, geologic)

The effects of the project on the currently roadless portions of IRAs and the portions that include roads are analyzed and disclosed separately because retaining roadless character is difficult, if not impossible, in areas of IRAs that already include roads.

Spatial and temporal bounding

The spatial boundary for analysis includes the IRAs within the project area boundary because only activities that occur within the IRAs affect the roadless characteristics of the IRAs.

The short-term temporal bounding is one to eight years because effects will be realized during and shortly after project implementation. The long-term timeframe is 20 years because effects will fade by the end of that time.

Affected Environment

The following is information on the affected environment for IRAs displayed by fire-related project area. Project area A (Beaver fire) does not include any IRAs so no information is available for that area. The displayed information is for project area B (Happy Camp complex fires) and project area C (Whites fire).

There are four IRAs totally or partially within the Happy Camp fire area: Grider; Johnson; Kelsey; and Tom Martin. Two IRAs are partially within the Whites fire area: Russian; and Snoozer. Only the Grider IRA in the Happy Camp fire area and the Snoozer IRA in the Whites fire area retain a roadless character for the entire IRA. Roads were constructed in portions of the other IRAs between 1984, when these IRAs were "released" for road construction and other activities by the California Wilderness Act, and 2001 when the Roadless Area Conservation Rule limiting road construction and associated activities in IRAs was published. The total number of acres in each IRA within each fire-related project area, the acres that are considered to retain their roadless

character because no roads were constructed in them, and the acres that no longer retain roadless character are displayed in Table 3-80 which also displays the percentage of each IRA that burned at moderate to high severity in the 2014 fires.

Table 3-80: Acres within each IRA, and within the portions of each IRA that retain roadless character and percentage of acres that burned at moderate to high severity

IRA	Total Acres of IRA within project area	Percentage of burned acres that burned at moderate to high severity	Acres that retain roadless character	Percentage of burned acres that retain roadless character that burned at moderate to high severity	Acres that do not retain roadless character	Percentage of burned acres that do not retain roadless character that burned at moderate to high severity
Project Area B: Happy Camp						
Grider	10,640	57%	10,640	57%	0	0%
Johnson	4,900	22%	3,970	20%	930	28%
Kelsey	3,230	16%	510	23%	2,720	15%
Tom Martin	9,050	47%	5,650	53%	3,400	35%
Totals for Happy Camp Project Area	27,820	43%	20,770	49%	7,050	26%
Project Area C: Whites						
Russian	13,540	34%	11,910	34%	1,630	30%
Snoozer	9,250	43%	9,250	43%	0	0%
Totals for Whites Project Area	22,790	37%	21,160	38%	1,630	30%

Environmental Consequences

Activities or treatments that may potentially affect roadless character include site preparation and planting, fuels treatments and roadside hazard treatments. Although no salvage harvesting will occur within inventoried roadless areas, roadside hazard treatments include harvesting of trees greater than 16 inches in diameter along with cutting and leaving smaller trees for firewood or eventual fuels treatment as described in Chapter 2. Acres treated in each alternative are a proxy for effects on roadless character. Since no roads will be built in IRAs and no salvage harvesting will occur, and these activities that are likely to have a measurable effect on roadless character are not present in any alternative, there will not be substantial effects. In addition, there are no research natural areas or special interest areas within any portion of an IRA that will be treated in any alternative. There are no municipal watersheds within any portion of an IRA that will be treated in any alternative.

Alternative 1

Project Area B: Happy Camp Complex

Direct and Indirect Effects

Since there are no management actions with this alternative, there will be no direct or indirect effects on IRAs.

Cumulative Effects

Since there are no direct or indirect effects, there are no cumulative effects of adding the zero effects of Alternative 1 to the past, ongoing or reasonable foreseeable future actions listed in Appendix C that overlap IRAs in time or space.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

Since there are no management actions with this alternative, there will be no direct or indirect effects on IRAs.

Cumulative Effects

Since there are no direct or indirect effects, there are no cumulative effects of adding the zero effects of Alternative 1 to the past, ongoing or reasonable foreseeable future actions listed in Appendix C that overlap IRAs in time or space.

Alternative 2

Direct and Indirect Effects

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The direct or indirect effects on roadless characteristics in IRAs are based on the type and extent of activities within each IRA, especially within the roadless portions since the roadless characteristics of the roaded portions have already been affected. Acres of IRAs within the project boundary that retain roadless character and those that do not are displayed in Table 3-81.

About 207 acres of fuels treatment, 121 acres of site preparation and planting, and 74 acres of roadside hazard treatment have the potential to affect roadless character. Project design features requiring hand treatments for site preparation and planting mitigate negative effects of these treatments on roadless character. There is general agreement among resource specialists that fuels treatments will not negatively affect roadless character and that roadside hazard treatments will not negatively affect roadless character of sections of IRAs that retain roadless character due to their placement along roads that are outside the boundaries of the IRAs.

Cumulative Effects

Adding the effects of Alternative 2 to the past, ongoing or reasonable foreseeable future actions listed in Appendix C that overlap IRAs in time and space will produce negligible cumulative effects to roadless characteristics. There are no current or reasonably foreseeable future projects that include any treatments in the four IRAs within this fire-related project area and no private land project or private lands within these IRAs.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

About 5,280 acres of fuels treatment, less than 40 acres of site preparation and planting, and 36 acres of roadside hazard treatments have the potential to affect roadless character. Project design features requiring hand treatments for site preparation and planting

mitigate negative effects of these treatments on roadless character. There is general agreement among resource specialists that fuels treatments will not negatively affect roadless character and that roadside hazard treatments will not negatively affect roadless character of sections of IRAs that retain roadless character due to their placement along roads that are outside the boundaries of the IRAs.

Cumulative Effects

Adding the effects of Alternative 2 to the past, ongoing or reasonable foreseeable future actions listed in Appendix C that overlap IRAs in time and space will produce negligible cumulative effects to roadless characteristics. There are no current or reasonably foreseeable future projects that include any treatments in the two IRAs within this fire-related project area and no private land project or private lands within these IRAs.

Table 3-81: Alternative 2 proposed activities within each IRA, in portions that retain and do not retain roadless character

IRA	Acres within IRA	% of IRA with Activity	Acres within IRA retaining roadless character	% of IRA with Activity retaining roadless character	Acres within IRA no longer retaining roadless character	% of IRA with Activity no longer retaining roadless character
Project Area B: Happy Camp Complex						
Grider	148	2%	148	2%	0	0%
Fuels Treatment	43	<1%	43	<1%	0	0%
Site prep./plant	82	1%	82	1%	0	0%
Roadside Hazard	23*	<1%	23*	<1%	0	0%
Johnson	511	10%	198	5%	313	34%
Fuels Treatment	160	3%	114	3%	47	5%
Site prep./plant	184	4%	39	1%	146	16%
Roadside Hazard	167	3%	46*	1%	121	13%
Kelsey	318	10%	5	<1%	313	12 %
Fuels Treatment	0	0%	0	0%	0	0%
Site prep./plant	44	1%	0	0%	44	2%
Roadside Hazard	274	8%	5*	1%	269	10%
Tom Martin	750	8%	50	1%	700	20%
Fuels Treatment	213	2%	50	1%	163	5%
Site prep./plant	47	<1%	0	0%	47	1%
Roadside Hazard	490	5%	0	0%	490	14%
Happy Camp Totals	**1,727**	**6%**	**402**	**2%**	**1,327**	**19%**
Fuels Treatment	416	2%	207	1%	210	3%

IRA	Acres within IRA	% of IRA with Activity	Acres within IRA retaining roadless character	% of IRA with Activity retaining roadless character	Acres within IRA no longer retaining roadless character	% of IRA with Activity no longer retaining roadless character
Site prep./plant	357	1%	121	<1%	237	3%
Roadside Hazard	954	3%	74*	<1%	880	12%
Project Area C: Whites Fire						
Russian	2,296	17%	1,853	16%	442	27%
Fuels Treatment	1,935	14%	1,782	15%	153	9%
Site prep./plant	131	1%	39	<1%	92	6%
Roadside Hazard	230	2%	32*	<1%	197	12%
Snoozer	3,463	37%	3,463	37%	0	0%
Fuels Treatment	3,459	37%	3,459	37%	0	0%
Site prep./plant	0	0%	0	0%	0	0%
Roadside Hazard	4*	<1%	4*	<1%	0	0%
Whites Totals	5,759	25%	5,316	25%	442	27%
Fuels Treatment	5,394	24%	5,241	25%	153	9%
Site prep./plant	131	<1%	39	<1%	92	6%
Roadside Hazard	234	1%	36*	<1%	197	12%

*Acres are within 200 feet of a road that is outside the IRA.

Alternative 3

Direct and Indirect Effects

The actions proposed in this alternative are the same as Alternative 2; therefore, direct and indirect effects will be the same as for Alternative 2.

Cumulative Effects

Adding the effects of Alternative 3 to the past, ongoing or reasonable foreseeable future actions listed in Appendix C will produce the same cumulative effects to roadless characteristics as for Alternative 2.

Alternative 4

Direct and Indirect Effects

The actions proposed in this alternative are the same as Alternative 2; therefore, direct and indirect effects will be the same as for Alternative 2.

Cumulative Effects

Adding the effects of Alternative 4 to the past, ongoing or reasonable foreseeable future actions listed in Appendix C will produce the same cumulative effects to roadless characteristics as for Alternative 2.

Alternative 5

Direct and Indirect Effects

No site preparation and planting actions are proposed in IRAs in this alternative as noted below in Table 3-82. The direct and indirect effects on roadless characteristics are due to fuels treatments and roadside hazard treatments; these treatments are the same as for Alternative 2.

Cumulative Effects

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

About 207 acres of fuels treatment and 74 acres of roadside hazard treatments have the potential to affect roadless character. There is general agreement among resource specialists that fuels treatments will not negatively affect roadless character and that roadside hazard treatments will not negatively affect roadless character of sections of IRAs that retain roadless character due to their placement along roads that are outside the boundaries of the IRAs.

Cumulative Effects

Adding the effects of Alternative 5 to the past, ongoing or reasonable foreseeable future actions listed in Appendix C that overlap IRAs in time and space will produce negligible cumulative effects to roadless characteristics. There are no current or reasonably foreseeable future projects that include any treatments in the four IRAs within this fire-related project area and no private land project or private lands within these IRAs.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

About 5,280 acres of fuels treatment and 36 acres of roadside hazard treatments have the potential to affect roadless character. There is general agreement among resource specialists that fuels treatments will not negatively affect roadless character and that roadside hazard treatments will not negatively affect roadless character of sections of IRAs that retain roadless character due to their placement along roads that are outside the boundaries of the IRAs.

Cumulative Effects

Adding the effects of Alternative 5 to the past, ongoing or reasonable foreseeable future actions listed in Appendix C that overlap IRAs in time and space will produce negligible cumulative effects to roadless characteristics. There are no current or reasonably foreseeable future projects that include any treatments in the two IRAs within this fire-related project area and no private land project or private lands within these IRAs.

Table 3-82: Alternative 5 proposed activities within each IRA, in portions that retain and do not retain roadless character

IRA	Acres within IRA	% of IRA with Activity	Acres within IRA retaining roadless character	% of IRA with Activity retaining roadless character	Acres within IRA no longer retaining roadless character	% of IRA with Activity no longer retaining roadless character
Project Area B: Happy Camp Complex						
Grider	66	1%	66	1%	0	0%
Fuels Treatment	43	<1%	43	<1%	0	0%
Site prep./plant	0	0%	0	0%	0	0%
Roadside Hazard	23*	<1%	23*	<1%	0	0%
Johnson	327	7 %	160	4%	168	18%
Fuels Treatment	160	3%	114	3%	47	5%
Site prep./plant	0	0%	0	0%	0	0%
Roadside Hazard	167	3%	46*	1%	121	13%
Kelsey	274	8%	5	1%	269	10%
Fuels Treatment	0	0%	0	0%	0	0%
Site prep./plant	0	0%	0	0%	0	0%
Roadside Hazard	274	8%	5*	1%	269	10%
Tom Martin	703	8%	50	1%	653	19%
Fuels Treatment	213	2%	50	1%	163	5%
Site prep./plant	0	0%	0	0%	0	0%
Roadside Hazard	490	5%	0	0%	490	14%
Happy Camp Totals	**1,370**	**5%**	**281**	**1%**	**1.090**	**15%**
Fuels Treatment	416	2%	207	1%	210	3%
Site prep./plant	0	0%	0	0%	0	0%
Roadside Hazard	954	3%	74*	<1%	880	12%
Project Area C: Whites Fire						
Russian	2,165	16%	1,814	15%	350	21%
Fuels Treatment	1,935	14%	1,782	15%	153	9%
Site prep./plant	0	0%	0	0%	0	0%
Roadside Hazard	230	2%	32*	<1%	197	12%
Snoozer	3,463	37%	3,463	37%	0	0%
Fuels Treatment	3,459	37%	3,459	37%	0	0%
Site prep./plant	0	0%	0	0%	0	0%
Roadside Hazard	4*	<1%	4*	<1%	0	0%
Whites Totals	**5,628**	**25%**	**5,277**	**25%**	**350**	**21%**
Fuels Treatment	5,394	24%	5,241	25%	153	9%
Site prep./plant	0	0%	0	0%	0	0%
Roadside Hazard	234	1%	36*	<1%	197	12%

*Acres are within 200 feet of a road that is outside the IRA.

Alternative 2 Modified

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

The actions proposed in this alternative are the same as Alternative 2; therefore, direct and indirect effects will be the same as for Alternative 2.

Cumulative Effects

Adding the effects of Alternative 2 Modified to the past, ongoing or reasonable foreseeable future actions listed in Appendix C will produce the same cumulative effects to roadless characteristics as for Alternative 2.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

The actions proposed in this alternative are the same as Alternative 2; therefore, direct and indirect effects will be the same as for Alternative 2.

Cumulative Effects

Adding the effects of Alternative 2 Modified to the past, ongoing or reasonable foreseeable future actions listed in Appendix C will produce the same cumulative effects to roadless characteristics as for Alternative 2.

Alternative 3 Modified

Project Area B: Happy Camp Complex

Direct Effects and Indirect Effects

About 288 acres of fuels treatment, 120 acres of site preparation and planting, and 31 acres of roadside hazard treatments have the potential to affect roadless character. There is general agreement among resource specialists that fuels treatments will not negatively affect roadless character. Roadside hazard treatments, and site preparation and planting, occur primarily within parts of IRAs that did not retain roadless character in 1995. The small number of acres of roadside hazard treatments within parts of IRAs that did retain roadless character is along roads that are adjacent to IRAs within minor inclusions into the edges of IRAs; therefore, roadside hazard treatments will not measurably affect roadless character. Site preparation and planting will be all by hand treatment and will not measurably affect roadless character.

Cumulative Effects

Adding the effects of Alternative 3 Modified to the past, ongoing or reasonable foreseeable future actions listed in Appendix C that overlap IRAs in time and space will produce negligible cumulative effects to roadless characteristics. There are no current or reasonably foreseeable future projects that include any treatments in the four IRAs within this fire-related project area and no private land project or private lands within these IRAs.

Project Area C: Whites Fire

Direct Effects and Indirect Effects

About 5,240 acres of fuels treatment, 39 acres of site preparation and planting, and 34 acres of roadside hazard treatments have the potential to affect roadless character. There is general agreement among resource specialists that fuels treatments will not negatively affect roadless character. Roadside hazard treatments, and site preparation and planting, occur primarily within parts of IRAs that did not retain roadless character in 1995. The small number of acres of roadside hazard treatments within parts of IRAs that did retain roadless character is along roads that are adjacent to IRAs within minor inclusions into

the edges of IRAs; therefore, roadside hazard treatments will not measurably affect roadless character. Site preparation and planting will be all by hand treatment and will not measurably affect roadless character.

Table 3-83: Alternative 3 Modified proposed activities within each IRA, in portions that retain and do not retain roadless character

IRA	Acres within IRA	% of IRA with Activity	Acres within IRA retaining roadless character	% of IRA with Activity retaining roadless character	Acres within IRA no longer retaining roadless character	% of IRA with Activity no longer retaining roadless character
Project Area B: Happy Camp Complex						
Grider	227	2%	227	2%	0	0%
Fuels Treatment	124	1%	124	1%	0	0%
Site prep./plant	82	1%	82	1%	0	0%
Roadside Hazard	22*	<1%	22*	<1%	0	0%
Johnson	227	9%	156	4%	271	29%
Fuels Treatment	160	3%	114	3%	47	5%
Site prep./plant	184	4%	39	1%	146	16%
Roadside Hazard	83	2%	4*	<1%	79	8%
Kelsey	133	4%	5	1%	127	5%
Fuels Treatment	0	0%	0	0%	0	0%
Site prep./plant	44	1%	0	0%	44	2%
Roadside Hazard	88	3%	5*	1%	83	3%
Tom Martin	613	7%	50	1%	562	16%
Fuels Treatment	213	2%	50	1%	163	5%
Site prep./plant	47	1%	0	0%	47	1%
Roadside Hazard	352	4%	0	0%	352	10%
Happy Camp Totals	**1,401**	**5%**	**440**	**2%**	**961**	**14%**
Fuels Treatment	497	2%	288	1%	209	3%
Site prep./plant	358	1%	120	1%	237	3%
Roadside Hazard	546*	2%	31*	<1%	514	7%
Project Area C: Whites Fire						
Russian	2,266	17%	1,854	16%	412	25%
Fuels Treatment	1,936	14%	1,783	15%	153	9%
Site prep./plant	122	1%	39	<1%	83	5%
Roadside Hazard	209	2%	32*	<1%	177	11%
Snoozer	3,460	37%	3,460	37%	0	0%
Fuels Treatment	3,458	37%	3,458	37%	0	0%
Site prep./plant	0	0%	0	0%	0	0%
Roadside Hazard	2*	<1%	2*	<1%	0	0%
Whites Totals	**5,726**	**25%**	**5,314**	**25%**	**412**	**25%**
Fuels Treatment	5,393	24%	5,240	25%	153	9%
Site prep./plant	122	<1%	39	<1%	83	5%
Roadside Hazard	211	1%	34*	<1%	177	11%

*Acres are within 200 feet of a road that is outside the IRA.

Cumulative Effects

Adding the effects of Alternative 3 Modified to the past, ongoing or reasonable foreseeable future actions listed in Appendix C that overlap IRAs in time and space will

produce negligible cumulative effects to roadless characteristics. There are no current or reasonably foreseeable future projects that include any treatments in the two IRAs within this fire-related project area and no private land project or private lands within these IRAs.

Summary of Effects

Table 3-84: Summary of Effects by analysis indicator for the Happy Camp Fire Area.

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 2 Mod.	Alt. 3 Mod.
Acres of treatments in parts of IRAs in which roadless character is retained	0	402	402	402	281	402	440
Acres of IRA on which roadless character will be affected	0	0	0	0	0	0	0

Table 3-85: Summary of Effects by analysis indicator for the Whites Fire Area

Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 2 Mod.	Alt. 3 Mod.
Acres of treatments in parts of IRAs in which roadless character is retained	0	5,316	5,316	5,316	5,277	5,316	5,314
Acres of IRA on which roadless character will be affected	0	0	0	0	0	0	0

Comparison of Effects

There is little difference among alternatives in effects on roadless character of IRAs because the treatments proposed in any alternative have little effect on the roadless areas that retain roadless characteristics. Alternative 1 does not propose any treatments in IRAs; IRAs will regenerate naturally as described in the vegetation section of this chapter. In action alternatives, only prescribed burning affects a sizeable number of acres; this action mimics the effects of low intensity wildfire and will not substantially affect roadless character. Construction and maintenance of shaded fuel breaks on a small number of acres that retain their roadless characteristic and removal of small fuels (generally less than 3 inches in diameter at breast height) will also not substantially affect roadless character. Alternative 3 Modified includes more acres of fuels treatment in the Happy Camp fire area than other alternatives because some of the additional fuelbreaks recommended by the Karuk Alternative are included; roadless character will not be substantially affected by these added acres of fuels reduction. Roadside hazard treatments, primarily along roads within the portions of the inventoried roadless areas that do not retain roadless character, will have little effect on roadless character. Site preparation and planting using hand tools and methods in Alternatives 2, 3, 4, Alternative 2 Modified and Alternative 3 Modified (with implementation of project design feature IRA-1) will have a minor effect; this will occur on only 160 acres of areas that currently retain roadless character (about 120 for Happy Camp and almost 40 for Whites fire-related areas). No site preparation and planting will occur in Alternative 5; effects of natural regeneration will be the same as for Alternative 1.

Compliance with law, policy, regulation and the Forest Plan

All alternatives will comply with the Roadless Area Conservation Rule and applicable Forest Plan standards as amended by this rule.

Climate Change

Increasingly, the relationships between human-caused emissions, climate change, and the role of the forests as carbon sinks (carbon sequesters) are being documented (IPCC 2007). Although uncertainty exists in quantifying the impact of emissions on climate, a global warming of 1.4 to 5.8 degrees centigrade is projected by 2100 (USDA Forest Service 2007b). Adapting to climate change and its potential impacts poses challenges and opportunities to managing resources. Forests and rangelands are seen as part of the solution to reducing atmospheric carbon dioxide and other greenhouse gases due to their ability to sequester or store carbon. However, the magnitude of the opportunity for carbon storage is not well quantified or thoroughly understood, especially at the project level.

The use of future climate scenarios and ecological models suggests that the impact of climate change on ecosystems in the United States may include increases in ecosystem productivity in the short term and shifts in the distribution of plants and animals in the long term (Joyce and Birdsey 2000). As climate changes advance, there are some indications that there will be increases in disturbances such as wildfires, drought, and insects (USDA Forest Service 2007b).

Although climate change simulations vary considerably in making future predictions of climate change, in most scenarios relatively little change in overall precipitation is projected. Most precipitation will continue to occur during winter storms. However, increased winter temperatures may mean that more of the winter precipitation falls as rain and less as snow. Snow accumulations may decrease and spring snow melt is projected to occur earlier. There is no local scientific information to suggest that storms may increase in size or frequency so no projections are made concerning the effects of storm events on the project area. Dry seasons may be drier, warmer and longer, with resulting increases in the frequency and size of wildfires as seen in 2014. This project may allow some adaptation to climate change effects on the local level.

Based on the best available science, it is still speculative to factor any specific ecological trends or substantial changes in climate into the analysis of environment impacts of individual projects. Currently, the best available science concerning climate change is not adequate to support reliable predictions about ecological interactions and trends at the local project level. Local information concerning precipitation and temperature in the vicinity of the Westside Fire Recovery project suggests that national predictions on increasing temperature may be reflected at the project level but precipitations trends are more variable (USDA Forest Service 2011b). Based on regional predictions of a warming climate and increases in disturbances such as wildfire and insect infestations, it is expected that treatments proposed in the action alternatives for this project will benefit forests through fuel-reduction treatments designed to promote species diversity, favor fire-resistant tree species, and reduce risk of loss due to wildfire. Specifically, the following may occur:

- Increases in average temperatures, with earlier snowmelt, may lead to an increase in the size and frequency of wildfires with warmer and longer fire seasons as was evident in 2014
- Harvest of burned areas can reduce fuels, especially those that are slow to ignite but burn at high intensities lead heated soils that damage soil productivity.

- From our current state of understanding, climate change may bring about increases in insect and pathogen outbreaks.

The contribution of this project to factors that may affect climate change such as greenhouse gas emissions is disclosed in the Air Quality section of this chapter and referenced Air Quality resource report.

Active forest management is believed to be an effective method of carbon sequestration (IPCC 2007). Although there is some controversy about whether older trees are more successful in storing carbon than younger trees (Coulson et al. 2015), there is general agreement that forests are an important factor in carbon storage (Fitzsimmons, et al. 2004, US EPA 2013, Pan et al. 2011). Likewise, there is general agreement that less carbon is stored in decaying wood than in wood content in lumber and manufactured wood products (Skog 2008, Finkral and Evans 2008) and that stand-replacing wildfire releases carbon into the atmosphere (Vose et al. 2012).

Selecting trees for reforestation that are likely to survive if climate change predictions are fulfilled in the project area is discussed in the discussion of site preparation and planting in Chapter 2 and the Vegetation section of this chapter of the final EIS. Harvest, fuel breaks and other fuel-reduction treatments will not eliminate wildfire from the project area but can help change fire behavior (as discussed in the Fire and Fuels section of this chapter and Fire and Fuels resource report), thereby likely reducing carbon dioxide emissions resulting from wildfire. Effects on future global climate change from this project are too small to measure.

Aquatic Conservation Strategy

Introduction

The Forest Plan contains the components, objectives and standards and guidelines for consistency of projects with the Aquatic Conservation Strategy (ACS). The Record of Decision (ROD) for the Forest Plan (USFS, 1995c) is the guiding document for Forest projects; the Forest Plan ROD incorporates the Aquatic Conservation Strategy standards and guidelines from the ROD for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (commonly known as the Northwest Forest Plan) (USDA Forest Service and USDI Bureau of Land Management 1994b).

The Aquatic Conservation Strategy has four components. These are Riparian Reserves, Key Watersheds, Watershed Restoration, and Watershed Analysis (Forest Plan, page 4-25). Within Riparian Reserves are standards that prohibit and regulate activities that retard or prevent attainment of Aquatic Conservation Strategy objectives (Forest Plan, page 4-106). This analysis documents the consistency of the project with the Aquatic Conservation Strategy objectives at the site scale and the 5th field watershed scale. The consistency is analyzed at the short-term (during implementation up to the first 1-2 years) and the longer-term scales (>2 years).

This discussion will summarize the comprehensive information provided in the project Aquatic Conservation Strategy Report and Amendment. Those reports provide detailed descriptions of the existing watershed condition including the important physical and biological components of the 5th field watersheds and a discussion of the natural range of

variability for potentially affected processes. The complete discussion of relevant recommendations of watershed analyses is also found in the Aquatic Conservation Strategy Report and Amendment. This summary focuses on the treatments proposed in Modified Alternative 3 since this alternative is the preferred alternative. Detailed descriptions of the actions proposed are in Chapter 2 of the final EIS.

Riparian Reserves

The interim widths defined in the Forest Plan were used to define the Riparian Reserve widths for analysis and project design. See project design feature table in Chapter 2 of the final EIS for details on the widths defined by the Forest Plan.

Key Watersheds

The Westside Fire Recovery project contains portions of Key Watersheds as defined by the Forest Plan. These are the Elk Creek, North Fork Salmon River and South Fork Salmon River (minor project acreage) 5th field watersheds and the Grider Creek 6th field watershed (which was considered a 5th field watershed at the time of the Forest Plan ROD).

Watershed Restoration

Although watershed restoration is not the explicit purpose of the Westside Fire Recovery project, proposed actions within hydrologic Riparian Reserves were developed with input from wildlife and fish specialists and earth scientists to insure that Forest Plan direction and Best Management Practices from the Pacific Southwest Region Water Quality Management for Forested Lands in California publication are met (USFS 2011). Project-specific Best Management Practices and project design features were developed to reduce potential negative effects and meet the requirement of the Forest Plan (p. 4-106) to prohibit and regulate activities in Riparian Reserves that can retard or prevent attainment of the Aquatic Conservation Strategy Objectives.

Watershed restoration, including fish passage improvement, removing and upgrading roads and stream crossings, and restoration of large trees in Riparian Reserves, is an ongoing program on the Forest but not specifically the purpose and need for the Westside Fire Recovery project. However, treatments proposed in the project are intended to speed the recovery of mature forests which will improve watershed function. Additionally, repairing legacy sediment sites in the Elk Creek Key Watershed is included and will reduce risk over the long term to beneficial uses that are impacted by sediment and temperature impairment.

Existing Condition

There are twelve 5th field watersheds that are at least partly contained in the project area. Soil burn severity is used to assess post-fire existing conditions because it best represents the watershed's response to a wildfire. Fifty-four percent of the hydrologic Riparian Reserves in the Seiad Creek-Klamath River watershed was burned by the 2014 wildfires. Four-two percent, twenty-nine percent, twenty-five percent, nineteen percent, fifteen percent, thirteen percent and four percent of the hydrologic Riparian Reserves in Elk Creek, Lower Scott River, North Fork Salmon River, Beaver Creek, Horse Creek-Klamath River, Tompkins Creek and Humbug Creek watersheds were burned. South

Fork Salmon River, French Creek, Ukonom Creek and Indian Creek watersheds have less than one percent burn from the 2014 wildfires.

The Indian Creek and French Creek 5th field watersheds have no treatments; there will be no effects either at the site or watershed-scale and, therefore, these watersheds were not analyzed for compliance with Aquatic Conservation Strategy Objectives.

Watershed Analysis Recommendation

The project is compliant with all relevant watershed analysis recommendations. The Aquatic Conservation Strategy Report outlines the compliance in detail.

Treatments in Riparian Reserves

For the purposes of this analysis 'Hydrologic Riparian Reserve' includes the interim riparian buffers along intermittent and perennial streams (hydrologic Riparian Reserve) and inner gorges. Active landslides, toe zones of dormant landslides and steep-weathered granitic lands are Riparian Reserves but for this report they will be referred to as unstable lands to avoid confusion.

There will be no salvage harvest in hydrologic Riparian Reserve. Trees that pose a hazard to the road system will be felled but not removed from Riparian Reserves where needed to meet coarse wood objectives (see project design features in Chapter 2 of the final EIS). Modified Alternative 3 includes hand treatments in Riparian Reserves in all three fire areas and these treatments may include planting. The hand treatments in hydrologic Riparian Reserve are within site preparation units in plantations that have moderate and high vegetation burn severity. Trees up to 10 inches diameter at breast height will be felled, lopped and scattered. Material in excess of 7 tons per acre will be hand-piled and burned or broadcast burned. Hydrologic Riparian Reserves not in site preparation units are not included for hand treatment. The purpose of this treatment is to improve ground cover and reduce potential post-fire surface erosion, and thus reduce sediment production to stream channels in the short term. Also, this treatment provides an opportunity for maintenance underburning and reduction of accumulations of dead trees and brush; and planting if needed to re-establish conifers as a component of the regenerating forests. Acres of proposed hand treatments in hydrologic Riparian Reserve are summarized in Table 7 of the Aquatic Conservation Strategy Report Amendment. Fuels treatments will occur in hydrologic Riparian Reserve with limitations described in the project design features table in Chapter 2 of the final EIS.

There are treatments recommended for unstable lands, outside of hydrologic Riparian Reserves and inner gorges. The acres treated and effects as a result of the treatments are summarized in the Geology section of this chapter and Objective 4 below.

Objective 1

Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Range of Natural Variability

Watershed complexity, for this analysis will consider effects to large wood (a minimum of 50 feet long and 24 inches in diameter as defined in the Forest Plan EIS, page 3-68)

recruitment to streams and coarse woody debris (defined as woody material, at least 20 inches in diameter from whatever source that is dead and lying on the forest floor in the Forest Plan glossary) on the upland slopes.

Little quantitative data is available regarding the historic range of variability of large woody debris and coarse woody debris on the upland slopes. Assumptions can be made considering the history of disturbance. The sources of large woody (in-channel wood) and coarse woody (upslope downed wood) debris have been reduced from historical conditions by commercial harvest and 'stream cleaning' operations that occurred from approximately 1960 through the early 1980s; these operations removed large wood from many streams on the Forest with the intent of preventing damage to infrastructure and improving fish passage. Prior to effective fire suppression on the landscape scale, frequent wildfires would have contributed to well-distributed large woody and coarse woody debris by creating snags that eventually fall; some of these are recruited to stream channels.

Actions that remove large wood from near stream areas on Forest lands, for the most part, ended when the current Forest Plan and its Aquatic Conservation Strategy was put in place in 1994; currently only the removal of hazard trees in administrative and recreation sites, in limited circumstances, results in the loss of any large wood from near stream areas. Forest Plan Standards and Guidelines help move toward the desired condition of large wood in the streams and coarse wood in the upslope areas. Standard and Guideline MA10-56 (page 4-112) outlines the large wood requirements for 3rd to 5th order streams. Standard and Guideline 6-16 outlines the upslope coarse wood requirements at the landscape scale (pages 4-23 and 4-24).

Proposed Action Influence on Objective

There is no salvage harvest proposed in hydrologic Riparian Reserve (see definition in Treatments in Riparian Reserves section above), therefore these actions would not influence habitat elements or processes described in this Objective. Hand treatments are proposed in hydrologic Riparian Reserve in site preparation units (see Treatments in Riparian Reserves). Snag, legacy component and coarse woody debris retention standards are included in the project description (Chapter 2 of the final EIS) and will ensure that the project retains these habitat elements on the landscape. Snag retention will allow for long-term recruitment of coarse wood on the upslope and large wood in the hydrologic Riparian Reserve. The project meets the Forest Plan Standards and Guidelines by retaining a portion of snags and coarse wood.

Roadside hazard reduction is the only action that could have a measurable effect on the presence of large trees near streams and large wood recruitment. Considering that the probability of wood entering an active stream channel from greater than one tree height is generally low (FEMAT 1993), the project includes a design feature (Watershed-12) that requires all hazard trees 26 inches in diameter at breast height and greater that are felled within the first site tree from all defined streams (fish-bearing, perennial non-fish-bearing, and intermittent) are left on site. Additionally, any tree that would contact a fish bearing stream channel, if felled that direction, will be retained on site. This ensures that trees larger than the standard site tree height but further than that height from the channel will not be removed. Due to these protection measures, potential effects are limited along those stream reaches affected by the action to loss of dead trees 14-26 inches dbh within

one site tree distance from stream channels that are deemed hazardous to the road, and loss of hazard trees of any size from the outer Riparian Reserve (farther than one site tree height from fish bearing streams) where they are not likely to be recruited to stream channels but are more important for terrestrial species and habitat.

As part of project planning and effects analysis, biologists and fuels specialists worked to find consensus on what fuels reduction actions are needed in Riparian Reserve in order to manage these areas within their historical range of variability. The team relied upon Forest Plan direction, historic information including fire history, field review, and best available information including scientific literature. Research specific to fire regimes and forest management in the Klamath Mountains are particularly relevant, including Skinner, 1997; Taylor and Skinner, 1998; and Skinner, 2003. In order to manage riparian areas within their natural range of variability, the historical fire regime must be an important and explicit consideration (Skinner 1997). As described in the literature, the Mediterranean climate of the Klamath Mountains is characterized by pronounced annual drought (independent of any prolonged drought). Even Riparian Reserves in the Klamath Mountains regularly experience conditions where fires can easily ignite and spread. Field review of existing conditions in the project area further reinforced for biologists the need to propose fuels and site preparation treatments in Riparian Reserves, and that removal of hazard trees 14-26 inches dbh within Riparian Reserves is consistent with Forest Plan LWD objectives and appropriate management to maintain and restore riparian function within the natural range of variability. Field review also included evaluation of potential effects of proposed hazard tree removal in the outer Riparian Reserve (farther than one site tree distance from fish-bearing streams). In consideration of both the historic fire regime (frequent mixed severity fire) and the current fire regime which is a product of mostly effective suppression then high severity fire, allowing hazard tree removal in these outer portions of the Riparian Reserve is likely to provide for more effective fuels management and decrease the probability that future high severity fire would reach near stream areas. For these reasons, and considering the relatively minor amount of near stream habitat that would be exposed to effects of these actions, proposed hazard tree removal would have only discountable effects to large wood recruitment.

Project fuels treatments will occur within hydrologic Riparian Reserve and include specific protection measures to ensure that these actions do not reduce the presence of large snags or downed wood. Because no large trees will be removed, coarse wood and snag Forest Plan Standards and Guidelines will be met in the short term and the long term. Also, the treatment will reduce the risk of high severity fire in the project area in the long term. Especially considering the fire regime of the Klamath Mountains, this action will restore and maintain this objective at the watershed and site scales for the short and long term.

Site preparation and planting will not reduce large trees, snags, or downed wood in hydrologic Riparian Reserves in the short term and may actually speed the development of large trees in the long term due to reforestation efforts. Because no large trees will be removed, coarse wood and snag Forest Plan Standards and Guidelines will be met in the short term and the long term. Also the treatment is likely to reduce the time it takes to recover the mature conifer forest in the project area in the long term.

Temporary road actions within Riparian Reserves are subject to the same project design features that reduce potential loss of large wood as described above. New temporary road

segments outside of hydrologic Riparian Reserve are short features that are used to facilitate salvage and site preparation. As a result of these actions, there may be minor site level reduction of large wood where trees are removed from the roadbed; however, snag retention project design features ensure that snags of the largest size and pre-existing (prior to wildfire) snags and coarse woody material would remain on site. This action will meet the Forest Plan Standards and Guidelines for coarse wood and snag retention.

Use of new landings in hydrologic Riparian Reserve could result in felling of hazard trees and snags; however, project design feature watershed-12 ensures that if any hazard tree equal to or greater than 26 inches in diameter at breast height is felled within one site tree height distance from any stream channel it will remain on site. New and existing landings in hydrologic Riparian Reserve will be shaped and treated for erosion control at the end of each season of use, and hydrologically restored at project completion (including sub-soiling and covering with slash/mulch as needed). New and existing landings in hydrologic Riparian Reserve will have site specific erosion control measures to reduce risk of sediment delivery into streams. New landings outside of hydrologic Riparian Reserve may require removal of large trees or snags in some cases. Snag and coarse woody debris retention standards are included in the project description and design features. They ensure that these habitat elements persist on the landscape within and outside of hydrologic Riparian Reserve.

5th Field Watershed Analysis

As described above, roadside hazard tree removal in hydrologic Riparian Reserve is the only action that may result in removal of near stream large wood and thus influence this objective. As shown in

Table 3-86, a relatively small proportion of the total intermittent and perennial streams within any given watershed may be affected by proposed roadside hazard tree actions.

Table 3-86. Miles of intermittent and perennial stream in close proximity to roadside hazard tree removal proposed in Modified Alternative 3.

5th field watershed	Miles of perennial stream within 200 feet from roadside hazard tree removal roads	Miles of intermittent stream within 200 feet from roadside hazard tree removal roads	Total stream miles in watershed -intermittent and perennial Percentage of streams miles potentially affected by Project roadside hazard tree removal
Beaver Creek	3	4	277 2.5%
Horse Creek-Klamath River	0	2	322 0.6%
Seiad Creek-Klamath River	6	0	205 2.9%
Lower Scott River	4	5	476 1.9%
Thompson Creek-Klamath River	2	4	297 2.0%
Elk Creek	5	4	300 3.0%
North Fork Salmon River	11	5	654 2.4%
TOTAL	31	24	2,531 2.2%

Based on inclusion of watershed project design features, and project specific Best Management Practices, field review of hazard tree removal areas, and consideration of the proportion of watersheds that would be affected, this analysis concludes that hazard tree removal actions are consistent with large woody debris objectives and maintain and restore habitat elements and processes described in this objective.

Objective 2

Maintain and restore spatial and temporal connectivity between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Range of Natural Variability

Watershed connectivity for this analysis takes into consideration effects to aquatic and terrestrial species passage and habitat connectivity and focuses on physical blocking of the stream channels and snag retention.

Historically, watershed connectivity would have ranged from high to impaired on any given reach of the Klamath, Scott, and North Fork Salmon rivers and their tributaries due to natural landslides, flood events and wildfires (See Fire and Fuels section for details on range of snags and coarse wood).

Proposed Action Influence on Objective

Salvage will not occur in hydrologic Riparian Reserves and there would be no effect to connectivity of aquatic or riparian habitat due to salvage harvest. The amount of salvage

relative to the fire-affected area is small and, therefore, the project is not likely to impact connectivity at the 5th field watershed scale but may reduce connectivity at the site scale. The project maintains all large trees and snags in hydrologic Riparian Reserves, and retains legacy components and snags within units so it meets Forest Plan Standards and Guidelines for retention of large wood and coarse woody material and minimizes effects to connectivity.

Roadside hazard tree removal will occur in hydrologic Riparian Reserves with restrictions on heavy equipment and the requirement of retention of 26 inch diameter at breast height or larger trees within the first site tree in hydrologic Riparian Reserves. These protection measures ensure that roadside hazard removal will not impact stream habitat and thus will have no impact on aquatic habitat connectivity at the watershed or site scale for the short or long term. The roadside hazard tree removal will be intermittent along the roadways and green tree 'bridges' will be left along the corridors which will serve to provide connectivity for terrestrial species. These effects would occur where habitat connectivity is already impacted by roadways and will have minimal effect to habitat connectivity at the watershed scale (see Chapter 3 of the EIS and the wildlife resource report for further discussion).

Hazardous fuels reduction are designed to reduce fuels accumulations and small trees (less than 16 inches) to provide some protection for future watershed condition and function especially if/when a fire occurs greater than five years in the future. Because near stream areas are protected from disturbance by project design features and no large trees will be removed by fuels treatments, coarse wood and snag Forest Plan Standards and Guidelines will be met in the short term and the long term (see the wildlife section of Chapter 3 of the EIS and the wildlife resource report).

Site preparation and planting will have beneficial effects to aquatic and riparian species because it is designed to achieve near-term ground cover and to encourage regeneration in the hydrology Riparian Reserves and unstable lands (See Geology Section). No large trees will be removed; coarse wood and snag Forest Plan Standards and Guidelines will be met in the short term and the long term. Site preparation and planting will reduce the time it takes to recover the mature conifer forest in the project area in the long term. In the long term, terrestrial connectivity may be improved as planting is likely to result in a forest with larger trees faster than without planting.

Temporary road actions that involve crossings on perennial stream channels would temporarily impact aquatic habitat connectivity. Modified Alternative 3 includes only two such crossings, on a perennial non fish-bearing tributary of lower Grider Creek (see fisheries section of Chapter 3 of the EIS and aquatic resources report). The impact of these actions would be limited to the in channel work area and a short distance downstream, this involves only a small amount of aquatic habitat that would be temporarily affected (approximately 0.5 miles). These minor site level impacts would not influence aquatic habitat connectivity at the 7th or 5th field watershed scale. The openings in the canopy from temporary access activities are not large enough to affect connectivity at the site or watershed scale for terrestrial wildlife.

The project includes a project design feature that generally precludes new landing construction in hydrologic Riparian Reserves. However, six new landings in outer portions of Riparian Reserve were considered appropriate for use by watershed

specialists because field visits confirmed they were on stable landforms and slope positions, were in the outer zone of the hydrologic Riparian Reserves, and/or were separated from streams by existing, stable road segments. New landings in Riparian Reserve may have site-level impacts to terrestrial habitat connectivity where large trees or snags are removed. The average size of the landings proposed is no larger than natural openings; therefore, these actions will not prevent connectivity but they may increase the risk of predation for individuals until the canopy cover is recovered (greater than 10 years in some areas).

5th Field Watershed Analysis

Proposed salvage may affect terrestrial habitat connectivity at the site scale in Seiad Creek-Klamath River, Lower Scott River, Elk Creek and North Fork Salmon River watersheds. Proposed temporary road actions that involve stream crossing work would temporarily affect aquatic habitat connectivity at the site of two perennial stream crossings in Seiad Creek-Klamath River watershed. The 5th field statistics for roadside hazard reduction and new landings is described under objective 1 above.

Objective 3

Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Range of Natural Variability

Aquatic systems integrity will consider potential effects to channel morphology from increased peak flows, as measured by the ERA model, and landslide likelihood, as defined in the Geology section. In the historic range of variability, the banks, shorelines and stream bottoms would have been varied and heterogeneous. Historically, floods and debris flows affected and altered morphology along miles of stream channels; however, there would have been a high percentage of streams with functioning channel beds and banks comprised of varied substrates.

Proposed Action Influence on Objective

Potential effects to peak flow are only measurable at the watershed scale. Grant et al. (2008) demonstrated a correlation between watershed ERA and peak flow. However, potential increased peak flow related to timber salvage is indistinguishable beyond increases expected to result from the 2014 wildfires based on model results. Salvage harvest is not expected to affect base flow beyond influences of the 2014 wild fires. The removal of dead or dying trees (salvage harvest) does not increase the landslide likelihood (See Geology Report and Amendment).

Hazard trees may be felled in hydrologic Riparian Reserves where they pose a threat to adjacent roadways. The direct effects to bank integrity will be minimal because project design features prohibit the removal of any hazard tree within 25 feet of a channel and trees greater than 26 inches diameter at breast height in the first site tree of a channel. The removal of dead or fire-injured trees does not increase the landslide likelihood (Geology Report and Amendment). The project design features require the use of directional felling and avoiding removing trees anchored in the banks of stream channels to minimize impacts to the aquatic integrity.

There are not likely to be direct effects to stream channels from hazardous fuels treatments. Hazardous fuels reduction will not decrease root strength, which is identified as the main driver of landslide process in the Geology Report and Amendment, so it will not increase landslide likelihood. There will be hand treatments and planting in the hydrology Riparian Reserves in Alternative 3 Modified intended to increase ground cover and encourage regeneration of conifer forest. This has a benefit to physical integrity of aquatic systems because the roots from the re-established conifer forest will increase the stability of the stream banks and bottoms.

The effect to peak flow from temporary roads and new landings is not measurable because of the relatively small percentage of watersheds affected. There are six new landings in hydrologic Riparian Reserves for the entire project area. Temporary road actions and new landing construction will increase landslide likelihood at the site scale for the first winter after completion. The temporary roads and landings will be hydrologically stabilized which minimizes the effects to landslide likelihood (See Geology Report Amendment). New landings in hydrologic Riparian Reserves can have unstable fills which may have small landslides affecting the stream banks or the banks can be disturbed by heavy equipment while constructing the landings. In these cases, stream banks will likely experience long-term effects. However, the roads and new landings are used to facilitate salvage harvest and site preparation as well as planting which benefit the physical aquatic system via accelerated reforestation and recovery of forest over the long term.

5th Field Watershed Analysis

The actions with measureable effects on stream channel integrity are temporary road actions and new landing construction in Hydrologic Riparian Reserves. The 5th field statistics for roadside hazard reduction and new landings is described under Objective 1 above.

Objective 4

Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that retains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Range of Natural Variability

This objective related to water quality is evaluated based on potential impacts to stream temperature, which is also influenced by sediment-related effects. The North Fork Salmon River, the Scott River and the Klamath River are listed in the 303 (d) Clean Water Act for stream temperature impairment (Hydrology resource report and water quality section of Chapter 3 of the EIS). The Total Maximum Daily Loads (TMDLs) for the Klamath, Scott, and Salmon Rivers contain numeric targets that represent attainment of State water quality standards for temperature and sediment. The water quality analysis for this objective will focus on the effects to stream temperature. Sediment is covered in Objective 5.

The California Regional Water Quality Control Board North Coast Waiver of Waste Discharge Requirements for Non-point Source Discharges Related to Certain Federal

Land Management Activities on National Forest System Lands (Order No. R1-2010-0029) states that the Forest shall manage and maintain hydrologic Riparian Reserves on a trajectory such that natural shade conditions occur. The natural shade conditions are defined as the shade on a watercourse that results from the site potential naturally occurring vegetative community and topographic configuration. Shade can vary from very low in open meadows to upwards of 85% in heavily forested areas. Wildfire is a natural process in the Klamath Mountains and areas with moderate to high vegetation burn severity will have relatively low shade cover on intermittent and perennial streams.

Proposed Action Influence on Objective

No effects to shade as a result of salvage harvest are expected because salvage would not occur within hydrologic Riparian Reserves. Roadside hazard reduction will only occur only where trees were affected by the 2014 wildfires. These trees will be dead or fire-injured and are not likely providing effective shade to stream channels. Hazardous fuels reduction and site preparation and planting will occur within hydrologic Riparian Reserves and may remove dead trees up to 10 inches in diameter at breast height. Project design features limit these activities in near-stream areas so that no meaningful effect to shade is likely, at the site or watershed scale. The effects to shade from temporary road actions in hydrologic Riparian Reserves will be localized at stream crossings. The six new landings in hydrologic Riparian Reserves are considered appropriate because their use would not require removal of any vegetation that provides shade over streams; therefore, water temperature would not be affected at the site or watershed scale.

5th Field Watershed Analysis

Table 3-87displays near stream temporary road actions. Only the site on road 46N41YA may involve work within an active stream channel, and therefore may result in short term effects to stream shade at the site scale.

Table 3-87. Modified Alternative 3 near stream temporary road actions.

Receiving Stream Name	Road Type	Confirmed Stream Type Crossing	Comments
Grider Creek	Decomm. Road 46N41YA	2 perennial	One crossing is legacy site; the Project will reduce sediment in the long term by properly hydrologically stabilizing this crossing.
Cliff Valley Creek	Decomm. Road 46N77	1 Intermittent	Stable, moderate risk
China Creek	Decomm. Road 46N78	1 Intermittent	Stable, low risk
Kuntz Creek	Existing and New Temporary Road	No crossing involved in road (except crossing of private diversion ditch)	Road has drainage problems; use of road is low risk; the Project will reduce sediment long term

Objective 5

Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Range of Natural Variability

The sediment regime analysis will consider the effects of sediment delivery to streams as estimated by the Universal Soil Loss Equation and mass wasting (landslide) models at the 5th field watershed scale. The USLE and the mass wasting model have an approximation of the 'background' levels of soil erosion and landsliding on the landscape. The 'background' volumes of sediment are compared against the 'current' modeled sediment to derive the risk ratios for the 5th field watersheds. A risk ratio of 1.0 or greater is considered a 'yellow flag' where the risk of negative effects to beneficial uses is increased. The model results for background, current, indirect effects of the alternatives and the future foreseeable actions can be found summarized in the Hydrology report and in the Cumulative Watershed Effects results in the project record. Under natural conditions there would be a mosaic of vegetation and root support across the landscape and the landslide likelihood would be likely across the landscape. The duration of elevated risk for the 5th field watersheds will be also considered in meeting or not preventing attainment of this objective.

Proposed Action Influence on Objective

There will be no salvage, and no ground based equipment off roads, in the hydrologic Riparian Reserves. There are project design features intended to mitigate potential soil erosion and sediment delivery from salvage and it is not expected to increase the risk of sediment delivery to stream channels. Field review of hazard tree removal areas, and spatial analysis of the distribution and extent of proposed hazard tree removal, confirm that this action is likely to have only discountable effects to sediment regimes and site level sediment production. Hazardous fuels treatments are designed to reduce the adverse effects of future wildfires, therefore, would provide some protection for future watershed condition and function, especially if/when fires occur greater than five years in the future. The reduction of the risk of high severity fire will reduce the risk to the sediment regime at the site and watershed scale in the long term.

Proposed hand treatments in the hydrologic Riparian Reserves in site preparation units are intended to increase soil cover and thus lower the risk of surface erosion, as well as improve soil productivity. These actions will improve the hydrologic Riparian Reserves ability to filter sediment, and allow for reduction of dead fuels accumulations which allows for improved watershed condition over the long-term especially considering fire regimes. Planting in the salvage and site preparation units, if more than 25% of the high and moderate vegetation severity burned, will reduce the duration of elevated risk of landslides from greater than 80 years to about 30 years.

At the site scale, temporary road actions that involve stream crossings may increase the sediment delivered to streams. Watershed specialists identified all potential stream crossings on proposed temporary roads and reviewed them in the field to determine what actions would be taken and what effects to aquatic habitat may occur. Project design features and best management practices include the requirement to hydrologically stabilize temporary roads and remove any temporary crossings prior to wet weather, fix any current legacy sites on temporary roads the project uses, and adhere to the wet weather operation standards. Proper implementation of these measures is critical to minimizing effects to the sediment regime from this action. Thirty-three miles of Forest System roads will be storm-proofed and 148 legacy sites will be treated in the portion of the Elk Creek watershed in the project area. These treatments will reduce potential sediment delivery during storm events.

Landings constructed within hydrologic Riparian Reserves have a high risk of producing sediment at the site scale. Site-scale effects to sediment from landings depend on landing location, existing condition, and size/use. These effects could be of moderate duration and low to moderate intensity, depending on the volume of potentially unstable material and occurrence of stochastic weather-related events. However, only a limited number of new landings in hydrologic Riparian Reserves were considered appropriate by watershed professionals (landings #DZ03, DZ10, DZ23, L043, L044 and L090) and only if they were on stable/already-compacted landforms and slope positions, were in the outer zone of the hydrologic Riparian Reserves, or were separated from stream channels by existing, stable road segments. The use of the temporary road access and new landings will facilitate reforestation which will lead to accelerated recovery of forested conditions over the long term and thus does not prevent the attainment of the objective.

5th Field Watershed Analysis

The risk ratio for each 5th field watershed analyzed is summarized in Table 3-88. Beaver Creek is the only watershed that is over the threshold of concern with a risk ratio of 1.16 and 1.07 for USLE and mass wasting respectively. The elevated risk ratio is a result of the large amount of private land salvage in the Beaver fire area. Modified Alternative 3 drops all salvage harvest, temporary road actions, and landings in the Beaver Fire area therefore the project does not increase the risk ratio for either model for Beaver Creek. The remaining watersheds have a low risk of adverse effects to beneficial uses from sediment delivery to stream channels.

Table 3-88: Cumulative Watershed Effects model results for 5th field watersheds comparing conditions under the current post-fire conditions and Alternative 3 Modified proposed activities.

5th Field Watershed Name	USLE Risk Ratio Alternative 3 Modified	Mass wasting model Risk Ratio for Alternative 3 Modified
Humbug Creek-Klamath River	0.50	0.84
Beaver Creek	1.16	1.07
Horse Creek-Klamath River	0.81	0.87
Seiad Creek-Klamath River	0.70	0.83
Lower Scott River	0.47	0.57
Thompson Creek-Klamath River	0.30	0.49
Elk Creek	0.31	0.98
Ukonom Creek-Klamath River	0.19	0.56
South Fork Salmon River	0.26	0.40
North Fork Salmon River	0.32	0.72

There is an elevated risk of sediment delivery where temporary stream crossings will be placed in intermitted or perennial stream channels. There is one such crossing in the Thompson Creek watershed on a non-fish bearing intermittent tributary to China Creek, and crossings in the Seiad Creek-Klamath River watershed in the Kuntz, Lower Grider and Cliff Valley drainages. Stream reaches in the Seiad Creek-Klamath River watershed that would have temporary site level impacts related to sediment include a non-fish bearing perennial tributary to lower Grider Creek and a non-fish bearing intermittent tributary to Cliff Valley Creek.

The landslide likelihood is not affected by the project for any of the 5th field watersheds. There are ten 7th field watersheds that have enough planting in high and moderate vegetation severity burn areas to reduce the duration of elevated risk at the 7th field scale. In Seiad Creek 5th field watershed the Upper Grider Creek, Cliff Valley Creek, O'Neil Creek, Walker Creek, and Caroline Creek 7th field watersheds have a reduced duration of elevated risk. For the Lower Scott River 5th field the Middle Creek 7th field watershed has a reduced duration of elevated risk. Finally, Upper East Fork Elk Creek, Upper Elk Creek, and Lower East Fork Elk Creek 7th fields, in the Elk Creek 5th field watershed, have a reduced duration of elevated risk. There is a local reduction in landslide rate anywhere planting will occur even if there is not enough high and moderate severity areas treated to see a benefit at the 7th field watershed scale.

Thirty-three miles of Forest System roads will be storm-proofed and 148 legacy sites will be treated in the portion of the Elk Creek watershed in the project area. These treatments will reduce potential sediment delivery during storm events, and reduce chronic erosion from roads along approximately 14 miles of stream.

Objective 6

Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats, and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Range of Natural Variability

The hydrology report assesses the maintenance and restoration of instream flows by analyzing potential effects to base flow qualitatively. Historically, peak and base flows

have ranged from 100-year events such as the 1964 flood to extreme droughts where snow pack is less than 10% of normal (winter of 2014/2015). Spring-fed perennial streams have less variable base flows than snow-melt dependent streams. Large fires can increase stream flow peaks because of reduced precipitation interception, infiltration capacity (due to water-repellent soils), and ground surface roughness. These functions are provided by live vegetation and soil cover that reduce and slow overland flow and associated transport of sediment in unburned areas. Large fires can also produce temporarily increased base flow as utilization of water by vegetation through transpiration is reduced while burned areas re-vegetate.

Proposed Action Influence on Objective

Salvage harvest will remove only dead or dying trees which do not provide rainfall interception to the degree that live trees do. Mechanical activities in salvage units can decrease existing soil cover and increase soil compaction. However, potential increased peak flow related to timber salvage is indistinguishable beyond increases expected to result from the 2014 wildfires based on model results. Salvage harvest is not expected to affect base flow beyond influences of the 2014 wild fires.

There are no effects on peak flows anticipated from roadside hazard tree removal, hazardous fuels reduction, or site preparation and planting as these treatments will remove individual trees, and dead trees, rather than entire forested areas. With Modified Alternative 3 the length of temporary road proposed for project area 5th field watersheds is small and not expected to increase peak flows at the 5th field watershed scale (Table 3-88). Additionally, temporary roads are hydrologically stabilized and restored after use. The number of new landings being proposed is modest (less than 20) in all project 5th-field watersheds with the exception of Seiad Creek-Klamath River, Lower Scott River, Thompson Creek-Klamath River, and Elk Creek. However, potential increased peak flow related to new landing construction is not distinguishable from increases due to the 2014 wildfires based on ERA model results.

In-stream flows would only be affected at the site scale by project-related water drafting. Water drafting will be implemented according to NOAA specifications (when within Coho Salmon critical habitat) and Forest Best Management Practices (outside of critical habitat) that minimize potential impacts to flows and eliminate the likelihood that sites could be dewatered. Project design features also require that fisheries biologists are involved in where water drafting can occur so that potential impacts to critical thermal refugia habitat are avoided. No more than 10% of streamflow can be taken within NOAA specifications and no more than 20% (fish-bearing reaches) or 50% (non-fish-bearing) per Forest Best Management Practices. Water drafting will result in only slight temporary decreases in flow which will be undetectable both a short distance downstream and in the short term. Water drafting will not measurably affect base and peak flows at the 5th field watershed scale.

5th Field Watershed Analysis

The risk ratios for the ERA model used to determine peak flow changes using methods modified from Grant et al (2008) are summarized in Table 3-88. These numbers include the effects of Alternative 3 Modified and future foreseeable actions. The ERA risk ratio for this watershed is greater than 1.0 as a result of the 2014 wildfire and private land

salvage. Modified Alternative 3 drops all salvage harvest, temporary road actions, and landings in the Beaver Fire area therefore the project does not increase the risk ratio for either model for Beaver Creek. The ERA will be nearly recovered from the fire effects and the project effects in about 10 years. The other watersheds have risk ratios under 1.0 and have a low risk of adverse effects to beneficial uses.

The potential effects of water drafting were further minimized between draft EIS and final EIS by updating project design feature Watershed-34 with National Marine Fisheries Service Fisheries and Karuk Tribe specifically to avoid potential impacts drafting could have on salmonids that are dependent upon thermal refugia areas in summer and early fall. This project design feature specifies that certain areas (lower reaches of cold tributaries) across the project area and several specific creeks in the Happy Camp Fire area that have low base flows and are known to regularly support Coho salmon rearing are to be avoided during summer and fall water drafting (generally June through September). Creeks that will be avoided include Tom Martin Cr, O'Neil Cr, (Little) Horse Cr, and China Cr; aquatic species and habitat in these creeks would not be affected by Project water drafting. The increased protection of salmonid rearing habitat in these creeks, as well as flows in lower reaches of all cold tributaries reduces the chance that water drafting would have measurable negative impacts to fish that are relying upon thermal refugia. The project will not prevent the attainment of this objective.

Objective 7

Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows.

Due to the nature of Klamath Mountain physiography, most streams in the project area are steep, confined to relatively narrow valley bottoms, and thus lack sizeable floodplain landforms. Exceptions to this are floodplains along the Klamath River and along downstream portions of some of the larger streams such as Beaver Creek, Grider and Walker Creek.

Activities that could directly influence floodplain inundation are dam installation and removal, large water diversions, and modification of streams channels and floodplains by dredging, infilling, and channel relocation. None of these activities are being proposed in this project; the Westside Fire Recovery project, therefore, has no influence on this aspect of the objective at any scale. Water tables in meadows can be directly influenced by development of springs for domestic or agricultural use, dewatering the meadow via diversion, modification of meadow stream morphology, or disturbance to the surface of the meadow. However, project design features that identify the establishment of hydrologic Riparian Reserves (where no salvage harvest will occur) and guidelines for location and design of roads will prevent disturbance to meadows.

Beyond the direct influences to floodplain inundation discussed above, the disturbance of upland soils and vegetation such that rainfall-runoff relationships are altered and peak flows are increased could potentially influence this objective. Assessment of project effects to peak flow is discussed in detail for Objective 6 and is anticipated to be indistinguishable from increases due to the 2014 wildfires.

Objective 8

Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration, and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Range of Natural Variability

This analysis considers the expected response of conifer and hardwood trees in the hydrologic Riparian Reserves including species diversity and structural components.

Historically, the project area was rich in species and structural diversity. It was likely dominated by mixed conifer-hardwood forests at lower elevations which transitioned to primarily conifer dominated forests as elevation gradients increased. Stumps in the project area indicate that large trees were historically well distributed in and out of hydrologic Riparian Reserves throughout the project area. Timber harvest, tree planting, and fire exclusion have led to modifications in species composition and structural diversity. In order to facilitate timber production, past activities have likely caused a reduction in species diversity by contributing to the conversion of historically shrub- or hardwood-dominated vegetative assemblages to more conifer-oriented communities. Additionally, these past actions have created dense, stands that are of a more uniform age and composition.

Proposed Action Influence on Objective

Salvage would have no effect on species composition in the short or long term at the site or watershed scale because dead trees cannot produce offspring which are a necessary component for the maintenance and/or restoration of species composition. Since no salvage harvest is proposed in hydrologic Riparian Reserves, the effects of salvage activities on structural diversity would be negligible at the site and watershed scale at both short- and long-term timeframes. The effect of hazard tree removal on structural diversity will be minor on the site and watershed scale at both the long and short-term time frames. Hazardous fuels reduction will increase the long term health and resiliency of the hydrologic Riparian Reserves and upslope to disturbance by moving them towards more historic stocking levels. Reduction in stand density would reduce short- and long-term competition for resources (such as nutrients, water, and sunlight), generating a positive effect on species composition and structural diversity by increasing the growth and vigor of the remaining vegetation.

Site preparation and planting treatments would occur within hydrologic Riparian Reserves that have moderate to high vegetation mortality from the 2014 fires. Treatments include the hand removal of dead trees 10 inches in diameter or less in order to reduce fuel loads, achieve near-term ground cover (if fuel loading does not exceed desired condition), and assist in the reestablishment of riparian vegetation. Following hand treatments, planting will occur only where necessary to reestablish conifers as a component of hydrologic riparian reserves.

Conifer planting would consist of a diversity of species including Douglas-fir, sugar pine, ponderosa pine, incense cedar, white fir and red fire depending on microsite characteristics. Plantings will aim to replicate the natural spatial variability and heterogeneous species composition of nearby stands by using site quality, elevation, and

aspect to determine the best planting locations as well as the appropriate species and quantity to use. More specifically, trees will be planted in clusters in order to mimic natural stand composition, while seedling survival rate and competition from early seral species are expected to create a natural mosaic of species and stocking densities. Follow-up release treatments will facilitate the growth of planted and naturally regenerating conifers and hardwoods. Once planted seedlings both within and surrounding hydrologic Riparian Reserves mature and begin producing seed they would contribute to long-term species composition and structural diversity at the site and watershed scale through the natural recruitment process. This action will maintain and restore the objective at the site and watershed scale for the short and long term.

5th Field Watershed Analysis

The primary effect of diversity in hydrologic Riparian Reserves is the hand treatments and planting. There are no hydrologic Riparian Reserve treatments in the Humbug Creek, Ukonom Creek and South Fork Salmon River watershed. There are 93 acres of hand treatments in the Beaver Creek watershed. There is 205 acres of hand treatments in the Horse Creek watershed. There is 81 acres of hand treatments in the Seiad Creek watershed. There is 75 acres of hand treatments in the Lower Scott River watershed. There are 47 acres of hand treatments in the Thompson Creek. There is 122 acres of hand treatments in the Elk Creek. There are 19 acres of hand treatments in the North Fork Salmon River watershed.

Objective 9

Maintain and restore habitat to support well-distributed populations of native plant and invertebrate riparian dependent species.

Range of Natural Variability

This analysis will consider the effect of the types of vegetation in hydrologic Riparian Reserves and the risk of spreading and introducing non-native invasive species.

Native riparian-dependent communities were historically well distributed within riparian areas and likely consisted of a mix of willow, alder, dogwood, and maple that transitioned into late-successional conifer forests. Logging and mining operations have led to a modification of riparian vegetative communities. Non-native invasive species were not present in riparian areas prior to introduction by humans.

Proposed Action Influence on Objective

Salvage on the landscape surrounding hydrologic Riparian Reserves would have no short- or long-term effect on the distribution of native riparian vegetation at the site or watershed scale since these trees are dead. Disturbance associated with ground-based and skyline logging operations may increase the risk of spreading non-native invasive species in the short term at the site and watershed scale; however, project design features have been incorporated to reduce the risk and limit spread in the long term.

For Roadside hazard reduction, many non-native invasive species populations are located along roads and subsequently these treatments may increase the short-term risk of spreading non-native invasive species at the site and watershed scale; however, project design features have been incorporated to reduce the risk and limit spread in the long

term. Hazardous fuel treatments are not anticipated to have a high risk of spreading non-native invasive species; project design features intended to reduce the likelihood of spread will help further limit this risk at both the site and watershed scale. Ground disturbance associated with actions outside hydrologic Riparian Reserves may increase the risk of spreading non-native invasive species in the short term at the site and watershed scale; however, project design features have been incorporated in order to reduce the risk and limit spread of non-native invasive species.

Hand treatments in the hydrologic Riparian Reserves will increase ground cover and allow for maintenance underburning and planting if needed to re-establish conifers as a component of forests. Hand treatments are likely to help create microsite characteristics favorable for native, riparian-dependent species through the retention of moisture, and improvement of soil productivity and stability, subsequently promoting the long-term development of well-distributed, native, riparian communities. Increased ground cover may also provide a barrier to the establishment of non-native invasive species in the short and long term at the site scale. Increased availability of light and nutrients from hand treatments would promote the growth of planted seedlings and encourage the establishment of pioneering plant species further promoting the distribution of native, riparian plant communities at the site and watershed scale.

The movement of soil associated with temporary road actions and new landing construction has the potential to spread non-native invasive species. Weed-prevention project design features include the exclusion of equipment and vehicles from high priority and large non-native invasive species infestations, required washing of heavy equipment following off-road activities, specific management techniques for infested landings, and the required use of weed-free materials. Additionally, the continuation of the existing Forest weed monitoring and treatment program would detect any new high-priority weed sites that may become established within the project area. Quickly treating these sites will limit new NNIS establishment.

5th Field Watershed Analysis

The primary factor in the spread of non-native invasive species is the presence of populations in the areas where disturbance will happen. There are few populations in the Humbug Creek watershed and limited disturbance. There is 149 acres of non-native invasive species in the project area in the Beaver Creek watershed. There is 238 acres of non-native invasive species in the Horse Creek watershed. There is only 19 acres of non-native invasive species in the Seiad Creek watershed. There is 126 acres of non-native invasive species in the Lower Scott River watershed. There is 75 acres of non-native invasive species in the Thompson Creek watershed. There is 58 acres of non-native invasive species in the project area in the Elk Creek watershed. There is 14 acres of non-native invasive species in the project area in the Ukonom Creek watershed. There are only a small number of populations in the project area in the South Fork Salmon River along with limited ground disturbing activities. Finally, there are 197 acres of non-native invasive species in the project area in the North Fork Salmon River.

Comparison of Alternatives

The components of all alternatives (salvage, roadside hazard, hazardous fuels treatments, site preparation and planting) and connected actions (landing construction, reopening of decommissioned roads, use of temporary roads on existing roadbeds and the construction

of new temporary access roads) are similar. There is no salvage in hydrologic Riparian Reserve or inner gorges for any of the alternatives. There is salvage harvest in unstable lands, which are Riparian Reserves, but salvage harvest in these areas still excludes hydrologic Riparian Reserves and inner gorges. The summary of treatments on unstable lands is in the Geology Section of this Chapter. The project design features intended to minimize effects to water resources and Aquatic Conservation Strategy objectives are the same for all alternatives.

Hand treatment in hydrologic Riparian Reserve is proposed to increase soil cover and to allow for the regeneration of vegetation. Hand treatments in hydrologic Riparian Reserve will include hand-work only (no ground-based equipment) and lop-and-scatter or other fuels reduction will be implemented if fuel loading is above seven tons per acre; fuels may be hand-piled and burned or underburned. The hand treatments in hydrologic Riparian Reserve are slightly different between the alternatives. Alternative 2 includes hand treatments in hydrologic Riparian Reserve within site preparation units in the Whites and Happy Camp fire area only and no planting is included; Modified Alternative 2 includes this same treatment but only in upper 1/3 of slopes in salvage or site preparation units. Alternative 4 includes the same areas as with Alternative 2 but also includes for hand treatment Riparian Reserve within salvage harvest units, and Alternative 4 includes the Beaver Fire area for hand treatments. Modified Alternative 3 includes hand treatments in hydrologic Riparian Reserve in all three fire areas and planting is included where needed to re-establish conifers where they occurred as a natural component of forested stands. Alternatives 3 and 5 do not include hand treatments within Riparian Reserve.

Summary and Conclusion

Project design and specific project design features minimize the effects of the actions on the ACS objectives and are designed to ensure the project will not prevent the attainment of the objectives in the short or long term. The decrease in future risk of high-severity fire due to reduction of heavy fuels in project salvage units will help to maintain and restore watershed processes identified in the ACS objectives. The site preparation and planting will decrease the time needed to recover forests with large conifers, on the acres treated. Proposed fuels reduction treatments will build upon beneficial effects of the wildfires by further reducing small fuels accumulations and conducting maintenance underburns designed to mimic the natural role of fire in the Klamath Mountains. The treatment of legacy sediment sources constitutes a meaningful step in restoring the sediment regime in the Elk Creek 5th watershed over the long term.

For this analysis, watershed specialists considered the affected post-fire environment, proposed actions, and potential cumulative impacts associated with taking action at this time (as compared to not taking action). The analysis considered both short- and long-term potential effects to watershed resources (riparian and aquatic), and evaluated proposed actions at the watershed scale and the site level. We conclude that the activities proposed either maintain and restore the ACS Objectives or at the least do not prevent attainment of the Objectives (Forest Plan Standard and Guideline MA10-3 pg. 4-108).

Short-term Uses and Long-term Productivity

NEPA requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Short-term uses are those that occur within the first few years of project implementation. Long-term productivity refers to the capability of the land and resources to continue producing goods and services long after the project is complete. Harvesting or salvaging of standing trees can be considered a short-term use of a renewable resource. Trees can be reestablished and grow if the long-term productivity of the land is maintained. Long-term productivity is maintained through application of management requirements described in Chapter 2, in particular those applicable to soil and water resources.

The action alternatives (2, 3, 4, 5, 2 Modified, and 3 Modified) all would provide for the long-term productivity of the project area through removal of biomass and other fuel reduction actions creating a resilient forest where areas can recover from future fire effects naturally. Harvesting or salvaging standing trees will generate short-term economic returns through the sale of salvage timber, as well as providing for worker and public safety in the most critical areas within a short timeframe.

Unavoidable Adverse Effects

Implementation of any of the alternatives would result in some unavoidable adverse environmental effects. Although formation of the alternatives included avoidance of some effects, other adverse effects could occur that cannot be completely mitigated. The environmental consequences section for each resource area discusses these effects.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of a mined ore. No irreversible commitments of resources would result from implementation of any of the alternatives because no permanent, irreversible resource loss would occur.

Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line right-of-way or road. Irretrievable losses can be regained over time. Implementation of all action alternatives would not irretrievably commit resources, but help in the long-term recovery of the landscape.

Legal and Regulatory Compliance

The National Environmental Policy Act of 1969 (NEPA) requires that all major federal actions significantly affecting the human environment be analyzed to determine the magnitude and intensity of those impacts and that the results be shared with the public and the public given opportunity to comment. The regulations implementing NEPA

further require that to the fullest extent possible, agencies shall prepare EISs concurrently with and integrated with environmental analyses and related surveys and studies required by the Endangered Species Act of 1973, the National Historic Preservation Act of 1966, and other environmental review laws and executive orders. Other laws and regulations that apply to this project are described below

Clean Air Act

The Clean Air Act of 1970 provides for the protection and enhancement of the nation's air resources. No exceeding of the federal and state ambient air quality standards is expected to result from any of the alternatives. The Clean Air Act makes it the primary responsibility of States and local governments to prevent air pollution and control air pollution at its source. All alternatives are compliant with the Clean Air Act and the Conformity Rule. See the air quality section of Chapter 3 for details.

Clean Water Act

The Clean Water Act of 1948 (as amended in 1972 and 1987) establishes federal policy for the control of point and non-point pollution, and assigns the states the primary responsibility for control of water pollution. The Clean Water Act regulates the dredging and filling of freshwater and coastal wetlands. Section 404 (33 USC 1344) prohibits the discharge of dredged or fill material into waters (including wetlands) of the United States without first obtaining a permit from the U.S. Army Corps of Engineers. Wetlands are regulated in accordance with federal Non-Tidal Wetlands Regulations (Sections 401 and 404). No dredging or filling is part of this project and no permits are required.

Legacy sediment sites will be scheduled for treatment in compliance with the Clean Water Act as a condition of the North Coast Regional Water Quality Control Board waiver of waste discharge requirements (Order No. R1-2010-0029). Compliance of this project will be met through a waiver application and approval process with the board, following the decision. See the hydrology section of Chapter 3 for more information about the Clean Water Act.

Endangered Species Act

Section 7 (d) of the Endangered Species Act of 1973 requires that after initiation of consultation required under section 7(a)(2), a Federal agency "shall not make any irreversible or irretrievable commitment of resources with respect to the agency action which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative which would not violate subsection (a)(2)." The Forest Service is undergoing consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service for this project and will comply with the Endangered Species Act.

National Historic Preservation Act

The National Historic Preservation Act of 1966 as amended "requires federal agencies to take into account the effects of their undertakings on historic properties." This is accomplished through a four-step process following 36 CFR Part 800, the implementing regulations for Section 106 of the National Historic Preservation Act. The regulations allow alternative procedures for meeting Section 106 to be developed through programmatic agreements. The Pacific Southwest Region of the Forest Service (Region 5) which includes the Forest has entered into a programmatic agreement for complying

with Section 106. Additionally, the Forest is developing the Westside Fire Recovery Programmatic agreement to address project specific issues and concerns. The programmatic agreements allow limited project activities to occur within certain historic properties without adverse effects, as long as project-specific Standard Resource Protection Measures (SRPMs) are applied. The Westside Fire Recovery programmatic agreement, being developed in consultation with the California State Historic Preservation Officer, the Advisory Council on Historic Preservation, and local tribes, tiers to the Regional programmatic agreement and meets the requirements for compliance under Section 106 of the National Historic Preservation Act.

National Forest Management Act

The National Forest Management Act of 1976 amends the Forest and Rangeland Renewable Resources Planning Act of 1974 and sets forth the requirements for Land and Resource Management Plans for the National Forest System. Through consistency with the Forest Plan (as amended) this project is consistent with National Forest Management Act. A Forest Plan consistency checklist is available in the project record.

Executive Orders

The project will be consistent with all applicable executive orders.

Chapter 4 Consultation and Coordination

This Chapter includes a section for Preparers and Contributors followed by a section for Distribution of the EIS.

Preparers and Contributors

The Forest Service worked with the following individuals, federal, state and local agencies, organizations; and tribes during the development of this EIS.

Interdisciplinary Team

Mike Hupp
Team Leader

Education: Bachelor of Science in Forest Management, University of Missouri

Qualifications: Currently employed as a Senior Analyst and NEPA Specialist, North State Resources (NSR) and as an independent Registered Professional Forester in California. Prior to employment with NSR Mr. Hupp worked for the Forest Service in various positions in Oregon and northern California including ranger district staff officer, project team leader, forest planning team leader, forest staff officer for planning and administration and district ranger.

Andrew Skowlund
Team Co-Lead

Education: Graduated from University of Washington in 2009 with a Masters of Public Affairs and the University of Minnesota in 2001 with a Bachelor of Science in Natural Resources Management

Leslie Taylor
NEPA Planner and Writer/Editor

Education: Graduated from University of California, Davis in 2007 with a Bachelor of Science in Community and Regional Development with emphasis in Organizational Management and Community Groups

Qualifications: Contracted though Siskiyou County as a Natural Resource Specialist and GIS Specialist 2011-2014. Forestry Technician for the Forest Service from 2004 to 2011

Wendy Coats
Environmental Coordinator

Education: Graduated from Ohio University in 2001with a Master's of Science in Environmental and Plant Biology. Graduated from the University of Pennsylvania in 1999 with a Bachelors of Arts in Environmental Geography/Biology

Qualifications: Klamath Forest Environmental Coordinator 2010-2015, Klamath Forest NEPA planner since 2008-2010. I have led and served on interdisciplinary NEPA teams since 2004

Clint Isbell
Fuels Planner

Education: Graduated from the University of Idaho in 2005 with a Master's of Science in Fire Ecology. Graduated from California Polytechnic State University in 2004 with a Bachelor of Science in Natural Resources

Qualifications: 15 years' experience with the US Forest Service. Nine years as a Fire Ecologist and 6 years in Fire and Aviation Management

Brian Ebert
Fuels Planner

Education: Graduated from Humboldt State University in 2001 with a Bachelor of Science in Natural Resources Planning and Interpretation

Qualifications: 15 Years' experience with the US Forest Service serving in Fire and Aviation Management: Firefighter, District Assistant Fire Management Officer, District/Forest Fuels Officer, Fire Management Specialist. 2001 – 2015

Jeff Paulo
Silviculturist

Education: Graduated from Humboldt State University in 1976 with a Bachelor of Science-Forest Management

Qualifications: Forestry Technician, Prep Forester, Reforestation TSI Forester, and Silviculturist with the Modoc National Forest, Chequamegon National Forest, and Shasta-Trinity National Forest

Marissa Jones
Forester

Education: Graduated from Humboldt State University in 2006 with a Bachelor of Science in Forestry, Wildland Fire Management. Graduated from University of California, Los Angeles in 2000 with a Bachelor of Art in Psychology

Qualifications: Fuels Management Specialist 2007-2008; Fire Suppression Modules 2001-2005

Carl Varak
Silviculture

Trish Johnson
Wildlife Biologist

Education: Graduated from Humboldt State University with a Bachelor of Science in wildlife management

Qualifications: Wildlife Biologist for the US Forest Service for 22 years.

Chad Bell
Forest Wildlife Biologist

Education: Graduated from Humboldt State University in 2011, with a Master of Science in Wildlife Biology. Graduated from the University of Montana in 2008, with a Bachelor of Science in Wildlife Biology

Qualifications: US Fish and Wildlife Service Wildlife Refuge Manager Papahanaumokuakea Marine National Monument Hawaii from October 2012 to May 2013; US Forest Service, District Wildlife Biologist, Coronado National Forest, Arizona from May 2012 to September 2012

Bryan Yost
Wildlife Biologist

Bobbie Miller
Watershed Coordinator

Education: Graduated from the University of Idaho in 2002 with a Master's of Science in in Biology. Graduated from the University of Illinois Champaign-Urbana in 1998 with a Bachelor of Science in Animal Science

Qualifications: Served as fisheries biologist for Klamath National Forest and National Marine Fisheries Service 2003-2007; environmental coordinator for Shasta-Trinity National Forest 2007-2012

Alice Berg
Fisheries Biologist

Jason Coats
Archeologist

Jeanne Goetz
Archeologist

Education: Graduated from California State University, Chico in 2005 with a Masters in Anthropology, Archaeology Emphasis. Graduated from University of Minnesota, Minneapolis in 1983, with a Bachelor of Individualized Studies.

Qualifications: Forest Heritage Program Manager and Tribal Liaison 2012-2015. Served as Goosenest District Archaeologist, Klamath National Forest from 2002-2012.

Angie Bell
Forest Geologist

Education: Graduated from University of Montana in 2008, with a Master of Science in Geology. Graduated from Edinboro University of Pennsylvania in 2006, with a Bachelor of Science in Geology

Nikos Hunner
Soils Scientist

Educational Background: Graduated from California State University, Cal Poly San Luis Obispo in 2004 with a Bachelor of Science in Soil Science

Qualifications: Soils Scientist, SECOR International, Staff Scientist 2004 to 2006

Joe Blanchard
Soils Scientist

Zach Mondry
Hydrologist

Greg Laurie
Hydrologist

Education: Bachelor of Science in Physical Science-Hydrology, Masters of Science in Watershed Science

Qualifications: U.S. Forest Service Hydrologist for 25 years

Gregg Bousfield
CWE Modelling and Hydrology Input

Education: Graduated from California State University, Humboldt in 2004 with a Bachelor of Science in Forestry; Graduated from California State University, Humboldt in 2008, with a Master of Science in Watershed Management.

Qualifications: Served as a seasonal Hydrologic Technician from 2005-2007 for the Lassen National Forest, Supervisors and Almanor Ranger District Offices; Served as a Hydrologist from 2007-2015 for the Klamath National Forest, Supervisors and Happy Camp Oak Knoll Ranger District Offices

Erin Lonergan
Botanist

Education: Graduated from Humboldt State University in 2009 with a Bachelor of Science in Botany. Graduated from Montana State University, Bozeman in 2012, with a Master's of Science in Plant Science

Qualifications: Botanist with the Forest Service from 2014 to Present, Research Associate at Montana State University 2013-2014, Research Assistant at Montana State University 2011-2012, Plant Disease Diagnostician at Montana State University in 2012

Bob Talley
Scenery, Recreation, and Wild and Scenic Rivers

Education: Graduated from Virginia Polytechnic Institute and State University, Blacksburg in 1979 with a Bachelor of Landscape Architecture

Qualifications: Served as a Landscape Architect from 1988-2013 for the Klamath National Forest

Marla Knight
Botanist

Lori Jackson
Engineering

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Range Specialist

Education: Graduated from Oregon State University with a Bachelor of Science in Animal Science and Rangeland Ecology

Qualifications: Rangeland Specialist with the Klamath National Forest.

Nick Dennis
Economics

Education: Ph.D. Wildland Resource Science, University of California, Berkeley. M.S. in Forest Science from the University of Wisconsin, Madison. Bachelor of Science in Forest Science, University of Wisconsin, Madison.
Qualifications: Socioeconomic analyst and forester, ICF International, Mt. Shasta, CA, 2008 - present; Professional forester, The Hearst Corporation, McCloud, CA, 2000-2008; Socioeconomic

analyst and forester, Jones & Stokes Associates, Sacramento, CA, 1987- 2000; Forest economist, The John Muir Institute, Berkeley, CA, 1981-1986

Peg Boland
Social Economics, Inventoried Roadless Areas, Climate Change, Writer/Editor

Education: Graduated from the University of Michigan in 1959 with a Bachelor of Arts in Sociology and in 1963 with a Masters of Arts in Sociology.

Qualifications: Assistant Professor of Sociology, Mars Hill College in North Carolina from 1973-1980; Served as Sociologist on development of two Land Management Plans and multiple NEPA documents for the National Forests in North Carolina from 1981-1989; Served in the national headquarters of the Forest Service as drafter of appeal decisions on land management plans in California from 1989-1992; Served in the national headquarters of the Forest Service as land management planner from 1992-1995; and reviewed and signed NEPA documents from 1995-1999 for the Los Padres National Forest and from 1999-2007 for the Klamath National Forest.

Melanie Hans
GIS Specialist

Education: Graduated from Southern Illinois University in Carbondale, Illinois with a Bachelor of Science in Zoology.

Qualifications: GIS Coordinator, Klamath National Forest, Wildlife Biologist/GIS Specialist for the Koyukuk/Nowitna National Wildlife Refuge Complex in Galena, Alaska from 2002-2011.

Sher Marantos
GIS Specialist

Debra-Ann Brabazon
Public Affairs

Education: Graduated from Columbia Southern University with a Bachelor of Fire Science Administration. Graduated from Point Park College in 1987, with a Bachelor of Arts in Journalism and Mass Communications

Qualifications: Worked in the print and broadcast publication field from 1985 through 1997, Wildland Firefighter for the Commonwealth of Pennsylvania from 1997 through 2005. Dispatch Center Manager on the Huron-Manistee NF in Region 9 since 2005.I detailed on the Shasta Trinity NF in 2013 as the Dispatch Center Manager and in 2014 as the Public Affairs Specialist. Continue to work in Public Affairs in the Private and Public sector as a freelancer and a detailed specialist.

Josh Veal
Public Affairs

Education: Graduated from Hiwassee College, Madisonville, TN Associate of Science

Qualifications: Currently serve as the Prevention Battalion Chief on the Goosenest Ranger District, background in fire prevention and public affairs. Also serve as a Public Information Officer on wildfire incidents.

Ben Haupt
Vegetation Program Manager

Education: Graduated from Humboldt State University, in 2004 with a Bachelor of Science in Forestry

Qualifications: Served as a Timber Management Officer from 2009-2014 for the US Forest Service, Klamath National Forest and a Forester from 2004-2009 for the US Forest Service, Mendocino National Forest

Travis Coughlin
Logging Systems

Heather Mobley
NEPA Writer/Editor and NEPA Planner

Elizabeth Nielsen
NEPA Writer/Editor and NEPA Planners

Education: Graduated from California State University, Chico in 2010 with a Bachelor of Science in Agricultural Business

Qualifications: NEPA Planner, Klamath National Forest, January 2015-Present, Served as a Water and Lands Specialist from 2010-2012 and a Natural Resources Specialist from 2012-2015 for the Bureau of Reclamation, Klamath Basin Area Office.

Dan Blessing
Consultation and Review

Education: Graduated from University of California, Santa Barbara with a Bachelor of Arts degree in Environmental Biology.

Qualifications: Serves as the Natural Resource Officer for the Klamath National Forest, Supervisors Office. Served as a Forest Vegetation Program Manager from 2005-2010 and Silviculturist on the Goosenest Ranger District from 2003-2005.

Federal, State, and Local Agencies:

Council on Environmental Quality

Environmental Protection Agency

United States Fish and Wildlife Service

National Oceanic and Atmospheric Administration, National Marine Fisheries Service

California State Historic Preservation Office

North Coast Regional Water Quality Control Board of California

Siskiyou County

Advisory Council on Historic Preservation

Tribes:

Klamath Tribes

Quartz Valley Indian Reservation

Shasta Nation, Inc.

Confederated Tribes of Grand Ronde

Confederated Tribes of Siletz Indians

Karuk Tribe

Pit River Tribe

Shasta Indian Nation

Additional Organizations and Individuals:

Citizens Advisory Committee

National Institute for the Elimination of Catastrophic Wildfire

Distribution of the EIS

Federal, State and Local Agencies

Federal Agencies

Advisory Council on Historic Preservation, Director, Planning and Review

Army Corp of Engineers

Environmental Protection Agency, Region 9

Federal Aviation Administration

Federal Highway Administration

National Marine Fisheries Service

USDA Natural Resources Conservation Service

US Coast Guard, Energy, Director, Office of NEPA Policy and Compliance

United States Department of the Interior, Bureau of Land Management

State Agencies

California Department of Fish and Wildlife

California Department of Transportation

California Water Resources Control Board

State Clearing House (California)

Elected Officials

Federal:

US Representative Doug LaMalfa

Senator Barbara Boxer

Senator Diane Feinstein

Siskiyou County Board of Supervisors:

Brandon Criss – District 1

Ed Valenzuela – District 2

Michael N. Kobseff – District 3

Grace Bennett – District 4

Ray A. Haupt – District 5

Organizations:

Fire Safe Councils (all of Siskiyou County)

Siskiyou County Department of Agriculture

Happy Camp Fire Protection District

Sierra Pacific Industries

American Forest Resource Council

Siskiyou County Planning Department

Klamath Siskiyou County Wildlands Center

Timber Products Company

American Forest Resource Council

Klamath Siskiyou Wildland Center

Klamath Forest Alliance

Environmental Protection Information Center

Backcountry Horsemen

Butte Valley Chamber of Commerce

Center for Biological Diversity

California Forest Association

California Wilderness Coalition

Earth Justice Legal Defense Fund

Fort Jones Fire Department Chief

French Creek Fire Safe Council

John Muir Project

Native Plant Society of Oregon

Natural Resources Defense Council

Natural Resources Management Corp

Northcoast Environmental Center

Tribes:

Klamath Tribes

Quartz Valley Indian Reservation

Shasta Tribe Inc.

Confederated Tribes of Grand Ronde

Confederated Tribes of Siletz Indians

Karuk Tribe

Pit River Tribe

Shasta Indian Nation

Yurok Tribe

Individuals

Thousands of emails were sent to individuals alerting them to the distribution of the Draft and Final EIS'. For a complete list of these individuals, please refer to the Project Record.

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Glossary

Activity Centers (ACs) (Northern Spotted Owl)	The area that includes the Northern Spotted Owl home range and core area.
Anadromous Fish	The species of fish, commonly salmon and steelhead, born in fresh water, migrate to the ocean to mature, and return to fresh water to lay eggs (spawn).
Home Range (Northern Spotted Owl)	An area defined by a 1.3-mile radius around a NSO activity center within which owls forage, nest, and roost.
Core Area (Northern Spotted Owl)	An area defined by a 0.5-mile radius around a NSO activity center that owls use most often, especially during the nesting season.
Aquatic Conservation Strategy (ACS)	A strategy developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands.
Aquatic Hydrologic Reserves	Refer to Hydrologic Riparian Reserves.
Area of Potential Effects (APE)	The area within which project activities are expected to occur that may affect historic properties.
Basal Area	The area of a section of land that is occupied by the cross-section of tree trunks and stems at their base.
Best Management Practices (BMPs)	A codified series of about 100 practices for protecting water quality when conducting forest management activities. BMPs are referenced in R5 FSH 2509.22, Soil and Water Conservation Handbook; Chapter 10, Water Quality Management Handbook.
Best Management Practices Evaluation Program (BMPEP)	A program for monitoring and evaluating the implementation and effectiveness of application of BMPs.
Broadcast Burning	Prescribed burning of the understory of an area.
Burned Area Emergency Response (BAER)	A Forest Service activity of immediate post-wildfire response to assess and reduce the risk of loss of human life, property damage, and adverse effects to critical natural and cultural resources from threats caused by the fire.
Burned Area Reflectance Classification (BARC)	A model using pre- and post- fire satellite imagery to derive a preliminary classification using of landscape change as a result of a wildfire that, after field verification, will become soil burn severity.
Clear-cut Logging (clearcutting)	An even-aged management silvicultural system applied to green forest stands for the purpose of regenerating a new age class. Trees are selected and removed in groups up to 40 acres in size followed by artificial or natural regeneration.
Coarse Woody Debris (CWD)	Woody material at least 20-inches in diameter from whatever source that is dead and lying on the forest floor. Term used for terrestrial species habitat.
Code of Federal Regulations (CFRs)	A codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government.

Connected Actions	Actions that: (i) automatically trigger other actions which may require environmental impact statements; (ii) cannot or will not proceed unless other actions are taken previously or simultaneously; or, (iii) are interdependent parts of a larger action and depend on the larger action for their justification (40 CFR 1508.25).
Connectivity	The degree to which the landscape facilitates animal movement and other ecological flows. The linkage of similar but separated vegetation stands by patches, corridors, or “stepping stones” of like vegetation. This term can also refer to the degree to which similar habitats are linked.
Critical Habitat	Areas designated for the survival and recovery of federally listed threatened or endangered species.
Cumulative Effects	Those effects resulting from incremental effects of actions, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions.
Cumulative Watershed Effects (CWE)	A model for Cumulative Watershed Effects with three components: Equivalent Roaded Acres (ERA), sediment delivery from surface erosion (Universal Soil Loss Equation or USLE), and sediment delivery from mass wasting (GEO). The model quantifies disturbances and land sensitivity at the watershed scale (usually the 7th field watershed scale but also at larger scales). The estimated results fall on a continuum. As disturbances increase over time and space, at some point the risk of initiating or contributing to existing adverse cumulative watershed impacts becomes a cause for concern. Concern thresholds have been identified for each component based on field observations in the KNF. The CWE models may measure the additive direct and indirect effects of various activities within an alternative but may also be used to add the effects of alternative actions for a project to the effects of reasonably foreseeable future actions.
Decommissioned Road	Road that has been administratively removed from the National Forest Transportation System. Many such roads have undergone activities that result in the stabilization and restoration of unneeded roads or trails to a more natural state (FSM 7703.2(1)).
Danger Tree	Refer to Hazard Tree.
Degrade (Habitat)	The habitat characteristics will be affected but it will still function as the pre-treatment habitat.
Diameter at Breast Height (DBH)	The diameter of a tree trunk 4.5 feet above the ground.
Direct Effects	Those effects occurring at the same time and place as the initial cause or action.
Dispersal Habitat	Northern Spotted Owl habitat that where there is a moderate level of canopy closure (compared to nesting/roosting) and trees large enough to provide shelter and potential foraging opportunities for traveling NSO.
Downed Large Wood	Refer to Large Woody Debris.
Downgrade (Habitat)	Habitat prior to treatment will no longer function as that type of habitat but will function as a lower quality habitat.

Draft Environmental Impact Statement (DEIS)	A detailed written statement as required by section 102(2) (C) of the NEPA (40 CFR 1508.11) that is released to governmental agencies and the general public for review and comment.
Egress	A route that provides a way out of an area.
Endangered Species	Those plant or animal species that are in danger of extinction throughout all or a significant portion of their range. Endangered species are identified by the Secretary of the Interior in accordance with the Endangered Species Act of 1973.
Environmental Justice	The state (or condition) which all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by government programs and activities affecting human health or the environment.
Equivalent Roaded Acres (ERA)	Refer to Cumulative Watershed Effects.
Erosion Hazard Rating (EHR)	A rating system used to classify the relative vulnerability of soil to erosion.
Fire Affected Nesting/Roosting Habitat	Nesting/Roosting habitat that burned at moderate severity.
Fire Behavior	The variable characteristics of an active flaming front.
Fire Hazard	A fuel complex, defined by volume, type condition, arrangement, and location, that determines the degree of ease of ignition and of resistance to control.
Fire Perimeter	The entire outer edge or boundary of a fire.
Fire Regime	The combination of fire frequency, predictability, intensity, seasonality, and distinctive characteristics of fire in an ecosystem. Agee (1993) defines three broad categories of fire severity “based on the physical characters of fire and the fire adaptations of vegetation:” Low Severity Fire Regime: Effect of typical fire is benign. Fires are frequent (often < 20 years), of low intensity, and the ecosystems have dominant vegetation well adapted to survive fire. Mixed Severity Fire Regime: Fires are of intermediate frequency (25-100 years), range from low to high intensity, and have vegetation with a wide range of adaptation. High Severity Fire Regime: Fires are usually infrequent (often >100 years) but may be of high intensity, most vegetation is at least top-killed.
Fire Return Interval	Number of years between two successive fires in a specified area.
Fire Severity	The level of effects of fire on the post burn landscape. In most cases when the term fire behavior is used to indicate fire severity, it adds the qualifier “problem fire behavior”.
Fireline	A corridor, which has been cleared of organic material to expose mineral soil. Firelines may be constructed by hand or by mechanical equipment (e.g., dozers).

Fish-Bearing Streams	Fish-bearing streams are distinguished from intermittent streams by the presence of any species of fish for any duration. Many intermittent streams may be used as spawning and rearing streams, refuge areas during flood events in larger rivers and streams, or travel routes for fish emigrating from lakes.
Flame Length	The length of flame measured in feet. Increased flame lengths increase resistance to control and likelihood of torching events and crown fires.
Foraging Habitat (F)	Northern Spotted Owl habitat where the canopy cover is slightly less than Nesting/Roosting habitat with fewer large trees but still enough space in the understory for Northern Spotted Owl to maneuver through the trees for hunting prey.
Fuel Management Zones	A system of linear or mosaic patch treatments of forest or shrub vegetation designed and treated to reduce fire spread, intensity, and create barriers to fire spread.
Geologic Riparian Reserves	Refer to Unstable Lands.
Green Hazard Trees (Not Fire-damaged)	Trees that have not been fire-damaged and that meet the definition of a hazard tree. For the purposes of this project, these green trees will not be cut and removed by roadside hazard treatments unless they are an immediate hazard (unless they have a high hazard potential).
Green Trees that are Fire-damaged	For the purposes of salvage harvest, green trees are those that have 30 percent or greater chance of survival for 3-5 years. In salvage harvest units, trees with greater than 70 percent or greater probability of mortality in 3-5 years would be considered a dead or dying tree and could be harvested where appropriate. In roadside hazard units, green trees are those that have 40 percent or greater chance of survival for 3-5 years. In roadside hazard units trees that have a 60 percent or greater chance of mortality in 3-5 years would be considered a dead or dying tree and could be harvested as appropriate. Criteria for evaluating probability of mortality come from “Marking Guidelines for Fire-Injured Trees in California” (Smith and Cluck, 2011).
Ground Cover	Natural organic and inorganic material that covers the watershed ground surface in sufficient quantity to allow a satisfactory rate of water infiltration to replenish ground water and limit erosion to natural rates. Ground cover usually consists of perennial vegetation, forest floor litter and duff, rock, downed wood, or similar erosion resistant material.
Grubbing	The removing all vegetation within a minimum of a five foot radius from planted or natural regenerated seedlings.
Habitat Connectivity	Refer to Connectivity.
Hand Piling	The piling of limbs and branches by hand for burning at a later time.
Hazard Tree	A standing tree that presents a hazard to people due to conditions such as deterioration of or damage to the root system, trunk, stem, or limbs or the direction or lean of the tree (29 CFR 1910.266(c); FSH 6709.11, glossary). Synonymous with danger tree for purposes of this project.

High Hazard Potential	Hazard tree rating is defined in the Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (Report #RO-12-01). The hazard potential is determined by the probability of the tree falling or part of the tree falling and the potential effect of the tree falling. A high hazard potential requires prompt removal of the tree or part of the tree (mitigation).
High-priority danger tree hazard	A road or road segments where danger trees are determined to be highly likely to fail and where those failures would be highly likely to cause injuries (FSH7709.59 Section 40.5).
Hydrologic Riparian Reserves	Riparian Reserves associated with intermittent stream channels, perennial stream channels, wetlands or springs.
Hydrologic Stabilization	Activities that ensure that roads and trails will not contribute negative effects to water sources. Methods for hydrologic stabilization include water-barring, removing culverts, covering and seeding as stated in Best Management Practices.
Indirect Effects	Those effects occurring later in time or that are spatially removed from the activity.
Ingress	A route that allows access into an area.
Inner Gorges	Slopes greater than 65% which occur along rivers and streams.
Intermittent Stream	Any non-permanent flowing drainage feature having (1) a definable channel and (2) evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two physical criteria. Some intermittent streams flow after July 1 and are termed “late-flowing” intermittent streams.
Inventoried Roadless Area	Areas identified in a set of inventoried roadless area maps, contained in Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000, which are held at the National headquarters office of the Forest Service, or any subsequent update or revision of those maps.
Irretrievable	A term that applies to the loss of production, harvest, or use of natural resources. For example, some or all of the timber production from an area is lost irretrievably while an area is serving as a winter sports site. The production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume timber production.
Irreversible	A term that describes the loss of future options. Applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity that are renewable only over long periods of time
Issue	Point of discussion, debate, or dispute about the environmental effects of the proposed action.
Landslide Risk	The intersection of the likelihood of a landslide event and the consequences of a landslide event. The analysis is on the 7th field watershed scale.
Large Woody Debris	Woody material, at least 24” in diameter and 50 feet long, that is dead and lying on the forest floor. Term used for aquatic habitat.

Late Successional Reserve (LSR)	Large blocks of habitat that are distributed across the range of the northern spotted owl and spaced closely enough to facilitate dispersal of owls. Late successional reserves are managed to provide habitat for late successional and “old growth” species.
Limited Operating Periods (LOPs)	Specified dates that restrict management activities (1) near known wildlife nesting sites or un-surveyed suitable nesting habitat during the breeding season; or (2) restrict equipment use during periods of wet weather to minimize or avoid sedimentation into streams (also known as periods when wet weather operating standards (WWOS) will apply).
Maintenance Level	Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria.
Maintenance Level 1 Road	Roads that have been placed in storage between intermittent uses. A Maintenance Level 1 road is closed to vehicular traffic but may be available and suitable for non-motorized uses.
Maintenance Level 2 Road	Roads open for use by high clearance vehicles. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Passenger cars are discouraged or prohibited.
Maintenance Level 3 Road	Roads open and maintained for travel by a prudent driver in a standard passenger car. Roads in this maintenance level are typically low speed with single lanes and turnouts.
Maintenance Level 4 Road	Roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most level 4 roads are double lane and aggregate surfaced, but may single lane, paved and/or dust abated.
Maintenance Level 5 Road	Roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated.
Management Area (MA)	A distinct geographical area with specified objectives and prescriptions.
Moderate Hazard Potential	Hazard tree rating is defined in the Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (Report #RO-12-01). The hazard potential is determined by the probability of the tree falling or part of the tree falling and the potential effect of the tree falling. A moderate hazard potential requires the documentation and tag and map the tree (monitor) or the removal of the hazard tree (mitigate).
Monitoring	Process of collecting information to evaluate if objective and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.
National Environmental Policy Act (NEPA)	Codifies the national policy of encouraging harmony between humans and the environment by promoting efforts to prevent or eliminate damage to the environment, thereby enriching our understanding of ecological systems and natural resources. It declares the federal government to be responsible for: (a) coordinating programs and plans regarding environmental protection; (b) using an interdisciplinary approach to decision-making; (c) developing methods to ensure that non-quantifiable amenity values are included economic analyses; and (d) including in every recommendation, report on proposals for legislation, or other major federal actions significantly affecting the quality of the environment a detailed environmental impact statement (EIS).

National Forest Management Act (NFMA)	An amendment to the Resource Planning Act providing direction for the development of land and resource management plans for each national forest.
National Forest System Land	Consists of units of federally owned forest, range and related lands united into a nationally significant system dedicated to the long-term benefit for present and future generations. The NFS includes all national forest lands acquired through purchase, exchange, donation or other means; the national grasslands; and other lands, waters or interests which are administered by the Forest Service.
National Forest Transportation System (NFTS)	The system of National Forest System roads, National Forest System trails, and airfields on National Forest System lands (36 CFR 212).
Naturally Occurring Asbestos	Natural geologic occurrence of various types of asbestos minerals that pose a potential health risk if released into the air through ground-disturbing activities.
Nesting/Roosting Habitat (NR or N/F)	Northern Spotted Owl habitat that is in mid- to late-seral forests that contain stands of large trees with high canopy cover (≥60%), multilayered canopies, and nesting platforms.
Non-native Invasive Species	Any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment.
Noxious Weed	See Non-native Invasive Species.
One-hour Fuels	Fine flashy fuels, dried herbaceous plants or round wood less than 1/4" diameter. Also includes the uppermost layer of litter on the forest floor.
One-hundred-hour Fuels	1" to 3" diameter sticks and brush.
Outstanding Remarkable Value	A river-related value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale.
Perennial Stream	A stream which normally flows throughout the year.
Plantation	A group of trees that have been planted together.
Post-fire Foraging Habitat (PFF)	Foraging habitat that burned at moderate and high vegetation severity or nesting/roosting that burned at high severity.
Prescribed Fire or Prescribed Burning	A type of fuel treatment whereby fire is intentionally set in wildland fuels under prescribed conditions and circumstances.
Primary Constituent Elements (PCE)	The physical and biological features that provide the essential life history requirements of the species.
Project Design Features (PDF)	Mitigations developed and incorporated into the alternatives considered in detail to minimize or eliminate negative effects of the project, and protect and promote late successional habitat, consistent with the Forest Plan.

Rapid Assessment of Vegetation Conditions (RAVG) after wildfire	The product is generated for National Forest Service lands (including wilderness) to provide information that can assist post-fire vegetation management planning designed to address a number of management objectives. The product provided to the Forest are Map and GIS products showing location of basal area loss within fire perimeter. Summary table of vegetation affected by the fire, separated into four classes of basal area loss. Refer to Vegetation Burn Severity for description of categories of severity.
Reforested/Reforestation	The natural or artificial restocking of an area with trees.
Regeneration	The act of renewing tree cover by establishing young trees naturally or artificially-generally, promptly after the previous stand or forest has been removed.
Release	Release treatments include manually removing competing plants or water uptake from competing plant roots by “grubbing” around conifer seedlings or natural hardwood seedlings.
Removal of Trees and Fuels	For salvage, this is the act of removing trees, which includes yarding of the tree, intermediate decking of logs and the eventual hauling of the logs off site. For fuel loading, removal could also include prescribed burning of the material.
Removal of Habitat	Habitat prior to treatment is lost and will no longer function as habitat (for Northern Spotted Owl and other species) after treatment.
Resistance to Control	The relative difficulty of constructing and holding a control line as affected by resistance to line construction and fire behavior; also called “difficulty of control.”
Riparian Reserves (Unstable Lands (Geologic) and Hydrologic)	A land allocation in the Forest Plan that includes an aquatic ecosystem and the adjacent upland areas directly affecting it. It also includes unstable and potentially unstable lands that are not associated with aquatic areas. Specific standards and guidelines provide direction for these areas as outlined in Management Area 10 of the Forest Plan. For the purposes of this project, a hydrologic Riparian Reserve includes areas associated with bodies of water (primarily streams) and inner gorges that may be associated with streams, and geologic Riparian Reserves are associated with factors such as unstable lands but do not include inner gorges.
Risk Ratios (For Cumulative Watershed Effects Models)	The amount of the disturbance in the watershed relative to the hydrologic or sediment inference point.
Roadless Area	Refer to Inventoried Roadless Areas.
Salvage Harvest (salvage logging)	The removal of dead trees after a natural event (for example, after a wildfire) to remove hazards to public safety, capture the economic value of burned trees, and/or remove excessive fuel accumulation. Dead trees (or snags) exceeding those needed by other resources (e.g. for wildlife habitat) are removed. Although some salvage harvested areas may appear similar to clearcuts, the different is that salvage trees are dead and their size and location were determined by the natural event. Salvage harvest is also a fuels reduction activity that will over time, help protect the remaining adjacent late-successional habitat and promote the late-successional character by accelerating the regeneration to a forested stand that will eventually regain late-successional characteristics.

Scenic Character	The aggregate of features and traits that form the individual scenic nature of an area.
Second Entry Burns	Prescribed fire that will occur after an initial fuels reduction treatment.
Sensitive Species	Plant or animal species which are susceptible to habitat changes or impacts from management activities. The official designation is made by the USDA Forest Service at the regional level and is not part of the designation of threatened or endangered species made by the U.S. Fish And Wildlife Service.
Site Preparation	The removal or reduction of competing vegetation or logging debris, to prepare the area for planting and to promote the growth and survival of desired tree species.
Snag	A standing dead or dying tree that has lost most of its branches, or the standing portion of a broken-off tree. Snags provide cavities for nesting, perches, and feeding sites for wildlife.
Snag Retention	Areas where snags will be left on site and standing where they do not pose a hazard to implementers.
Soil Burn Severity	The effect of a fire on ground surface characteristics, described in terms of char depth, organic matter loss, altered color and structure of soil, and reduced infiltration. Soil burn severity is measured in high, moderate and low classes based upon the degree of effects.
Soil Organic Matter	The amount of organic matter within the mineral soil, indicated by the color and thickness of the upper soil horizon, is within the normal range of characteristics for the site, and is distributed normally across the area. The upper soil horizon is not displaced or eroded to the degree or extent that soil productivity is decreased for the desired vegetation.
Soil Stability	An adequate level of soil cover is maintained to prevent accelerated erosion, and erosion prevention measures are effectively implemented following soil disturbing activities. Effective soil cover includes organic surface materials, living vegetation less than 3 feet tall (grasses, forbs and low growing shrubs), surface rock fragments larger than ¾ inch, or where needed applied mulches.
Soil Structure	State of having pores or holes in the soil that hold air or water; permeability
Stand	A group of trees that occupies a specific area and is similar in species, age and condition.
Standard and Guideline	A principle requiring a specific level of attainment, a rule to measure against.
Subsoiling	Mechanical lifting and shattering of the layer of soil beneath the topsoil in order to reduce soil density and strength, improve moisture infiltration and retention, and increase root penetration in the soil.
Suitable Lands	Land where the harvest activities could occur without causing irreversible damage to soil or watershed.

Surface Organic Matter	The amount of organic material on top of the mineral soil is maintained at levels to sustain soil microorganisms and provide for nutrient cycling. Organic materials may range in size from amorphous and fine organic matter that makes up the O horizon, needles and twigs, to coarser materials such as branches and logs.
Temporary Roads	Roads authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be a part of the forest transportation system and not necessary for long-term resource management (36 CFR 212.1).
Ten-hour Fuels	Needle cast and small dead/downed material primarily fuels < 1" diameter.
Understory Vegetation	Vegetation (trees or shrubs) growing under the canopy formed by taller trees.
Underburning	Prescribed burning of the understory.
Universal Soil Loss Equation (USLE)	Refer to Cumulative Watershed Effects.
Unstable Lands	Riparian Reserves associated with active landslides (including earth flows), inner gorges, toe zones of dormant landslides, or steep-weathered granitic lands.
Unsuitable Lands	Forest land withdrawn from timber utilization by statute or administrative regulation or identified as not appropriate for timber production in the forest planning process, i.e., irreversible soils damage and non-reforestable in five years.
Vegetation Burn Severity	Most trees within high severity burn areas are expected to die in the three to five years. Areas characterized by moderate-severity burns experienced 50 to 75 percent vegetation mortality, substantial reduction in canopy, understory cover, duff layers and large woody debris. Areas characterized by low or very low severity burns experienced zero to 50 percent vegetation mortality and a reduction in fuel loading. Refer to Rapid Assessment of Vegetation Conditions (RAVG) for process.
Vegetation Burn Severity	The effect of a fire on vegetation, often described by the degree of scorch, consumption, and mortality of vegetation. Vegetation burn severity is measured by classes of canopy mortality or basal area loss.
Viewshed	A total landscape seen or potentially seen from specific points on a logical part of a travel route or water body.
Watershed:	The entire land area that drains to a specific point. 5th field watershed: A watershed that is usually more than 40,000 acres in size. 6th field watershed: A watershed that ranges from about 10,000 to 40,000 acres in size. 7th field watershed: A watershed or drainage that ranges from about 2,500 to 10,000 acres in size.
Wild and Scenic River	A river that is either already designated or proposed for designation because of its free flowing condition and outstanding remarkable values.

Wildland Urban Interface (WUI) Commonly referred to as the WUI (woo-ee). This is an area, or zone, where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. It generally extends out for 1.5 miles from the edge of developed private land into the wildland.

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United States
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Forest
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R5-MB-287

July 2015

Final Environmental Impact Statement

Westside Fire Recovery Project
Volume II – Appendices A and B

Happy Camp Oak Knoll and Salmon/Scott River Ranger Districts,
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Westside Fire Recovery Project

Klamath National Forest

Volume II

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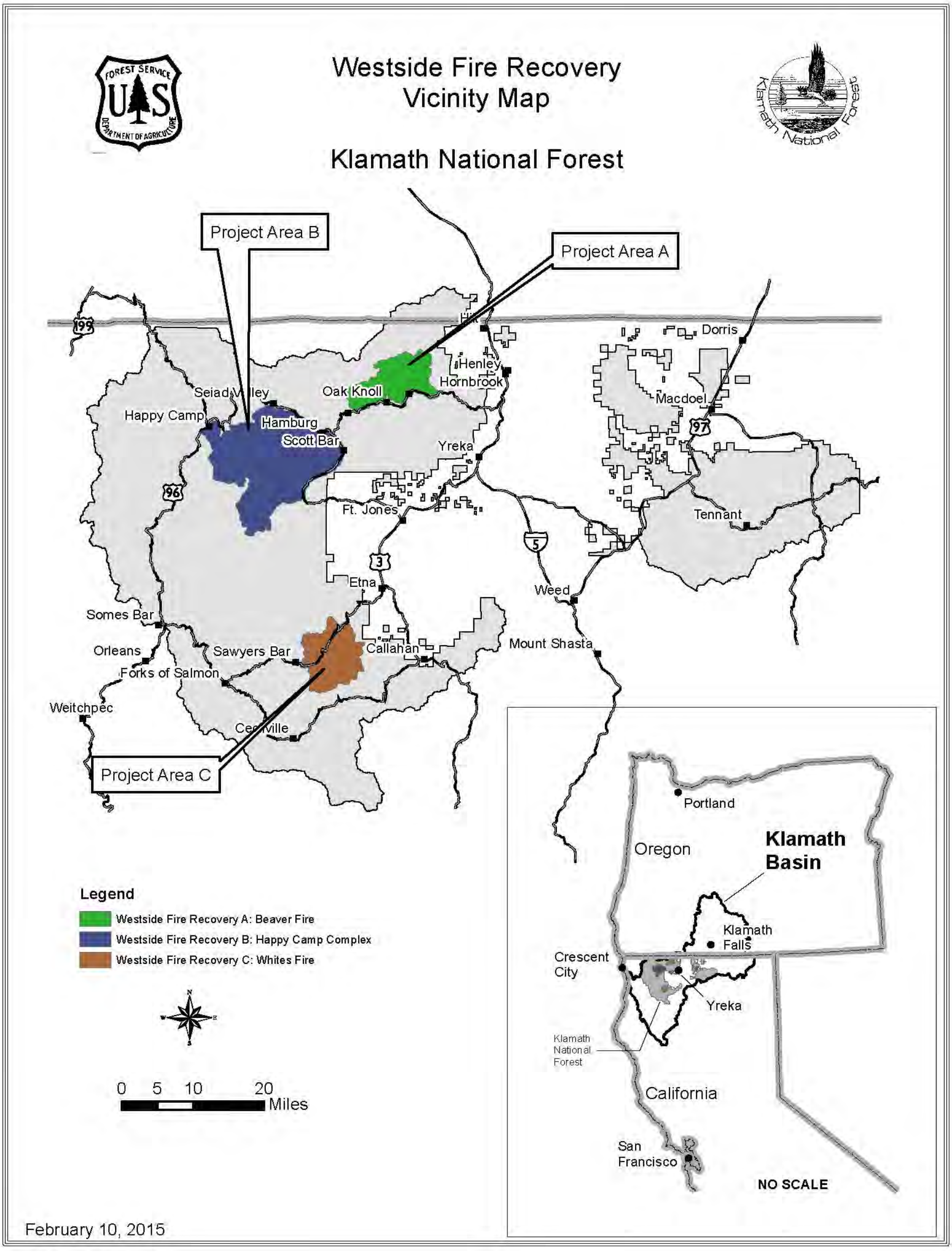

Map A-1: Westside Fire Recovery Vicinity Map

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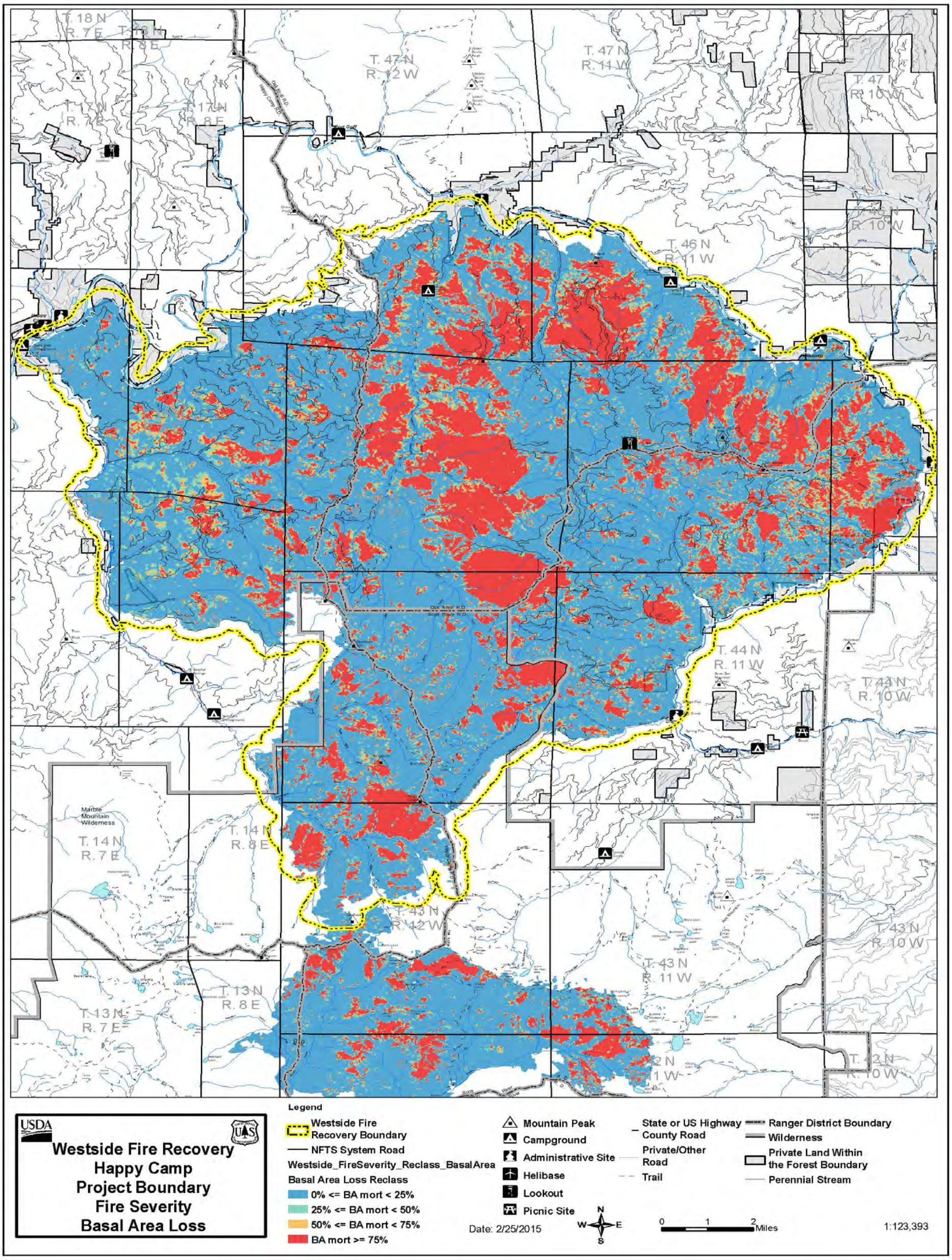

Map A-2: RAVG Map – Happy Camp Complex

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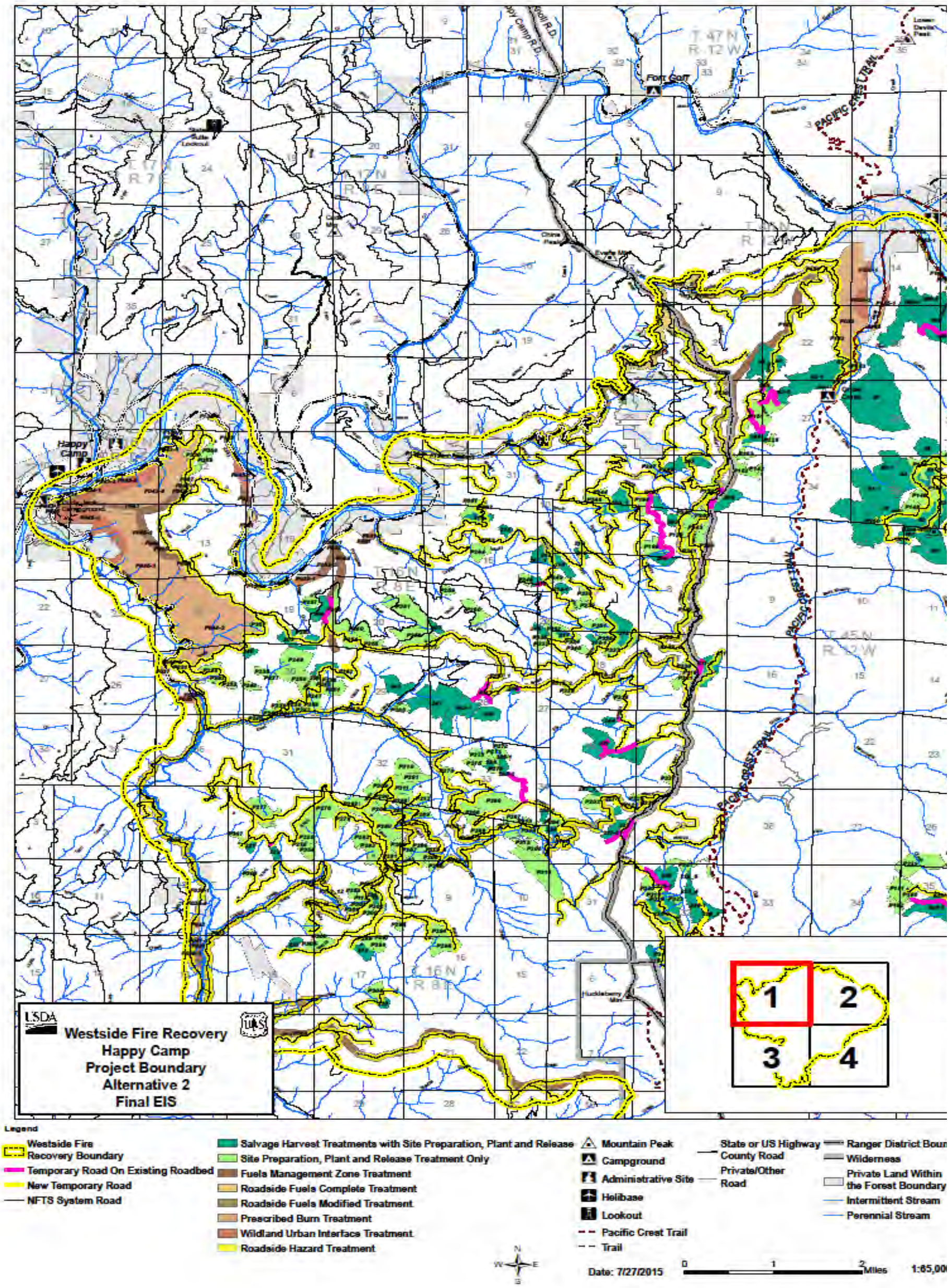

Map A-3: Alternative 2 – northwest section of the Happy Camp Complex. Please note: Each Alternative of the Happy Camp complex has been broken into four sections to allow for clarity and readability

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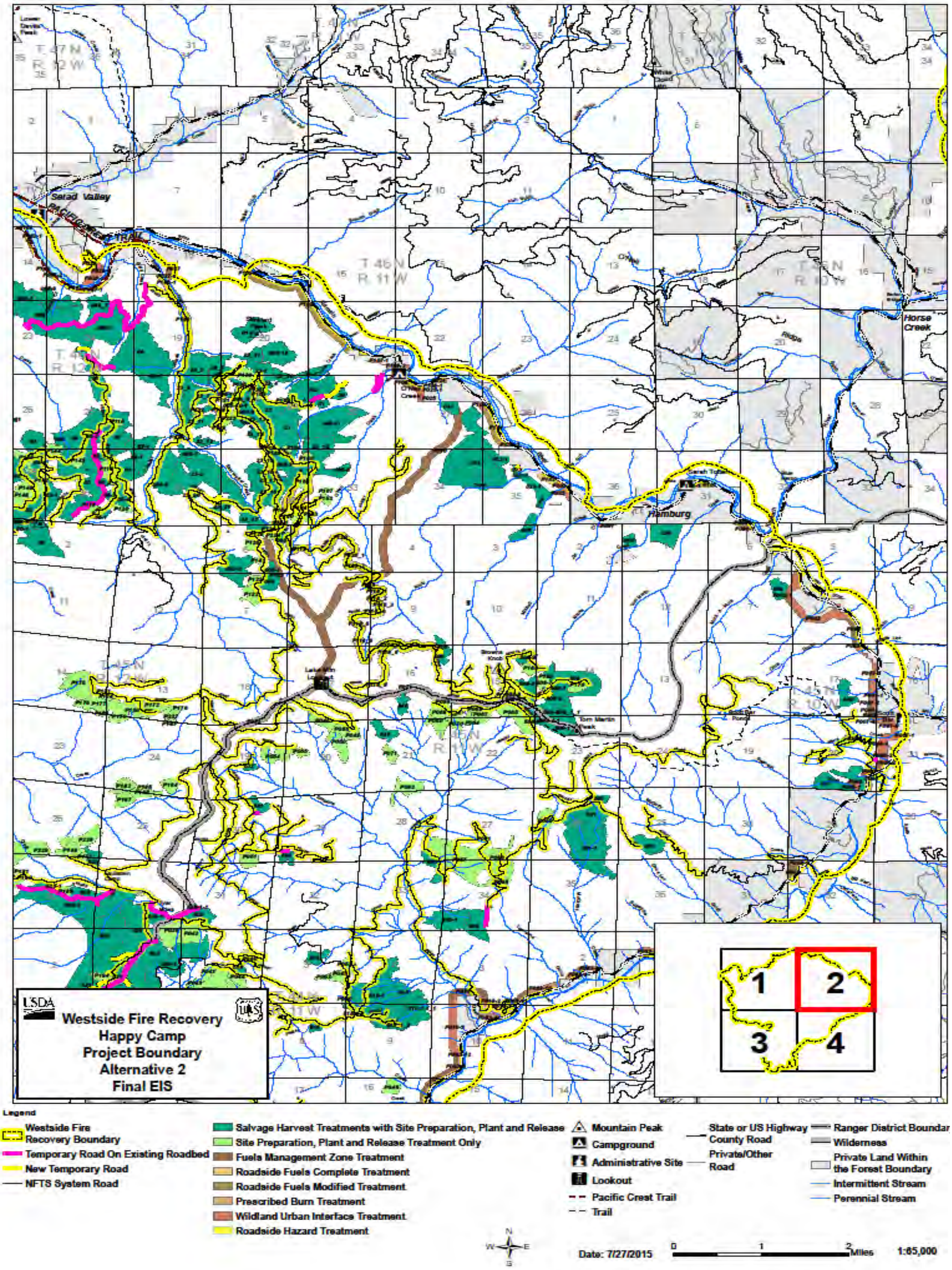

Map A-4: Alternative 2 – northeast section of the Happy Camp Complex

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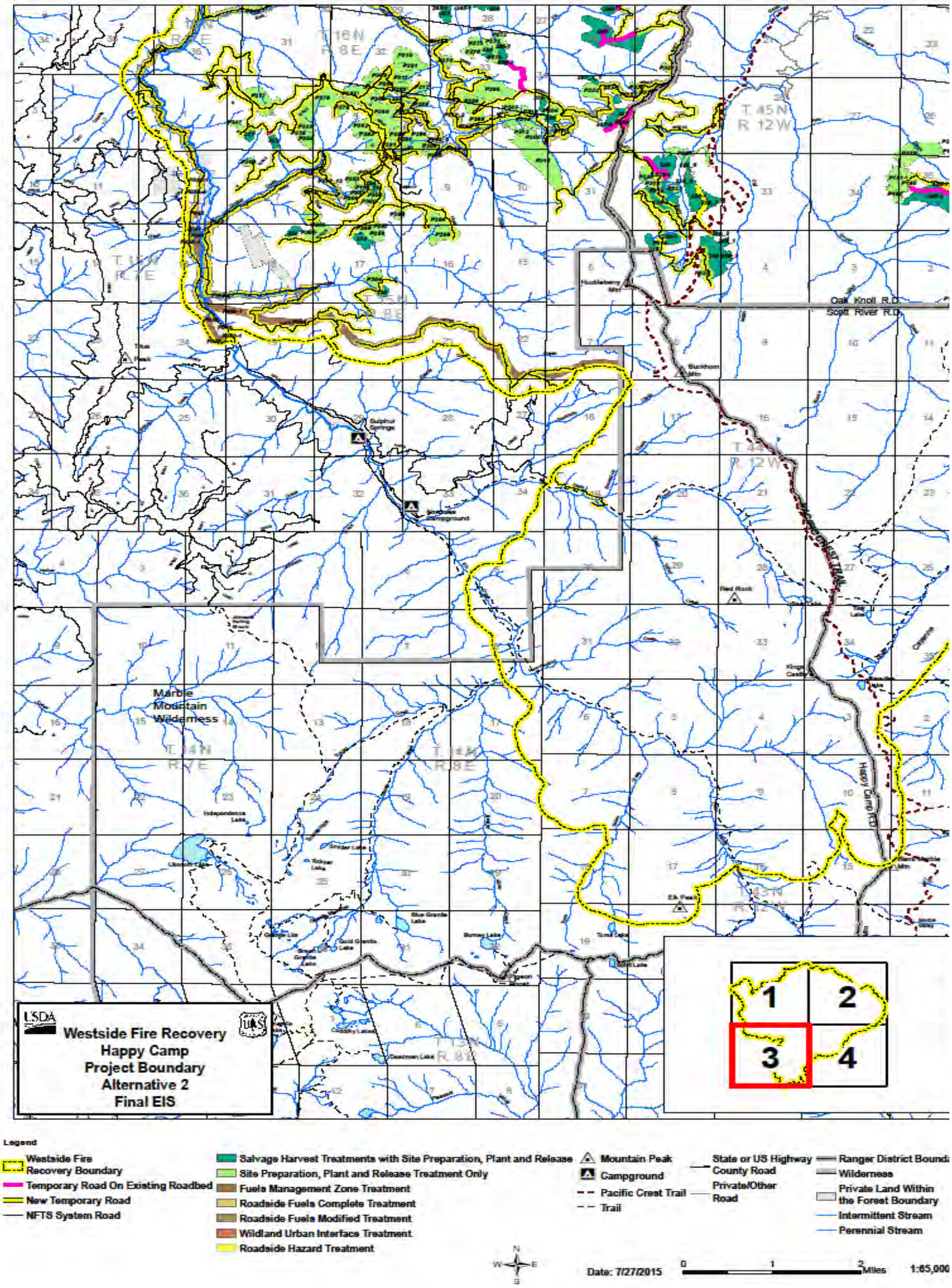

Map A-5: Alternative 2 – southwest section of the Happy Camp Complex

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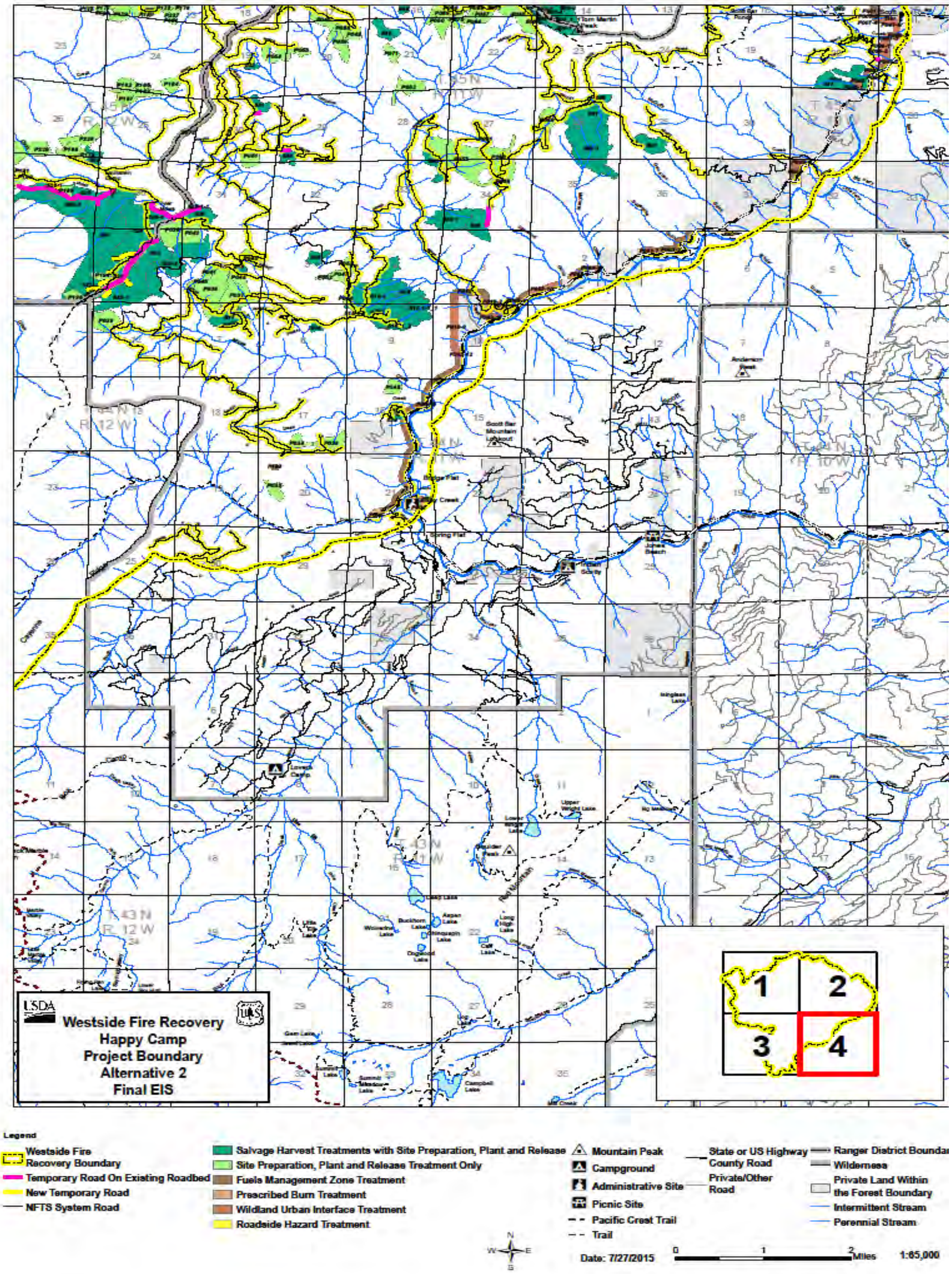

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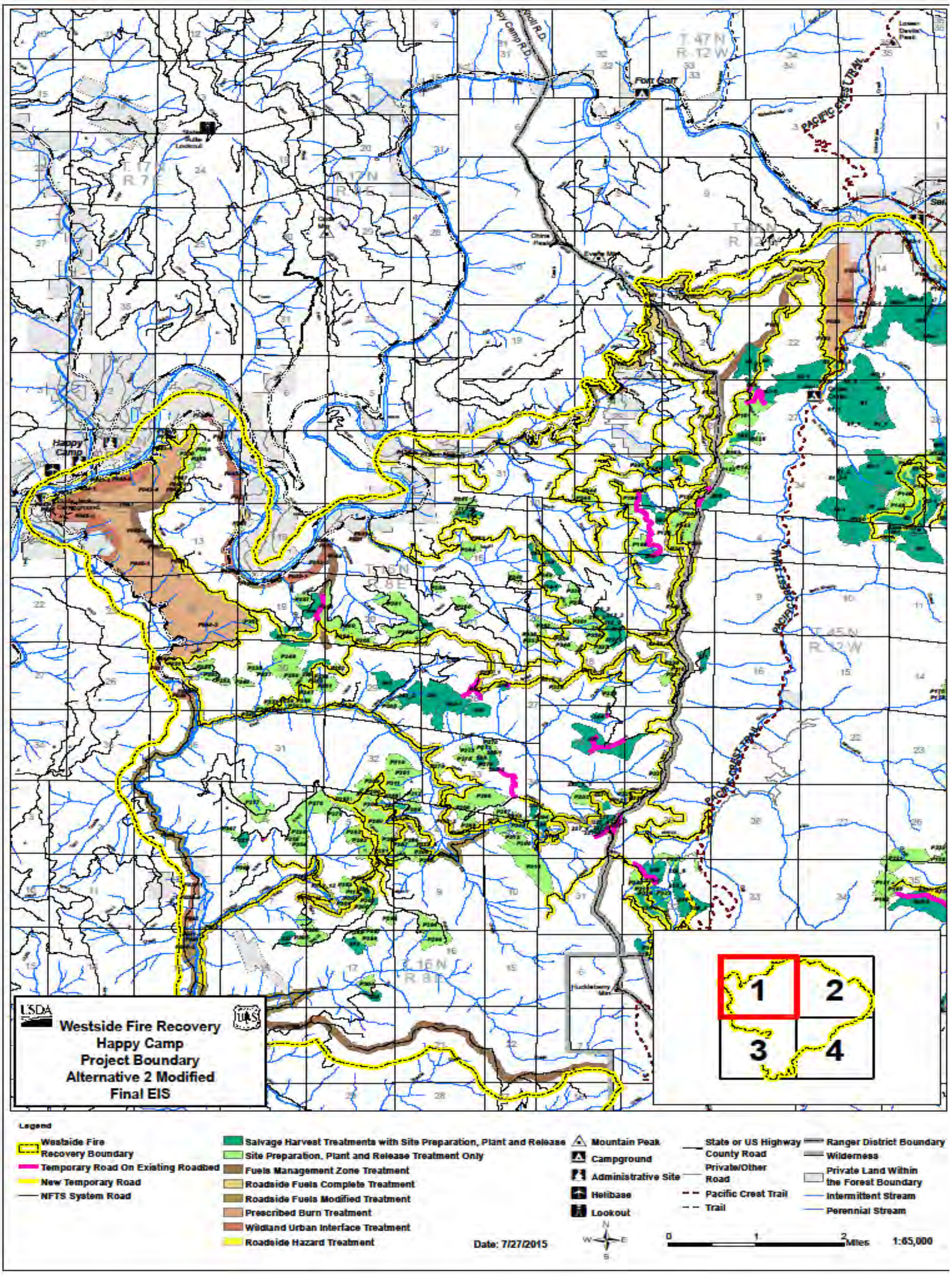

Map A-7: Alternative 2 Modified – northwest section of the Happy Camp Complex

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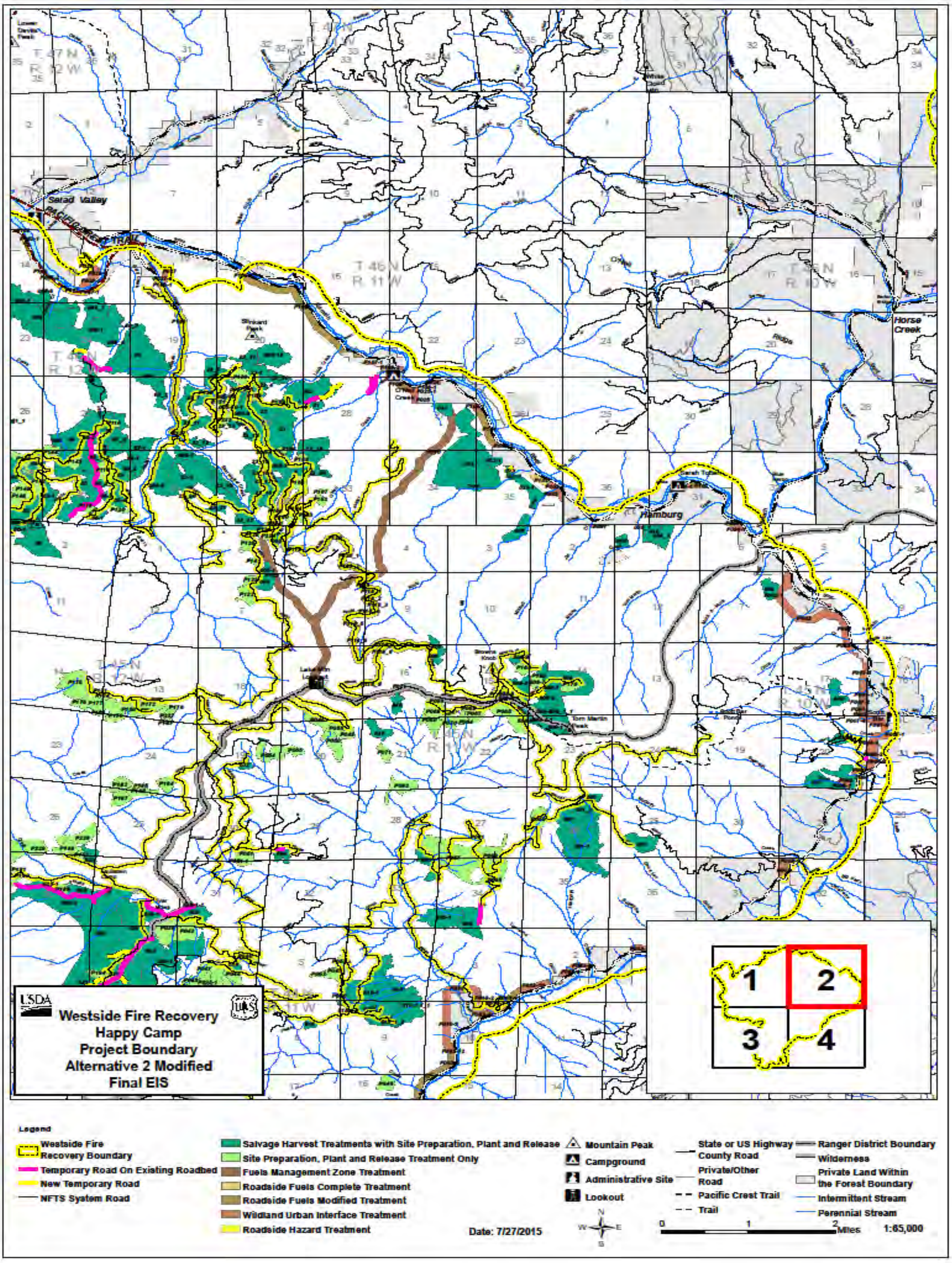

Map A-8: Alternative 2 Modified – northeast section of the Happy Camp Complex

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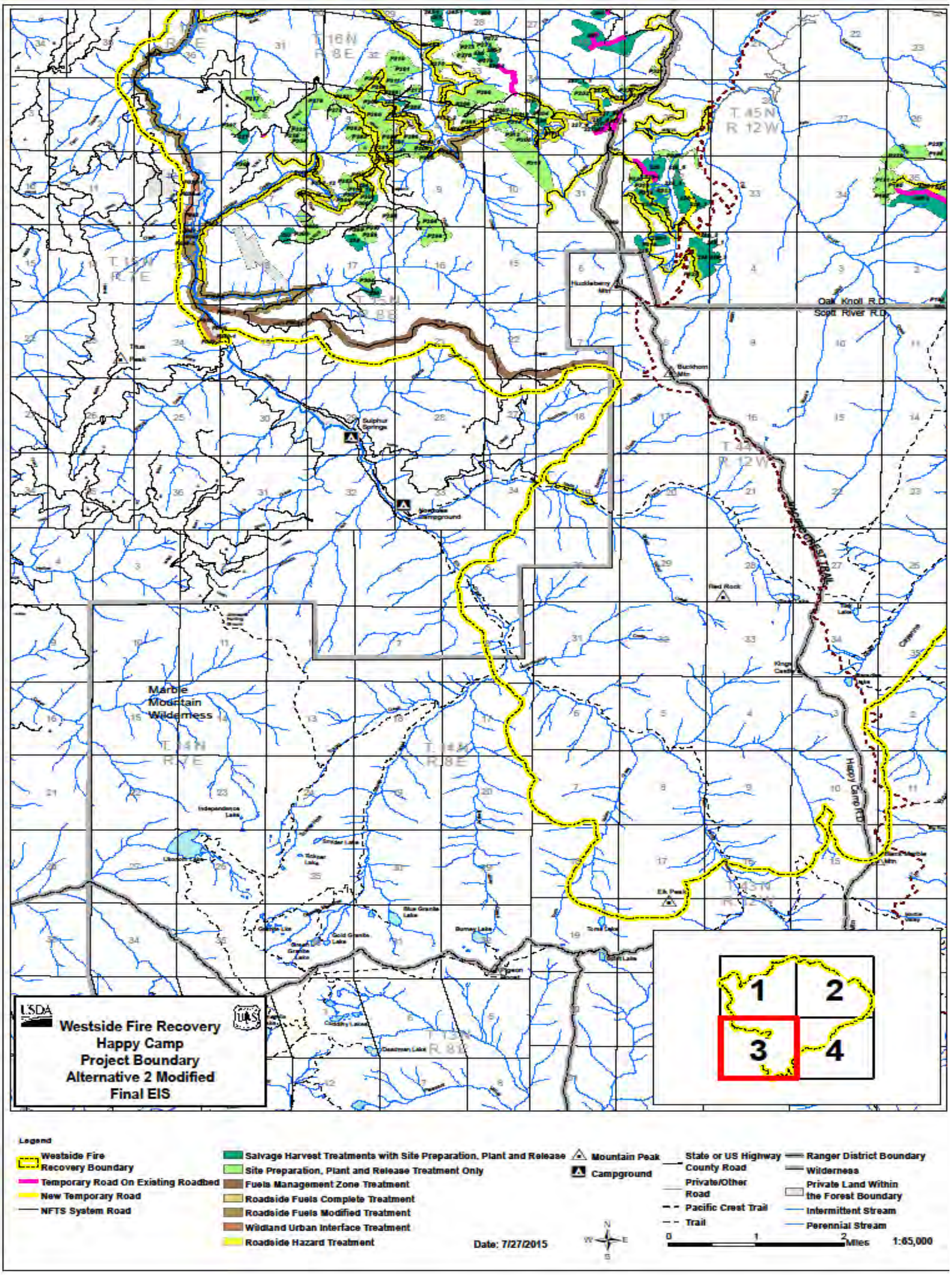

Map A-9: Alternative 2 Modified – southwest section of the Happy Camp Complex

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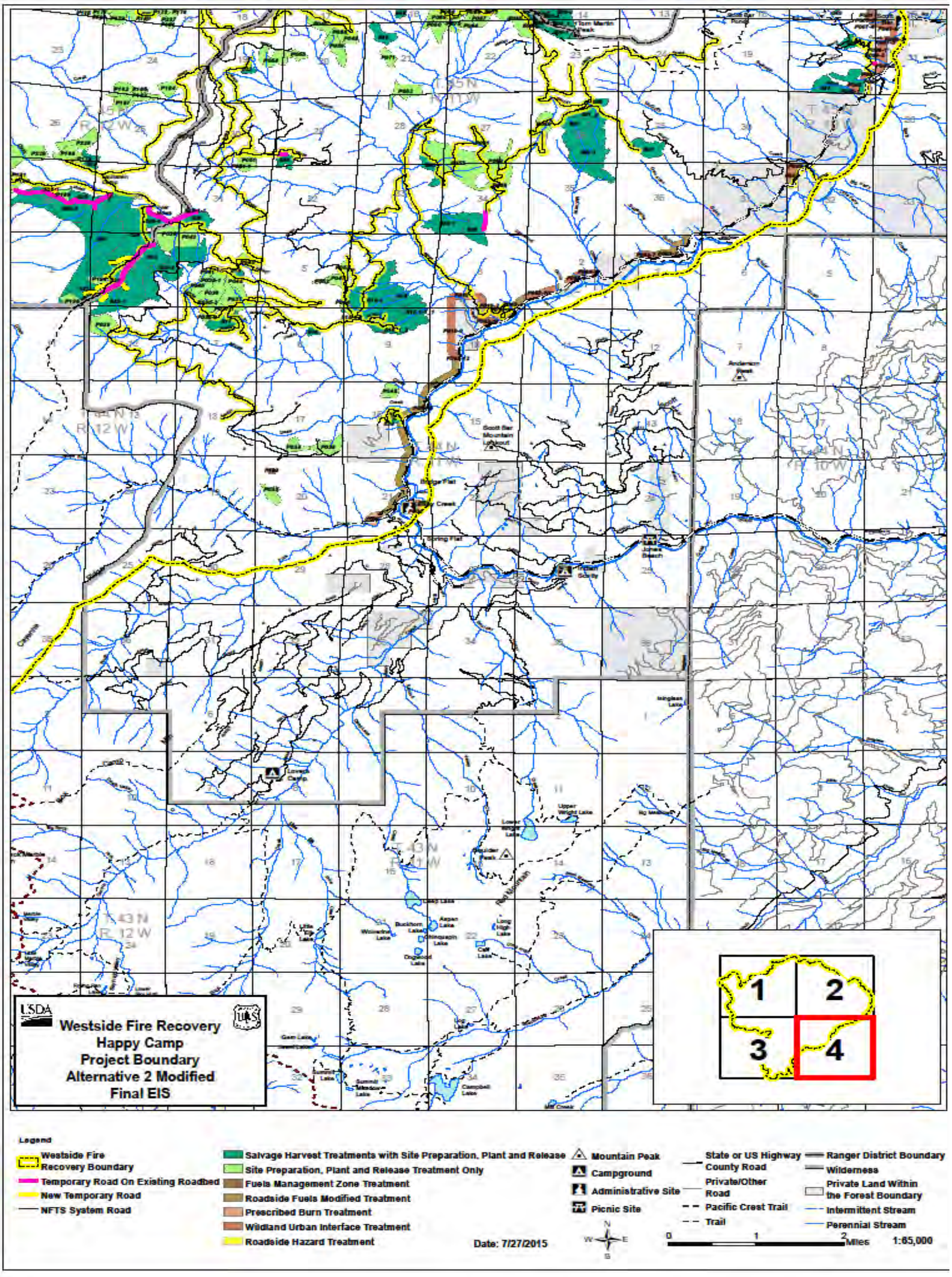

Map A-10: Alternative 2 Modified – southeast section of the Happy Camp Complex

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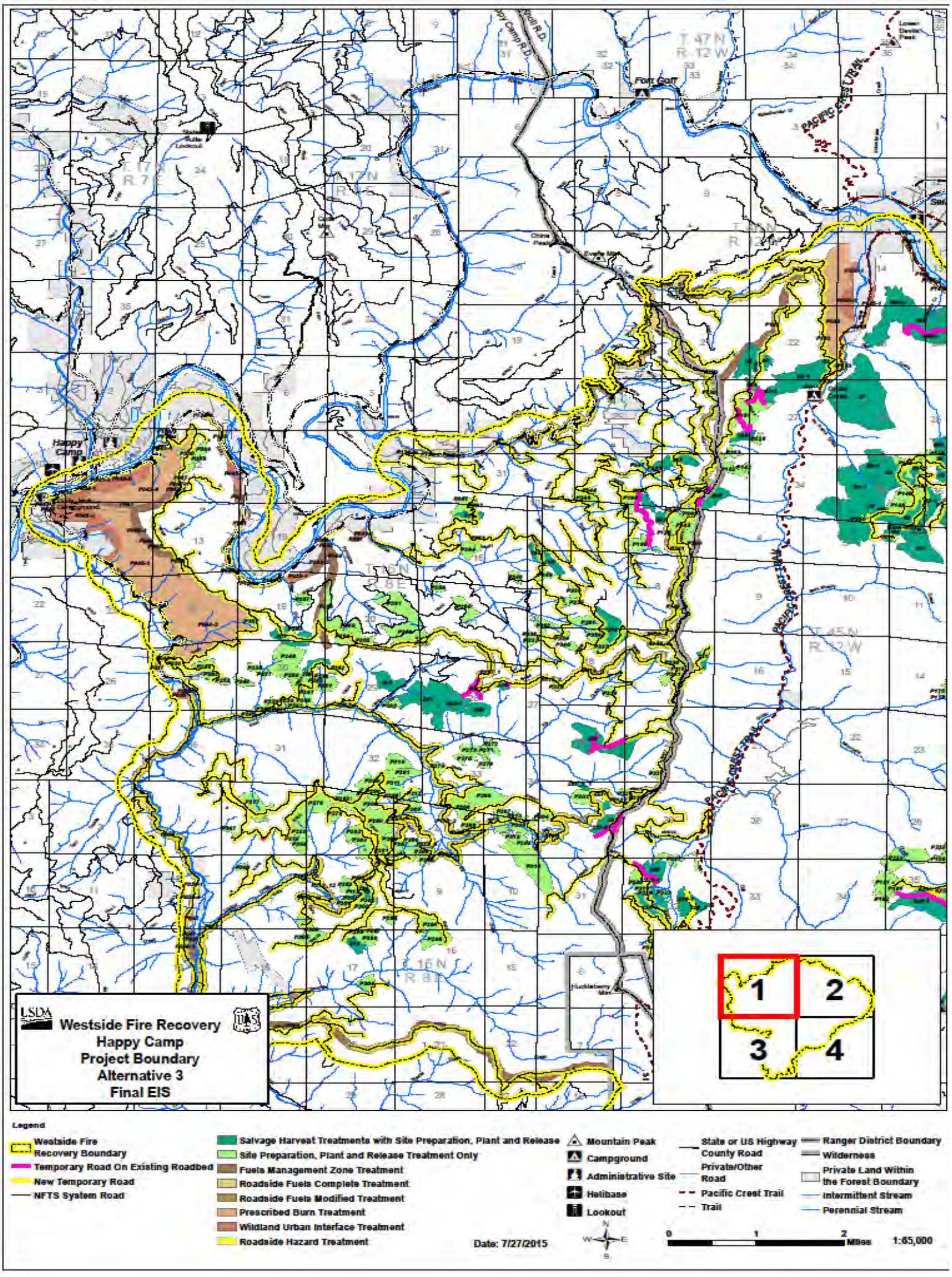

Map A-11: Alternative 3 – northwest section of the Happy Camp Complex

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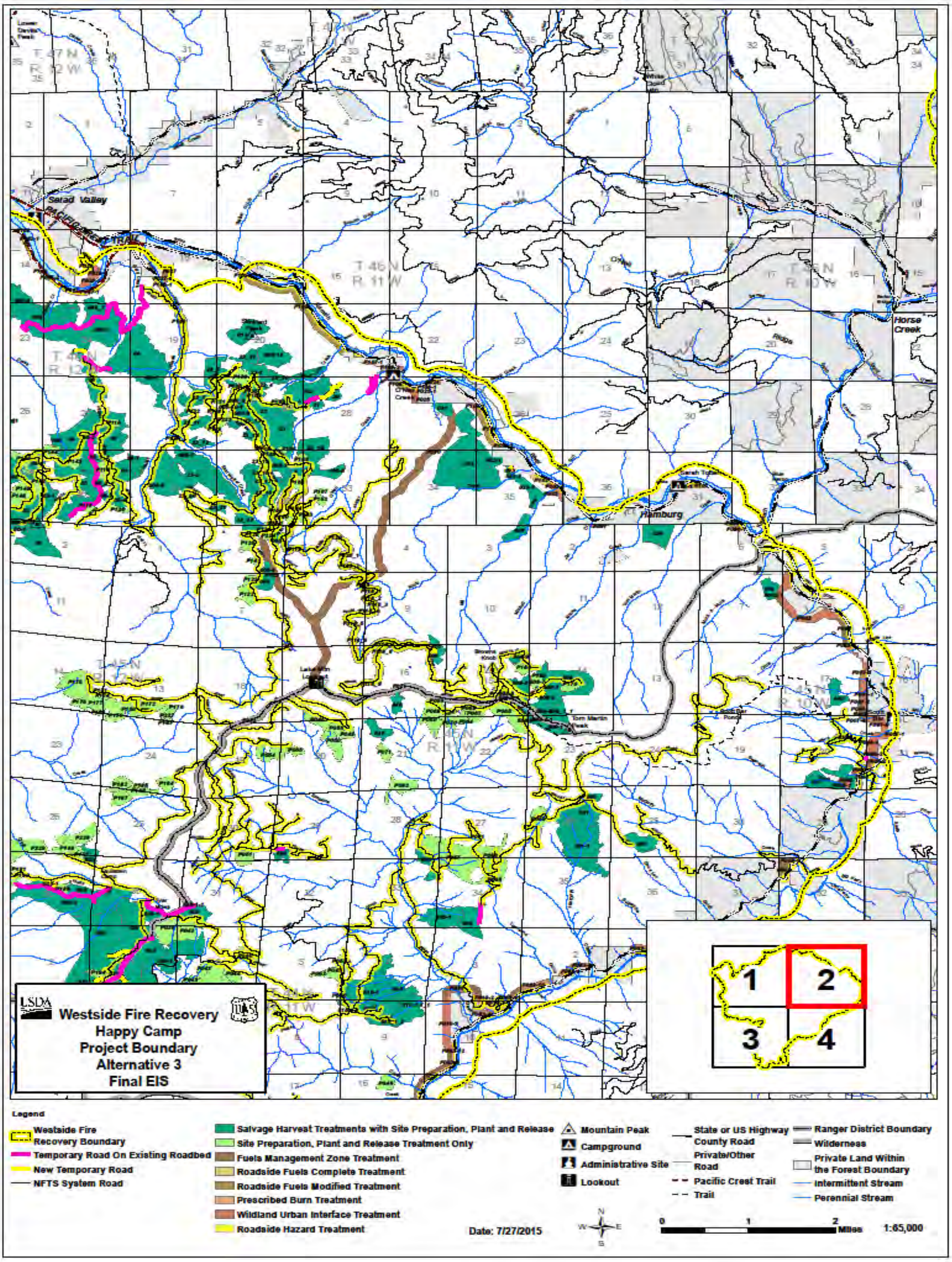

Map A-12: Alternative 3 – northeast section of the Happy Camp Complex

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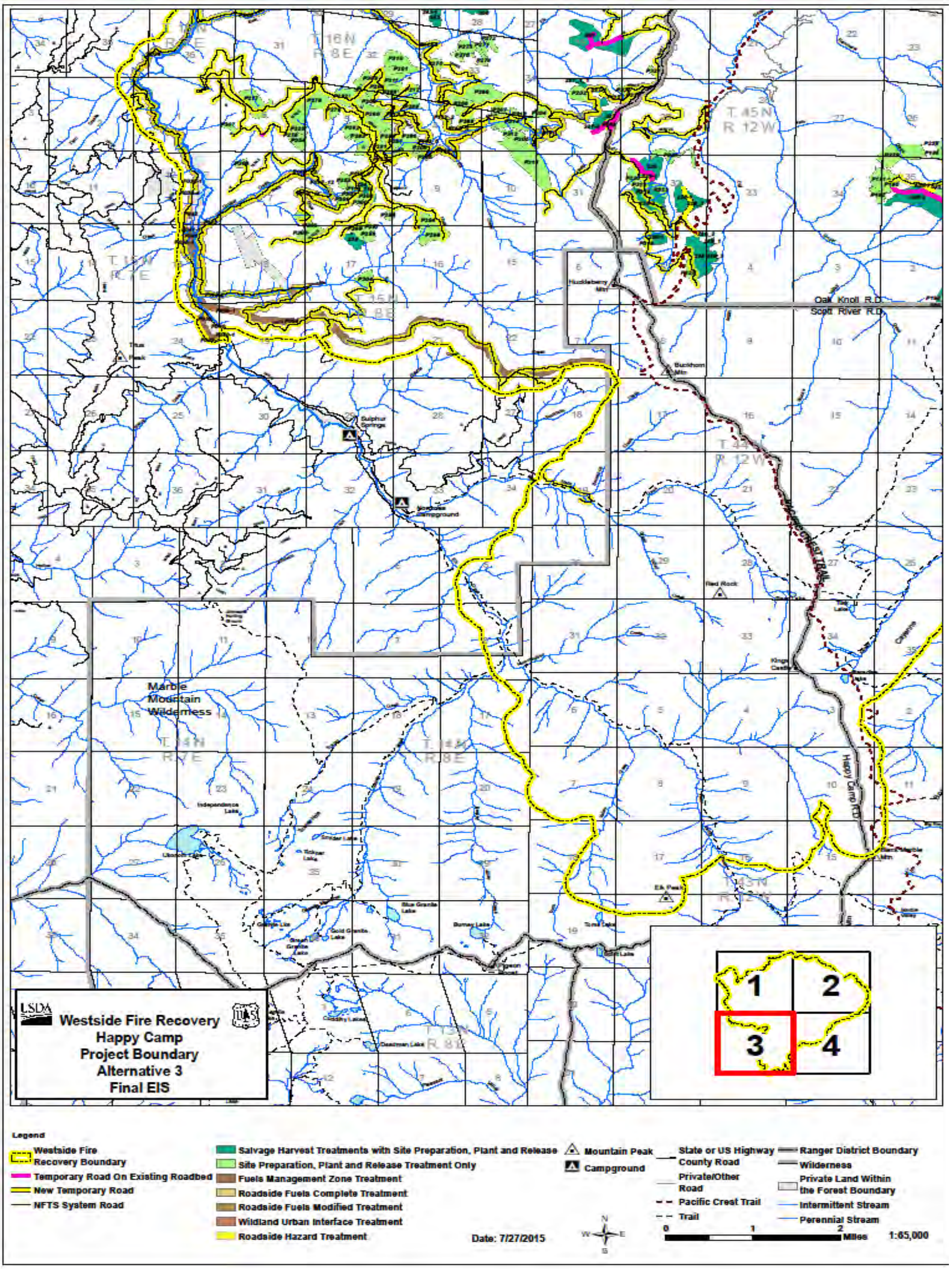

Map A-13: Alternative 3 – southwest section of the Happy Camp Complex

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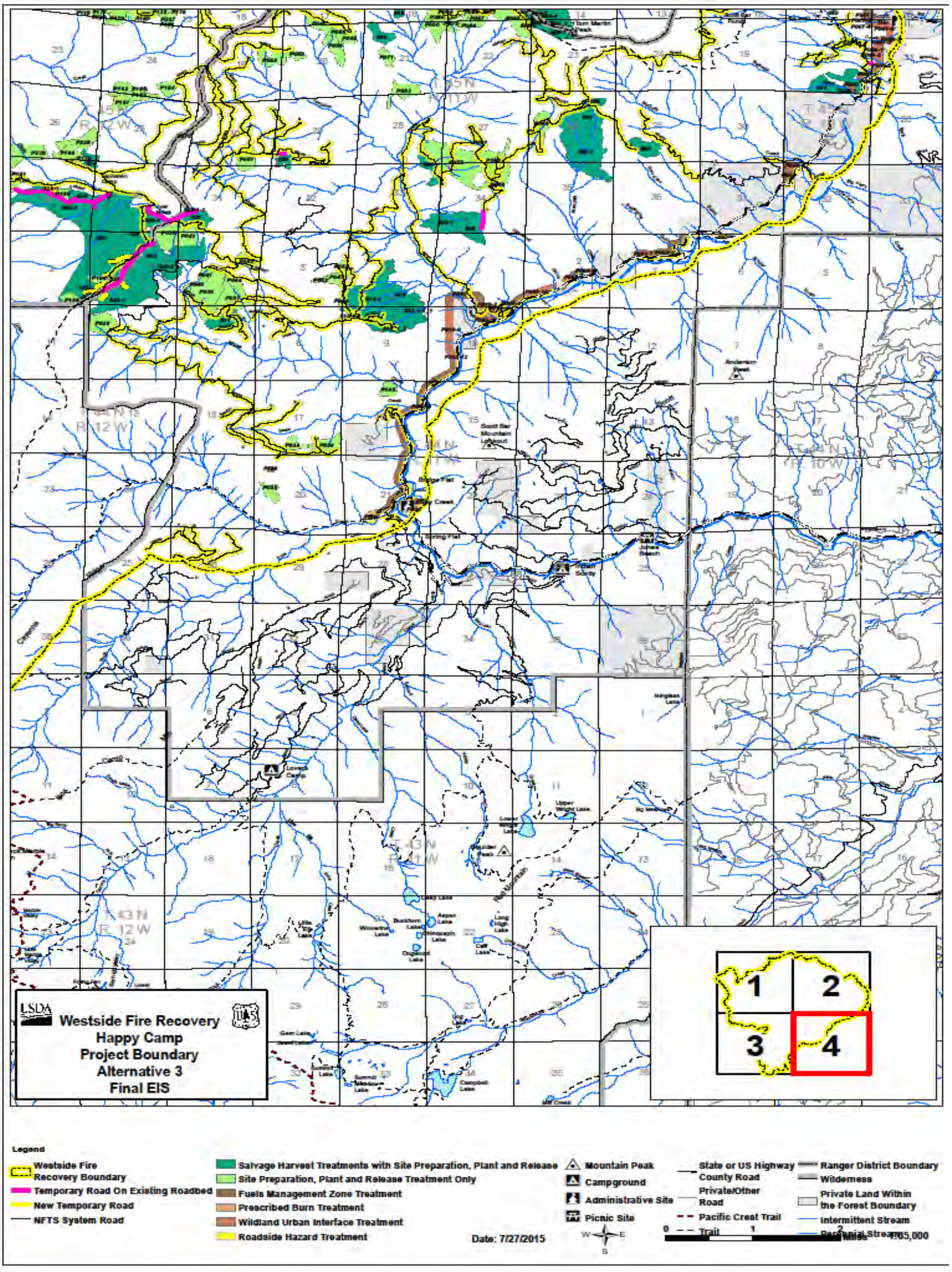

Map A-14: Alternative 3 – southeast section of the Happy Camp Complex

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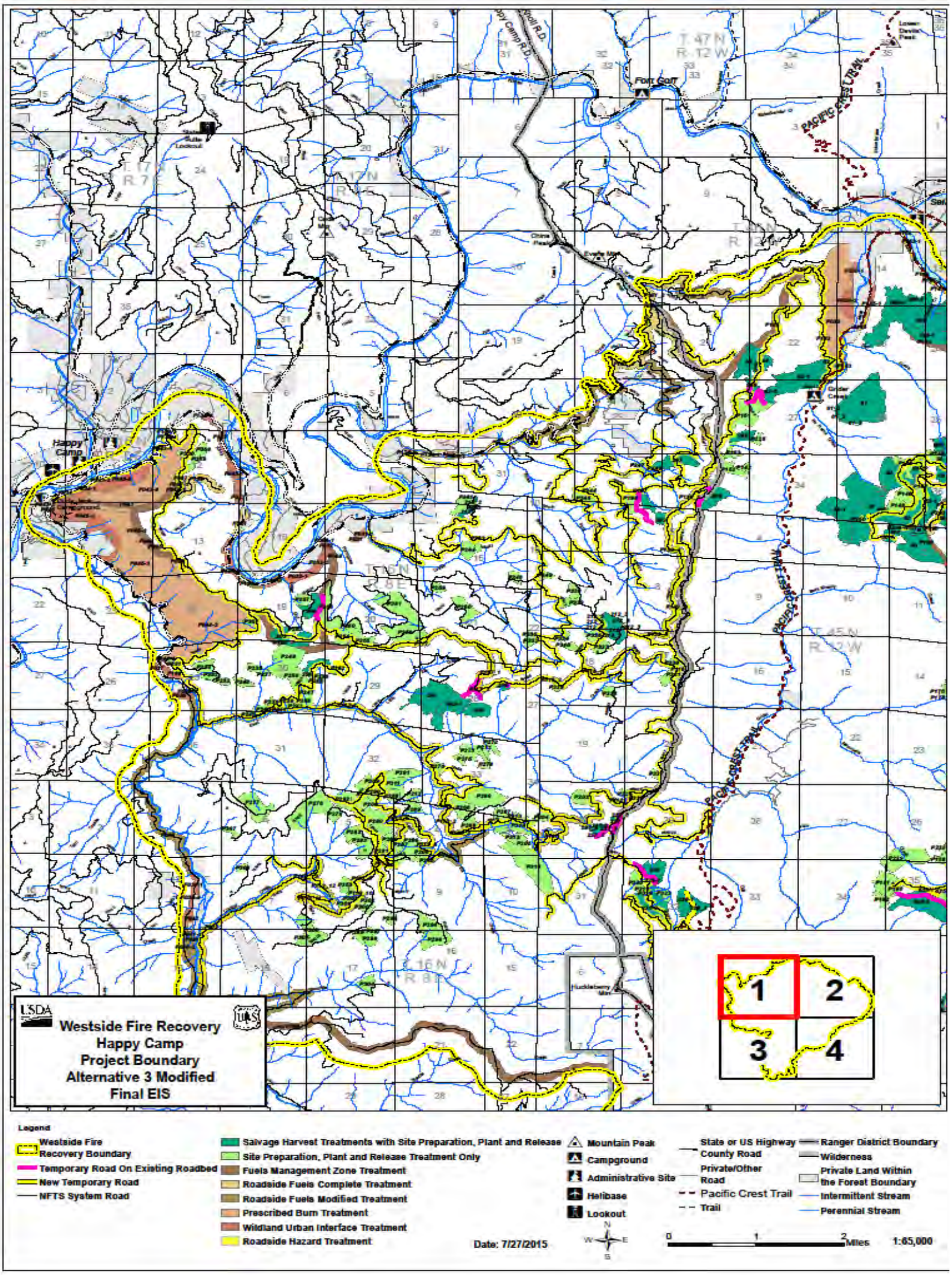

Map A-15: Alternative 3 Modified – northwest section of the Happy Camp Complex

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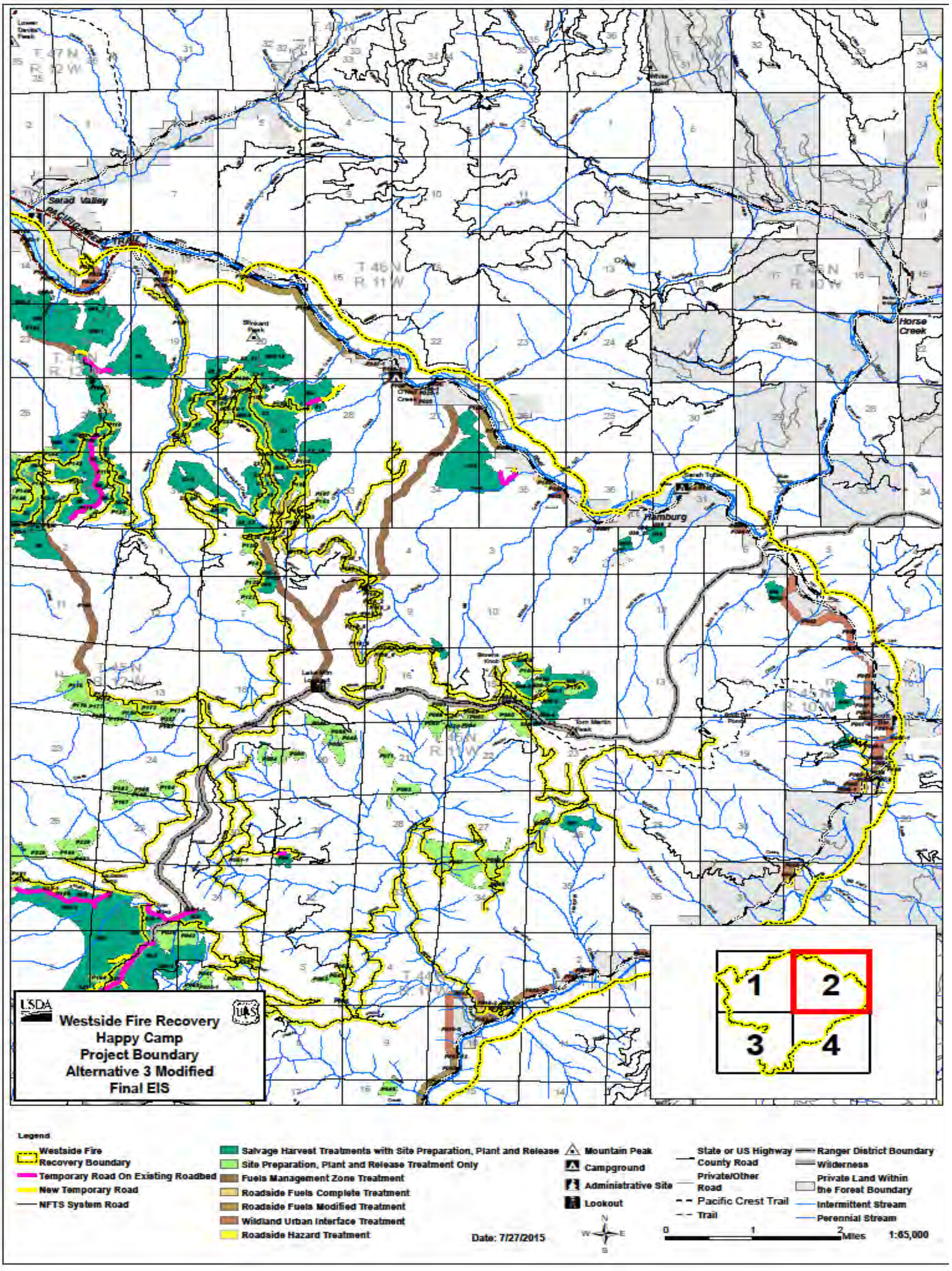

Map A-16: Alternative 3 Modified – northeast section of the Happy Camp Complex

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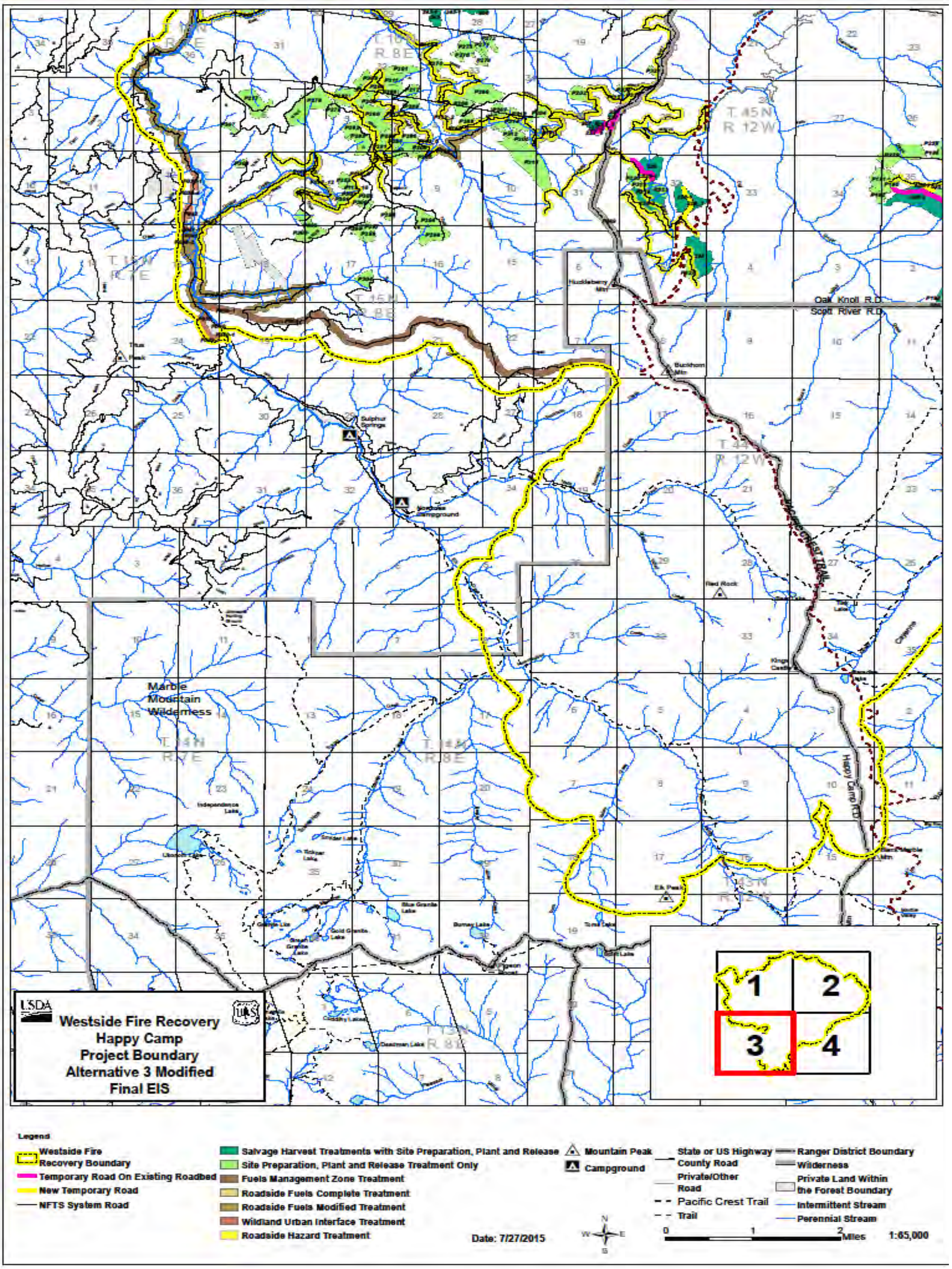

Map A-17: Alternative 3 Modified – southwest section of the Happy Camp Complex

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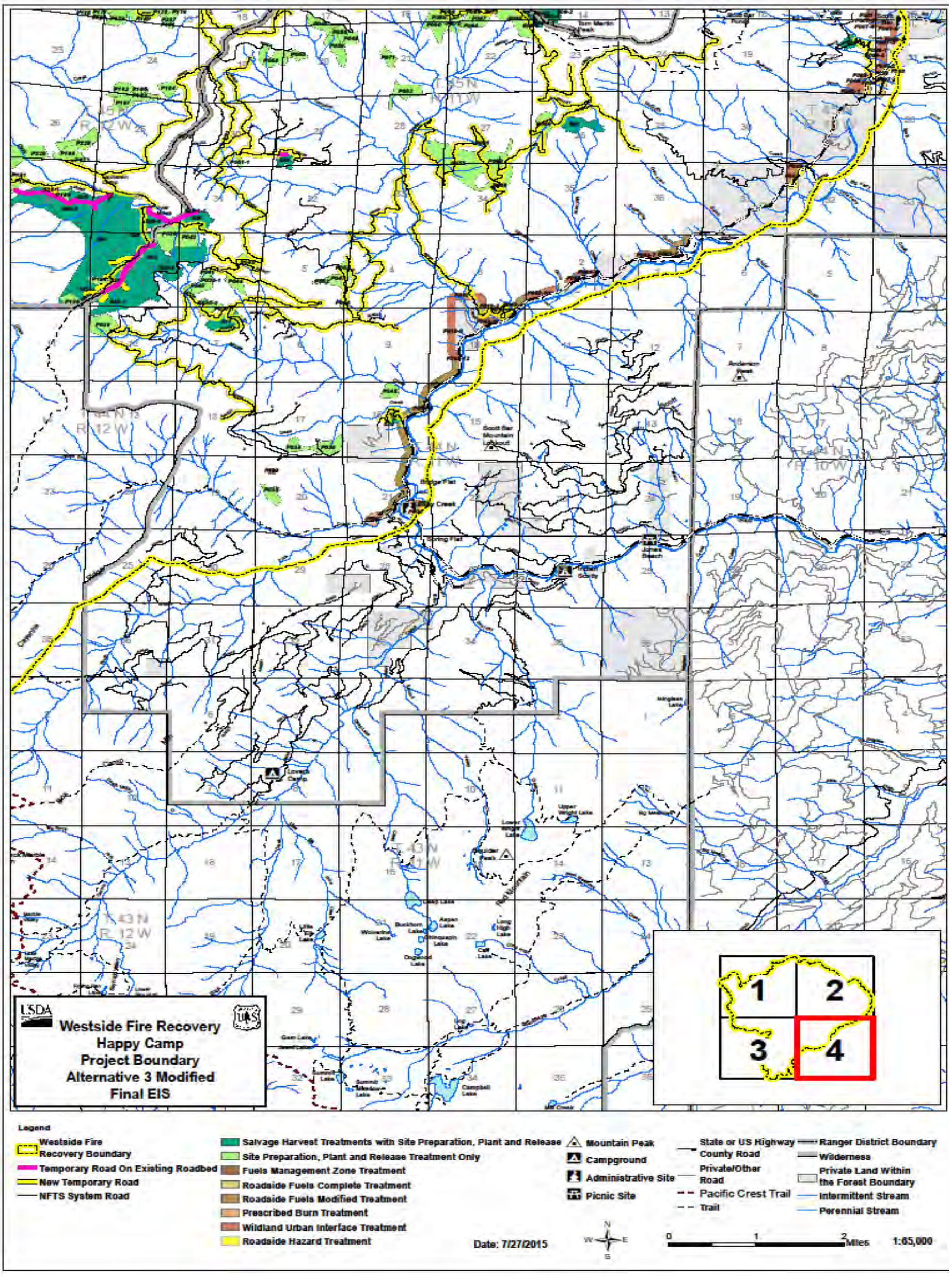

Map A-18: Alternative 3 Modified – southeast section of the Happy Camp Complex

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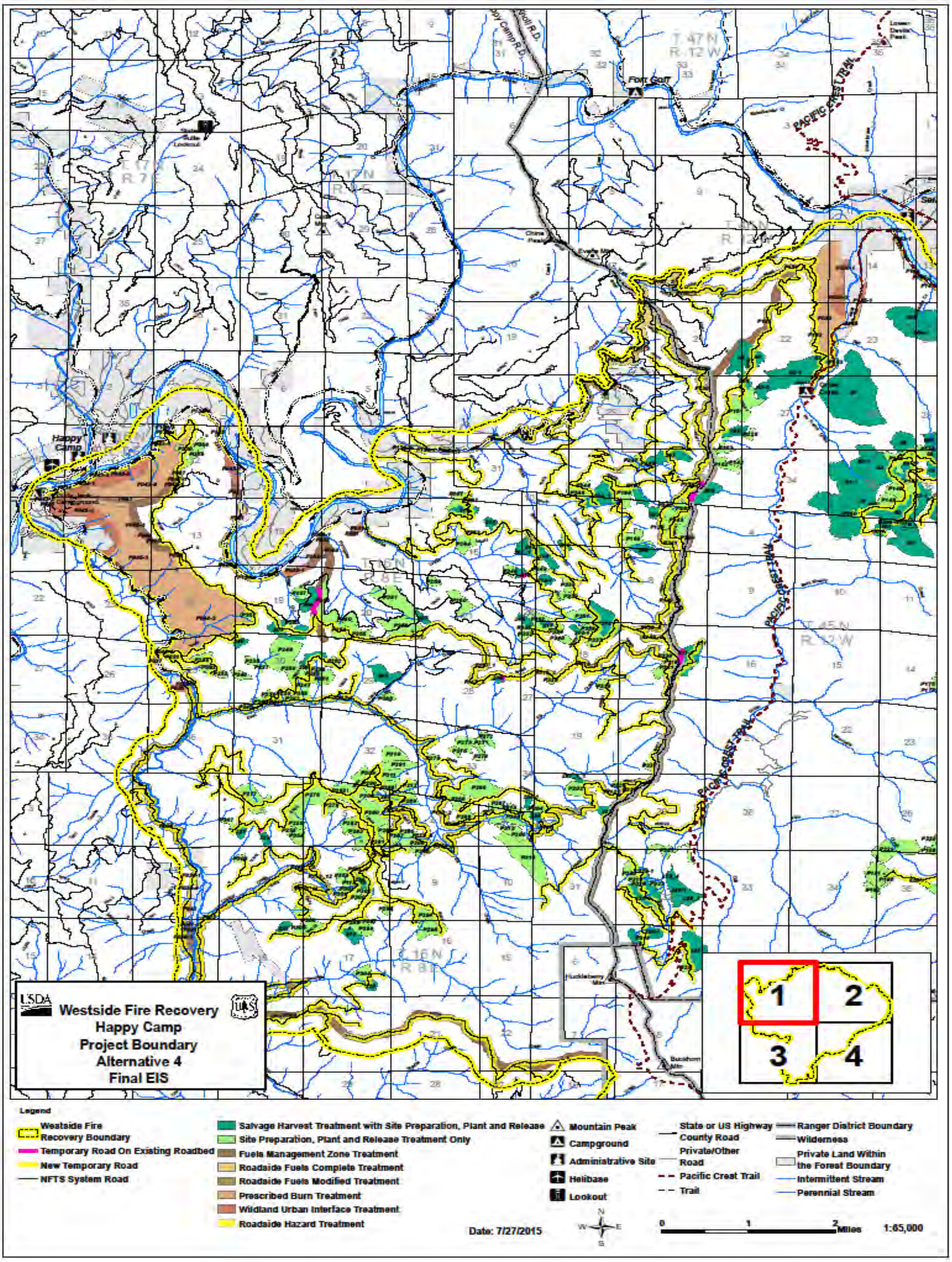

Map A-19: Alternative 4 – northwest section of the Happy Camp Complex

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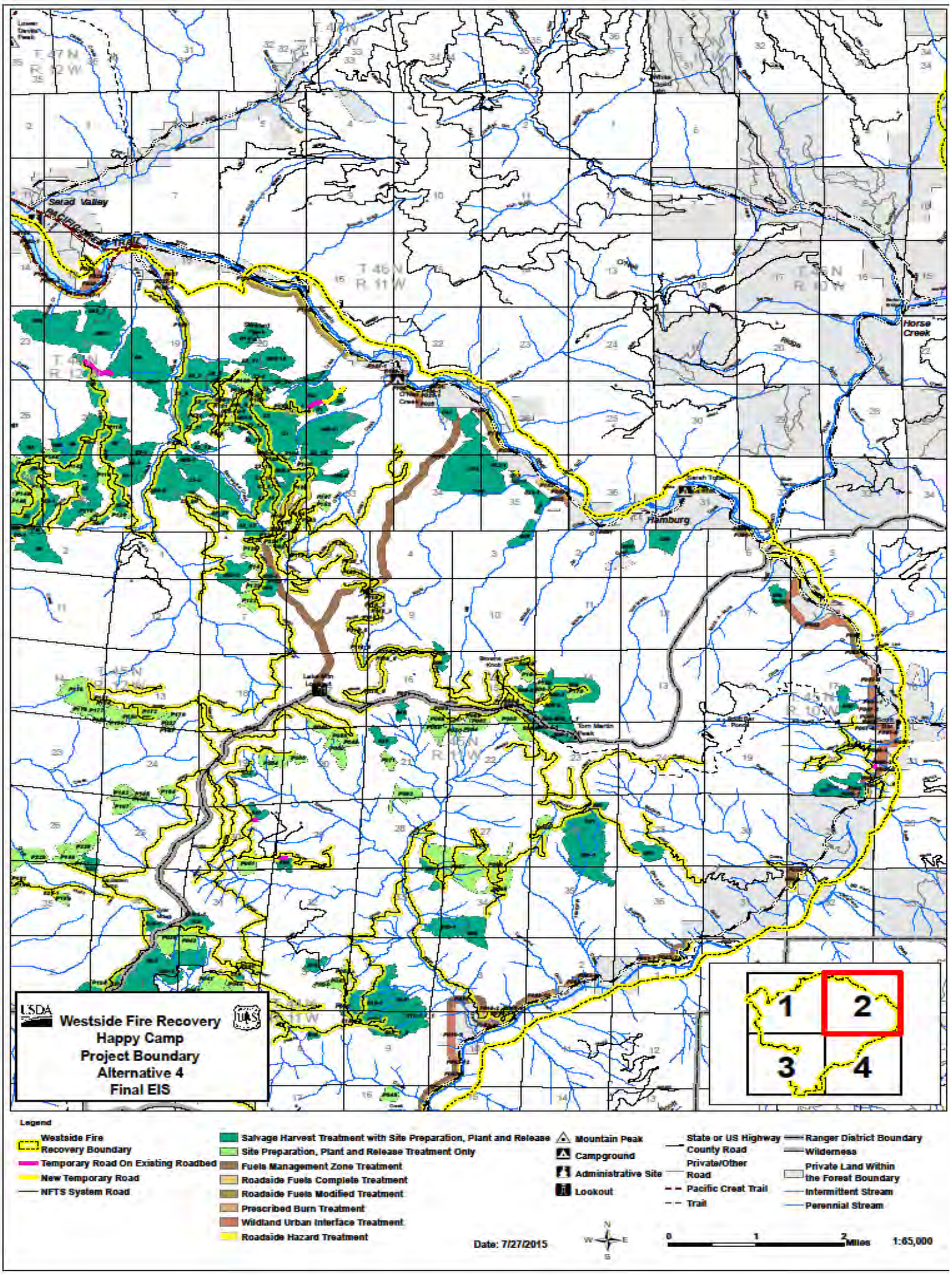

Map A-20: Alternative 4 – northeast section of the Happy Camp Complex

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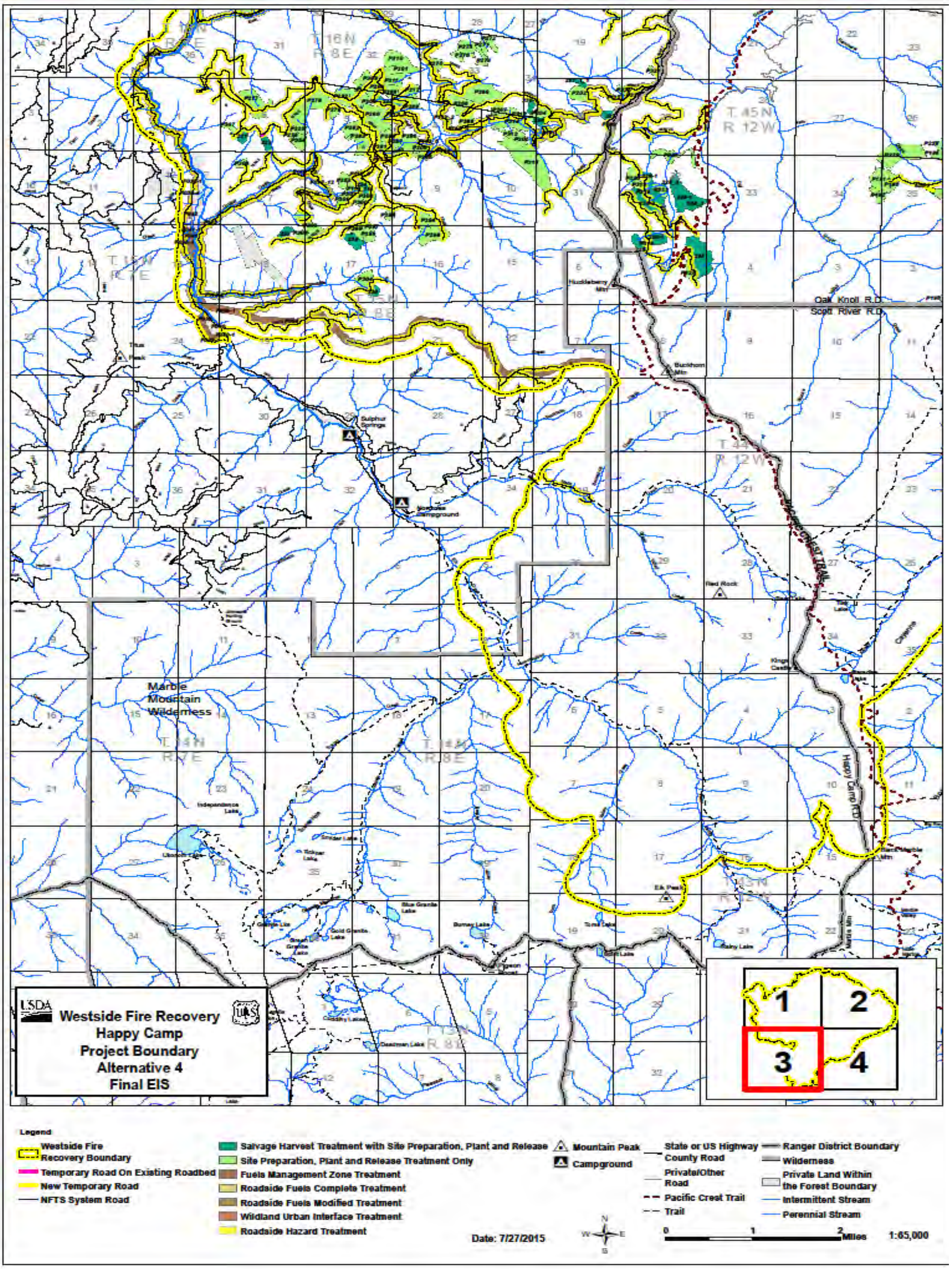

Map A-21: Alternative 4 – southwest section of the Happy Camp Complex

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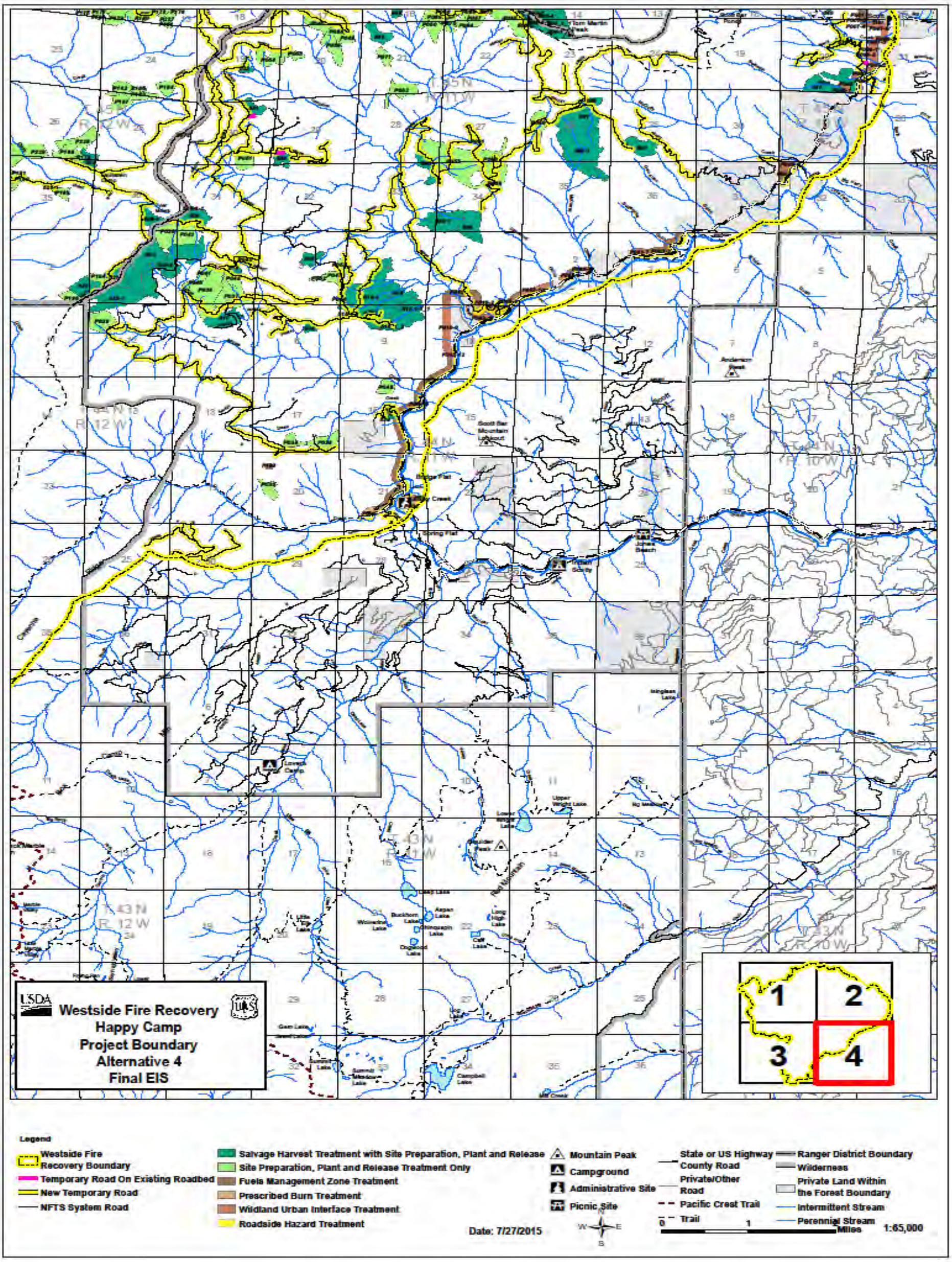

Map A-22: Alternative 4 – southeast section of the Happy Camp Complex

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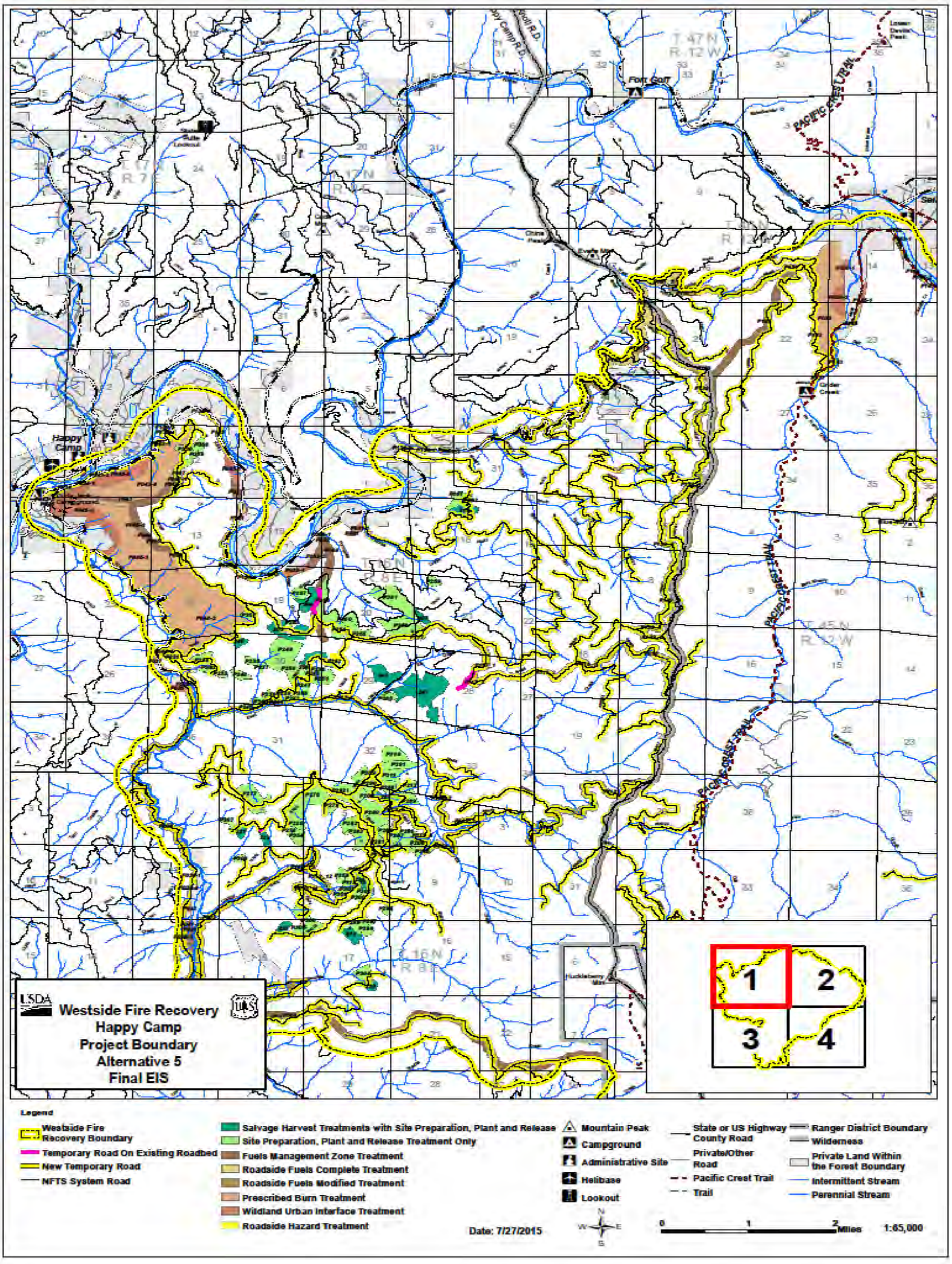

Map A-23: Alternative 5 – northwest section of the Happy Camp Complex

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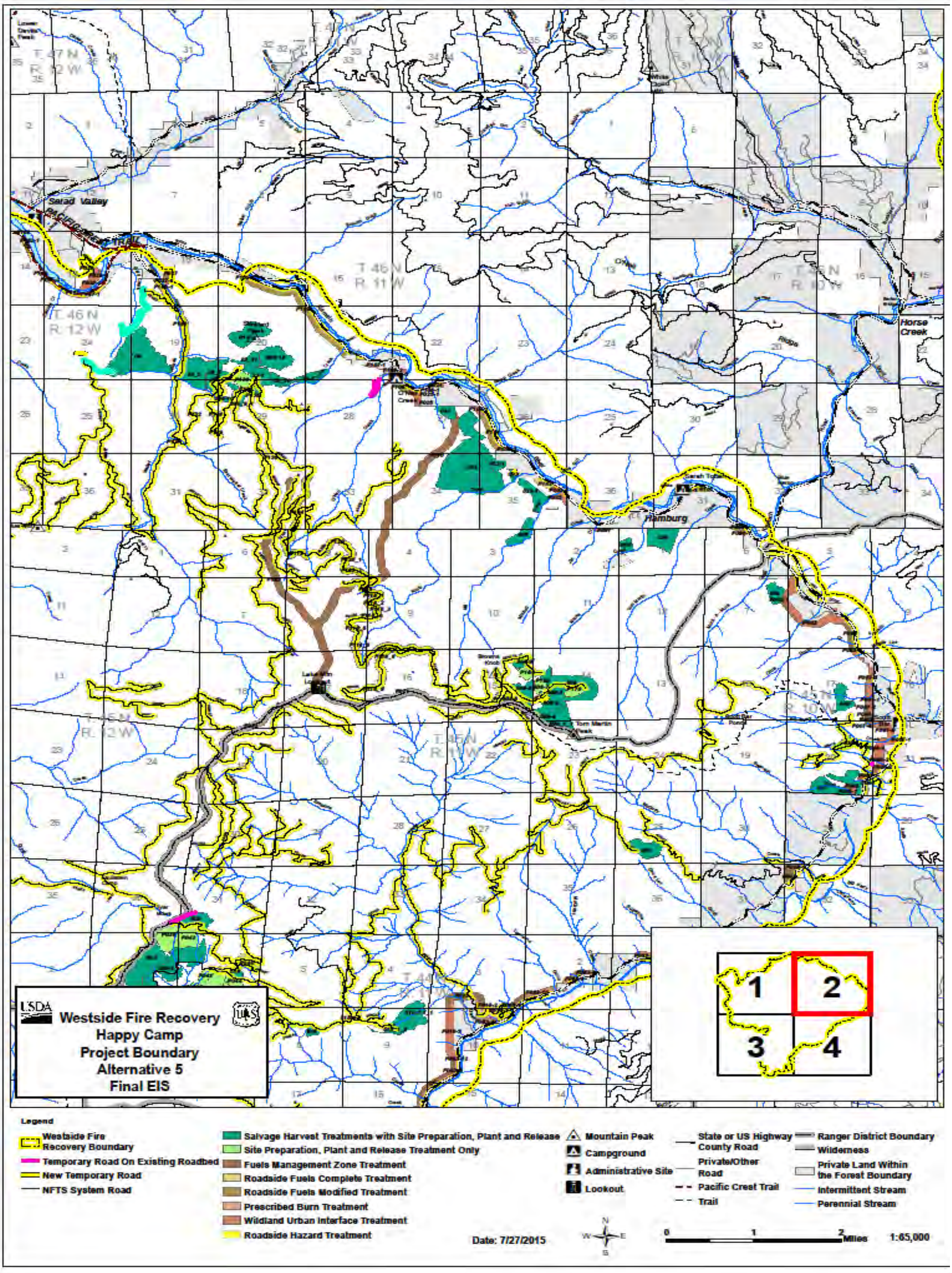

Map A-24: Alternative 5 – northeast section of the Happy Camp Complex

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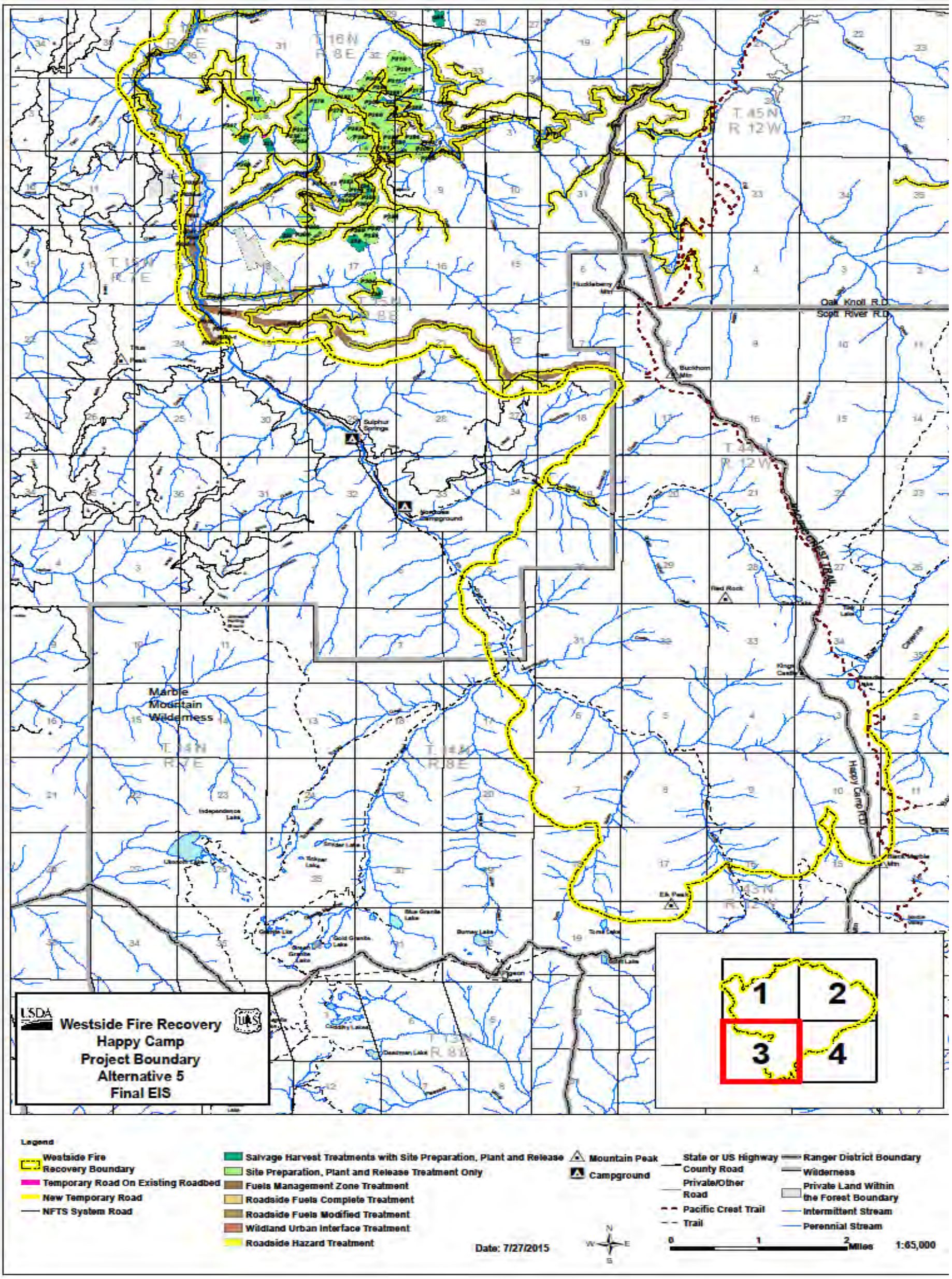

Map A-25: Alternative 5 – southwest section of the Happy Camp Complex

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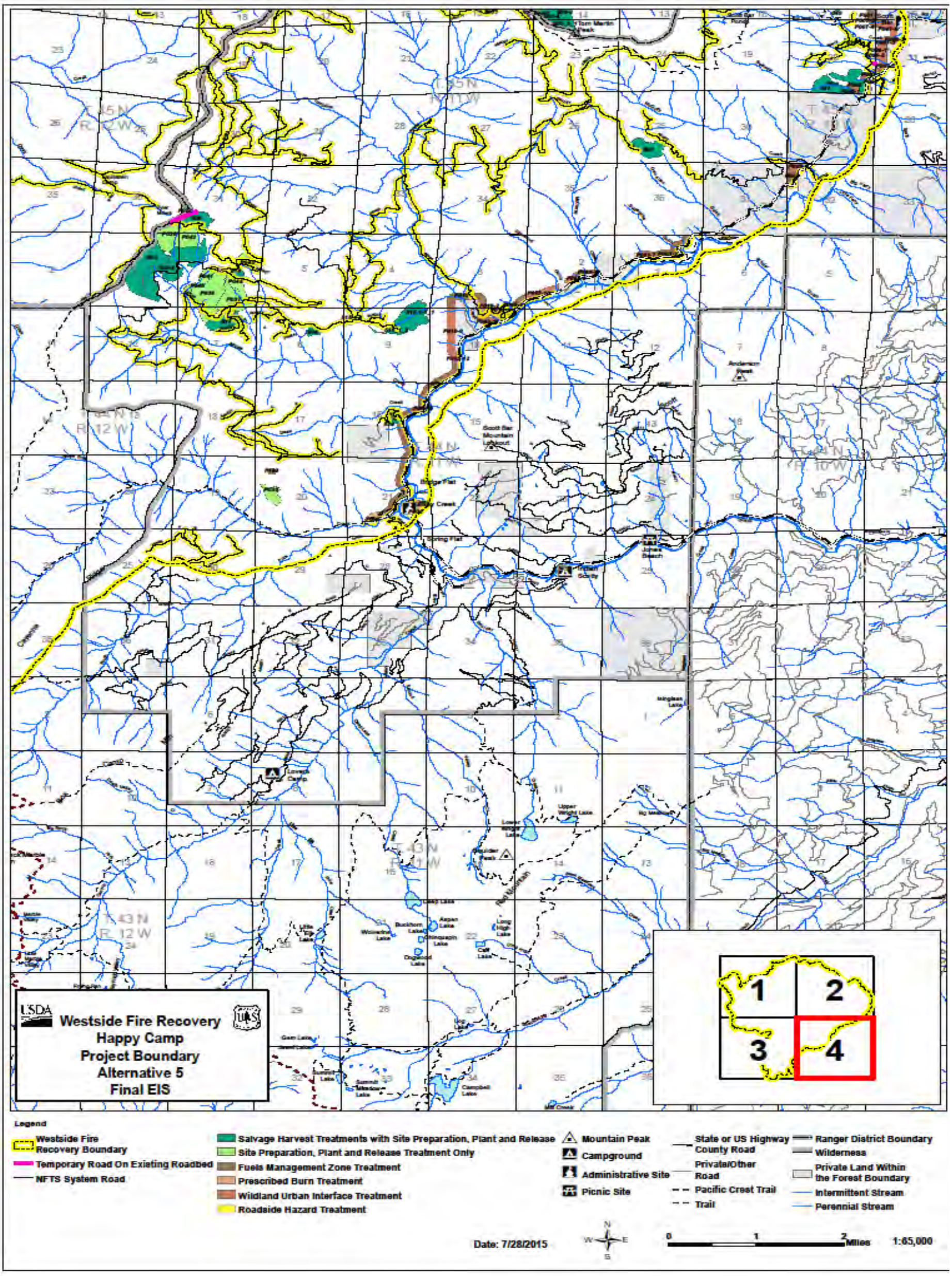

Map A-26: Alternative 5 – southeast section of the Happy Camp Complex

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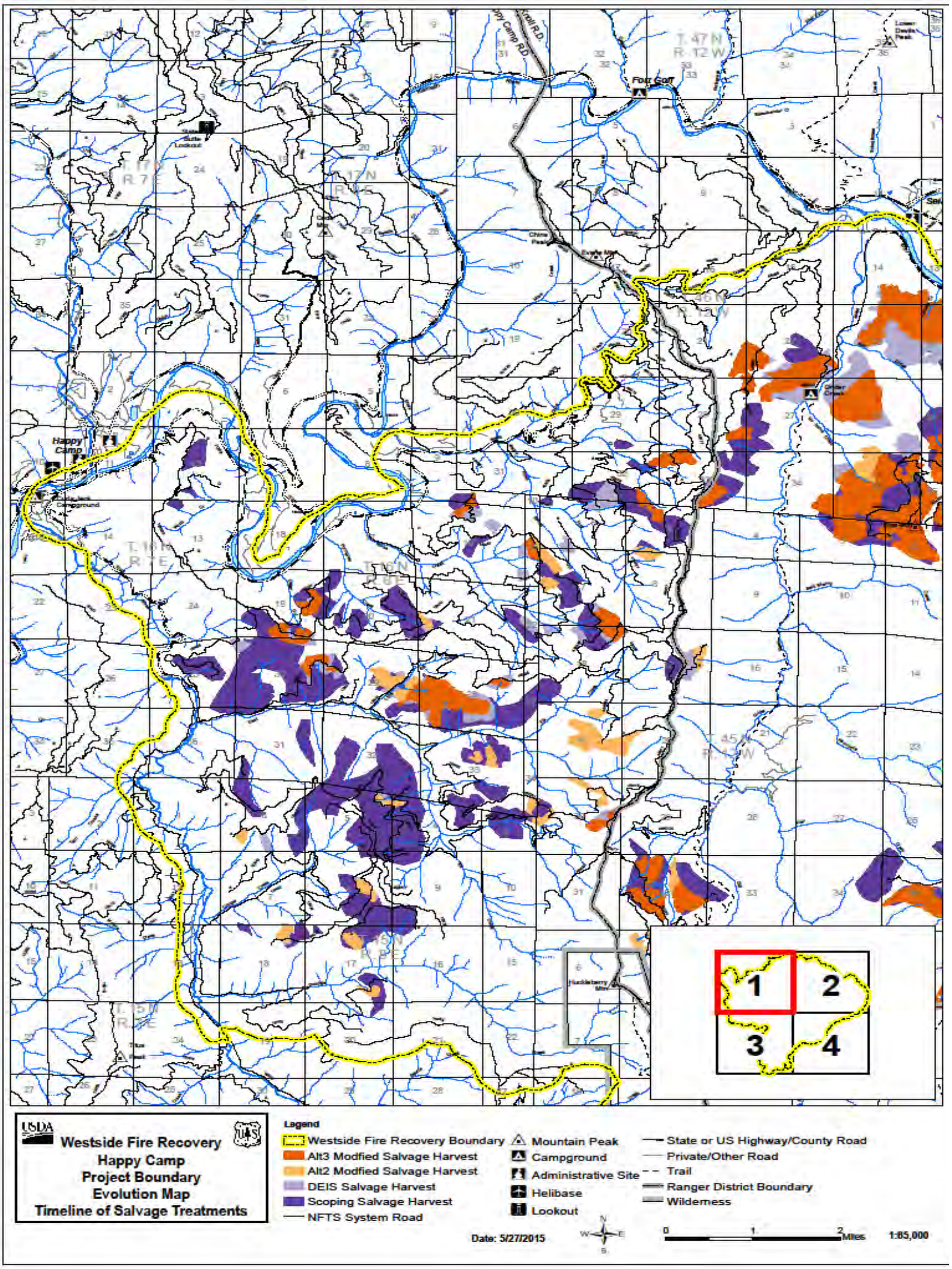

Map A-27: Evolution Map – northwest section of the Happy Camp Complex

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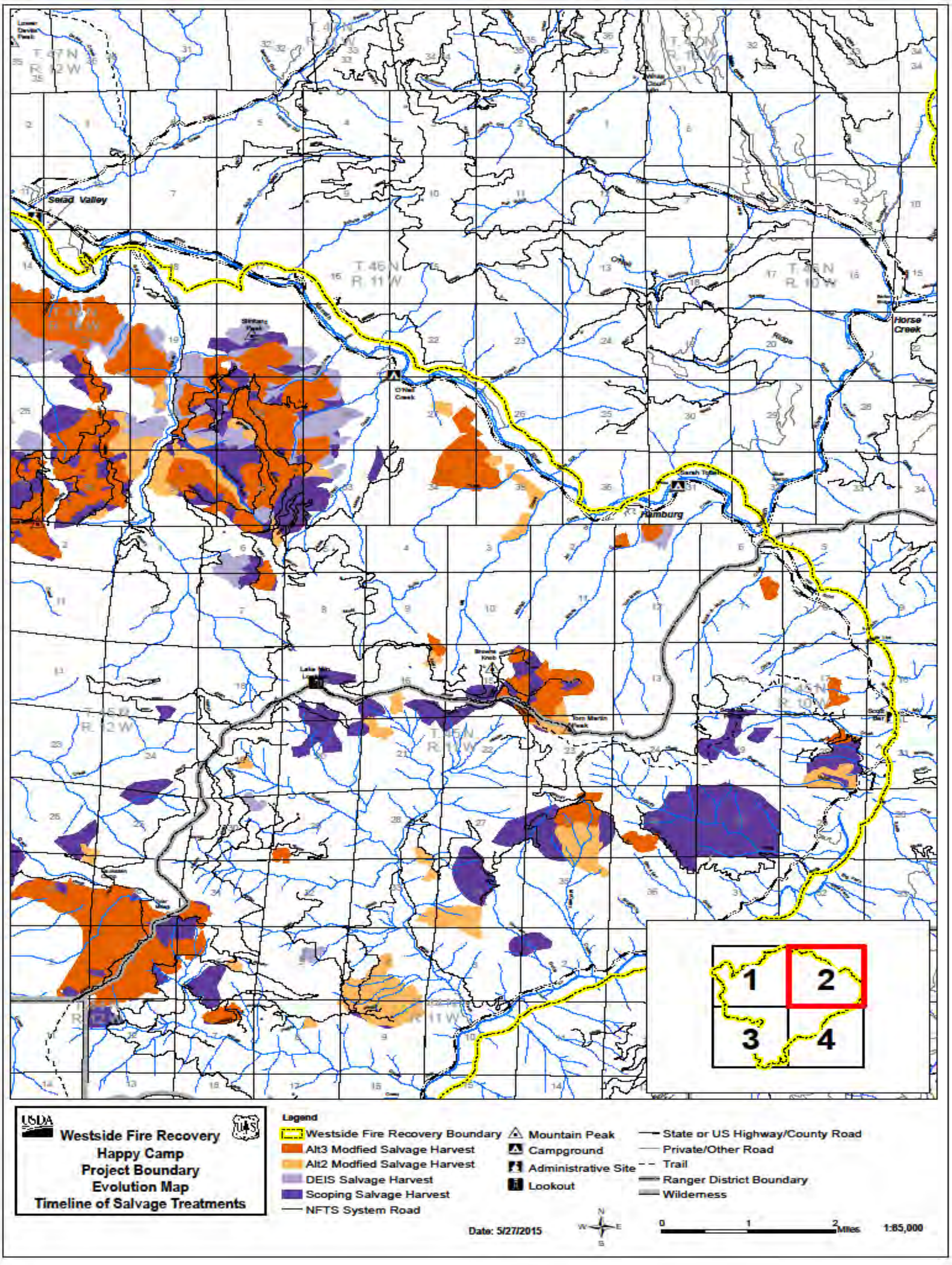

Map A-28: Evolution Map – northeast section of the Happy Camp Complex

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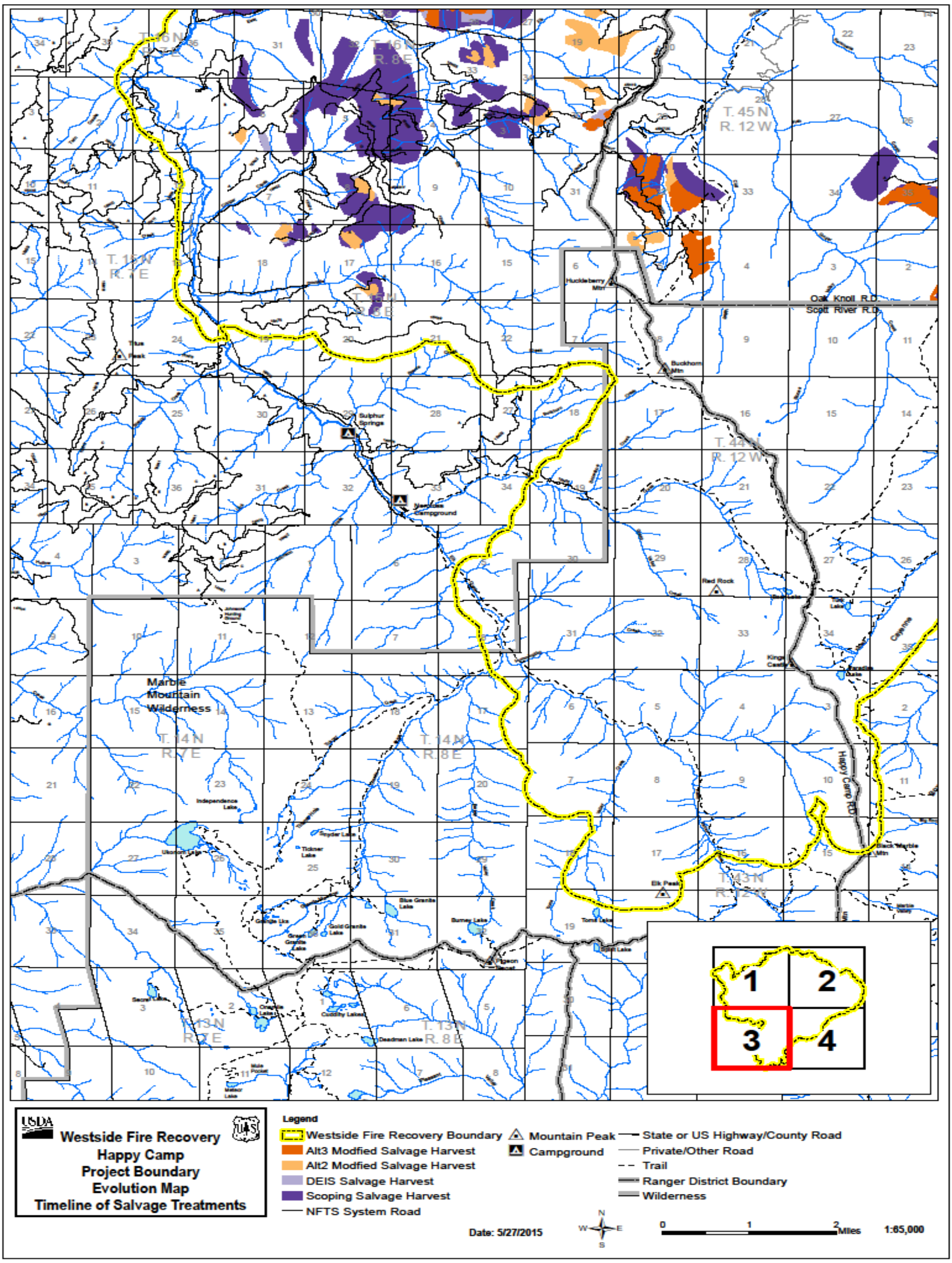

Map A-29: Evolution Map – southwest section of the Happy Camp Complex

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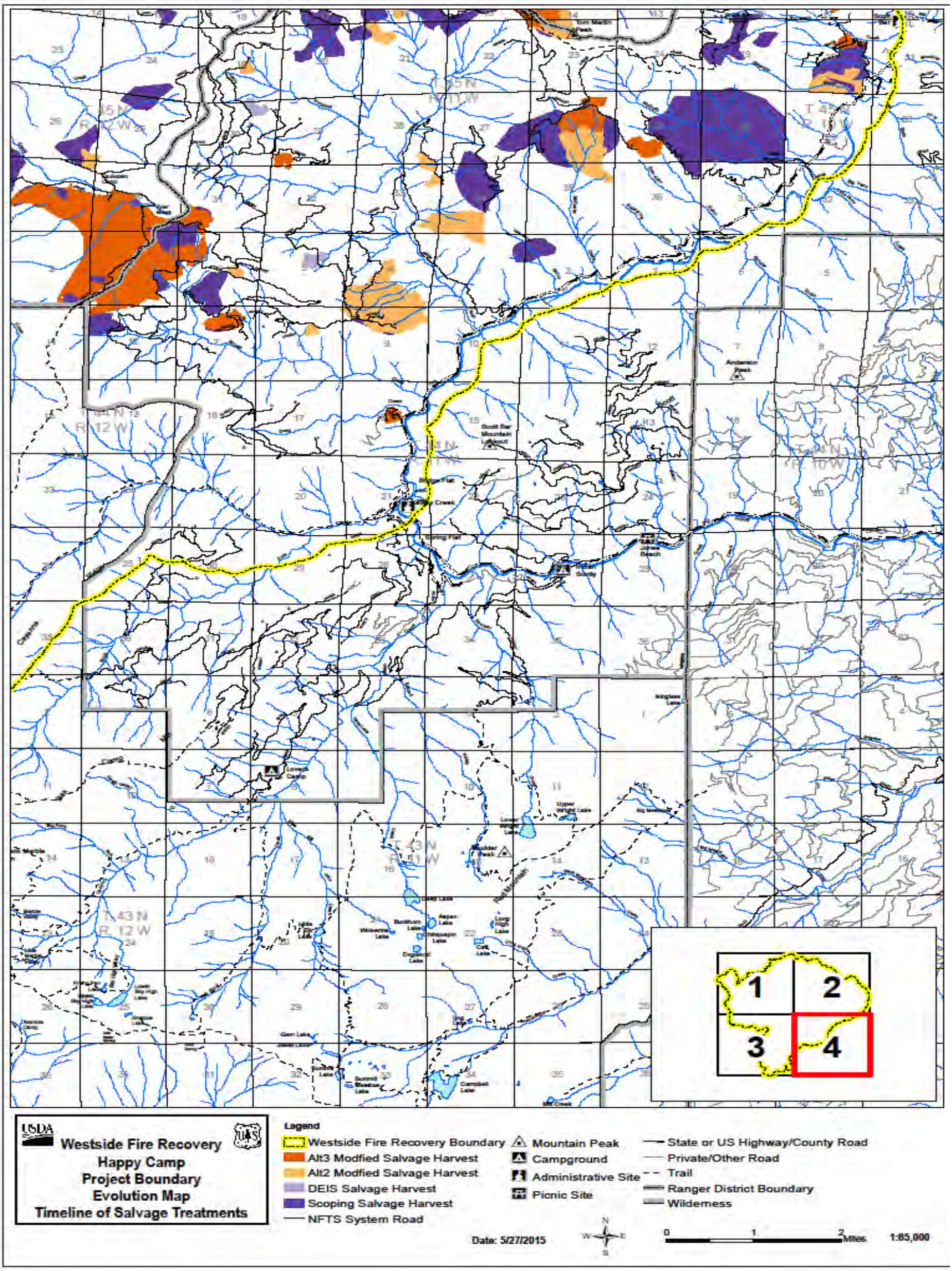

Map A-30: Evolution Map – southeast section of the Happy Camp Complex

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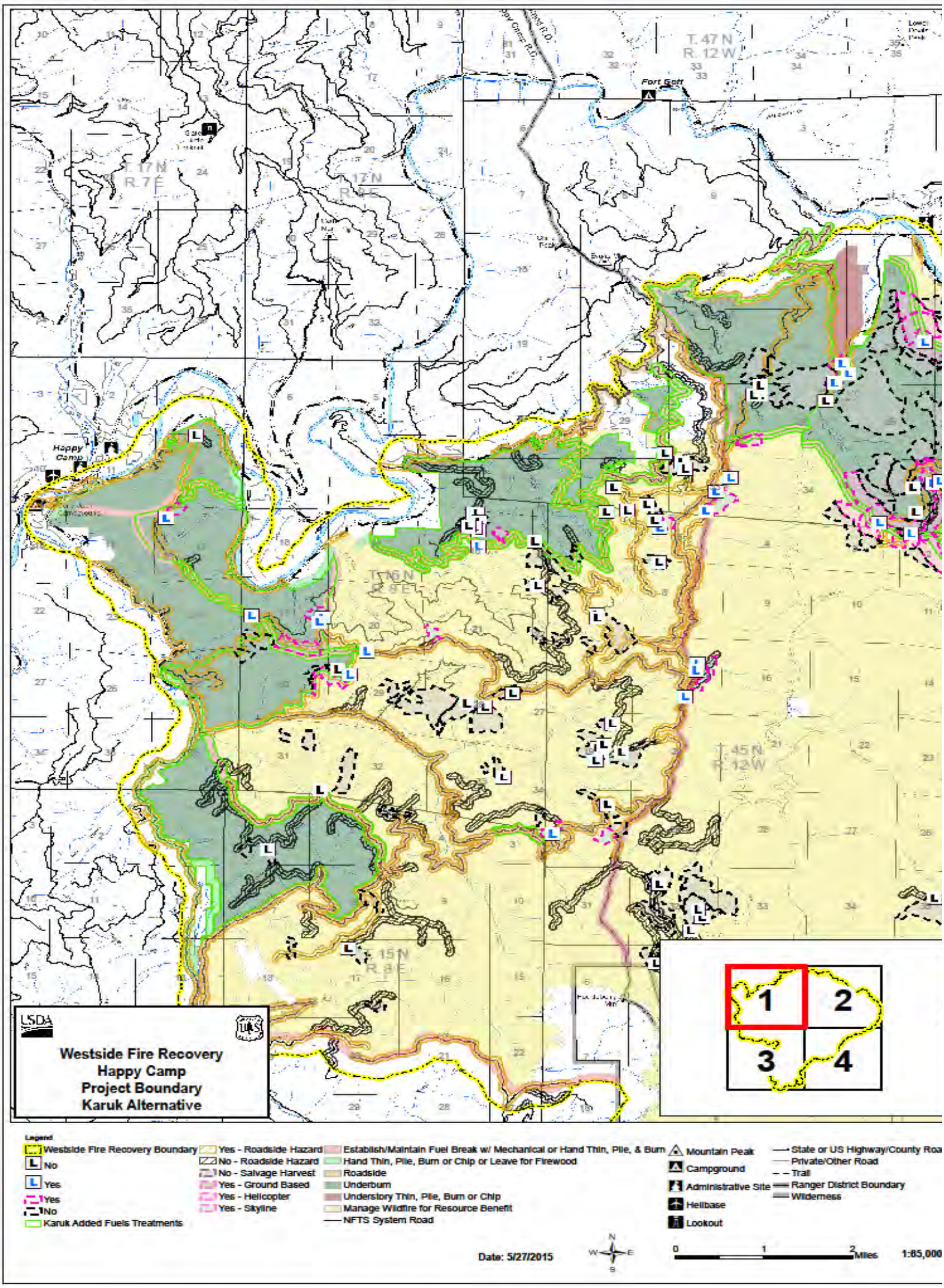

Map A-31: Karuk Alternative – northwest section of the Happy Camp Complex

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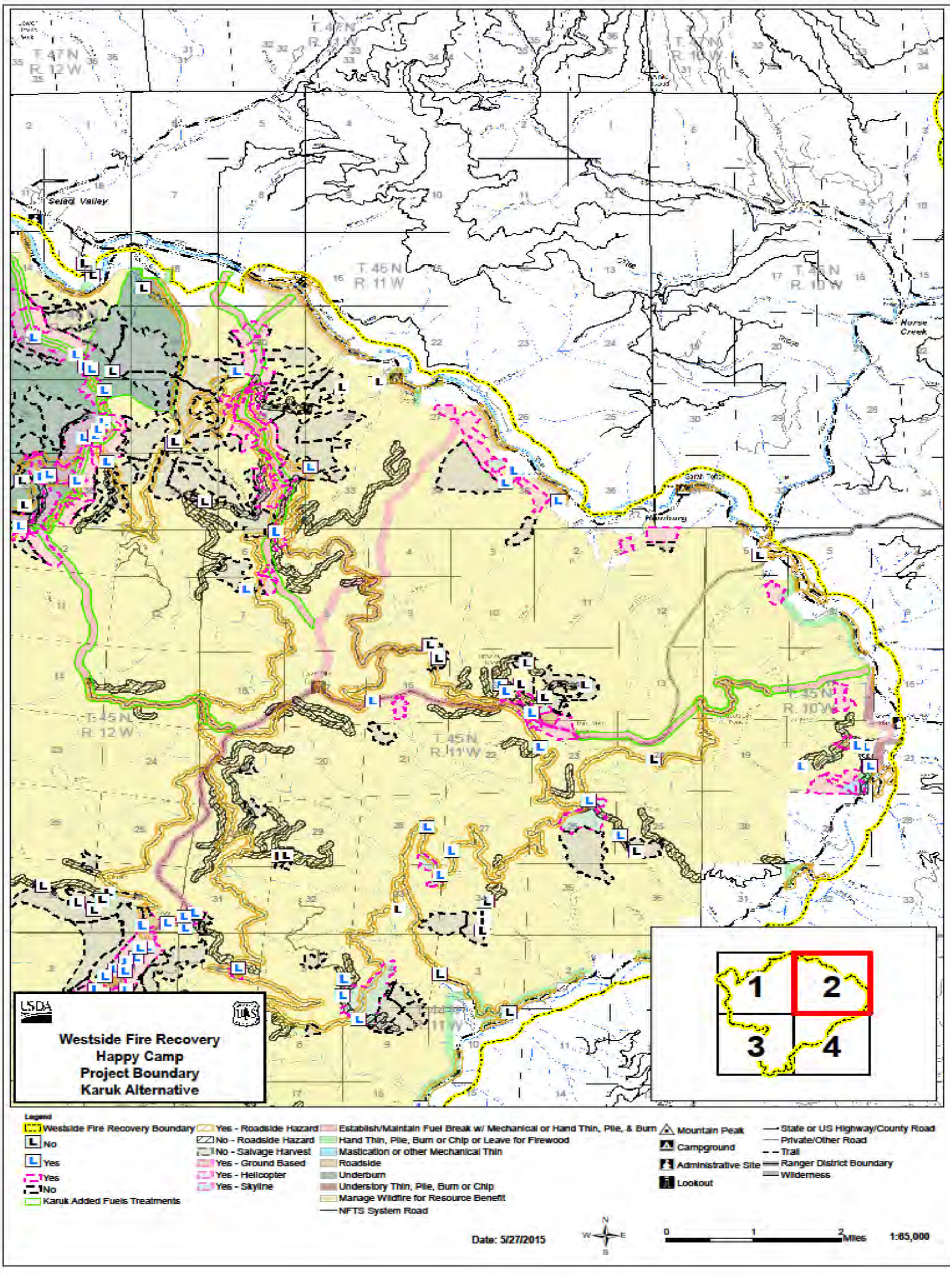

Map A-32: Karuk Alternative – northeast section of the Karuk Alternative

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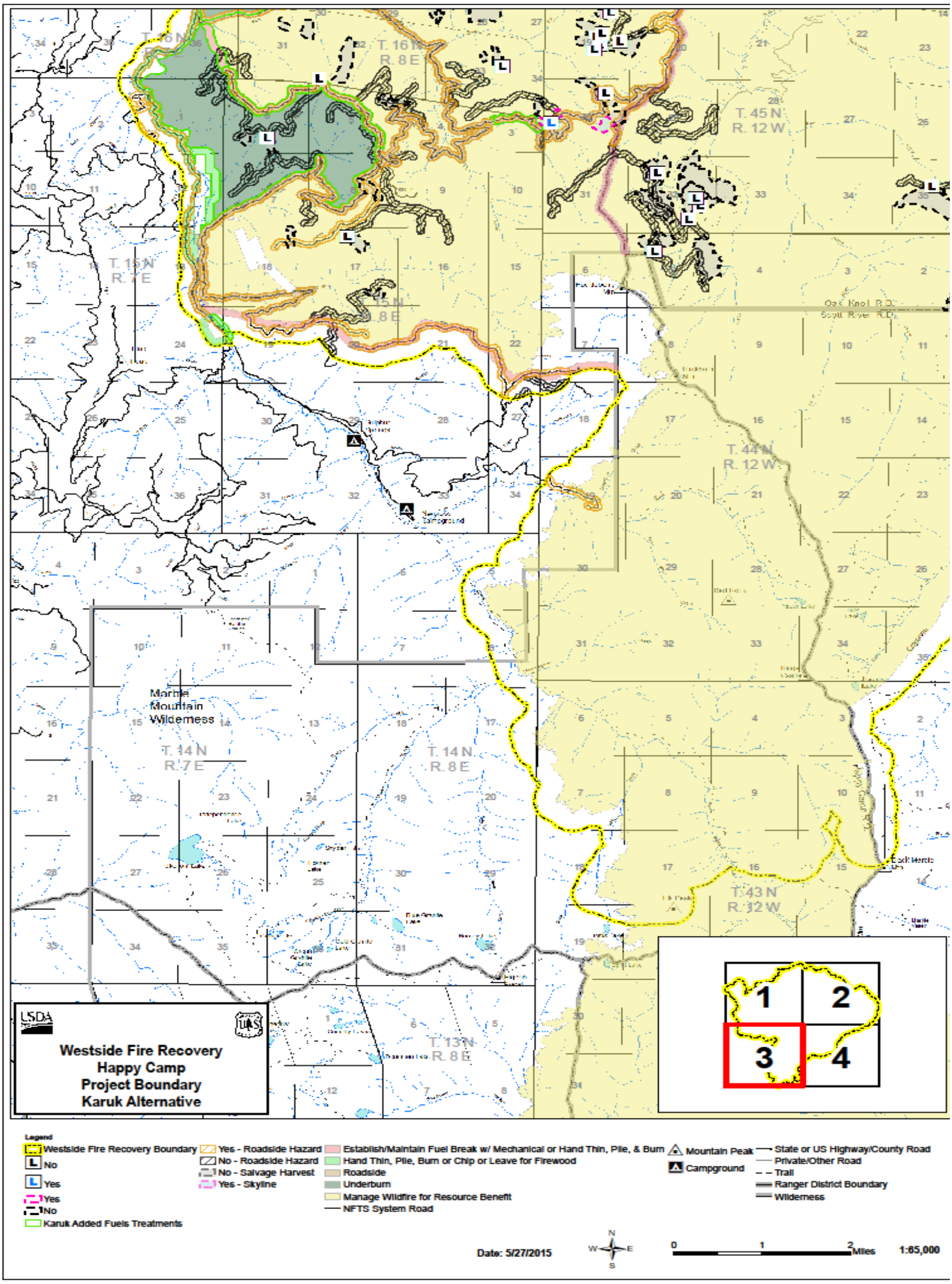

Map A-33: Karuk Alternative – southwest section of the Happy Camp Complex

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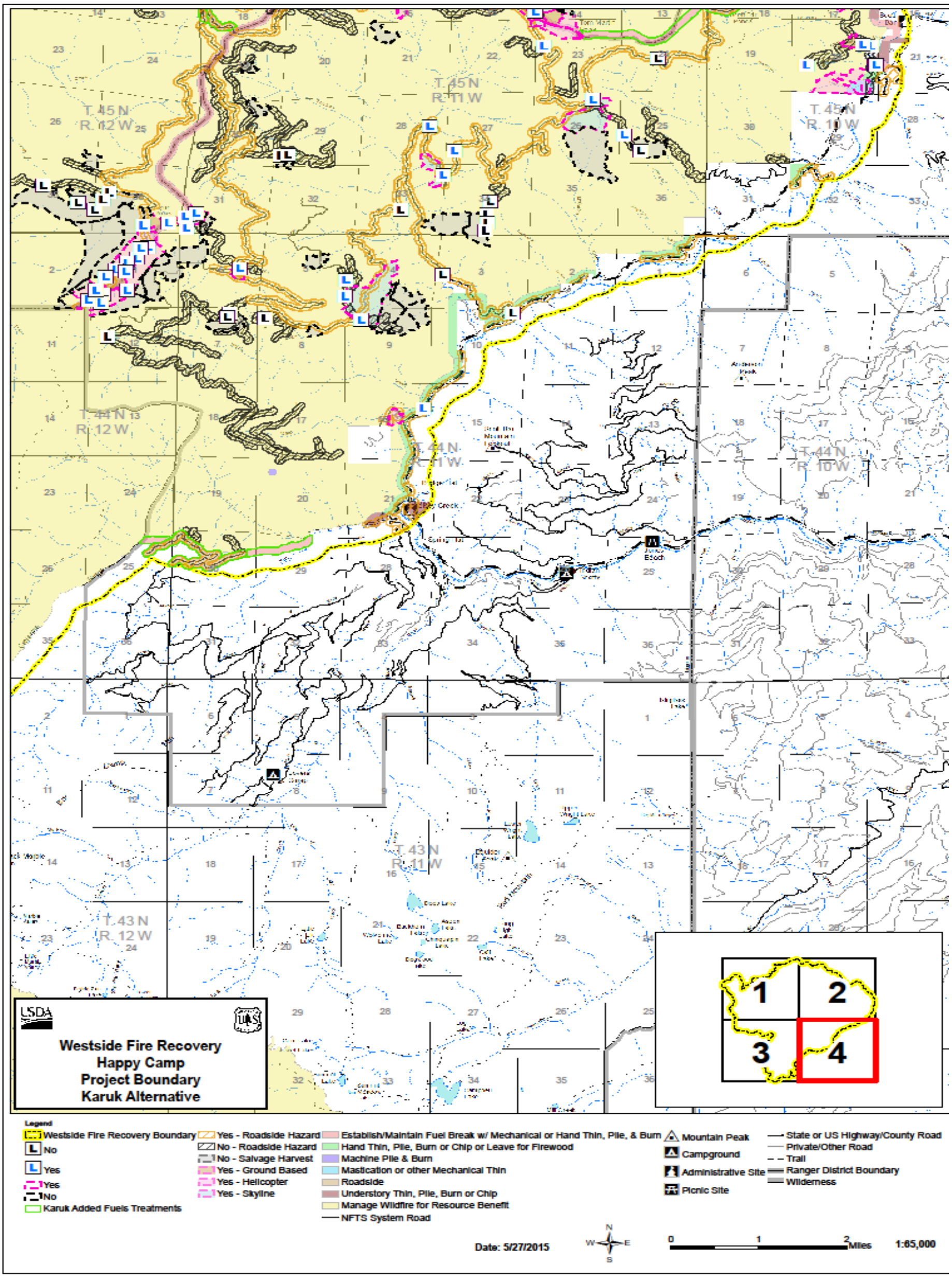

Map A-34: Karuk Alternative – southeast section of the Happy Camp Complex

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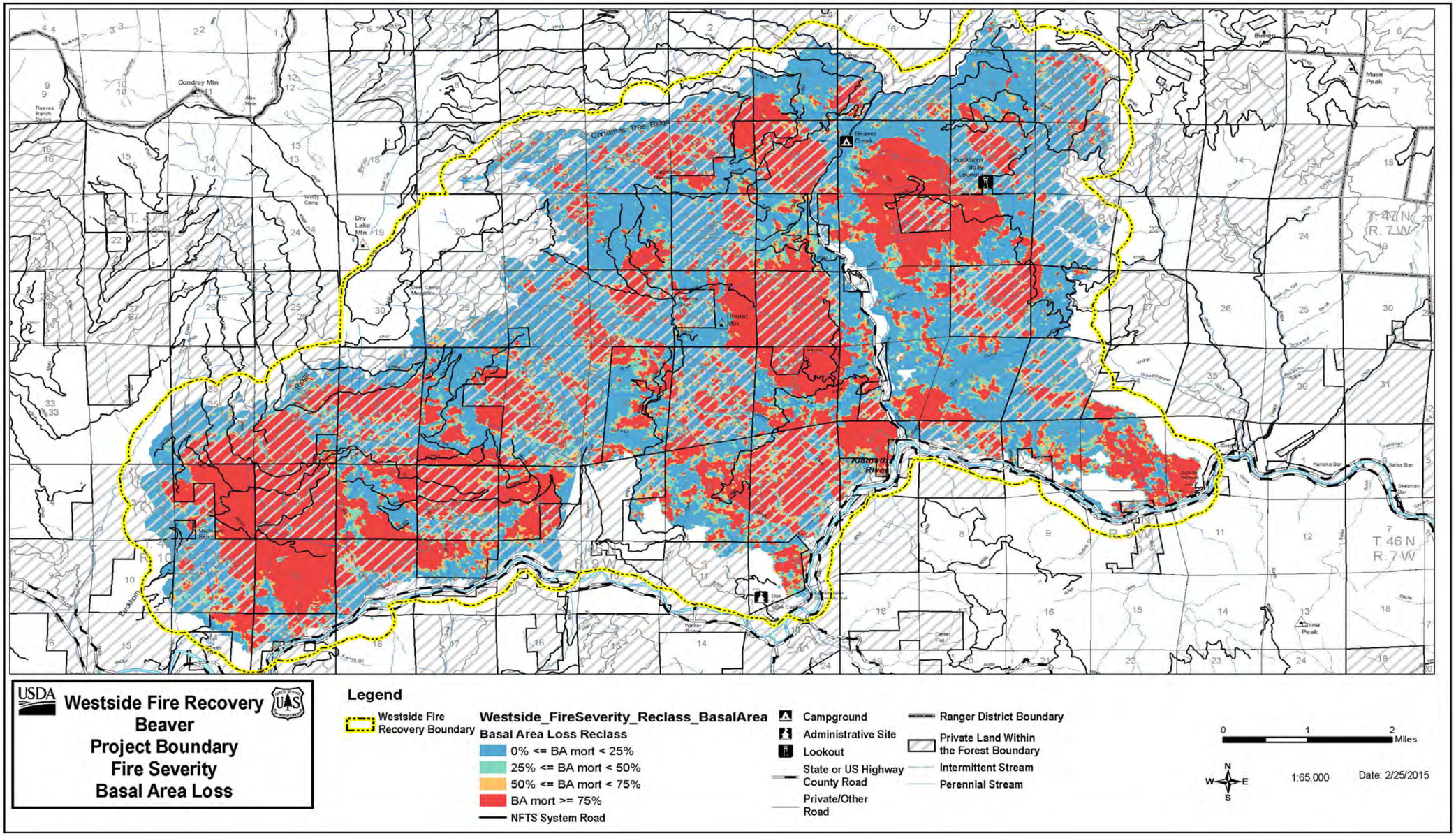

Map A-35: RAVG Map – Beaver Fire

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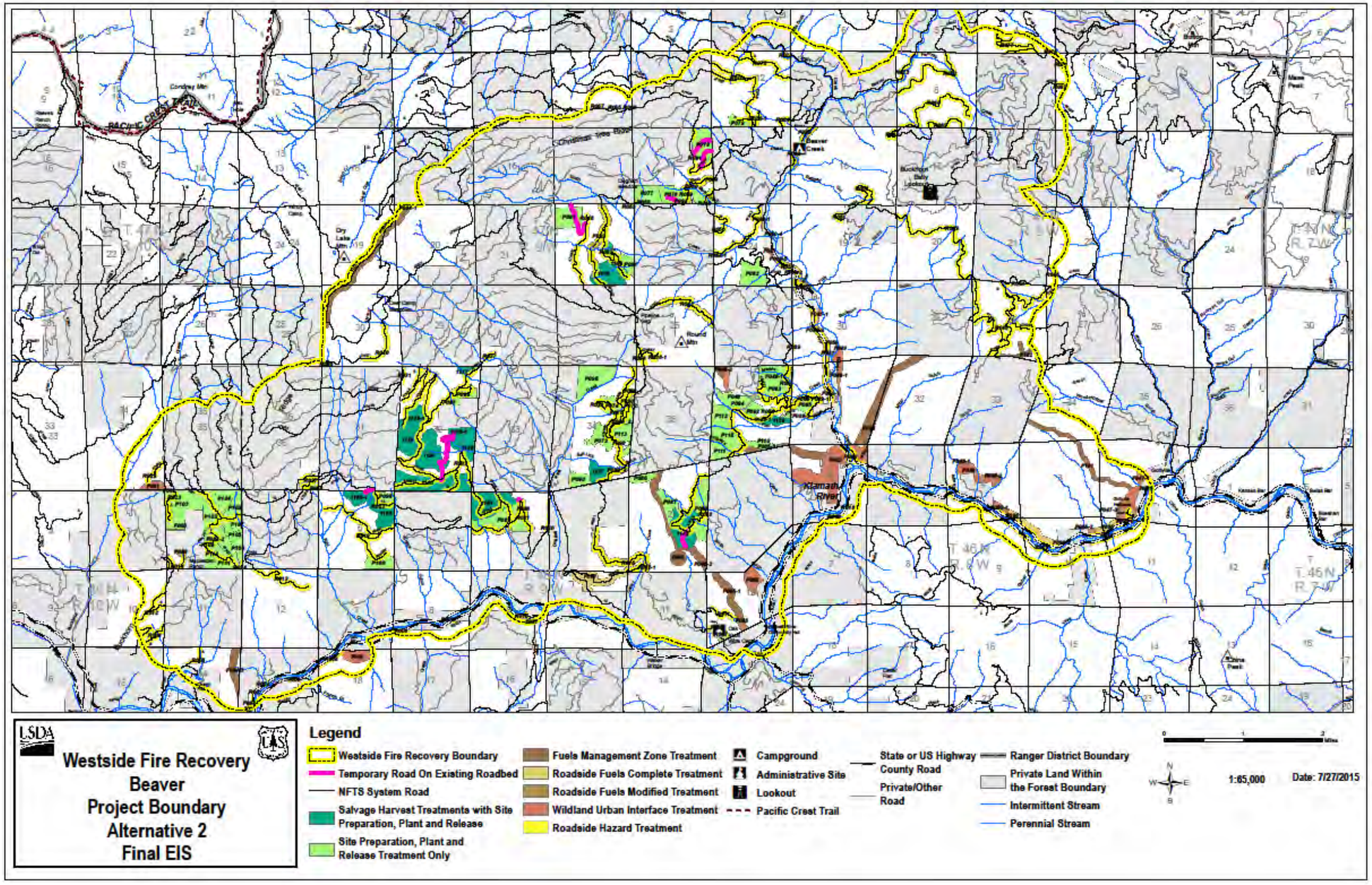

Map A-36: Alternative 2 – Beaver Fire

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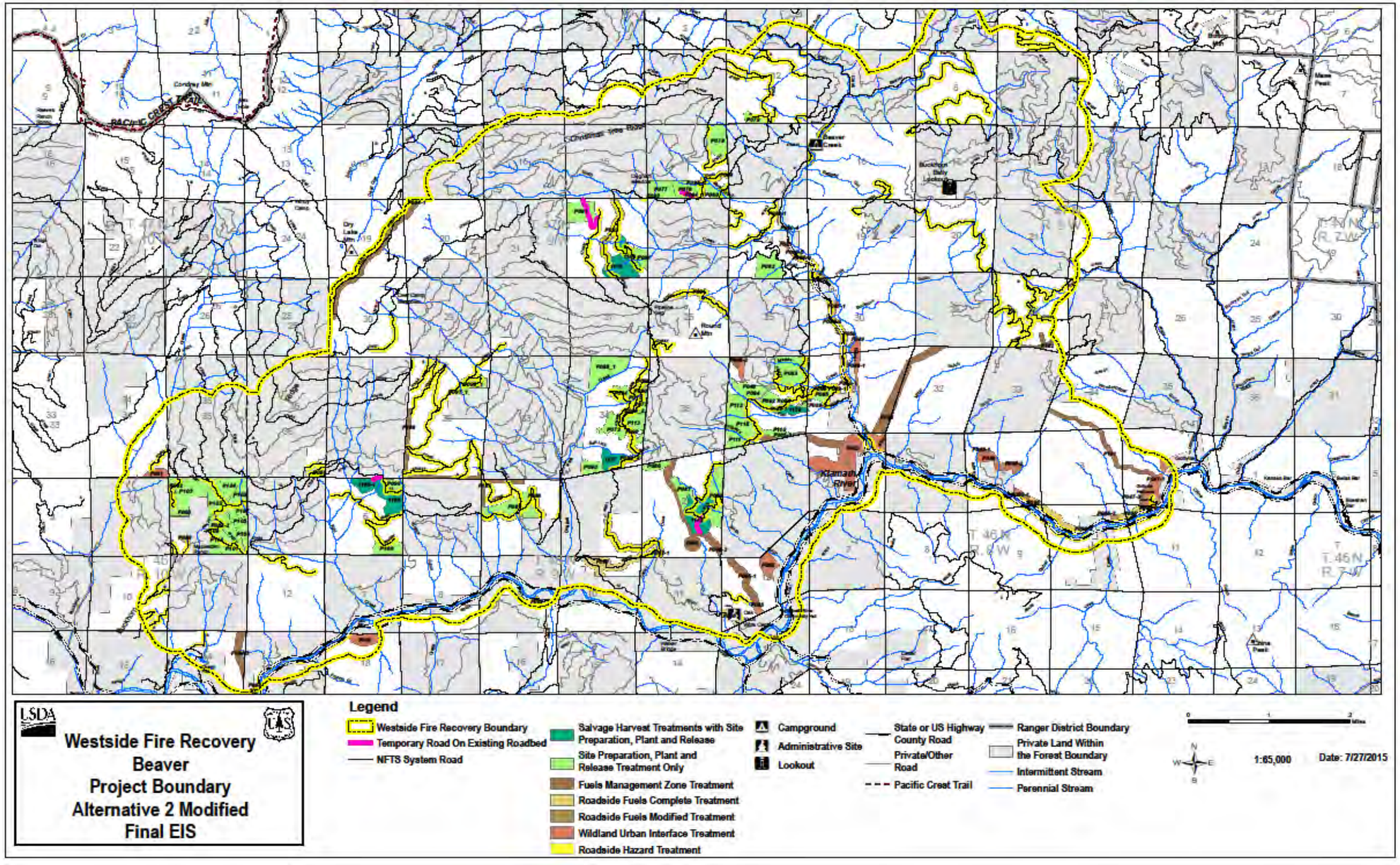

Map A-37: Alternative 2 Modified –Beaver Fire

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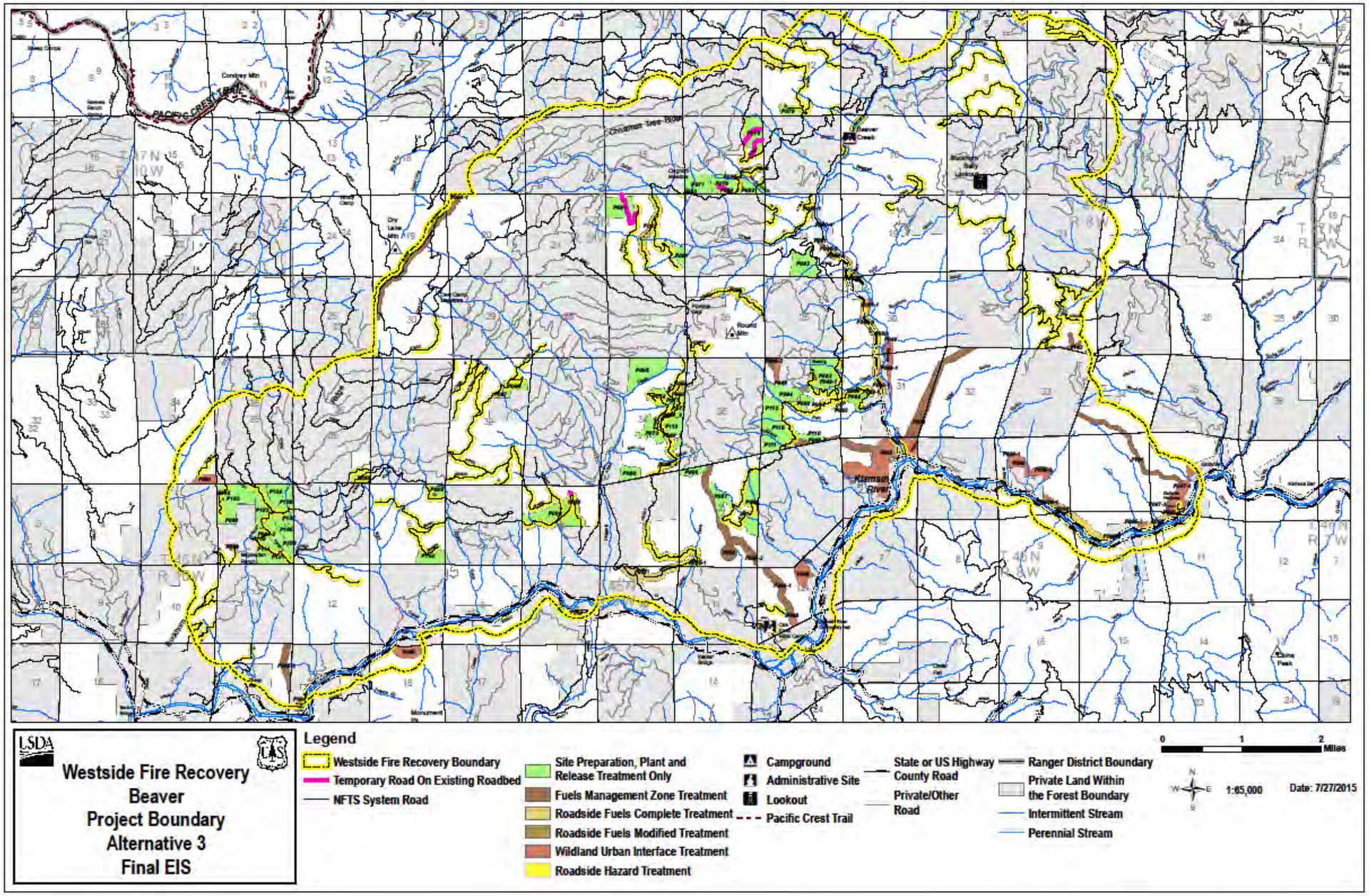

Map A-38: Alternative 3 – Beaver Fire

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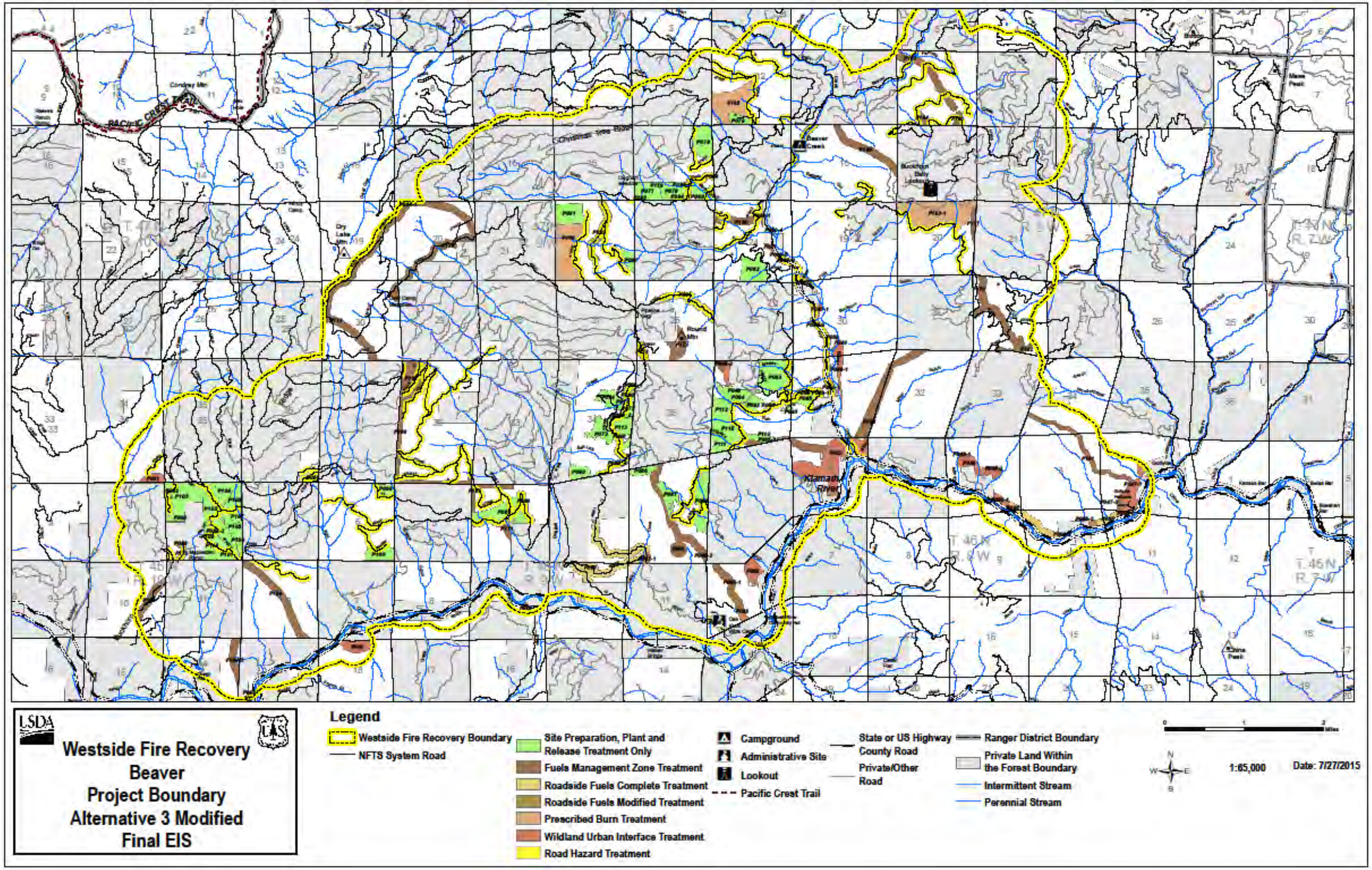

Map A-39: Alternative 3 Modified – Beaver Fire

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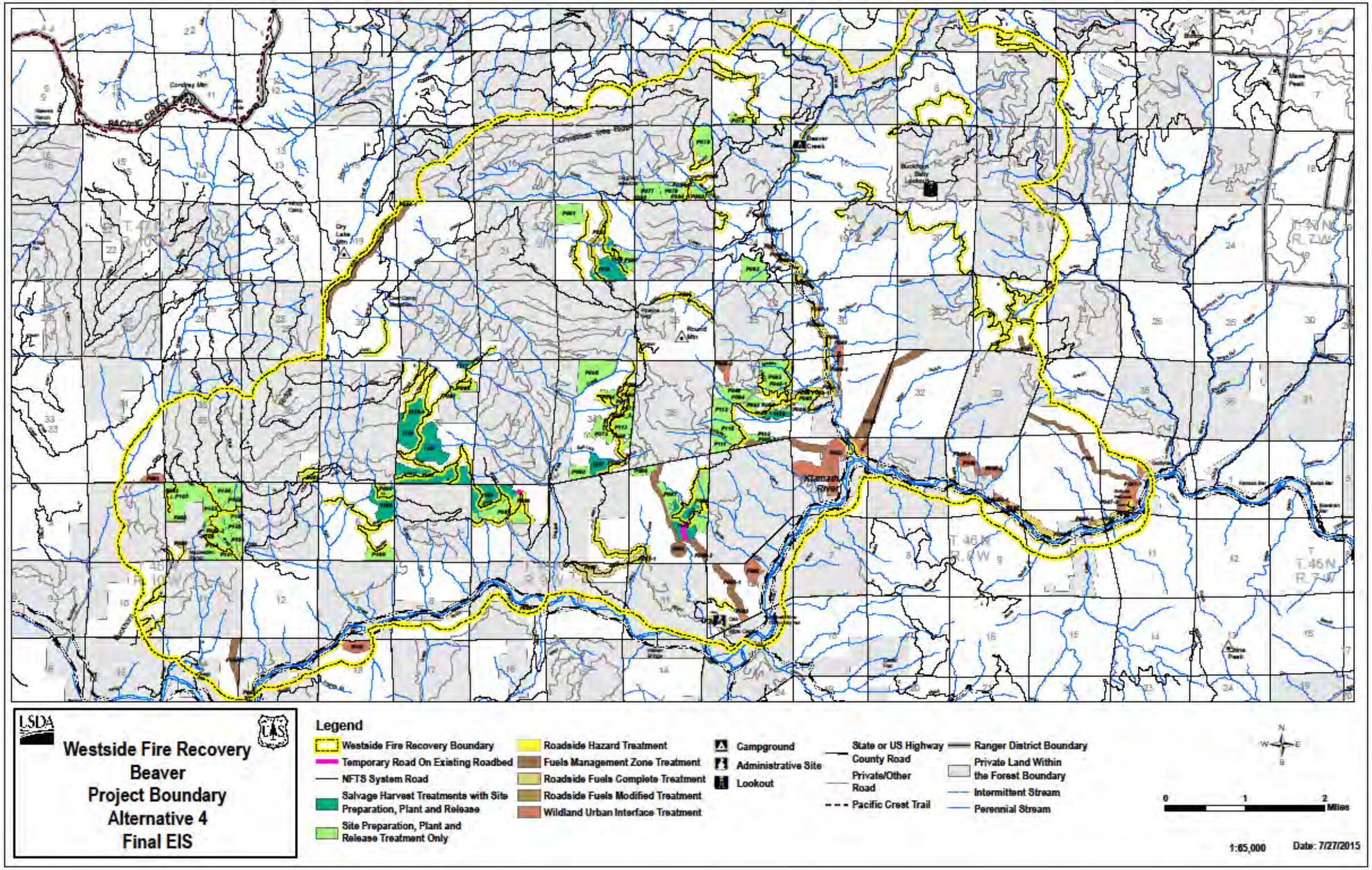

Map A-40: Alternative 4 – Beaver Fire

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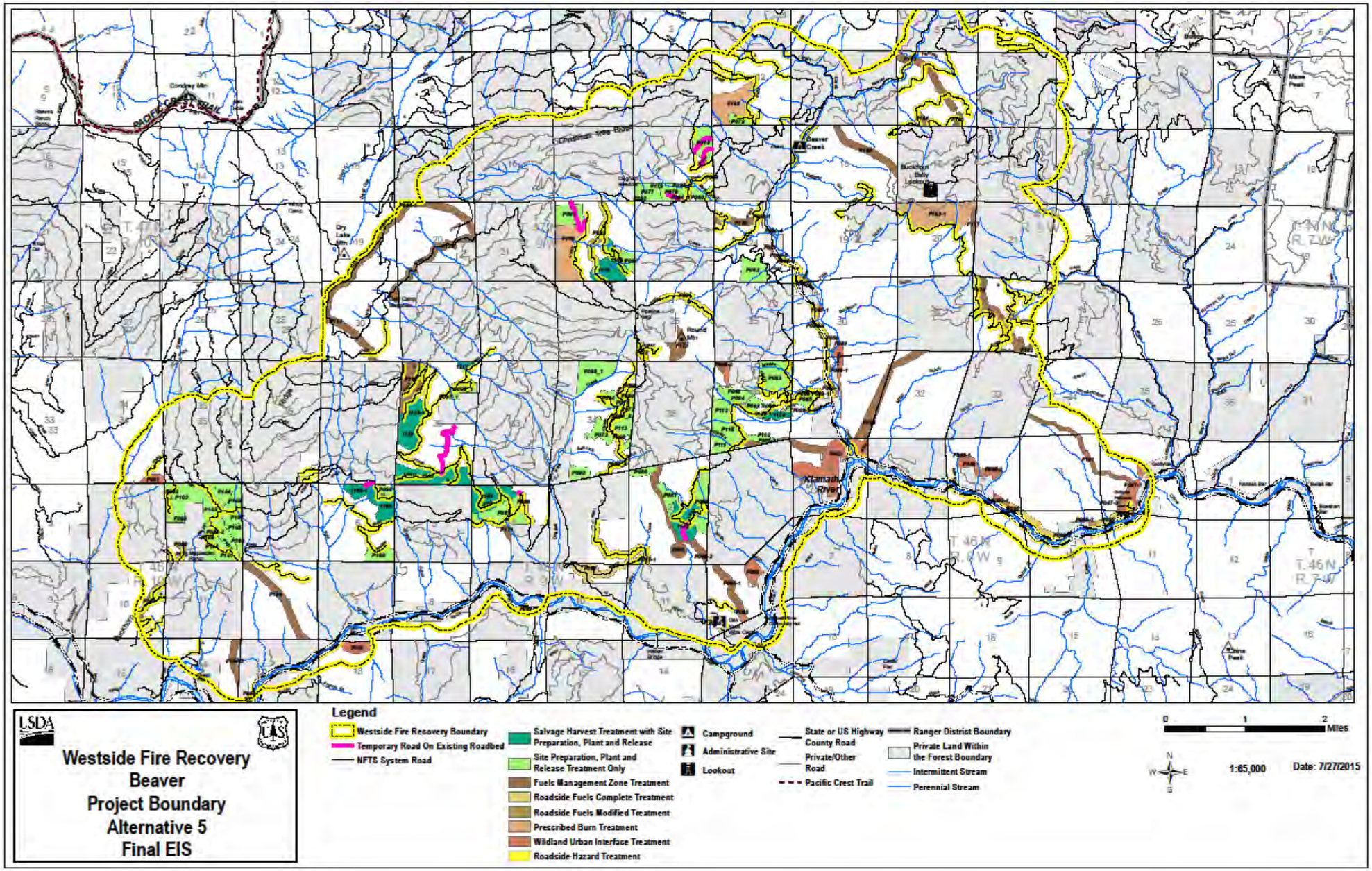

Map A-41: Alternative 5 – Beaver Fire

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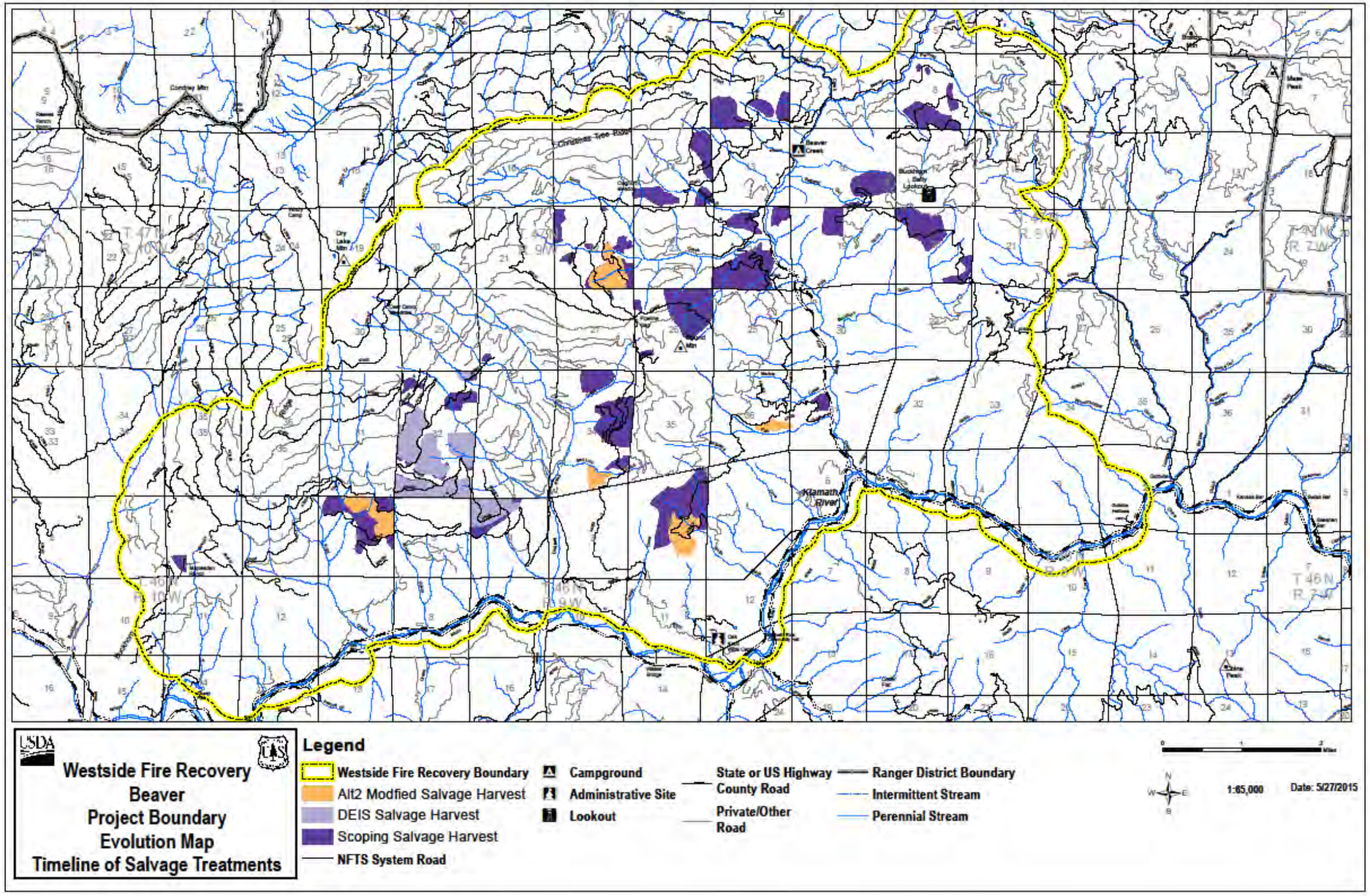

Map A-42: Evolution Map – Beaver Fire

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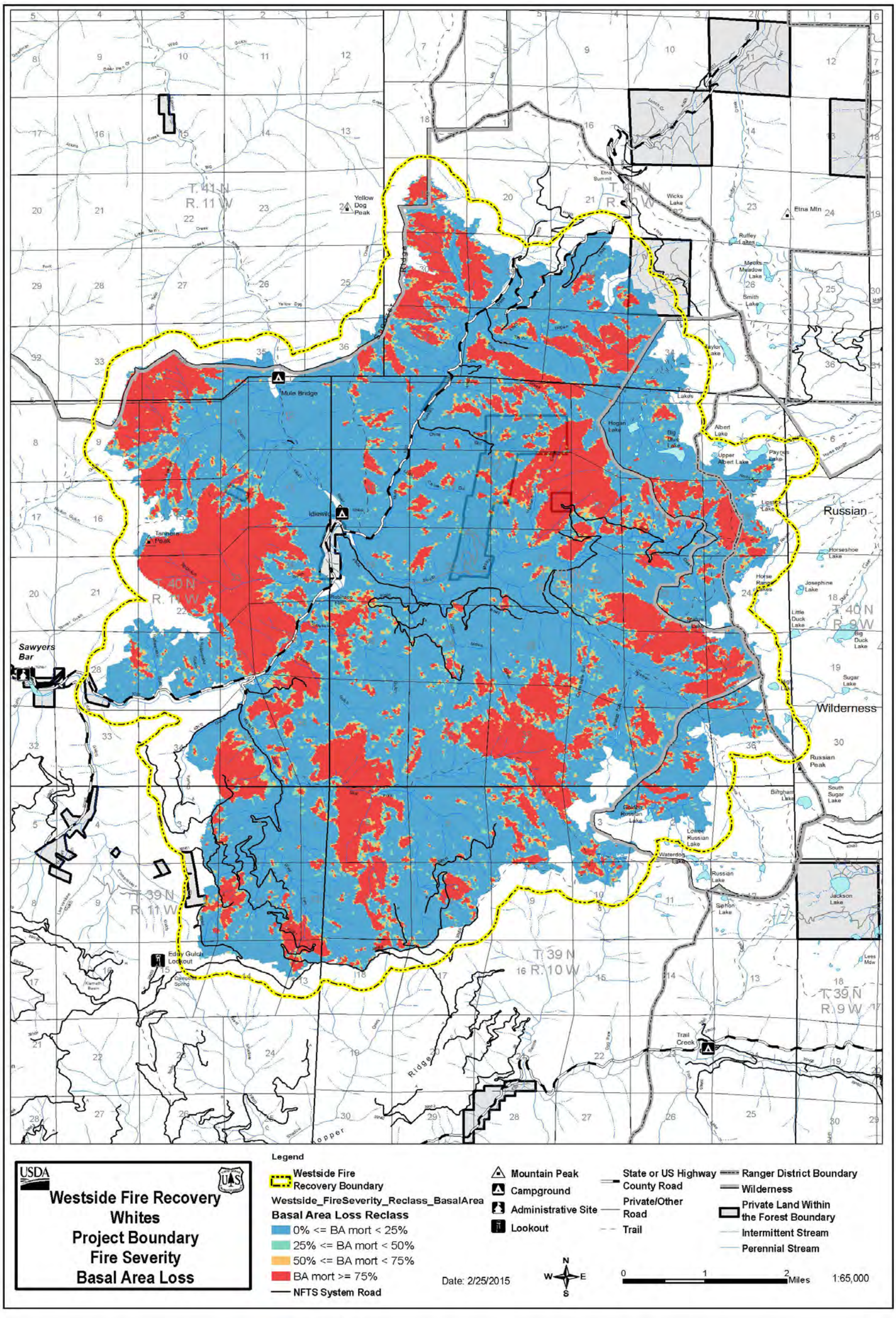

Map A-43: RAVG Map – Whites Fire

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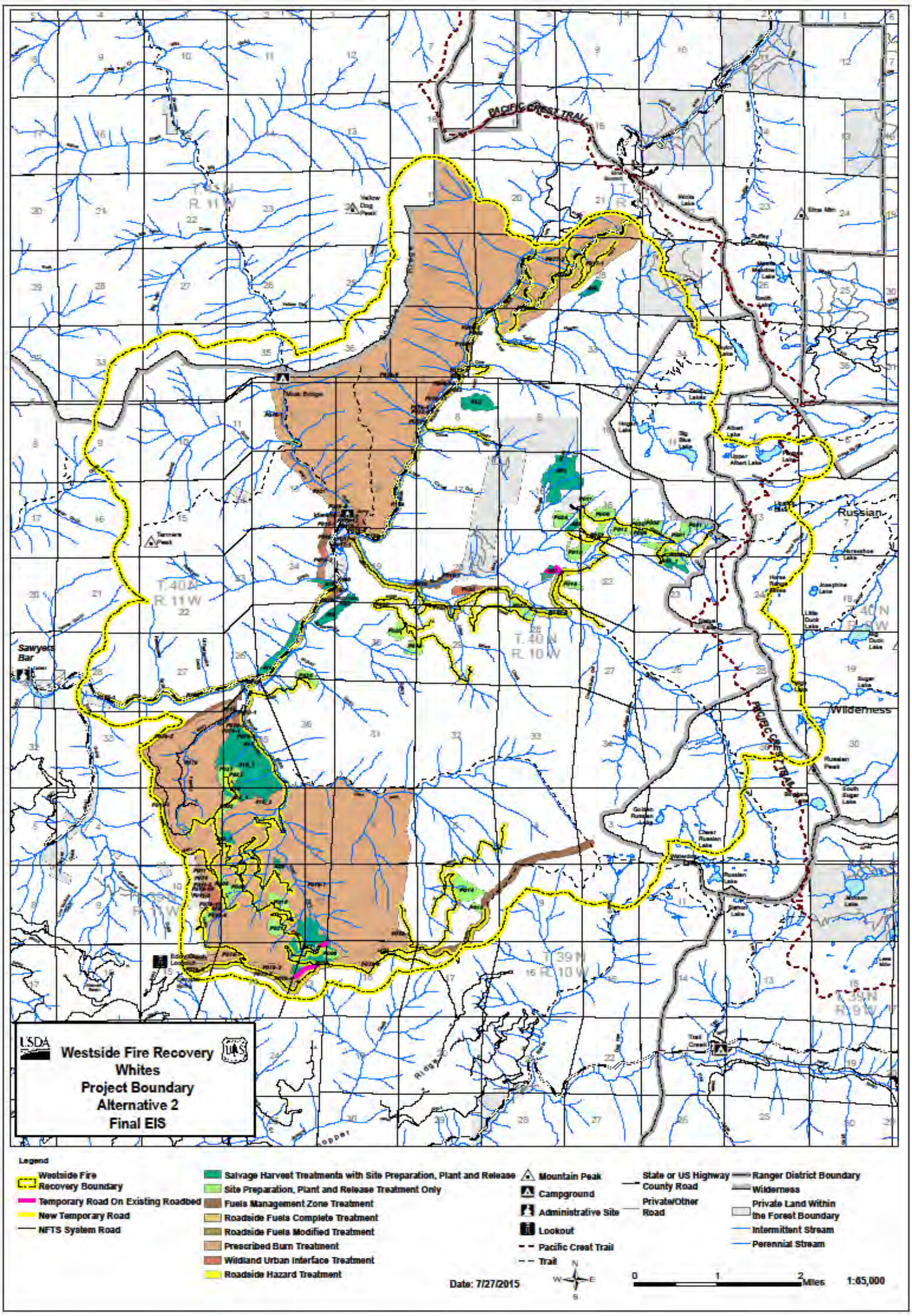

Map A-44: Alternative 2 – Whites Fire

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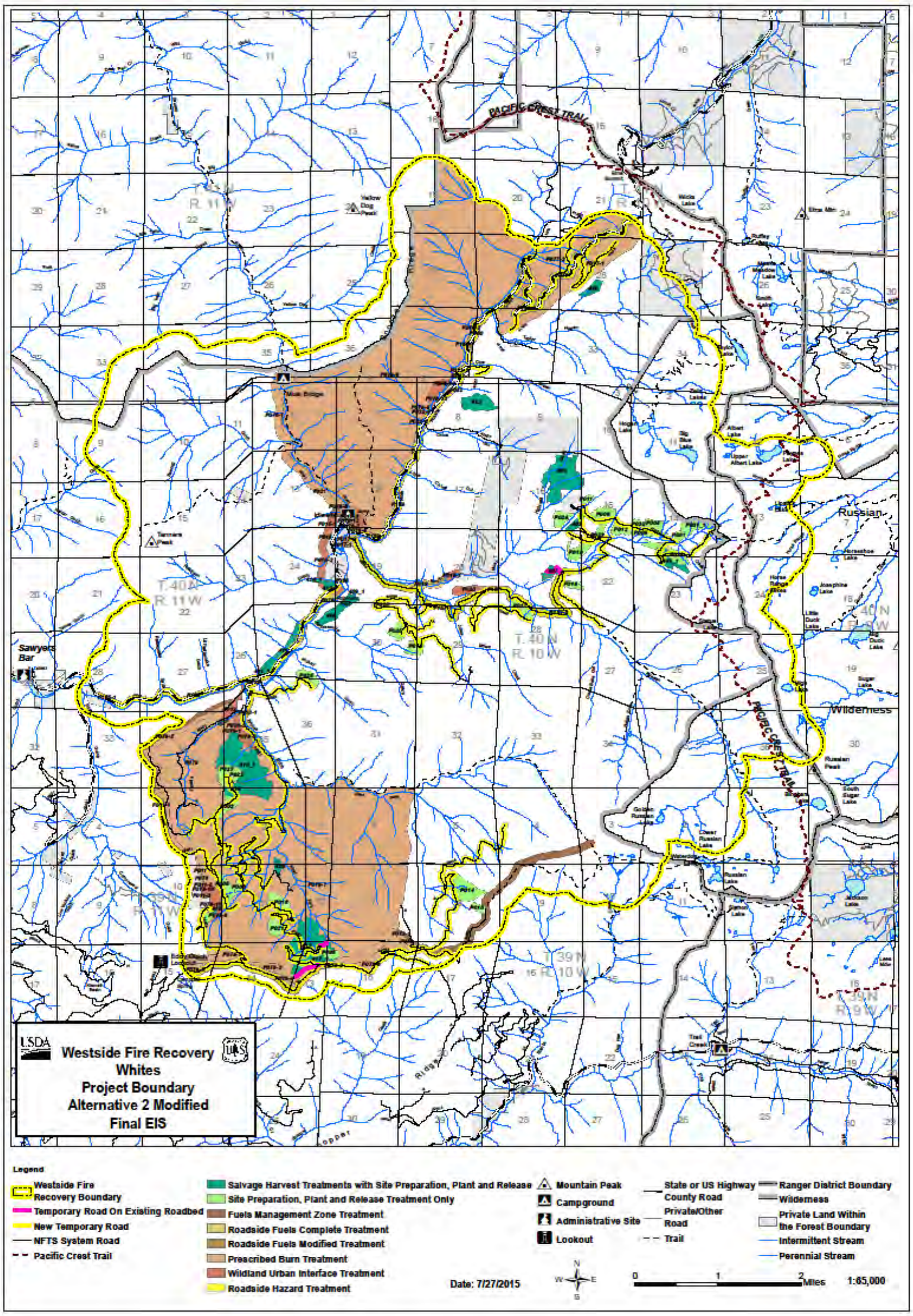

Map A-45: Alternative2 Modified – Whites Fire

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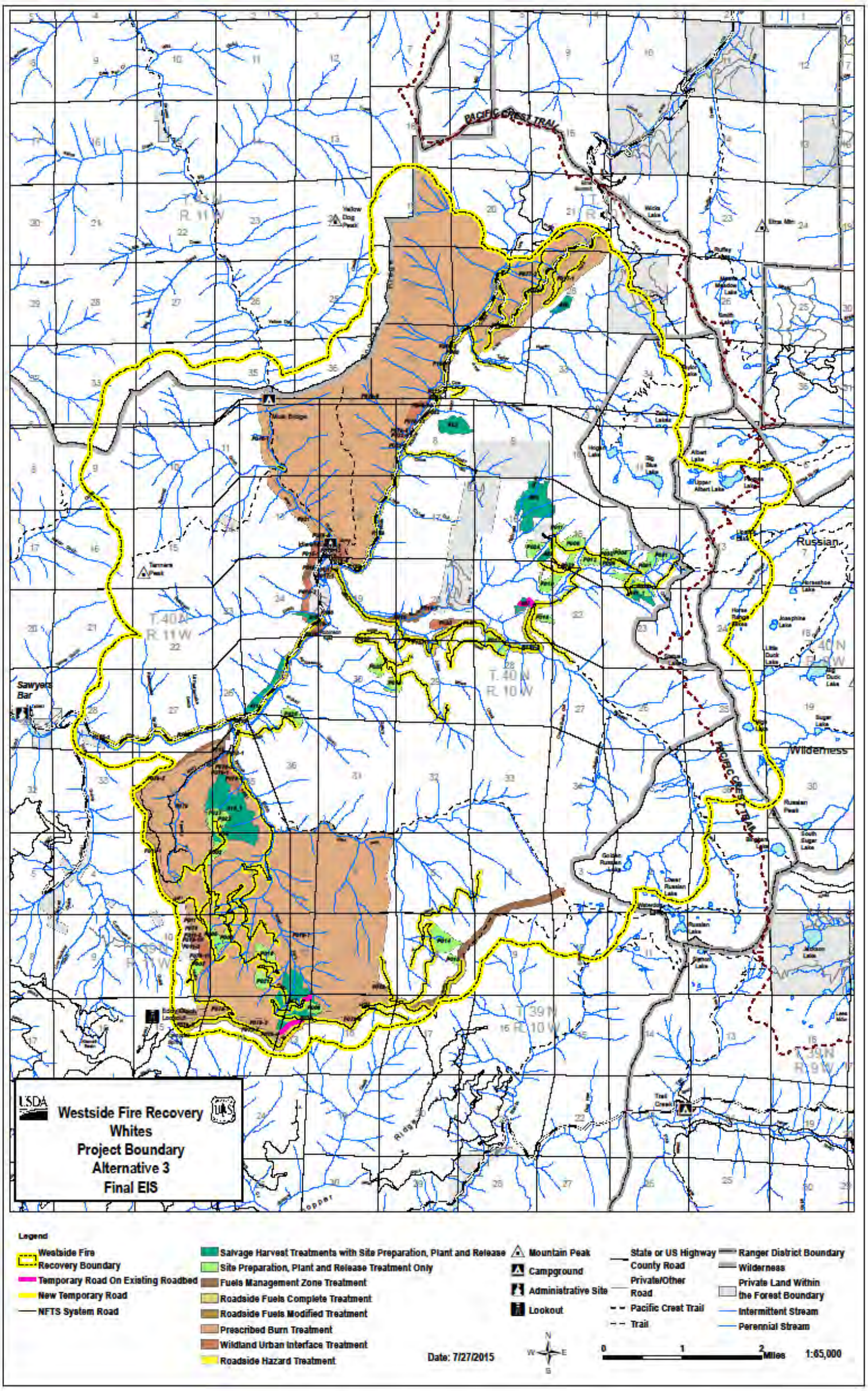

Map A-46: Alternative 3 – Whites Fire

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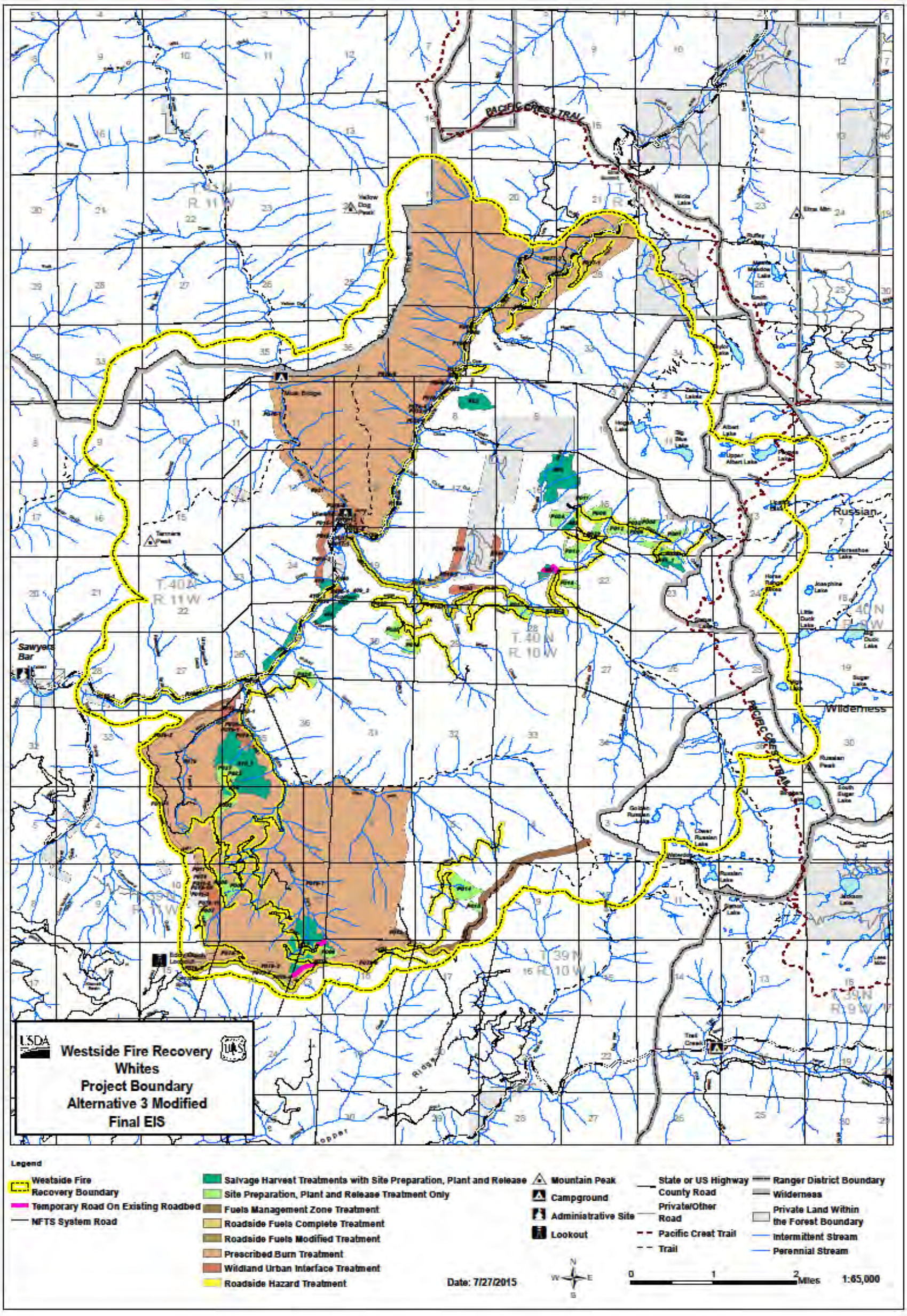

Map A-47: Alternative 3 Modified – Whites Fire

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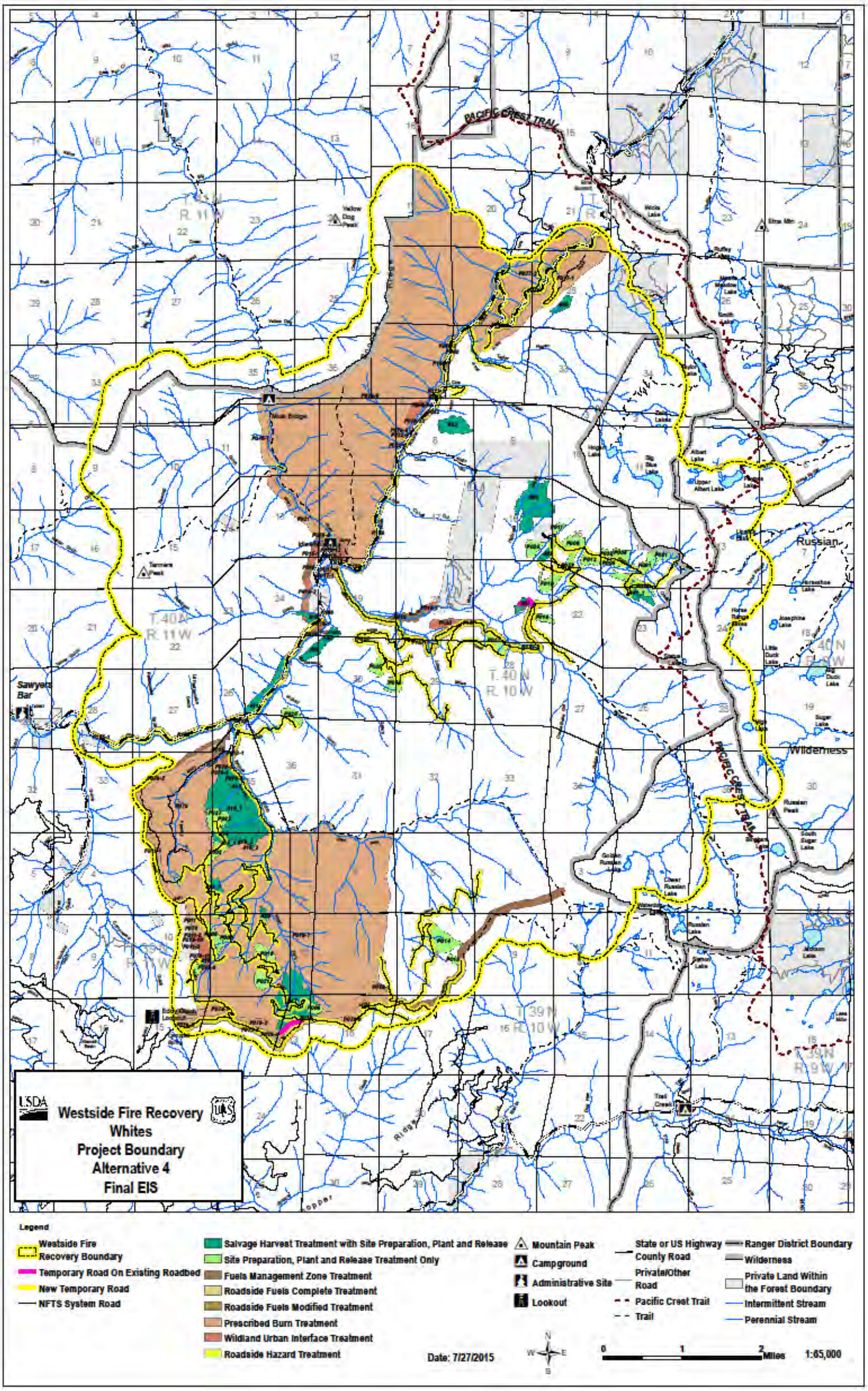

Map A-48: Alternative 4 – Whites Fire

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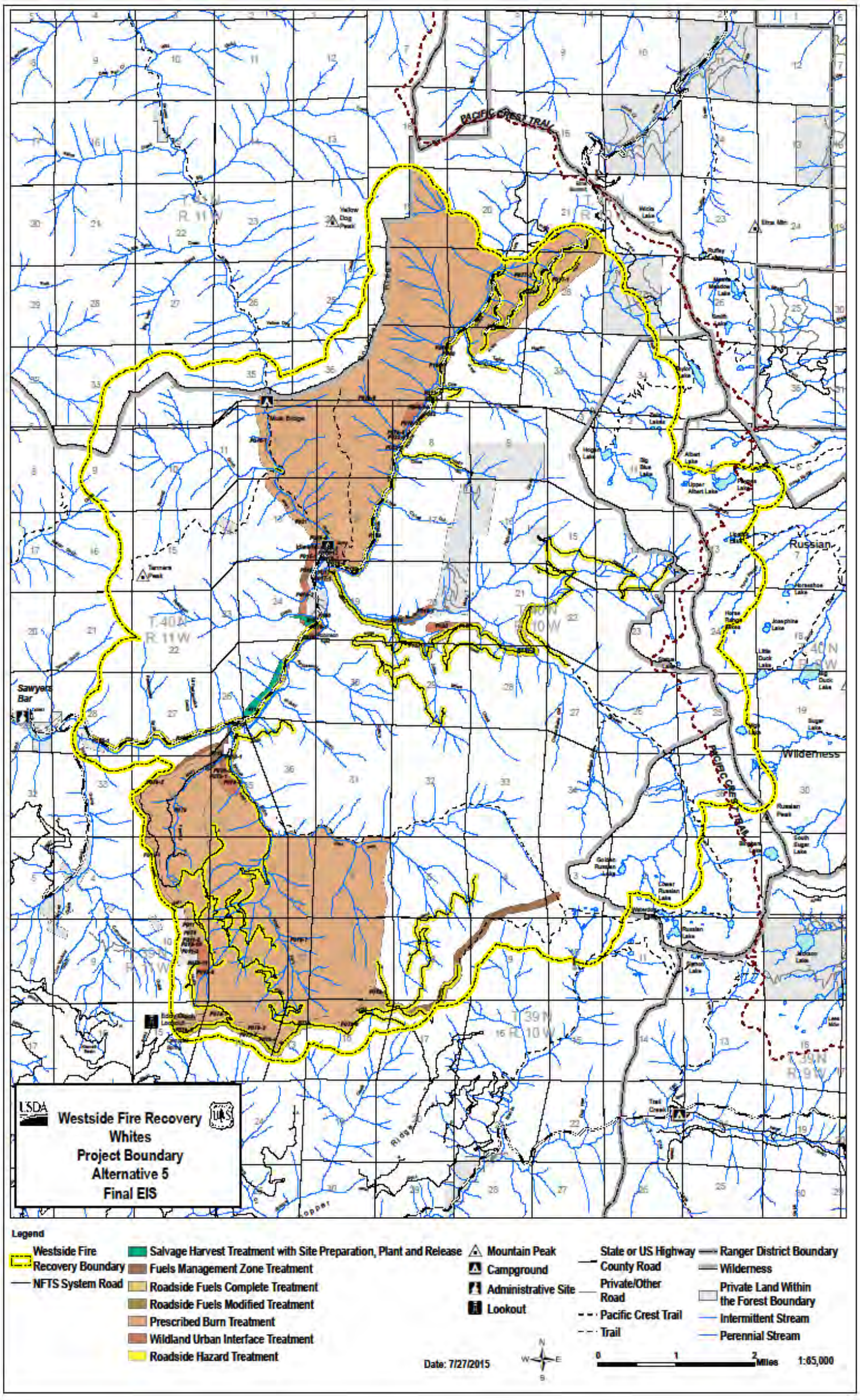

Map A-49: Alternative 5 – Whites Fire

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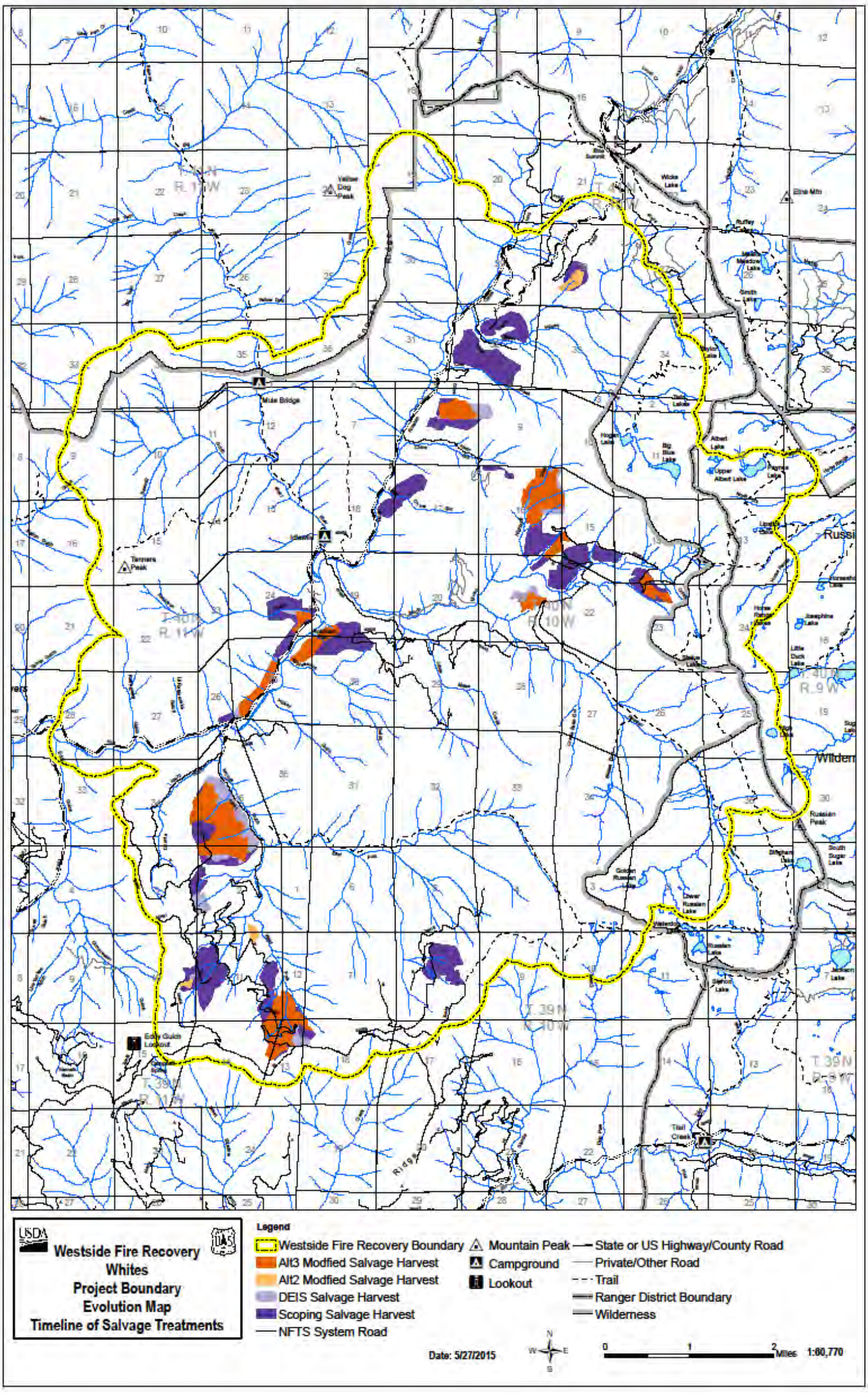

Map A-50: Evolution Map – Whites Fire

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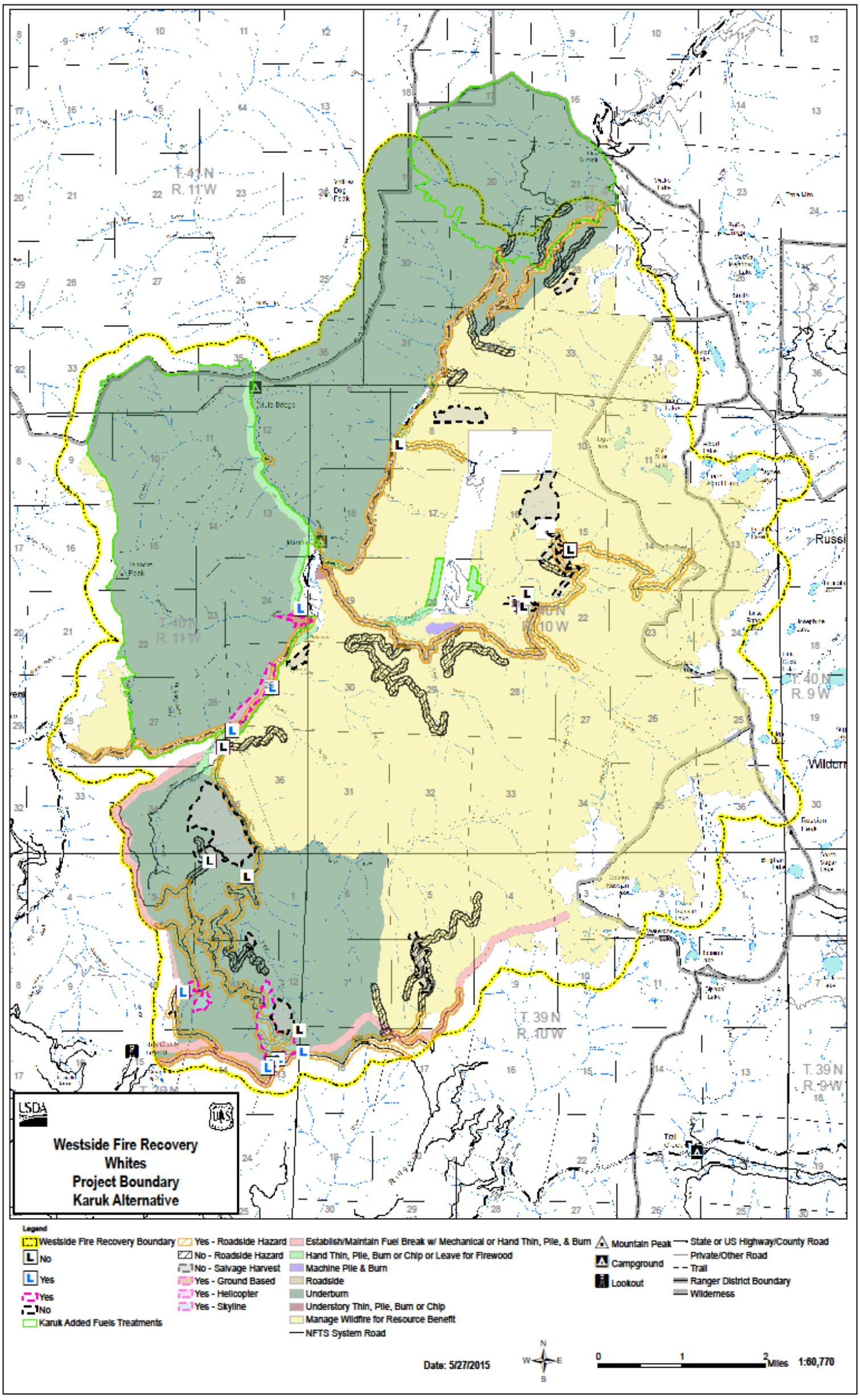

Map A-51: Karuk Alternative – Whites Fire

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Appendix B: Response to Comments on the Westside Fire Recovery Draft EIS

Comment Period on the Draft Environmental Impact Statement

On March 6, 2015, the draft environmental impact statement (EIS) and supporting documents for the Westside Fire Recovery Project (Project) were posted to the project's webpage (http://www.fs.fed.us/nepa/nepa_project_exp.php?project=45579). Notifications of the publication of the draft EIS were sent to interested and affected parties, including other public agencies, tribes, adjacent property owners, and interested groups and individuals by email or by letter. On March 6, 2015, the Council on Environmental Quality granted the Forest Service alternative arrangements, shortening the required comment period on the draft EIS from 45 to 30 days. On March 13, 2015, a Notice of Availability was published in the Federal Register and a legal notice was published in the Siskiyou Daily News, beginning the 30-day comment period. On April 3, 2015, a notice of extension of the draft EIS comment period was published in the Federal Register and the Siskiyou Daily News. The comment period was extended an additional 15 days in response to public requests for additional review and comment time. Comments received by April 27, 2015, were considered timely and addressed in this response to comments. See the public involvement section of chapter 1 for details about public involvement.

Methodology

Comments received before or after the comment period on the draft EIS are included in the project record and are being considered for the decision but were not responded to by the agency. Comments received during the comment period were included in the project record, tracked upon receipt, and agency responses to them were prepared for this appendix. The agency requested comments to be submitted either electronically into the public reading room on the project's webpage (http://www.fs.fed.us/nepa/nepa_project_exp.php?project=45579) or by hard-copy to the Forest Service office. However, a large portion of these letters were hand-delivered to the Forest Service at the Medford, Oregon open house on April 21, 2015, as form letters (one letter submitted by multiple commenters).Other form letters were emailed to a variety of individual email accounts of Forest Service employees Submitted and tracked emails were then uploaded into the Comment Analysis and Response Application (CARA) database for coding. Comment letters and attachments were logged in and scanned into an electronic file and made available in the project's public reading room for public review. Codes were initially used to organize the comments received. Form letter comments were only coded once. For form letters, the database recognized "master form letters" (the first in a series of the same form letter) and "form plus" letters (form letters that match the master letter but deviate slightly). Each master form letter was coded. Then, form plus letters were compared to the master form; any additional substantive comments in the letter were coded. For coding, individual comments from within each comment letter were identified and highlighted. Based on the comments received, a unique coding list was developed. All comments were then coded using the CARA database system. Due to the number of comments received, comments were initially categorized by subject area as provided in coding structure report in the project record. The code used in not necessarily reflective of how the comment was addressed during response. Once comments were coded they were exported to a spreadsheet for review and response by the interdisciplinary team. Duplicate comments were deleted so that they were only responded to one time.

Some public comments included citations or references and/or attachments of various articles and publications. References were filtered from further consideration if they were:

- cited but not provided by the commenter, or hyperlinks were not functioning and references were not readily available to the agency;
- cited and provided but not related to the project;
- cited and provided but not related to comments from the commenter about the project; or
- cited and provided but not a scientific study (e.g. opinion pieces).

Some commenters cited references (e.g. published journal articles) but either did not provide the referenced document as an attachment to their comment or provided a non-functional website hyperlink. First, the agency attempted to find all references or citations that were cited but not provided. The agency was able to find many but not all of the cited references. We appreciated those individuals or groups who provided cited references as an attachment to the comments or took the time to confirm that the hyperlinks being provided as a part of their comment were functional. The project record includes a list of publically identified literature cited and how these were tracked and found, noting those that were not found. The project record also has a list of the comments received, including of cited references, and a review of whether or not the comment and cited reference was scientific in nature and related to the project and the commenter's discussion of the project. References of scientific literature that were cited, provided or found, and tied to comments were reviewed by the appropriate interdisciplinary team member to determine whether or not the comment and reference were relevant to the actions being proposed and their potential effects. Literature was incorporated into analysis as appropriate. The attachments and the full review of references cited are also available in the project record.

Below is a list of tables produced for this appendix.

- Table B- 1: Number of comments for or against an action alternative presented in the draft EIS.
- Table B- 2: Letter numbers, letter count, and a short summary of the master comment letters received during the draft EIS comment period.
- Table B- 3: List of unique commenters by letter number, name, organization, and submittal date.
- Table B-4: Forest Service response to comments.

Results of the Draft EIS Comment Period

A total of 13,413 comment letters were received during the draft EIS comment period for the Project. The agency received 265 unique letters, 21 master form letters, and 263 form plus letters (with slight modifications of the master form letters; the remainder of the letters were form letters identical to one of the 21 master form letters).

Many commenters expressed concerns about:

- Impacts to wildlife and wildlife habitat;
- Impacts to watersheds and fisheries resources;
- Procedures related to public comment and review opportunities (i.e. emergency situation determination and/or alternative arrangements) and/or decision and implementation timelines;
- Value of harvested timber;
- Fuels conditions post-fire and/or post-salvage, especially near communities and in the Wildland Urban Interface; and
- Forest Plan consistency or other legal requirements.

See Table B-4 for agency responses to comments.

Table B-1 below, compiled from the CARA database, quantifies comments which expressed a preference "for" or "against" a given action alternative presented in the draft EIS and opinions that were expressed for a given alternative "plus" a typical treatment or "minus a typical treatment. This table does not reflect all viewpoints expressed by commenters. For example, some comments that expressed preference for or against an alternative may have been coded as relating to specific resource area such as wildlife or fuels for the purposes of response. However, in most cases such comments were coded twice. The comment automatically considers any commenter names provided more than once as false duplicates. This resulted in some difficulty when generating an accurate number of total comments submitted. For example, many form letters were signed anonymously (as "anon") or were only identified by a common first name (e.g. "John"). As a result, roughly half of the comments were not accounted for in Table B-1. Of the comment letters received during the Westside Fire Recovery DEIS comment period, 549 unique, master, or form plus letters were coded by members of the interdisciplinary team. A large portion of these letters were delivered to the Forest Service at the Medford, Oregon open house on April 21, 2015, and expressed opposition to Alternative 2 in the DEIS. Other form letters were emailed to the Forest Service and included a mix of opposition and support for the project.

Table B- 1: Number of comments for or against an action alternative presented in the draft EIS.

Code	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Karuk Alternative
As is	257	1	3	6	123
Against	5,999	6	6	7	6
Plus (General)	12	1	1	0	7
Plus Salvage Harvest	39	1	0	1	0
Plus Roadside Hazard	1	1	0	0	0
Plus Site Prep and Planting	1	0	0	0	1
Plus Fuel Burn	4	0	0	0	1
Plus Fuel Break	3	0	0	0	0
Plus Fuel Treatment Other	5	0	0	0	0
Plus Temp Roads	0	0	0	0	0
Minus (General)	1	0	0	1	7
Minus Salvage Harvest	6	0	0	1	0
Minus Roadside Hazard	0	0	0	0	0
Minus Site Prep and Plant	0	0	0	0	0
Minus Fuel Burn	1	0	0	0	0
Minus Fuel Break	0	0	0	0	0
Minus Fuel Treatment Other	2	0	0	0	0
Minus Temp Roads	6	0	1	1	0

Below is a compilation of the form letters received during the comment period on the draft EIS for the Project. Several versions of form letters were received; Table B -2 outlines how many of each form letter were submitted and summarizes each letter. See the discussion about Table B-1 for how the numbers for Table B-2 were generated.

Table B- 2: Letter numbers, letter count, and a short summary of the master comment letters received during the draft EIS comment period

Master Form Letter Number	Letter Count	Short Summary of the Letter
12350	3	Form letter discussing the need to protect wilderness areas, re-planting of whitebark pine, and limited salvage within the Project area.
12467	2	Form letter opposing the proposed Westside Fire Recovery Project and overall salvage logging.
12549	1,005	Form letter expressing outrage over the proposed Westside Fire Recovery Project and concerns that the Project would harm wildlife and watershed's within the area. The letter also requests that the Project be rescinded.
16695	3	Letter from former southern Oregon residents opposing the proposed Westside Fire Recovery Project.
17111	2	Letter from Jerry Franklin that was also submitted by one other commenter.
17282	140	Letter outlining concerns that the proposed Westside Fire Recovery Project will harm water quality and salmon. Letter also supports implementation of the Karuk Alternative
17366	2	Letter outlining concern over the size of the proposed Westside Fire Recovery Project and potential harm to waters within the Project area.
17368	2	Letter urging implementation of the Karuk Alternative
20	3,585	Letter opposing the proposed Westside Fire Recovery Project and request that the Northwest Forest Plan be followed.
21	2	Letters from Siskiyou Land Conservancy outlining opposition to the proposed Westside Fire Recovery Project.
23	3	Letter outlining support of the Westside Fire Recovery Project and the need to implement the most ecological and economical alternative.
6570	1,275	Letter outlining opposition to the Westside Fire Recovery Project and claims that the Project is actually a proposal to clear-cut old growth forests.
6733	43	Letter asking that the Westside Fire Recovery Project be eliminated due to concerns over watersheds and wildlife habitat.
9310	2	Request to the Forest Service to protect important aspects of the Forest and limit proposed activities within the Westside Fire Recovery Project.
17489	13	Letter outlining support of the proposed Westside Fire Recovery Project, and support of the work that has gone into the development of the Environmental Impact Statement.

18942	129	Letter outlining support of the Project and support of an Emergency Situation Determination.
19,112	2	Letter outlining support of Alternative 2 of the proposed Westside Fire Recovery Project and the need to keep open communication with Regional and DC offices.
17286	6	Letter outlining support of the proposed Westside Fire Recovery Project and post-fire salvage logging.
17349	2	Letter outlining support of the proposed Westside Fire Recovery Project, post-fire treatment activities, use of Forest Service roads, fuel treatment activities, treatment around WUI areas, and plantations.
28	21	Letter outlining general support of the Westside Fire Recovery Project and its implementation as quickly as possible.

Table B-3 below provides a list of names and organizational affiliation of each unique letter received and identifies whether or not references were attached. Following Table B-3 are the letters submitted during the draft EIS comment period from the Environmental Protection Agency and North Coast Regional Water Quality Control Board. All comments can be viewed from the public reading room accessed from the project webpage at: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=45579.

Table B- 3: List of unique commenters by letter number, name and organization (as identified during submittal), and submittal date.

Letter No.	Author Name	Organization	Submittal Date
1	Sproul, Bob	East Fork Lumber Company, Inc.	3/9/2015
2	moffatt, alden	ancient forest national park	3/10/2015
3	Ayres, Patrick		3/11/2015
4	McBroom, Dean		3/11/2015
5	Mosca-Clark, Vivianne		3/11/2015
6	Moffatt, Alden	ancient forest national park	3/11/2015
7	Johnston, Denver	Scoot Bar Fire Safe Council	3/15/2015
8	Hixon, Anthony	Local citizen	3/16/2015
9	Haney, Max	Sierra Pacific Industries	3/16/2015
10	Grace, Christina	Seiad Firesafe council	3/18/2015
13	Pace, Felice		3/19/2015
14	Svilich, Richard	American Forest Resource Council	3/19/2015
15	Moffatt, Alden	ancient forest national park	3/21/2015
16	Jereb, Jerome	None	3/23/2015
17	Kaufner, Doug	Back Country Horseman of California	3/23/2015
18	Harris, Jill	Rotary Club of Yreka	3/25/2015
19	Wuerfel, Jeremy	Timber Products Company	3/25/2015
24	Payne, Sandra		3/26/2015
25	Morone, John		3/26/2015
26	Bicego, Robert		3/26/2015

27	Ohlund, Barry		3/18/2015
31	Harris, David		3/27/2015
33	Dunning, Joan		3/27/2015
36	Fitzpatrick, Tim		4/1/2015
37	Sharnoff, Stephen		4/1/2015
38	Fitzpatrick, Tim		4/2/2015
3678	Artley, Dick		4/3/2015
3679	Livingston, Jill		4/4/2015
3680	Raymer, Terry		4/5/2015
3681	Moffatt, Alden	ancient forest national park	4/6/2015
5873	Heiken, Doug	Oregon Wild	4/7/2015
5874	Heiken, Doug	Oregon Wild	4/8/2015
6097	Herbert, David		3/26/2015
6271	Flann, Nicholas		3/25/2015
6646	Tasker, Kaitlin		4/3/2015
6924	Hoffman, David		3/26/2015
7136	Taormina, Carolyn		3/27/2015
7563	) Marie, (		4/8/2015
7580	Emily, Anon		4/8/2015
7776	Rooney, S.		4/3/2015
7794	McLaughlin, Michael		4/3/2015
7831	T, G		4/3/2015
7904	Fiske, Colin		4/3/2015
8435	Glass, Frank		4/3/2015
8701	S.F., Anon		4/8/2015
9122	Marissa, Anon		4/8/2015
9222	Jonathan, Anon		4/8/2015
10329	Linda, Anon		4/8/2015
10336	Michael, Anon		4/8/2015
10398	Jillian, Anon		4/8/2015
10450	Michael, Anon		4/8/2015
11365	Wayne, Anon		4/8/2015
11445	Randal, Anon		4/8/2015
12254	Sheryl, Anon		4/8/2015
12293	Mark, Anon		4/8/2015
12346	Sexton, George		4/8/2015
12347	Johnston, Denver		4/9/2015
12348	Lenz, Eric		4/11/2015
12349	David, Aaron		4/11/2015
12351	Rohde, Robert	Natural Solutions	4/6/2015
12352	Derry, Karen		4/6/2015
12353	Bennett, Grace		4/9/2015

12354	McLaughlin, Michael		4/6/2015
12356	Connelly, Matt and Susan		4/1/2015
12358	Briggs, Glen O.		4/1/2015
12359	Tyler, Kathleen		4/13/2015
12360	Haynes, Bruce		4/1/2015
12361	Clark, Katherine		3/29/2015
12362	Moore, Michael	Columbia Helicopters	4/14/2015
12363	Krall, Michelle		4/15/2015
12364	Pace, Felice		4/15/2015
12365	Menke, John		4/16/2015
12366	Jones, M.		4/18/2015
12367	Rainey, Gary		4/20/2015
12368	Pinkos, Tim		4/20/2015
12470	charles, Anon		4/9/2015
12471	John, Anon		4/9/2015
12972	hutchinson, janice		4/17/2015
13535	Viner, Doug		4/21/2015
13597	Dantine, D		4/12/2015
13780	kevin, Anon		4/9/2015
13834	Jim, Anon		4/9/2015
14307	Mary, Anon		4/11/2015
14451	olivier, Anon		4/11/2015
14501	Will, Anon		4/11/2015
14904	Christina, Anon		4/9/2015
15037	Brett, Anon		4/9/2015
15118	Charles, Anon		4/9/2015
15216	Tom, Anon		4/9/2015
15561	Beth, Anon		4/9/2015
16756	Mary, Anon		4/8/2015
16864	Sudjai, Richard		4/8/2015
16915	Harry, Anon		4/8/2015
16939	John, Anon		4/8/2015
16954	Peter, Anon		4/8/2015
16957	Whiteley, Jacob		4/21/2015
17112	Osborn, Brittney		4/21/2015
17223	Victor, Anon		4/15/2015
17233	Victor, Anon		4/15/2015
17280	Hilton, Sue		4/22/2015
17281	Pounds, Jacob		4/22/2015
17285	Stone, Jeffrey		4/23/2015
17290	Herrera, Kathy		4/23/2015
17295	Sansone, V. R.		4/23/2015

17305	Peters, Thomas		4/23/2015
17307	Luczyski, Richard		4/23/2015
17313	Sharp, Carol	Happy Camp Fire Safe Council, Inc.	4/23/2015
17315	Tereszkiewicz, Thomas		4/24/2015
17318	Most, Steven		4/24/2015
17320	Dupin, Dorie	Defenders Of Wildlife	4/24/2015
17325	Alderson, George and Frances		4/24/2015
17326	Chandler, Susan		4/24/2015
17328	Several Signatorees, Several Signatorees		4/16/2015
17329	LaMalfa, Doug		4/14/2015
17354	Lefevre, Marmi		4/9/2015
17355	Haynes, Brenda		4/13/2015
17357	Browning, Pat and Nita		4/19/2015
17358	Fitzpatrick, Tim		4/24/2015
17371	Moffatt, Alden	ancient forest national park	4/24/2015
17377	Perry, Ayn		4/25/2015
17379	Stineman,, James		4/26/2015
17384	White, Edwina		4/26/2015
17385	Carr, Patrick		4/26/2015
17387	Kim, Tai	Happy Camp Resident/Landowner	4/26/2015
17396	eaton, john	Mountain Area Preservation	4/26/2015
17397	Martin, Halimah		4/26/2015
17398	McKay, David		4/26/2015
17401	Johnston, Barbara Rose	Center for Political Ecology	4/26/2015
17402	Lewis, Sherman		4/26/2015
17403	Cooper, Laurence		4/26/2015
17409	Gardner, Bill		4/26/2015
17419	Savino, M.		4/26/2015
17427	Webb, Loraine		4/25/2015
17437	Lester, Paul	American Rivers	4/26/2015
17440	Smith, Henry	US Fish & Wildlife Service (not official)	4/26/2015
17442	Wright, Melinda		4/26/2015
17446	Bowles, Bruce		4/26/2015
17448	North, Jill		4/26/2015
17450	Boone, Foster		4/26/2015
17455	Thomas, Leonard		4/26/2015
17457	Levitus, Walt		4/26/2015
17459	Royce, Edwin		4/26/2015
17460	Motyka, Mark		4/26/2015
17464	Sauve, Kenny		4/27/2015
17465	Larson, Eugenia		4/27/2015

17471	Davis, Cynthia		4/27/2015
17472	covault, jonnel		4/27/2015
17474	Farren, Carol		4/27/2015
17478	richardson, rex		4/27/2015
17481	Courtright, Bruce	The National Institute for the Elimination of Catastrophic Wildfire	4/19/2015
17482	Schmidt, Bill		4/26/2015
17483	Trabucco, Dan		4/13/2015
17485	Allred, Ryan		4/27/2015
17486	Crawford, Mark		4/12/2015
17488	Greenberg, Karina		4/8/2015
17493	Richard, Pamela		3/27/2015
17494	Hite, Ryan	Boise Cascade, L.L.C.	4/27/2015
17497	Martin, Nadine		3/31/2015
17498	O'Cardiff, Ana		3/31/2015
17499	Krasner, Rachel		4/27/2015
17500	Guera, Suzanne		3/31/2015
17502	Gusky-Sharp, Kathy		3/31/2015
17503	Maki, Karen		3/31/2015
17505	None Provided, Julie		4/1/2015
17507	Royce, Edwin		4/26/2015
17508	Liddle, George	Friends Of The River	4/27/2015
17509	Groves, Jacob	Murphy Company	4/26/2015
17764	Mueller, Peter		4/27/2015
17873	richard, Anon		4/24/2015
17910	Terence, Sue		4/23/2015
17939	mjm1182@humboldt.edu, Anon		4/8/2015
17955	riverhair@gmail.com, Anon		4/9/2015
18147	headway@sisqtel.net, Anon		4/21/2015
18602	va.molitor@gmail.com, Anon		4/17/2015
18726	Gustin, Amy		4/25/2015
18747	Prather, Ed		4/26/2015
18845	Vanderveen, Anna		4/27/2015
18848	Gravina, Muriel		4/27/2015
18849	Costales, Ric	Siskiyou Forest Health Collaborative	4/26/2015
18850	Peters, Will		4/26/2015
18851	Mosier, Jerry		4/27/2015
18852	Hentz, Michael		4/26/2015
18853	Carleson, Eric	Associated California Loggers	4/26/2015
18857	Owens, Dylan		4/26/2015
18858	Ryberg, Erik		4/26/2015

18859	Klug, Rich		4/26/2015
18861	Perrochet, Julie	A member of the Public	4/27/2015
18862	Baker, Kimberly	Klamath Forest Alliance	4/27/2015
18863	O'Leary, Brendan		4/1/2015
18864	None Provided, Mahaia		4/1/2015
18865	None Provided, None Provided		4/2/2015
18866	Taranto, Julia		4/2/2015
18867	Oliver, Lauren		4/2/2015
18868	VanDuzer, Sydney		3/27/2015
18869	Challstrom, Gordon		4/20/2015
18870	Lindsay, Morgan		4/20/2015
18871	Anzo, Phillip	CALFIRE	4/20/2015
18872	Hall JR., Roy	Shasta Indian Nation	4/23/2015
18873	Nelson, Ian	PCTA	4/26/2015
18874	Maplesden Strickland, Elizabeth		4/21/2015
18875	Klug, Anon	Klamath Alliance for Resources & Environment	4/27/2015
18877	Smith, F. Richard		4/21/2015
18878	Attebery, Russell	Karuk Tribe	4/26/2015
18879	Harper, George And Alice		4/11/2015
18883	Livingston, John	Sierra Club Shasta Group	4/26/2015
18893	Bailey, Nadine	Family Water Alliance	4/27/2015
18894	Munson, James	EPA	4/26/2015
18895	Jones, David		4/27/2015
18896	Hilden, Brian		4/20/2015
18897	Bundy, Lorrie	resident	4/26/2015
18898	Richard, Pamela		4/26/2015
18899	Augustine, Justin	CBD et al.	4/26/2015
18900	Herrera, Kathy		4/21/2015
18901	Jones, Janet	Siskiyou County Resident	4/27/2015
18903	Augustine, Justin	CBD	4/27/2015
18904	Augustine, Justin	CBD	4/27/2015
18907	Livingston, John	Sierra Club Shasta Group	4/26/2015
18908	Augustine, Justin	CBD	4/27/2015
18909	Baker, Kimberly	Klamath Forest Alliance	4/26/2015
18910	Augustine, Justin	CBD	4/27/2015
18911	Augustine, Justin	CBD	4/27/2015
18912	Keel, Dylan		4/27/2015
18913	Lass, David	Trout Unlimited	4/27/2015
18915	Kessler, John		4/26/2015
18926	Brucker, Peter		4/27/2015

18927	Henson, Ryan	California Wilderness Coalition and Friends of the River	4/27/2015
18931	Colonna, Andy		4/27/2015
18934	Greenberg, Karuna	Salmon River Restoration Council	4/27/2015
18937	Dyer, Kerul	Klamath Riverkeeper	4/26/2015
18939	McBroom, Dean		4/23/2015
18978	Smith, Zane		4/16/2015
19019	James, Henry		4/16/2015
19073	Wienke, Kenneth	Boise Cascade, L.L.C.	4/26/2015
19074	White, Ann		4/26/2015
19075	Brockway, Marty		4/25/2015
19076	Wilson, Karen	South Fork Trinity Up-River Friends	4/23/2015
19078	Chichizola, Regina		4/26/2015
19079	McCovey, Jene		4/26/2015
19146	Mcphee, John		4/27/2015
19154	Pearson, Chris		4/23/2015
19155	Lefevre, Taylor		4/14/2015
19156	Anon, Anon		4/26/2015
19157	MacMullin, Robert	MacMullin Forestry and Logging	4/26/2015
19158	Olson, Eric		4/16/2015

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

APR 27 2015

Patricia A. Grantham, Forest Supervisor
Klamath National Forest HQ
Attn: Wendy Coats, Environmental Coordinator
1711 South Main Street
Yreka, CA 96097

Subject: Draft Environmental Impact Statement for the Westside Fire Recovery Project, Klamath National Forest, California (CEQ# 20150062)

Dear Ms. Grantham:

The U.S. Environmental Protection Agency has reviewed the Draft Environmental Impact Statement for the Westside Fire Recovery Project, Klamath National Forest, California. Our review is provided pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

EPA understands that the current conditions in the Klamath National Forest are extremely vulnerable to fire, largely due to fire suppression, climate change and past forest activities such as planting proximity and replanting species to further future timber harvest rather than a diverse sustainable forest environment. However, we understand that past forest activities of managing forest purely for outputs such as timber rather than sustainability are no longer the Forest Service practice. Specifically, the Forest Service plans to replant a verity of conifer species to ensure the natural strength that comes with diversity of species. We also understand that due to the intensity of the fires in the project area, little if any seed storage is available in the burned areas. Therefore, allowing the area to naturally re-vegetate is not a viable solution. The DEIS indicates that existing hardwoods will be retained/encouraged and that replanting of conifers will include spacing to safeguard epicormic sprouting areas such as growth that emerge from the trunks of burned trees.

The Proposed Action would initiate forest recovery and the salvage of dead trees across more than 162,300 acres of National Forest System land, and would include 650 miles of roadside hazard treatments. The project proposes to use a combination of ground-based, skyline, and helicopter logging systems to facilitate timber removal. EPA acknowledges that removal of dead trees is not without adverse environmental impacts. However, leaving the dead trees would essentially amount to providing a pile of charcoal next to remaining intact forest which, would potentially lead to additional destruction when future fires occur, further degrading the environment.

EPA supports the use of best management practices to effectively protect water quality. We understand that the Forest Service is working with the State Water Quality Resources Control Board to implement mitigation measures to reduce adverse impacts to watersheds in the project area such as sedimentation and temperature variation.

The EPA commends the Forest Service for limiting operations in areas containing species of concern. We recommend that the Final Environmental Impact Statement fully commit to protecting intact critical habitat for species of concern such as the northern spotted owl, coho salmon, eagles and pacific fisher. While salvage of dead trees could destroy some potential habitat, we understand that the Forest Service anticipates that the vast amount of remaining unlogged charred and/or dead trees will be enough to sustain the surviving wildlife species dependent on post-fire environments. We recommend that the FEIS include the results of consultation with the United States Fish and Wildlife Service and the National Oceanic and Atmospheric Administration if appropriate. We recommend that the FEIS include a closure and restoration plan for the proposed temporary roads and landings when the project is completed.

EPA appreciates that the Forest Service cites and uses recommendations in the 2014 Council on Environmental Quality Draft Greenhouse Gas guidance in the DEIS, and we believe it was helpful to include an estimate of greenhouse gas emissions. We also note that estimates of carbon storage were not provided, based on a conclusion that carbon storage "is not well quantified or thoroughly understood, especially at the project level." While a calculation of carbon storage may not be relevant in this particular fire recovery project, we recommend that the Final EIS provide additional information as to why carbon storage was not calculated, recognizing that the Forest Service has several tools and calculators that can estimate carbon storage. Finally, we also recommend that the FEIS include, in addition to estimates of average global temperature increases, estimates from the US Global Change Research Program for average temperature increases in the U.S.

The project area is culturally and spiritually important to Tribes and Tribal Consultation is an important component of the decision-making process associated with the project. We encourage the Forest Service to continue meaningful consultation throughout the NEPA process, with all potentially affected tribal governments. We recommend that the results of consultations with tribal governments and with the Tribal Historic Preservation Office/State Historic Preservation Office be included in the FEIS.

EPA has rated the DEIS and preferred alternative 2 as Lack of Objections—LO (see enclosed "Summary of Rating Definitions"). We support the best management practices and resource protection measures included in the project design. We recommend that the FEIS incorporate the additional measures and information specified above.

Thank you for the opportunity to review this DEIS. We also appreciate the Forest Service's coordination with us prior to and during our review, via phone calls and site visits. When the FEIS is released, please send one hard copy and one CD to the address above (mail code: ENF-4-2). If you have any questions, please contact me at (415) 972-3521, or have your staff contact James Munson, the lead reviewer for this project. James can be reached at (415) 972-3852 or Munson.James@epa.gov.

Sincerely,

Connell Cunning

for Kathleen Martyn Goforth, Manager
Environmental Review Section

Enclosure: Summary of the EPA Rating System

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

Category "1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category "2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category "3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

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CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

North Coast Regional Water Quality Control Board

April 27, 2015

Ms. Patricia Grantham
Attention: Ms. Wendy Coats
Klamath National Forest
1711 South Main Street
Yreka, CA 96097

Dear Ms. Grantham:

Subject: KNF Westside Fire Recovery Project DEIS Review

File: USDA – Klamath National Forest

On March 5, 2015, the United States Forest Service (USFS) published a notice titled, "Opportunity to comment on the Westside Fire Recovery Project." This notice stated, "The draft Environmental Impact Statement (EIS) for the proposed Westside Fire Recovery Project (Project) is now available for public review." The Project was developed in response to landscape-level changes to forested habitat resulting from the 2014 wildfires on the Klamath National Forest (KNF). The North Coast Regional Water Quality Control Board (Regional Water Board) appreciates the opportunity to comment on the Project and wish to remain on the mailing list.

In reviewing and analyzing the preferred alternative (Alternative 2), we are concerned that this alternative proposes activities with potential impacts to water quality that will not be mitigated to less than significant. Although this letter does not serve as a final determination, Regional Water Board staff currently do not believe that the Alternative 2 project would be eligible for coverage under Order No. R1-2010-0029, *Waiver of Waste Discharge Requirements For Nonpoint Source Discharges Related to Certain Federal Land Management Activities on National Forest System Lands in the North Coast Region* (Waiver). It is possible that Alternative 4, with some modifications, may be eligible for Waiver coverage. A final determination cannot be made until the final EIS with the alternatives is prepared and finalized and a Decision is issued. We will outline our concerns below.

JOHN W. COGHETT, CHAIR | MATTHIAS ST. JOHN, EXECUTIVE OFFICER
5550 Skylane Blvd., Suite A, Santa Rosa, CA 95403 | www.waterboards.ca.gov/northcoast

RECYCLED PAPER

The Project proposes to: 1) reduce safety hazards to the public and forest workers from falling trees or hazardous fuel conditions; 2) obtain the maximum economic commodity value from burned timber by offering a sale while the wood is still marketable; and 3) promote ecosystem sustainability by increasing the likelihood and speed by which burned forested areas are regenerated. Funds gained from the salvage logging can be used for additional restoration work. The preferred alternative (Alternative 2) project area is comprised of 214,848 total acres, including 184,502 acres of KNF land. Alternative 2 proposed treatments include: 11,700 acres of salvage logging; 650 miles of roadside hazard treatment along KNF roads, state highways, and county roadways; 22,900 acres of hazardous fuels treatment; and 7,900 acres of site preparation, planting, and vegetation release.

The Waiver waives certain activities conducted on NFS lands from the waste discharge requirements of Article 4 (commencing with Section 13260) of Chapter 4, Division 7 of the California Water Code, except as provided within the Waiver. In order to receive coverage under the Waiver, projects must meet specific eligibility criteria and conditions. Projects are defined as Waiver Category A (lower threat to water quality) or Category B projects depending on the risks of water quality impacts. The Westside Fire Recovery Project is considered a Category B project because it is a timber harvest project.

Condition number 14 on page 16 of the Waiver states, "Compliance with Waiver conditions will ensure that no significant environmental impact to water quality occurs from an activity covered by this Waiver. Activities that have potentially significant impacts to water quality that cannot be reduced to less than significant levels are not eligible for coverage under this Waiver and the USFS will need to submit a Report of Waste Discharge to the Regional Water Board." Our staff analysis of Alternative 2 suggests that potential impacts to water quality have not been mitigated to less than significant levels for the following reasons:

1. <u>Aquatic Conservation Strategy Compliance</u>
   The Northwest Forest Plan Aquatic Conservation Strategy Objectives Guidelines state that Forest Service and BLM-administered lands within the range of the northern spotted owl will be managed to maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. The standards and guidelines for Riparian Reserves prohibit or regulate activities that retard or prevent attainment of Aquatic Conservation Strategy objectives.

   Alternative 2 proposes about 3,920 acres of salvage units (about 2,000 acres of salvage logging) on steep, weathered granitic lands in Riparian Reserves. No salvage logging is proposed on inner gorges, active landslides or toe zones of dormant landslides. Also proposed is about 960 acres of site preparation and planting, 4,395 acres of roadside hazard tree removal, and 3,940 acres of fuels treatment on unstable lands considered to be Riparian Reserves. Alternative 2 also proposes construction of new log landings within aquatic Riparian Reserves and the reuse of existing log landings within Riparian Reserves. The number of new and reused landings could not be determined from the DEIS. These activities in Riparian Reserves may result in significant impacts to water quality, and the draft EIS has not

adequately proposed mitigation measures to reduce impacts to less than significant levels.

2. Roadside Hazard Treatments
Alternative 2 proposes to identify and remove hazard trees along about 650 miles of National Forest Transportation System roads, county roads, and state highways. This includes Maintenance Level 1 roads used by Forest Service employees and contractors for administrative purposes. Maintenance Level 1 roads are not routinely maintained.

Reopening 69 miles of Level 1 roads for salvage logging and hazard tree removal may result in significant impacts to water quality, especially in cumulatively impacted watersheds that have burned with a moderate or high intensity.

3. Cumulative Impacts
The water quality risk to channel morphology was evaluated in the Project DEIS using the ERA model. USLE and mass-wasting models were also used to assess cumulative impacts. These cumulative impact models rely on "risk ratio", which is the model results (ERA, USLE or mass-wasting) divided by the watershed threshold of concern (WTOC) (model results/WTOC). The threshold of concern for the risk ratio is 1.0. According to the DEIS, "The threshold of concern does not represent the exact point at which adverse cumulative impacts will occur. Rather it serves as a "yellow flag" indicating increasing susceptibility for adverse effects to beneficial uses in a watershed." For the DEIS, watersheds with risk ratios of less than 1.0 are considered to have a low risk of increased susceptibility for adverse effects to beneficial uses in a watershed. Watersheds with risk ratios between 1.0 and 1.5 have a moderate risk, and greater than 1.5 have a high risk.

For ERA, the DEIS states, "A low risk to channel morphology means that there is not likely to be a measurable change to peak flows and the channel bed, banks and floodplain will undergo natural modifications that are proportional to the storm events. A moderate risk indicates that peak flows may be artificially increased by the actions taken. The increased peak flow is likely to leave the channel susceptible to modifications that are slightly more than would occur under natural conditions. The perturbation of the geomorphic process would be over the short term (about two to four years). A high risk to channel morphology means that the increase in peak flows would lead to undesirable changes (such as channel straightening and loss of coarse wood) that would require long-term recovery (greater than 10 years)."

From the Westside Fire Recovery Report – Hydrology Report analysis, it appears all eleven 7th field watershed ERA risk ratios are greater than 1.0 post-fire, no action, with two of the eleven having risk ratios >1.5. According to this report, risk ratios increase in most cases when implementing the preferred Alternative 2, with three of the eleven 7th field watersheds having risk ratios >1.5 after implementing Alternative 2.

A moderate risk indicates that peak flows may be artificially increased by

For the mass-wasting analysis, all nineteen of the 7th field watershed have risk ratios are greater than 1.0 post-fire, no action, with five of the nineteen watersheds >1.5. Risk ratios increase in most cases when implementing the preferred Alternative 2, with six of the nineteen 7th field watersheds having risk ratios >1.5 after implementing Alternative 2.

USLE modeling shows similar results. All eleven of the 7th field watershed have risk ratios greater than 1.0 post-fire, no action, with five of eleven being >1.5. Risk ratios increase in most cases when implementing the preferred Alternative 2, with six of the eleven 7th field watersheds having risk ratios >1.5 after implementing Alternative 2.

Our staff analysis of Alternative 2 raises concerns that conducting salvage harvest and associated activities in watersheds already exhibiting elevated risks for cumulative impacts could result in significant impacts to water quality, especially in watersheds that have burned with a moderate or high intensity.

4. Riparian Zone Treatments
Regional Water Board staff have reviewed the fire burn severity maps. In general, the burn intensity in riparian zones within the fire area was generally low or very low. This is because in most instances the fire backed into the riparian zone and the fire intensity decreased as the fire approached the stream. In a few areas such as the North Fork of the Salmon River and in White's Gulch, high winds caused the fire to burn with high intensity across the riparian corridor. In these areas, there is charred timber with bare mineral hydrophobic soil with very little surface cover. In some cases, there are steep slopes leading directly to perennial fish-bearing watercourses. Much of the tree branches, leaves, and needles were consumed in the fire. These areas will be subject to elevated erosion rates and increased sediment delivery to the watercourses due to the steep slopes, hydrophobic soils, and lack of surface cover for erosion control.

None of the alternatives evaluated in the DEIS of the KNF Westside Fire Recovery Project propose to treat riparian zones that burned in the fire with a moderate or high intensity. Treating these riparian areas, perhaps by falling some trees and leaving them on the ground, and/or spreading slash on bare soils, could help to break up the hydrophobic crust, provide temporary sediment storage, and increase infiltration rates. Treating the riparian areas that burned at a high intensity could provide significant benefits to water quality, but were not included in the proposed action.

Additionally, the proposed Project lacks an approved plan to treat legacy sediment sites. The Regional Water Board provided scoping comments on the Westside Fire Recovery Project to KNF on December 5, 2014. Below are excerpts of our comments on the preparation of a legacy site treatment program for the Project.

"It is our understanding that some treatment of legacy sediment sites along the NFS roads within the project area is being accomplished as a part of the USFS Burned Area Emergency Rehabilitation (BAER) program. The legacy site treatment that is planned or accomplished

under the BAER program may result in progress toward TMDL compliance but Regional Water Board staff cannot determine whether BAER activities alone will be adequate for USFS Waiver compliance without additional details of that work. Given the huge size of the Project area, treatment of all the legacy sites may not be a realistic goal. However, treatment of some of the high priority legacy sediment sites in the Project area may be necessary in order for the Project to be eligible for Waiver coverage. KNF must propose an acceptable legacy site treatment program for the Project to comply with the Waiver and demonstrate reasonable progress towards TMDL compliance."

The Regional Water Board received a draft legacy site treatment plan for the KNF Westside Fire Recovery Project on April 21, 2015, but has not yet had time to complete our review of the plan. An acceptable legacy site treatment program must be approved by the Executive Officer before Waiver coverage will be granted and Project activities can commence.

Most of the comments above are responding specifically to Alternative 2, the preferred alternative. Alternative 4 of the DEIS was designed to reduce watershed disturbance and impacts to water quality and fisheries, relative to Alternative 2, while still meeting the purpose and need for action on the Project. Alternative 4 addresses several of the above described water quality concerns, including not conducting roadside hazard tree removal and salvage logging on Maintenance Level 1 roads, and not constructing log landings within Riparian Reserves. It is possible that Alternative 4 could be modified to address the additional water quality concerns and be eligible for Waiver coverage. However, a final determination regarding Waiver coverage cannot be made until the final EIS is prepared with the alternatives finalized and a Decision is issued.

Thank you for the opportunity to comment on the KNF Westside Fire Recovery Project. If you have any questions, please contact Thomas Williams at (707) 576-2030.

Sincerely,

Matthias
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Water Boards
Matthias St. John
Executive Officer

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Code	Comment Number	Comment Text	Response
102.01 - Beyond Scope	#11365-2	Dead and down firewood cutting permits need to be expanded and clear cutting by privately owned companies must be regulated when there are others who own property in the area to prevent the eyesore	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Regulation of activities on private lands is outside the scope of the Westside Fire Recovery EIS. The private property timber land clear cutting is the responsibility of the California Department of Forestry and or the actual timberland company that owns it. Cumulative Effects from private timber activities is considered in the Cumulative Watershed Effects model for the watershed and in cumulative effects analysis throughout Chapter 3 of the final EIS.
102.01 - Beyond Scope	#12349-6	This leads to my last point. The KNF should be actively working to make its lands and the communities within its land more fire-resilient through small-diameter fuels reduction projects, prescribed burning, and by allowing naturally ignited fires to burn more extensively when conditions permit (I do acknowledge that KNF is already doing so to an extent). However, I am concerned that the KNF is using activities that are likely to have wide support and that are generally good ideas, such as making the forests more fire-resilient and removing major hazards to workers and the public, as justification to harvest timber that otherwise would have been unjustifiable to log in the absence of wildfire.	See response to comment number 7-2. Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.01 - Beyond Scope	#12351-2	The Westside Fire of 2014 was not an unexpected event. Prior to US Forest Service existence, native people of the region understood the role of fire in this fire prone landscape,and had been managing the landscape for thousands of years. It was the lack of understanding and sound judgement by the US Government that led to the horrific fire, affected all living things, and releasing huge quantities of carbon and other toxic gases into the atmosphere that threatens human existence on Earth. Conquered descendants from Europe and other regions of the world no longer realize that we were conquered anymore. So, we think like the conquerors do that over population and consumption are justified and just a reality of our current circumstances. This interpretation of our human story is so familiar and widely accepted that people do not question whether anything should change about it or not. Thus, the Klamath National Forest has been given the unrealistic task of balancing commodity production and environmental protection that will result in the release of even greater quantities of toxic gases into our atmosphere under the pretext of sound land use management. Reoccurring catastrophic fires throughout the Klamath and Siskiyou Mountains will continue regardless of what the Klamath National Forest is allowed to implement by law.	This comment is beyond the scope of this project's analysis.
102.01 - Beyond Scope	#12353-2	would like to know how many timber sales were stopped by frivolous law suit in this area, what was the value of the timber before it was burned and what the value after the fires.	The number of law suits brought against the Klamath National Forest and the value of timber involved in any said law suits is outside the scope of the Westside Fire Recovery analysis. Litigation analysis is outside the scope of analysis of this EIS.
102.01 - Beyond Scope	#12353-4	The forests on our public lands are over grown and many areas have dead and dying trees from beetle infestations. These forests need to thinned, brush and other vegetation has to be removed, the water sheds Will have more water if this happens and our people will be more productive.	Treating forest lands affected by beetle infestations is outside the scope of the Westside Fire Recovery EIS.

Code	Comment Number	Comment Text	Response
102.01 - Beyond Scope	#12359-1	As a resident of Siskiyou County since 1996, I have specific views of logging and forest health. My dad was a logger in the 1960's and as long as my brother and I stayed out of danger we were free to roam the woods. I grew up with the Forest being a huge part of my life. I grew up in Redway the heart of the redwood country. In the 1970's after college at CSUS in Sacramento, I went north to work in the mills of Washington State. I pulled green chain, drove a forklift, put sprinkler pipe up on the log decks, drove a water truck, worked on the chop saw, and my husband was a mill foreman at a different mill. We made a great living, benefits, wages, plus we were able to roam the forests nearby for personal activities. Then after the 1994 Northwest Forest plan went into effect, I saw the devastation to ways of life for the people in the logging communities in Washington were I was living. I moved to Siskiyou County and worked at the USFS in McCloud as a timber cruiser for two years. Basically the motto was "leave the best and take the rest" (best meaning healthy), and the slash was burned. What happened to this policy? We need to get back to it. On my on property on the east side a few miles out of Tennant, we have tried to keep the forest thinned and the slash removed. I have noticed after the light is allowed to get through the dense canopy and the slash is removed the vegetation especially the herb layer is returning. I see the deer returning for browse, the birds are coming back; we also have pine martens in the area, besides skunks, cougar etc. So on a very personal non-science based view, just one of observation, please log and keep logging, clear up most of the downed limbs and other slash, and bring the forest back to a viable, living, and ever changing entity and not keep it stagnant and in decay since the 1994 Forest Death Sentence was enacted.	Changing timber harvesting policy is outside the scope of the Westside Fire Recovery EIS.
102.01 - Beyond Scope	#14293-5	This is a [curse word] sham to allow cheap harvesting.. it has nothing to do with fire control and everything to do with $$$ for the timber companies.. If you were in the movie business, I'd say you were probably getting something sucked on when you made this decision.. shame on you.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. It is unclear how project design or effects should be adjusted. Beyond the scope of analysis.

Code	Comment Number	Comment Text	Response
102.01 - Beyond Scope	#17111-7	Late-Succesional Reserves A brief review of the conceptual basis for the Late Successional Reserve (LSR) system is appropriate before commenting specificall y upon activities proposed for LSRs impacted by the 2014 fires on the Klamath National Forest. LSRs were establ ished to provide for old-growth ecosystems and related natural processes and constituent species, of which the NSO is one. The LSR system was designed as a well-distri buted geographic network using occurrences of high quality late-successional forest as a primary criterion for locating boundaries of specific LSRs. The team that designed the LSR system knew that large stand replacing disturbances would impact LSRs and, therefore, that the LSR network needed to be able to accommodate such disturbances. The team had had numerous experiences with such disturbances, including the 1980 Mount St. Helens eruption and the 1988 Yellowstone Fires. Hence, the team built sufficient redundancy into the LSR system so that it could accommodate large disturbances and still remain viable as a regional network. This redundancy would also allow for natural recovery processes within impacted LSRs. Building reserve systems that will accommodate natural disturbance regimes is, of course, a first principle in conservation biology (Lindenmayer and Franklin 2003). Creating a resilient LSR network ultimately resulted in a higher density and greater total acreage of LSRs than a reserve system that would simply have accommodated current habitat needs for NSO. This point is illustrated by comparing the LSR system with the Habitat Conservation Area (HCA) system proposed (and, at that time, judged to be adequate) for NSO (Thomas et al. 1990). The HCA system proposed approximately 5.5 million acres of reserves in addition to areas already reserved from timber harvest by Congress and the management agencies. The LSR network incorporated 7.4 million acres (in addition to already reserved lands) with an additional estimated contribution of 2.6 million acres of Riparian Reserves. The ultimate adoption of the LSR network as the basis for the NWFP reserve system resulted in a network that provided for much larger numbers of NSO than the proposed HCA network (Noon and McKelvey 1996), because the LSRs were focused on incorporating the highest quality old-growth forests, has a greater total reserved acreage, and created some very large reserves. I have documented the basis for my assertion that the LSR network was built to be resilient in the preceding paragraph; i.e. it was built to accommodate significant loss and continue to function as an effective reserve system for old-growth related species. One could say that the LSR system was overbuilt i n terms of immed iate habi tat needs. A major reason for doing this was the FEMAT planners belief that natural recovery processes could and should be accommodated following major disturbances to LSRs. Hence, guidel ines for salvage included statements such as: "Management objectives [following natural disturbances i n Late-Succesional Reserves] should focus on either simulating natural succession or allowing it to occur unimpeded," FEMAT 1993, p. IV-36, and "Because there is much to learn about the development of species associated with these [old-growth] forests and their habitat, i t seems prudent to only allow removal of conservative quantities of salvage material from Late-Successional Reserves and retain management options until understandi ng of the process has improved." FEMAT 1993, p. III-36. One might question the appropriateness of allowing natural recovery processes to proceed if stand-replacement fire behavior with the resulting high levels of fuels were not characteristic of the LSRs. However, approximately % of the affected area in the LSRs are habitats that belong to PAGs on which either stand-replacement or mixed fire regimes are characteristic and, therefore, on which large fuel loads would have been experienced in past post-fire environments.	See EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised for a discussion of LSR. See Also Appendix E.
102.01 - Beyond Scope	#17307-1	It is time to revamp the the Forest Service Organization with hopeful policies that the public understands and will support	See response to comment number 4-2.

Code	Comment Number	Comment Text	Response
102.01 - Beyond Scope	#17371-1	It was very nice meeting you and your staff in Medford a few days ago. I appreciate the opportunity to talk to you personally. There are some things that became obvious at the meeting. 1) Your agenda is driven by something that is hidden from all of us. 2) You have not read any of the responses to this scoping or deis personally. 3) You want to avoid a lawsuit very much. 4) You don't have much on the ground experience with the Klamath-Siskiyou Mountains. Really and truly. That's what I got from the meeting, aside from the fact that you and your staff are all pleasant people and are very interested in selling your point of view. One thing that struck me was that you didn't know what the Slater Butte fire was. Slater Butte is the main communication hub for the Westside project. The fire scar there is monumental and it tells the story of how the forest service responds to fire salvage. The whole mountain was clearcut in the early 70s and was jillpoked, a term that you didn't know. Jillpoked means all the hardwoods were also felled and then the whole mountain was burned at high temperature, without regard for anything except money. Then the whole mountain was planted with genetically "superior" fir and pine trees. In 1987, of course, the whole even aged thing went up in smoke again leaving nothing to show for all the so called restoration. Now, right across the river, you want to do it again. History does repeat itself. Sad but true. You've only been on the forest for 8 years; well, mostly in the Yreka desert. And your staff has mostly been here for less years. That is a problem. So, I guess I'm now talking to the mail room flunky. Please pass my letter on to Patricia. She really needs to know that there are a bunch of laws the Westside Project will break, as outlined by a lot of very smart people who really are passionate about keeping the Klamath National Forest biologically rich and the roadless areas in tact. She really needs to personally read every bit of the response comments, especially the comments that say the USFS is going to break this law and that law and the USFS is totally ignoring a mountain of recent science.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest Service prepared the Westside Fire Recovery EIS in compliance with the National Environmental Policy Act and other relevant federal and state laws and regulations as well as using the best available science.
102.01 - Beyond Scope	#18907-28	There should be a half mile no disturbance zone outside the boundary of all Wilderness, Backcountry, Research Natural Areas, Recommended Wild Rivers, and Inventoried Roadless Areas to protect the scenic beauty and allow for natural regeneration of natural forest conditions.	Changing regulations to, or boundaries of wilderness, Research Natural Areas, recommended Wild Rivers, and inventoried Roadless Areas is outside the scope of the Westside Fires Recovery EIS.
102.01 - Beyond Scope	#18907-9	7. No grazing from cows should be allowed within the perimeter of any of the three fire areas for many years to come. Grazing is known to be detrimental to springs, creeks, grasslands, and the entire environment. Cows should be kept out of the fire areas and no new grazing areas should be opened to compensate for the loss.	Changes the grazing policy on the Klamath National Forest is outside the scope of the Westside Fire Recovery EIS.

Code	Comment Number	Comment Text	Response
102.01 - Beyond Scope	#18909-119	Johnny O'Neil LSR-354 LSRA 2-77, "A portion of this LSR originated as a HCA under the ISC's spotted owl management strategy. The HCA, which included portions of Seiad LSR, was intended to provide for 19 pairs of spotted owls in the future, that figure adjusted for demographic and environmental uncertainty." 2-78 , "This LSR currently has 34% of the capable land base in late successional habitat." "Mid- seral stands are a very important attribute for the development of future late-successional habitat. Mid-successional habitat currently accounts for 42% of the capable land base. Stands within this seral stage are key for developing into late successional habitat." 2-79 , "One particular area of concern for potential wildfire effects in this LSR are the acres in plantations. Past harvesting and fire salvage have created plantations scattered throughout the LSR. Sixteen percent of the LSR land base consists of plantations." "Plantations that have not been thinned or thinned and not treated increases the potential of loss not only to the plantation but also to the surrounding area." 2-79, "Road density within the Riparian Reserves of the LSR is above the mean for the 17 westside LSRs." "The percent of Riparian Reserves in plantation for the LSR is well above the mean (7.9%) for the Klamath's LSRs ." 2-79 , "The 1997 flood event resulted in 23 new slides over 26.5 acres on the Klamath portion of the LSR. A single slide in Horse Creek covered 15.4 acres. Channel scour affected 17.2 miles of stream in Seiad Creek and the East Fork of Horse Creek." 2-80 , "In terms of land base, the LSR provides some direct refugia for anadromous species, primarily steelhead. Road density within the Johnny O'Neil LSR (2.4) is just above the mean of the seventeen west side LSRs (2.3). On average, there are 0.9 road crossings per mile of stream within the LSR. This value is also just above the mean for the 17 west side LSRs (0.8 per mile of stream). When combined with the percentage of Riparian Reserves in plantation, the Johnny O'Neil LSR ranks low for aquatic environment connectivity." 2-80, "Botanical surveys over past years have confirmed the presence of 3 survey and manage vascular plants within the LSR. Cursory surveys for lichens and fungi have identified suitable habitat for several species in portions of the LSR. A considerable amount of the LSR has been surveyed for amphibians, revealing the occurrence of Siskiyou Mountains salamander at many locations." 2-80, "Great gray owls have been heard during surveys that have occurred along Siskiyou Crest." 2-80, "Johnny O'Neil provides approximately 20,420 acres of nesting/roosting habitat and 7,370 acres of foraging habitat for a total of 27,790 acres of suitable spotted owl habitat (Map Figure 7). An additional 8,850 acres could potentially provide spotted owl habitat. Given that the LSR is at 76% of capable, it is 1 percentage point within its expected range of 75-85% of capable." 2-82, "In conclusion, the Johnny O'Neil LSR, in combination with Seiad LSR, perform all the intended functions of CA 15 and OR 73. There are some portions of critical habitat that fall within "matrix," but overall, the intent of the critical habitat designation is exceeded by LSRs. 2-82, "The south west portion of the LSR, in the Seiad Creek drainage, however, is severely lacking in the distribution of LSOG habitat. Much of the area is dominated by early seral vegetation. Overall, the distribution and connectivity of LSOG habitat, relative to other Forest LSRs is moderate." Collins Baldy LSR-355 LSRA 2-83, "The LSR has its origin as a HCA under the ISC's strategy. Its primarily intent was to provide connectivity to HCAs farther east. Its future expected spotted owl pairs, adjusted for demographic and environmental uncertainty, was 3 pairs." 2-84, "Late-successional habitat is currently lacking within this LSR, 13% of the capable ground."	See response to comment number 18909-116.

Code	Comment Number	Comment Text	Response
102.01 - Beyond Scope	#18909-120	2-84 , "The fire risk one of the highest of all the LSRs, rating of 1.08, but only 12% has historically burned. This could be due to the proximity of Collins Baldy look out and early detection of fires." 2-85 , "The area is checkerboard ownership with high levels of harvest occurring over the past several years. Fuels have been allowed to accumulate, increasing the fire hazard. When considering the surrounding area of high fuel accumulation from the activity fuels, the fire behavior potential can change dramatically. Flame lengths would be at a point to where aircraft and equipment would be needed. This increase in fuels dramatically increases the probability of a stand replacement fire." 2-85, "Road density within the Riparian Reserves is the second highest of the 17 west side LSRs." "Road density within the Collins Baldy LSR (3.3) is above the mean (2.3), and is the fourth highest of the 17 westside LSRs. On average, there are 1.1 road crossings per mile of stream within the LSR. This value is above the mean for the 17 west-side LSRs (0.8 per mile of stream)." 2-85 , "Botanical surveys over the last several years have confirmed presence of two Survey and Manage vascular plant species within the LSR. Cursory surveys for lichens have identified suitable habitat along and upslope from the Klamath River. Amphibian surveys have occurred in portions of the LSR resulting in one known location of Siskiyou Mountains Salamander to date." 2-86 , "The results yielded fisher detections at 14 different stations during the survey period. Fisher detections occurred in Kinsman Creek, Dona Creek, Collins Creek, Singleton Creek, Gumboot Creek, Crooker Gulch, and along the ridge between Mill and McKinney Creeks. The results of this survey were somewhat surprising, given the fragmented nature of habitat throughout the sample area." 2-87 , "The Collins Baldy LSR provides approximately 4,600 acres of nesting/roosting habitat and 4,500 acres of foraging habitat for a total of 9,100 acres of spotted owl habitat (Map Figure 7). An additional 2,930 acres have the potential to provide spotted owl habitat. Given that the LSR is at 76% of capable, it is 1 percentage point inside its expected range of 75-85% of capable." 2-87, "Collins Baldy LSR overlaps almost entirely with critical habitat unit CA 16." 2-87, "Critical habitat unit CA 16 is about 12,370 acres. Table 2-103 summarizes overlap of CA 16 with Collins Baldy LSR and other land allocations. Approximately 99% of the critical habitat unit overlaps with the LSR. There is no overlap with other "reserved" land allocations." 2-87 , "Collins Baldy LSR includes 12 spotted owl activity centers. This exceeds the spotted owl pair objective for the critical habitat unit." 2-88 , "Currently, 1,630 acres or 13% of capable, are vegetated in LSOG habitat. This is the lowest proportion of capable ground vegetated in LSOG habitat, amongst the 11 LSRs covered in this assessment." 2-88, "The few stands of LSOG forest that occur are located in the upper reaches of Kinsman Creek, Dona Creek, and Franklin Gulch. Overall, the distribution of LSOG habitat throughout the LSR ranks low." 2-88, "Overall, the distribution and connectivity of LSOG habitat throughout the LSR ranks low."	This comment appears to be random citations from the Forest Late-Successional Reserve Assessment concerning the Collins-Baldy Late-Successional Reserve on the east side of the Scott River in Mill Creek. There are no Westside Fire Recovery Project activities proposed in the Collins - Baldy Late-Successional Reserve. This comment is outside the scope of this analysis.
102.01 - Beyond Scope	#18909-9	Looking at the Salmon Salvage timber sale recently implemented this winter, it is apparent that the intense amount of activity fuels left behind presents a serious fire risk. The deep bed of fuels is nearly or completely impenetrable, such that the Klamath National Forest is not sure how to treat the area and is considering torching the area with a helicopter. This presents its own dangers such as high intensity burning that may irreversibly harm soils or spread to adjacent areas. Further, there is little to no chance of natural recovery in the treated area because there is so much fuel on the ground. We are led to speculate that if these areas were left unlogged they would have already begun to regenerate, contrary to the argument in the DEIS that logging leads to forests growing back faster. The Salmon Salvage project is a much smaller area than what the agency is proposing in the Westside project, and thus the potential fire risk left by the proposed activities of the Westside project would be much larger than that left by Salmon Salvage. The DEIS fails to adequately explain the timing of treating activity fuels, as seen from the Salmon Salvage project, which are possibly too deep to be treated manually and on the slopes that are too steep to be treated mechanically.	The effects of the Salmon Fire Salvage project are outside the analysis area of the Westside Fire Recovery Project analysis, with the exception of how they are considered for cumulative effects analysis. That being said, treatments for the Salmon Salvage Project are still ongoing to address fuels conditions. We acknowledge the need to treat activity-generated fuels for this project, which is evidenced by the fact that we propose such treatments, including prescribed underburning, site preparation, fuel management zones and WUI treatments; see Chapter 2 of the final EIS for a description of proposed actions. Fuels treatments will break-up the amount and continuity of fuels across the landscape. About five years after the 2014 fire, most areas will be ripe for the prescribed underburning proposed in Chapter 2 of the final EIS. Timing of all burning activities must adhere to pertinent air quality regulations and a smoke permit that is administered by the local County Air Resource Agency.
102.01 - Beyond Scope	#18918-8	Also, I realize that the U.S. Fish and Wildlife Service has been playing games (and bowing to timber industry pressure) by continued refusal to list either the Pacific Fisher or the Humboldt Marten as threatened or endangered species. Such further fragmentation of habitat - and on a landscape scale - which would be done under the Westside "Fire Recovery" proposal, is exactly the kind of behavior that could drive these forest carnivores to extirpation and extinction.	U.S. Fish and Wildlife Service policy is outside the scope of the Westside Fire Recovery analysis.

Code	Comment Number	Comment Text	Response
102.01 - Beyond Scope	#18926-11	The DEIS acknowledges on page 179 that there are no regulations requiring private landowners to protect sensitive plant species or reduce the spread of NNIS species. However, there are no suggestions to integrate private landowners' management activities to align with the Forest Service's goals for this project. It is recommended that guidelines for attempting to gain private landowner cooperation via alignment of management methodology be incorporated into the DEIS or FEIS. ! ! Environmental Consequences	Regulation of activities on private property is outside the scope of the Westside Fire Recovery EIS. The Forest Service does facilitate work on private lands through the Rural Advisory Committee and other program work that is outside the scoping of this project. Contact Forest Service fuels/fire program manager for more information.
102.01 - Beyond Scope	#19079-1	What is the chemical make up of the fire retardant used to suppress the Westside fire? How many gallons were used? What was the method of delivery, the spreading of the retardant? What was the criteria for choosing one retardant over another? What adverse side effects does this retardant have on wildlife and aquatic life? What effects does the retardant have on soil PH levels? Does the retardant effect the ability for the ground soil's nutrients to be taken up into the plants?	Fire retardant use, method of delivery and effects of retardant use during the 2014 fire season is outside the scope of the Westside Fire Recovery analysis.
102.01 - Beyond Scope	#19079-8	When was the date of the accidental spill of fire retardant in the Klamath River? What accidental spill near the Klamath River landed direct on Klamath River waters? What was the fire retardant used during and throughout the Westside Fire? When did the applicator company report the accident? Was California Fish and game notified of the spill? Was US Fish and Wildlife informed of the spill? Was NOAA informed of the spill? Was the Yurok Tribe informed of the spill?	See response to comment number 19079-1.
102.01 - Beyond Scope	#34-3	The Forest Service has made signifiant and admirable progress away from the old, rogue agency of ancient forest liquidation toward an agency of legitimate, responsive ecological managers. The Klamath's own Gooseneck District has demonstrated ecologically sound, scientifically validated logging in the recent past, and yet the Supervisor's office is overcome by ecological and scientific amnesia in the aftermath of a fire that its own fire ecologists recognize as a historically familiar event. The FS could allow the forests affected by fire to set a demonstrative example of the capacity for intact old-growth forests to regenerate without intervention, as has been documented in the recovery of forests from the 2002 Biscuit fire on the nearby Klamath NF. This would help the FS to break the cycle of self-fulfilling prophecy that post-fire forests require logging, which in turn leads to overstocked stands of small-diameter trees, which in turn lead to greater vulnerability of stand-replacing fire. If the Klamath pursues this appalling conversion of old-growth forest into a fiber planation, it will be condemned to an indefinite sentence of firefighting, not the integration of ecologically benign fire that its scientists recommend.	The recovery of forests from the 2002 Biscuit fire is outside the scope of the Westside Fire Recovery analysis.
102.01 - Beyond Scope	#4-2	The project uses a varied approach to essential fuels reduction, including salvage, hand release, mastication, livestock grazing, reforestation, and underburning. In my opinion the planned actions are not aggressive enough, but adequate given the legal and political barriers and also restrictive timelines. Changes in ESA, NEPA, adjustments to LSR, and designated road less areas are imperative to allow professionals to manage the forest in an effective and efficient manner. Constant loud, uninformed, biased, non-local litigations have long delayed or restricted similar restoration actions in the region. I'm sure it's well known and understood that to delay further only compounds an already proven catastrophic situation. It is my hope that good science, history, and professional management can salvage and restore the lands of my grandfathers. Implementing this project is a good start.	Changes to Endangered Species Act, National Environmental Policy Act, Late-Successional Reserve and designated Roadless Area regulation and policy are outside the scope of the Westside Fire Recovery EIS.
102.01 - Beyond Scope	#5873-127	BLM's Western Oregon Plan Revision DEIS (p. LII) admits that structurally complex young forests develop old forest characteristics twice as fast as structurally deprived initial conditions. This is a serious indictment of salvage logging.	The Bureau of Land Management's Western Oregon Plan Revision draft EIS is beyond the scope of the Westside Fire Recovery analysis.

Code	Comment Number	Comment Text	Response
102.01 - Beyond Scope	#5873-145	The Warner Creek LSR salvage project on the Willamette National Forest endeavored to retain trees 20 inches and over. REO found it consistent with the LSR Standards & Guidelines. Consider the following excerpt from the REO review: Snags should be retained when they are likely to persist until late-successional conditions have developed. Complies. The project proposes to remove all dead trees within 1.2 to 2 acre circles in dispersed group selection areas, and all dead trees less than 20" dbh (those less likely to survive as snags during the next 80 to 100 years; i.e., the period of creation of LS/OG conditions) from a 50-foot area around the group selection salvage sites. … The project occurs in an area with nearly 100% tree mortality. The proposal anticipates that within the 492-acre group selection prescription, approximately 98 acres of dispersed openings 1.2 to 2 acres in size would be created. Within the 492-acre group selection, dead trees 20" dbh and larger surrounding these 98 acres of dispersed openings will be retained for snag and coarse woody debris recruitment. REO Review of Warner Creek Salvage. http://web.archive.org/web/20050226202105/http://reo.gov/library/lsr/letters/270lsr.htm	The Regional Ecosytem Office review of the Warner Creek Late-Successional Reserve Salvage project is outside of the scope of the Westside Fire Recovery analysis. The Regional Ecosytem Office has reviewed the Westside Fire Recovery EIS and has found the proposed actions to be consistent with Late-Successional Reserve standards and guidelines. All correspondence between the Forest and the Regional Ecosytem Office, including the Regional Ecosytem Office's findings regarding consistency, can be found in the project record. See Appendix E of the final EIS: Proposed Activities in Late-Successional Reserves, Westside Fire Recovery Project, Klamath National Forest.
102.01 - Beyond Scope	#5873-17	Prepare a new programmatic EIS on young complex forests. The agency must prepare a new programmatic EIS to consider the effect of salvage logging on young complex forests and the development of complex older forest. The agencies should not conduct any more salvage logging until they have fully disclosed and considered current scientific understandings about the role of fire and other disturbances in forest development.	Preparing a programmatic EIS on the effects of salvage logging in young forests and the development of complex older forests is outside the scope of the Westside Fire Recovery EIS. The project draft EIS analyzes the site specific effects of the no action, the proposed action and Alternatives.
102.01 - Beyond Scope	#5873-17	Prepare a new programmatic EIS on young complex forests. The agency must prepare a new programmatic EIS to consider the effect of salvage logging on young complex forests and the development of complex older forest. The agencies should not conduct any more salvage logging until they have fully disclosed and considered current scientific understandings about the role of fire and other disturbances in forest development.	Preparing a programmatic EIS on the effects of salvage logging in young forests and the development of complex older forests is outside the scope of the Westside Fire Recovery EIS. There is not requirement to prepare a programmatic EIS. The responsible official has chosen to complete analyze impacts of this project with one project-level site-specific EIS to meet the requirements of National Environmental Policy Act. Best available science is referenced throughout the final EIS and supporting documents. The final EIS analysis the direct, indirect, and cumulative site specific effects of the no action, the proposed action, and Alternatives to it.
102.01 - Beyond Scope	#5873-2	Forest plan objectives related to wood production after wildfire need to be reconsidered in light of new information on the adverse effects of salvage logging and the ecological value of natural recovery after fires.	Revision of the Forest Plan objectives is outside the scope of this analysis. The commenter fails to disclose new information for the agency's consideration. The existing Forest Plan currently provides management direction on the Klamath National Forest until the Forest Plan is revised. The impacts of salvage harvest are disclosed throughout Chapter 3 of the EIS. Analysis is based upon best available science as cited in the final EIS and supporting documents.
102.01 - Beyond Scope	#5873-65	The shortage of snags in the decades following stand replacing fire is acknowledged by the Forest Service on page 136 of the Wallowa-Whitman National Forest's Trail Vegetation Management Project EA (October 2012).	The Wallowa-Whitman Environmental Assessment is outside the scope of this project. See Chapter 1 of the EIS under the discussion of salvage in Late Successional Reserves; there is no shortage of snags in the project area.
102.01 - Beyond Scope	#8739-1	Additionally, I depend on a pristine environment there for one of my prescriptions authorized by my attending health practitioner. Any monopoly activity in this area threatens my personal health and wellness. This medication is ONLY available in that area.	Prescription medication availability is beyond the scope of the Westside Fire Recovery EIS.
102.01 - Beyond Scope	5873-20	The agency must prepare a programmatic EIS to comprehensively disclose and consider: a. the natural range of variability and existing rarity of complex young forests (e.g., young forests that are unsalvaged after disturbances). Since large snags are outside the natural range of variability across the landscape, the agency must retain all large snags to start moving the landscape toward the natural range of variability, or the agency must carefully justify in the NEPA analysis every large snag it proposes to remove. See Jerome J. Korol, Miles A. Hemstrom, Wendel J. Hann, and Rebecca A. Gravenmier. Snags and Down Wood in the Interior Columbia Basin Ecosystem Management Project. PNW-GTR-181. http://www.fs.fed.us/psw/publications/documents/gtr-181/049_Korol.pdf. This paper estimates that even if we apply enlightened forest management on federal lands for the next 100 years, we will still reach only 75% of the historic large snag abundance measured across the interior Columbia Basin, and most of the increase in large snags will occur in roadless and wilderness areas.	See response to comment number 5873-17.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#10-2	I also feel that replanting should be done, not plantation style, but with wildlife health a priority and that the ridge tops kept bare to prevent spread of fires. No live hardwoods should be cut down. We should consider what might be best to plant in a region that will be drier...?cactus?	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for proposed actions; plantation style replanting is not proposed. In response to comments, the final EIS clarifies site preparation, planting, and release criteria and treatments. Hardwoods are not proposed for cutting or removal, except for limited, strategic fuels treatments.
102.02 - Position, No Rationale	#10362-1	How can the Forest Service even consider this terrible plan. Are they being bought off by those who will gain financially? I am shocked by the extreme clearcut logging of "late-successional" old-growth reserves and geological riparian reserves proposed by the Klamath National Forest in the Westside Salvage Project. I believe money is behind this awful plan.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is proposed; see Chapter 2 of the final EIS for a description of the proposed actions. See Chapter 1 of the final EIS for a discussion of salvage logging in Late Successional Reserves.
102.02 - Position, No Rationale	#10398-1	Forests are the earth's lungs. The earth, as you might have heard, is running a fever. Any meteorologist or climatologist will confirm. When a patient is in the hospital with a fever, do you remove a big chunk of the lung? And when the earth is dead, sirs, where do you propose we should live?	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See the climate change section in Chapter 3 of the EIS for a discussion of related effects.
102.02 - Position, No Rationale	#10465-1	The proposed logging plans are a cruel joke, and would impact the waters,creatures, and habitat for thousands of years...maybe forever. That forest is doing more for California and the globe by just being than some corporation could even imagine, let alone replace.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 of the final EIS for a discussion of effect by resource area and Alternative.
102.02 - Position, No Rationale	#10564-1	I remember when a stand was made to keep the clear-cutting from happening some 25 years ago. My parents owned property in the "California Pines", an area that was beautifully rugged and relatively untouched. The community stood with guns, and ready to fight as the timber companies tried to steal thier lumber then.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is being proposed; see Chapter 2 of the final EIS for a discussion of the proposed action.
102.02 - Position, No Rationale	#10870-1	Are you kidding me? More greedy bastards cutting down forrests for money! Let me go chop down your homes and see how you like it! You [obsenity] are going to kill this planet and everyone on it, because you want more money. I spit on you. I	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The management indicator species analysis explores the effects of the project on identified important habitat associations per the Forest Plan. The drought conditions are considered in the affected environment.
102.02 - Position, No Rationale	#11093-1	We must preserve our ancient forest ofr sake of our children and our children's children. Please do not be short-sighted on this issue - It's time to cut profits, not trees!!! Save our trees and god's sake (and the sake of all living being upon this planet!!!) Bless you if you do :)	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project doesn't proposed to remove any ancient forests. See Chapter 2 of the final EIS for a description of what is being proposed.
102.02 - Position, No Rationale	#11835-1	If we have to continue to protest these type of clear-cutting old-growth reserves then we will because it is irresponsible stewardship of our forests will destroy ecosystems and important habitat. This is unacceptable and I am outraged.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is being proposed; see Chapter 2 of the final EIS for a description of the proposed actions.
102.02 - Position, No Rationale	#11835-2	I ask you not to log in protected important wilderness, wildlife and watersheds!	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No logging is proposed in designated Wilderness. Wildfire and watershed habitat is throughout the project area; see Chapter 3 for a disclosure of effects by resource area and Alternative.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#11850-1	Please take an ethical approach and tell the truth about just what you are up to. The words you use: "restoration" "salvage" all are disingenuous. I despair. We cannot live without our great forests. The earth is groaning.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#11908-1	It is unconscionable that with cavalier, devil-may-care attitudes, you folks are willing to sell out to timber companies (probably Chinese owned) and drop kick our heritage as well as ruin habitat for wild creatures without so much as a sliver of concern or culpability. How shameful! Please, please connect the dots with what is right for the American people, the American way of life and her creatures. These are our national treasures that I personally don't want squandered to the highest bidder with a pocketful of change.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#12214-1	A decision to permit logging on the Klamath National Forest is absolutely unsupportable. Please follow your own rules, and stop this from happening--do what you need to do, which you know is environmetally sane, wise, ethical and moral.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project is consistent with the Forest Plan and other relevant law, regulation, and policy, as disclosed in the final EIS.
102.02 - Position, No Rationale	#12232-2	The Forest Service needs to meet its obligation to be a good steward of this land that belongs to all Americans, rather than hand it on a silver platter to industrial interests who have already recklessly logged everything else.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project design and analysis is based upon best available science as described throughout the final EIS and supporting documents.
102.02 - Position, No Rationale	#12314-1	This is but the latest scheme by the corporate forest raiders--aided and abetted by their water-carriers (you know whom I'm talking about)--to grab more easy cash from taxpayers. I have hiked and backpacked pretty extensively in the Klamath NF over the years. I've experienced the rugged beauty and recoiled at the atrocities perpetrated by the forest-killing corporados. This must stop, now.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#12334-1	Please know that the marble mountain wilderness is one of my favorite places in the world!!! As a 12 year resident of Oregon that had to move back east, this is a place I want to return to. The views, the wildflowers, the lakes, the wildlife…	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No logging is proposed in designated Wilderness with this project under any Alternative, as described in Chapter 1 of the final EIS.
102.02 - Position, No Rationale	#12353-3	I understand that much of these areas were burned so hot that the soil was damaged and will not support any sort of reforestation for a very long time, however I feel that as much of this land should be replanted with a variety of trees, plants and grasses as soon a possible.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project does propose re-planting with a variety of tree species, as described in Chapter 2 of the final EIS.
102.02 - Position, No Rationale	#12361-1	The clear cutting that was done has caused the road to need upgrading almost yearly. To clear cut up from a paved road and creek system is not right. Clear cutting is a cheap way of logging and not good anywhere. It is happening at Taylor Lake area and Etna Mountain too. Our forest are losing more and more large trees and the small dieing trees are being left to burn. It is not a better forest or more fire resistant, it's being done for profit only. I see all kinds of Forest that have been "managed" and they are still full of dead and dieing trees left to burn when a fire does happen. Don't take my word for it, drive or walk through and see for yourselves. These huge slash piles are left for years at a time, some never get dealt with and the under brush still there to burn. Yes, the drought in California and other states is making fires harder to stop once they get going but that too is Mother Nature. We can' make water but lets not get rid of our forest because of it. We need to think about where we build some homes and try harder to make areas safer around our own properties. The Forest Service and Logging Companies need to do a better job with the underbrush and dead trees not Old growth and live trees. Please get out into the forest and look for yourselves. Mother Nature does a great job on her own. Our forest should not be for sale.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is proposed with this project; see Chapter 2 of the final EIS for a description of proposed actions. The effects of no action are disclosed by resource area throughout Chapter 3 of the final EIS. Green trees will be retained; see response to comment number 12346-55.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#12363-2	The Westside Fire Recovery Project would be detrimental to the organisms utilizing the land. This would be especially harmful to the salmonids in the streams impacted by the runoff from these logging locations and the spotted owls that have been shown to continue to utilize post-fire habitat in established territories for nesting and feeding. Roadless areas, such as the Grider Creek drainage need to be left alone, as do important coho salmon streams such as Tom Martin Creek and it's entire drainage. The "restoration" effort that will be conducted is also minimal, especially considering the lack of funds towards this effort. There needs to be funds for the entire "restoration" effort (of slash) after logging, not just 1/3 of it.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 5873-19. Consideration of funding for the Westside Fire Recovery project implementation is outside the scope of the analysis.
102.02 - Position, No Rationale	#12366-1	By clearcutting the timber in this area, you will be killing the forest, not recovering it! Our national forests should not be considered ATM machines for logging companies. They are our public treasures. There are other ways to foster equitable prosperity in the region. We need these forests to remain uncut for our livelihoods and our survival. Please think about the future for everyone, not quick bucks for a few.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 6924-1. No clear-cutting is proposed; see Chapter 2 of the final EIS for a description of proposed actions.
102.02 - Position, No Rationale	#12368-3	This logging need to happen in order to decrease the fire danger in this area. Being a resident in this area, it is important to me to have this forest cleaned up and healthy.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#12443-1	Having long been the owner of 25 acres of deciduous forest (which is a LOT in Central New Jersey) I know that foresters will produce any kind of "conservation" plan that they are paid to do. This may be legal from a technical viewpoint, but it's a lousy long-term solution to protecting forests.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#12467-1	Please follow your own rules and do not log healthy forests in the Westside Salvage Project in Klamath National Forest.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Also see response to comment number 18918-22 and comment number 18926-33. The commenter incorrectly asserts that the proposed actions are against "our own rules"; the project is consistent with the Forest Plan and other law, regulation, and policy.
102.02 - Position, No Rationale	#12467-2	Please don't use wildfires as an excuse to fast-track logging in protected forests!!	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#12467-3	The emphasis should be on restoration, not further degradation.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Restoration is a stated objective of the project; see Chapter 1 of the EIS under the purpose and need.
102.02 - Position, No Rationale	#12549-1	The Westside project would destroy the Caroline Creek eagle nest area and would harm Late-Succesional Reserves (LSRs), Riparian Reserves, imperiled native wildlife, endemic species, wild salmon, water quality, Wild and Scenic Rivers, Visual Quality Objectives, meadows, soils, geology, botany, cultural resources and vital biological legacies. Fuels treatments may never be funded and the project would endanger river communities.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The decommissioned section of Forest Road 46N62 (also referred to as the “Caroline Creek Road”) will remain closed. Sections of decommissioned road associated with dropped salvage units were also dropped. These roads include decommissioned sections of 45N56YA, 46N42Y, and 46N78, which will remain closed. See Chapter 1 for changes between the draft and final EIS. See Chapter 1 of the final EIS for a discussion of salvage in Late Successional Reserves. Effects of the project are discussed throughout Chapter 3 of the final EIS by resource area and Alternative. Also see response to comment number 12364-1.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#12549-5	Post-fire logging is not recovery. The DEIS is so full of inadequacies it should be rescinded. If you want to sustain the health, diversity, and productivity of the Klamath National Forest to meet the needs of present and future generations the agency should follow the law and serve the people by working on a long-term fire strategy plan that is good for wildlife, watersheds and the people.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter says that the draft EIS is inadequate but doesn't describe how. See Chapter 1 for the purpose and need and Chapter 3 for effects analysis of the proposed actions. The project complies with law, regulation, and policy. The Forest has a Fire Management Plan that incorporates the Forest Plan and is regularly updated.
102.02 - Position, No Rationale	#12643-1	the ignorance of men is the enemy of mama nature why is it that the most educated people commit the worst crimes against nature and humanity? men has turn earth into a painful place for all living beings...when you do wrong nothing goes unpunished	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#13381-1	Although I live near the California Coast about 50 miles North of San Francisco, I am very concerned with the health of our forests in the west and have seen first hand the kind of damage that logging as proposed in this plan can do.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#13780-1	Stop unnescessarily destroying our forests.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#13867-1	am writing from the perspective of a citizen who makes a personal commitment to practice what I preach and to attempt to limit the environmental impact through my daily lifestyle. Recreational pursuits also include visiting and camping within national parks and driving through our national forests. I am highly invested in their sustainability. For these reasons, I strongly support the position developed below by the Rainforest Action Network.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 1 of the final EIS for a description of the purpose and need of the project, including restoration.
102.02 - Position, No Rationale	#14451-2	Let the forest grow !	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#14501-1	There is so little beauty left. Please join it.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#14822-1	The following form letter succinctly states the concerns that I and many others have about this DEIS. I am deeply saddened that the Forest Service would be supportive of such a destructive logging plan, and choose to ignore the irreparable harm harm which will be done.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#15243-1	Is your job to protect and sustainably manage forests, or exploit and destroy them?	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#15243-2	I was born in the beautiful state of California, and I would like it to stay a beautiful state, not an over-farmed, over-developed and over-logged wasteland.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#15305-1	I have backpacked into the Marble Mts a few times - in the area that burned last summer. Maneaten Lake Is an awesome place and the Wooley Creek watershed is so wild, that if Bigfoot exist, they live in that valley.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#15335-1	We can count on a few greedy exploiters to enrich themselves by the age-old process of taking what does not belong to them, and selling it off, as money in their pockets now is more important to them than the future of the public that owns the land.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#15431-1	the ignorance of men is the enemy of mama nature why is it that the most educated people commit the worst crimes against nature and humanity? men has turn earth into a painful place for all living beings...when you do wrong nothing goes unpunished	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#15436-1	These actions are clearly motivated by profit, not by fire protection. This is not the contribution forestry is meant to make to our global and local environmental challenges.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#15490-1	First I am shocked by the plan to allow the logging of the Daniel Boone Forest in Pulaski and Whitley Counties in Kentucky. This land belongs to us all. Not to be sold at wholesale, costing us money for corporate profit.	This comment is outside the scope of this project.
102.02 - Position, No Rationale	#15617-1	Clear-cutting in old-growth? I thought that green-driven insanity, that annihilation of our most precious gene pools, had been banned a long time ago! Come on, you people! This is the Forest "service"????	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is proposed. Snags and other legacy components are being retained; see the wildlife project design features in Chapter 2 of the final EIS for details.
102.02 - Position, No Rationale	#16-1	I support alternative 2. I am hopeful that salvage can start soon and provide jobs and marketable timber. This alternative would also benefit local schools and the county roads department through the forest reserve funding formula set up by congress a long time ago. The hard work and consideration of the KNF staff is greatly appreciated and valued.	Comment of support. Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#16695-2	This logging project ignores what the Forest Service should have learned from a number of studies, including those conducted by its own agency scientists, concerning post-fire forest regeneration and the deleterious affects of post-fire salvage logging.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#16695-4	As a former resident of southwest Oregon who retains great affection for our precious forests, I shudder at the ecological carnage that Westside timber sale would wreak on over 60,000 acres, including precious roadless areas and old-growth forest, consisting of both living trees and snags. Contrary to the falsehood implicit in the term 'salvage,' these dead trees are extremely valuable as reservoirs for moisture and nutrients. In designating them for 'salvage' logging, a term that clearly implies a negation of these ecological values by 'salvaging' their economic value as the only extant one, the Forest Service confuses and undermines the public understanding of forest ecology that it attempts to communicate elsewhere. The FS, if it were reading its own studies and public literature concerning forest ecology, would not plan or enact so ecologically fallacious a management construct as "salvage logging" after a fire.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We understand the importance of leaving snags and downed wood on the landscape and have included wildlife and watershed project design features in this project for this purpose (final EIS, Chapter 2). See the glossary of the final EIS for a definition of salvage harvest. The final EIS incorporates best available science into the design and analysis of the project; see final EIS and supporting documents.
102.02 - Position, No Rationale	#16939-1	The fires are bad enough. Please don't increase the direct damage to the soil and biome, but the indirect damage caused by increasing levels atmospheric CO2 that lead to more drought and fires.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#17111-8	Hence, it would appear to me that the fire effects experienced were characteristic of what would be expected in the majority of the LSR area proposed for salvage in the Westside Fire area.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#17258-1	How can you still be cutting old-growth? Have we learned nothing of the delicate nature of an old-growth ecosystem? Does money still trump saving the last few percent of remaining ancient forests? Do I really have to tell my grandchildren what a forest might have looked like before Europeans took over here because there are none to actually show them	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#17301-2	In addition, I am opposed to any logging and mechanical entry into roadless areas, including areas proposed in legislation introduced by Senator Barbara Boxer in 2002 and 2006 for addition to the Marble Mountain and Russian Wilderness areas.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#17385-1	The level of logging and road building proposed is too much for the multiple uses that are intended for all national forests, and will damage the particular values that make this area of the KNF truly spectacular. While some removal of hazard trees along roads and fuels treatments are needed to protect local communities, I am concerned that the plan will continue efforts to eliminate fire, even good fire, and promote turning this remarkable natural area into a tree plantation.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 18918-14.
102.02 - Position, No Rationale	#17396-1	I wish to protest strongly against the proposed "salvage" logging in the Klamath Forest. The clear cutting and road building will do more damage than the fire did.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is being proposed. The construction and re-construction of roads for temporary use is minimal. See Chapter 2 of the final EIS for a description of proposed actions.
102.02 - Position, No Rationale	#17446-1	I am opposed to any expansion of blogging interest in the Klamath area	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#17466-1	I am very concerned about the Project's potential impact on water quality and threatened salmon, old growth forests and the Northern spotted owl, existing and proposed Wild & Scenic Rivers, and roadless areas (some of which have been proposed in legislation as additions to the Marble Mountain Wilderness).	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 of the final EIS for a disclosure of effects by resource area and Alternative. No treatments in Wilderness are proposed under any Alternative. No salvage harvest in proposed in Roadless Areas; however, limited roadside hazard treatments are proposed where exiting roads intersect Roadless Areas. See Chapter 1 of the final EIS for a discussion of management areas and see Chapter 2 for a description of the proposed actions.
102.02 - Position, No Rationale	#17466-2	The level of logging and road building proposed is simply too much. While some removal of hazard trees along public roads and strategic fuels treatments are needed to protect local communities, I am concerned that the Forest Service plan overall will continue to perpetuate the agency's century-old exclusion of fire and plantation forestry.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is being proposed. The construction and re-construction of roads for temporary use is minimal. See Chapter 2 of the final EIS for a description of proposed actions.
102.02 - Position, No Rationale	#17466-3	I am particularly concerned about proposed activities that could adversely impact the existing Klamath, Scott, and North Fork Salmon Wild & Scenic Rivers and segments of Elk Creek, Grider Creek, and South Fork Russian Creek recommended by the Forest Service for Wild & Scenic protection. In addition, I am opposed to any logging and mechanical entry into roadless areas, including areas proposed in legislation introduced by Senator Barbara Boxer in 2002 and 2006 for addition to the Marble Mountain and Russian Wilderness areas.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 of the final EIS for a disclosure of effects by resource area and Alternative. No treatments in Wilderness are proposed under any Alternative. No salvage harvest in proposed in Roadless Areas; however, limited roadside hazard treatments are proposed where exiting roads intersect Roadless Areas. See Chapter 1 of the final EIS for a discussion of management areas and see Chapter 2 for a description of the proposed actions.
102.02 - Position, No Rationale	#17479-1	The Klamath River is one of the most important rivers in California. We have continually degraded the habitat and have continually degraded the fishery with over logging and clearcutting. This project will continue this process and potentially eliminate what is left of the steelhead and salmon runs on the river. This would be an absolute disaster that would be irreversible.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is being proposed. See Chapter 2 of the final EIS for a description of proposed action. See Chapter 3 of the final EIS for a disclosure of effects to aquatic resources.
102.02 - Position, No Rationale	#17496-2	The project is one of the largest timber sales in recent Forest Service history and should be given a hard look. Required surveys and other environmental assessment should be undertaken on a site-specific basis and disclosed to the public before the initiation of a public comment period, which was not done in the current DEIS. The DEIS should analyze real world results rather than unscientific and unsubstantiated assumptions of analysis. The project should be canceled and a proposal addressing biological needs, ESA and fisheries needs, community fire protection needs and the region-wide reintroduction of fire should be considered. The project as proposed is simply irresponsible, short sighted, and expedited in a way that sacrifices all values beyond economic salvage.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. This comment contains inaccurate information that appears to be from a source other than the agency. The project is not the largest timber sale in recent history. See response to comment number 17371-1. See Chapter 2 of the final EIS for a description of what is being proposed.
102.02 - Position, No Rationale	#17496-4	The project also has strong negative implications for the threatened fisheries of the Klamath River and its tributary streams, northern spotted owl habitat, Pacific fisher habitat, and the maintenance of fire-resilient forest conditions. The project will increase future fire hazards in the forests and adjacent to the communities of the Klamath, Scott, and Salmon River watersheds. The project will also detract from the agency's obligation to protect communities from fire by practicing responsible and effective fuel reduction adjacent to homes, communities, ingress and egress roads, and strategic ridgelines. Instead, the agency has expended huge volumes of money and resources on illegal salvage logging operations far from homes and communities and within some of the most diverse and important watersheds on the West Coast.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 for a disclosure of effects by resource area and Alternative. The project is proposed to reduce fire risk and fuels hazards and to improve long-term watershed conditions.
102.02 - Position, No Rationale	#17498-1	Please preserve our wildlife for future generation, for job creation, and for the animals, themselves	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#17505-1	It is vital that you do everything in your power to protect our forests and the precious wildlife living within them. Please make sure to keep the health of all living things and protection of natural resources as your first priority.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#17506-1	Oh my, to be in your position with the amazing amount of power for one woman. I can trust, as also being a woman, that you will take into consideration the most sustainable and ecologically sound decision for this project. I ask that you remain humble and compassionate, thinking if those sacred things other than money. We sincere thanks, in advance.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#17764-1	I do not agree that the Westside Salvage Timber Sale is in need of an Emergency Situation Determination stamp by the Chief of the Forest Service.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 17501-2.
102.02 - Position, No Rationale	#17910-1	What science or experience has informed the decision to further degrade an already seriously impacted landscape? The negative impacts and irreparable harm that salvage logging has often caused in the past make this project untenable and unacceptable.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 1737-11. The methodology used for analysis of each resource is summarized in the draft EIS and detailed in the individual resource reports.
102.02 - Position, No Rationale	#18852-49	33) As a permanent resident of the Elk Creek watershed, I will be specifically affected by this project.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#18863-1	Be on the right side of history. Stop this please.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Chapter 1 and 2 discuss the purpose and need and the proposed action for hazard tree removal.
102.02 - Position, No Rationale	#18876-2	This area needs a leader like you to take on better plans and ensure that only regenerative and sustainable logging is done with water quality in mind as well as threatened salmon, old growth forests and the Northern spotted owl, existing and proposed Wild & Scenic Rivers, and roadless areas being protected.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#18878-10	Rugged mountainous topography, heavy fuel loadings Qackstraw fallen snags and trees), and limited access made fire suppression efforts extremely challenging. (Pg 2) Comment: Without documentation which can be cross referenced the latter portion of the above statement beyond the obvious rugged mountainous topography is specious at best. At worst it is used to have the narrative fit a pre-determined outcome such as the Refined Proposed Action.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#18878-12	Pg.6 "There is a need for restored and fire-resilient forested ecosystems." Comment: Our management philosophy and direction calls for a fire-adapted ecosystem which allows for fire to be an integral component of resiliency. The Refined Proposed Action will not allow for a transition back to a fire-adapted ecosystem that occurred before the fire-suppression period.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Wildfires provide some benefits to forest ecosystems such as snag and downed wood creation and short-term fuels reduction in areas of low intensity burns. However, intensely burned forested areas may be slow to recover and heavy fuel loading will result from fallen snags. See Chapter 1 in the draft EIS and the vegetation analysis discussion in Chapter 3 of the draft EIS for more detail of how the proposed action Alternatives would meet the purpose and need of restored and fire-resilient forest ecosystems. See Chapter 2 of the final EIS for a review of the Karuk Alternative and how it was considered and incorporated. See Chapter 1 for a summary of consultation.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#18878-80	In general the Karuk Tribe is fully supportive of roadside hazard treatments along access and egress routes for community safety and to support our often stated goal of putting fire 4of11 back on a fire adapted and dependent landscape. However, we are concerned with the amount of road miles overall, in particular by treating along Maintenance Level (ML) 1, 2 roads. There is also concern as to conditions of all ML roads pre and post project implementation and the impact to fisheries resources in both the short and long term.	Thank you for your comments on the Westside Fire Recovery Project. To provide for both public and Forest worker safety and future fire suppression efforts, roads classified in all maintenance levels were considered for roadside hazard treatments. Adjustments have been made to remove roadside hazard treatments from certain roads in the preferred or modified Alternative 3. Only hazard trees identified by the criteria listed in Chapter 2 of the draft EIS will be removed. Where no hazard trees are present, there will be no hazard tree removal. Effects to aquatic resources are summarized in Chapter 3 of the draft EIS and detailed in the aquatic resources report. See Chapter 2 of the final EIS for a review of the Karuk Alternative and how it was considered and incorporated. See Chapter 1 for a summary of consultation.
102.02 - Position, No Rationale	#18883-15	No activity of any kind should occur in Inventoried Roadless Areas. This includes roads across roadless areas to access other areas where equipment or people will do work.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No salvage harvest is proposed in Roadless Areas. However, other treatments including roadside hazard treatments (salvage logging where roads intersect Roadless Areas for safety), fuels treatments, and planting are proposed within Roadless Areas. See Chapter 1 and 2 for details of what is being proposed. Chapter 3 of the final EIS has a discussion of effects for Roadless Areas.
102.02 - Position, No Rationale	#18883-16	No activity of any kind should be allowed in late-seral or old-growth stands and no harvesting of individual trees over 30” diameter at breast height (DBH) should be allowed.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. There is no diameter limit; however, snags and legacy components, including large snags are being retained as described under the wildlife project design features in Chapter 2 of the final EIS.
102.02 - Position, No Rationale	#18896-1	I implore you to manage this project in a balanced fashion. Balance my need for enjoying wilderness values, rivers and streams, healthy forests and wildlife, and sharing it with my kids and theirs, in other words the public interest with any commercial needs which are motivated by financial interests. Life has shown me too many examples of clearcut public forests, and subsequent plantation style lands, and lacking wild values, due to USFS and public lands management	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is being proposed; see Chapter 2 of the final EIS for a description of proposed actions.
102.02 - Position, No Rationale	#18898-1	I wrote you, but I did not hear back from you. I am still worried sick about the disastrous consequences to the wildlife in the Klamath National Forest region if this plan to log so extensively goes through. We are supposed to protect endangered and threatened species- this timber plan violates that law and our trust in you to protect our rights to clean water and natural beauty.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. .Responses to comments received on the Westside Fire Recovery follow regulations from 40 CRF 1503.4. Responses to comments on the draft EIS are detailed in the final EIS.
102.02 - Position, No Rationale	#18907-11	9. Skyline logging is extremely damaging to the forest floor. This activity will tremendously increase the already bare soil mobility. Climate change is already demonstrating that increased intensity of precipitation is occurring and predictions are that it will occur in the future. These high intensity storms will increase soil particle mobilization of bare soils and skyline logging techniques will exacerbate the already fragile surface soil and cause deep gully erosion in steep areas.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 of the final EIS for a discussion of effects by resource area, including climate and soils.
102.02 - Position, No Rationale	#18907-26	The Forest Service should not be treating the Wildland Urban Interface to protect private property. Private property owners are responsible for protection of their property and not the Forest Service. Many communities have expanded with roads and many buildings into areas that used to be dense forest. If the private property owners want to do fire protection, then they can do it on their own in accordance with the laws that regulate fire and logging on their private property. This project should not be justified to protect these sprawling home sites and structures.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No treatment on private property is proposed with this project. Work within the Wildland Urban Interface is proposed nearby and adjacent to private property only. See Chapter 2 of the final EIS for a description of proposed actions. See response to comment number 18907-4.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#18907-3	What is a purpose and need for the project is taking measures to make the forest ecosystem resilient and sustainable. This should be the single greatest purpose of the project.	The purpose and need of the Westside Fire Recovery project is to address worker and public safety and access, safe conditions for firefighters performing fire suppression for community protection, create a project that is economically viable, meeting project objectives and benefiting our local communities, and restoring fire-resilient forested ecosystems. The purpose and need is described in detail in Chapter 1 of the draft EIS.
102.02 - Position, No Rationale	#18907-4	Alternative 2 is the proposed action. It appears to take the most extreme position on removal of trees and is the most adverse action to erosion, sediment production, protection of spotted owl and fisher habitat, habitat connectivity, and legacy components (i.e. old growth trees) and late-successional reserves. A new alternative should be developed and analyzed that incorporates the concepts listed herein.	The Forest Service developed 16 Alternatives to the proposed action; six Alternatives were designed to achieve the purpose and need and were studied in detail. The Alternatives are described in detail in Chapter 2 of the draft EIS. The Forest received an additional Alternative from the Karuk Tribe on March 5, 2015, which it has been incorporated into Appendix G of the draft EIS.
102.02 - Position, No Rationale	#18909-11	Another seemingly false statement in the DEIS page 112: "In some cases of high severity burn, there are no living conifer trees available to provide potential seed for potential regeneration for several miles." Please provide us with the locations of these areas.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The location of high severity burn areas within the Westside Fire Recovery project area can be seen on Rapid Assessment of Vegetation Condition after Wildfire (RAVG) maps in Appendix A of the draft EIS. This condition is most evident in portions of the Walker Creek drainage, including the East Walker Creek, upper O'Neil Creek, and Slinkard Peak areas. There are very few conifer trees remaining in these areas capable of providing potential seed sources for future potential natural regeneration needs in the near term.
102.02 - Position, No Rationale	#18909-12	The DEIS page 112 assumes that, "[t]he removal of these dead trees will help ensure effective and timely restoration of burned treatment stands." This is written under the Affected Environment section and is a broad assumption not based on the best available science. This is just one example of the false information throughout the DEIS, because the agency is proposing to extract an undisclosed number of living green trees within larger units	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Westside Fire Recovery draft EIS was developed using the best available science. The vegetation section of Chapter 3 in the draft EIS, describes the methodology and analysis indicators used to determine effects to vegetation, and a discussion of various scientific literature is incorporated to support the evaluation of effects from the stands to be treated. No living, green trees are proposed for removal. See response to comment number 12346-55.
102.02 - Position, No Rationale	#18909-13	On page 113 the DEIS assumes that "[w]ithout salvage, site preparation and planting, severely burned stands will likely be replaced by shrubs and brush (Skinner, Taylor and Agee 2006); regeneration of conifers and restoration of forested wildlife habitat may take decades….Although natural regeneration of conifer species has occurred elsewhere, following more typical wildfire site conditions, the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007)."	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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102.02 - Position, No Rationale	#18909-14	The 2014 fires burned within the range of historic variability. The soil burn severity for all the fires in the project area was below 10%, according to the Burned Area Emergency Reports even with the few extreme wind events that led to large areas of high severity. The Shatford et al 2007 study, referenced in the DEIS, highlights the importance of shrub growth on conifer regeneration, at DEIS page 143: "Across the range of Douglas-fir forest types (from the drier Douglas-fir through Douglas-fir/tanoak series), abundance of conifers was positively associated with cover of hardwoods and shrubs (Figure 7). Because this range of Douglas-fir associations describes a continuum of increasing productivity (Atzet et al. 1992), we interpret the positive relationship between hardwood and shrub cover and seedling abundance as a response to increased site productivity and availability of resources to vegetation in general (Whittaker 1960)." On page 144, "Seedling establishment was, however, conspicuously high on all sites within the white fir series; hence, competition from broad-leaved species does not seem to present a serious obstacle to conifer establishment there." On page 144: "We predict that conifer mortality will remain low and height growth will accelerate as individuals continue to emerge above the shrub layer (Conard and Radosevich 1982)." "Although short-term gains may be made from shrub removal, long-term benefits of increased nutrient levels and ultimately sustained conifer growth warrants additional consideration (Busse et al. 1996). The appearance of broad-leaved species from stumps, roots, or seeds can stabilize soils and reduce erosion hazards after fires. Where heat or drought may be limiting seedling establishment, shrubs facilitate natural tree regeneration and growth by providing shade and conserving moisture (Minore 1986, Kitzberger et al. 2000). The presence of vegetation also may play a critical role in attracting birds and mammals that act as agents of seed dispersal (Vander Wall 1990). Areas of shrub and hardwood cover benefit a variety of wildlife species (Alldredge et al.2001)."	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The comment includes quotes from the draft EIS. It is unclear in what way the commenter is asking the agency to adjust its treatments or effects analysis based upon this comment.
102.02 - Position, No Rationale	#18912-7	Lastly, and on a more personal note that relates less to the project, and more to my ethics, I believe that the Westside Fire Recovery Project makes it clear who the most important user group of the forest is. Yes, of course this timber has a short time frame to contribute lots of money to the forest (and even more to the Treasury of the US), but particularly the act of seeking an Emergency Decision status on this project isolates all other user groups of the forest. I hope you reconsider requesting this Emergency status because of the damage that bypassing a public appeals process will do to the Forest Service's relationship with the public. Financially, I think the Forest needs to bite the bullet, and wait another year to implement the cutting (excluding that which is safety related) and to respect a process that is more inclusive of the public and leaves more time for analysis of the proposal by the scientific community.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. An emergency situation determination has been granted by the Chief for this project; see Chapter 1 of the final EIS for details.
102.02 - Position, No Rationale	#18914-4	Regarding LSRs, I support the recommendations offered by Dr. Jerry Franklin.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See the beginning of Chapter 3 of the final EIS for a description of responsible opposing points of view, including those of Dr. Jerry Franklin.
102.02 - Position, No Rationale	#18915-2	REDUCE FOREST FUELS. As we have seen in recent years, and especially in 2014, fuel levels on western forests are at extreme levels that threaten the ability of those lands to remain forested and provide the multiple benefits that society expects from their public lands. Additionally, with the increasing severity of wildfires there is an increase in levels of atmospheric pollutants including CO, CO2, methane, and particulates among others. These burned forests are not only having a negative effect on the atmosphere and on local communities, but they are losing their ability to store carbon and act as carbon sinks. As the National Forest System addresses climate change and the interactions of the National Forests and the climate, it is critical that public lands do not become net emitters of carbon, which is where we are currently headed. Therefore, all post-fire project and all forest management projects need to work to reduce fuel loads and reduce the potential severity of the wildfires that will come as part of the natural processes of our western forests.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Other project planning and implementation is outside the scope of the Westside Fire Recovery project and its analysis. The effects of this project on climate change, emissions, and fuels is disclosed in Chapter 3 of the EIS.

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102.02 - Position, No Rationale	#18915-3	RECOVER THE VALUE. The National Forest System used to generate revenue to benefit the nation and local counties and communities. A portion of this revenue was returned to the counties as a payment in lieu of property taxes to help mitigate the impact of tax exempt lands to those counties. In the last 20 plus years, public lands have become more of a burden on the counties where they occur. The Forests and Ranger Districts do provide some local economic benefit from their employees living in the communities, but as many communities have seen, the reduction in and loss of PILT funds have led to the loss of tax generating infrastructure and jobs associated with harvesting and manufacturing wood products from National Forests. The National Forests need to proactively manage their lands to the extent allowed by law, and this includes salvaging dead and dying trees. In the case of wildfire, these salvage activities need to be promptly executed in order to minimize the loss of value and benefit to the Forest, to the affected communities, and to society as a whole. The argument that snags are needed for certain wildlife species is a false one, implying that the harvesting of these snags will have a negative impact on wildlife. The public forests in the western US have hundreds of thousands, if not millions, of snags left from previous fires and from areas that have experienced significant levels of mortality from disease and insect infestation. Whenever possible, as in this case, the public forest lands need to have dead and dying trees harvested to the extent feasible as quickly as possible.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Economic benefit is a part of the purpose and need of this project; see Chapter 1 of the EIS. Chapter 3 of the EIS has an economic analysis of this project's impacts along with the cumulative effects and other projects, as applicable. Dead trees or snags are being salvaged to the extent that it meets the purpose and need of the project, Forest Plan standards and guidelines, and other applicable law, regulation, and policy.
102.02 - Position, No Rationale	#18915-4	RESTORE THE FORESTS. The National Forest System leadership, including Regional Office managers, has acknowledged that the condition of the public forest lands is not healthy. Decades of fire suppression, combined with a lack of significant management over the last 20 years, has led to forest conditions that are less and less sustainable. While these forest evolved with the inclusion of fire, stand conditions were such that there were not the large wildfires destroying thousands of acres of forest. Researchers have shown that stand conditions were much more open and resilient to fire and, prior to the early 1900s, included significant amounts of annual burning. It has been stated that the scope and scale of forest restoration activities need to be drastically increased on public lands if those lands are to be retained as forests. A review of the areas of major wildfires from the past 20 years shows large landscapes that have become deforested. These former forests are now dominated by dense brush and heavy fuels awaiting the next fire to clean the ground to bare soil and start the cycle over again. Recent research has shown that stands experiencing a severe wildfire are more likely to repeat that scenario and develop a loop where the ecological processes maintain a brush and woody fuel habitat that may last for decades to centuries. Forests will likely develop, eventually, but it may be centuries down the road, and in the meantime less carbon will be stored, and it will be emitted into the atmosphere more frequently through wildfire. Ecologically and environmentally, forest restoration is the only sane action for public land managers to pursue. The National Forests need to be managed and maintained in a forested condition.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The affected environment of the project area after the fires as well as historic conditions have been considered for analysis, as described in the vegetation section of Chapter 3 of the EIS. The effects of the proposed actions on fuels conditions and climate change are disclosed in Chapter 3 of the EIS.
102.02 - Position, No Rationale	#18918-1	Thanks for accepting comments on the Westside so-called "Fire Recovery" Project. I contend that this project is almost entirely about timber industry greed colluding with a bureaucracy that has a deep desire to enlarge itself. When you see "Westside Fire Recovery Project" mentioned below, please consider the term "Fire Recovery" as having parentheses - since it doesn't take much on-the-ground or in salmon stream experience to realize that the more heavy equipment and active management are used following fires, the worse the ecosystem recovery will be.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#18918-14	I note the bogus excuse under "Emergency Situation Determination" pursuant to 36 CFR 218.21. I note that part of the definition of an "Emergency Situation Determination" is "avoiding a loss of commodity value sufficient to jeopardize the agency's ability project objectives directly related to resource protection or restoration." However, I have already pointed out that the first and third alleged "needs" that the WFRP addresses are bogus. To the KNF, they often see "resource protection" as protecting trees they want the timber industry to later butcher. With the admitted great biodiversity in the Klamath region, explain how planting more monoculture conifer plantations is related to either resource protection or restoration.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Planting more monoculture plantations is not proposed in the Westside Fire Recovery project. Planting prescriptions are based on historic unit conditions, projected unit composition, and the likelihood of long-term survivability of project units within a fire ecosystem. Tree species used for planting will include a variety of suitable species. An average of 130 to 300 trees per acre will be planted to achieve acceptable levels of stocking, depending on the site conditions, and trees will be planted in clusters to achieve groups of conifers throughout the landscape to mimic natural units. See Chapter 2 in the draft EIS for more information about the proposed action and Alternatives. See response to comment number 17501-2.

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102.02 - Position, No Rationale	#18918-15	Let's now turn our attention to the four bullet points on page iii of the DEIS which says that, "The purpose and need of the project is to address the following:". I have already addressed the bogus first point. I object to the second point because continuing the fire suppression / conifer plantation mentality will not make communities more fire-safe. The third is partly on economic viability of the timber, but it says "and benefitting our local communities". The boom-bust cycle and deleterious impact that the WFRP will have on native salmon streams and rivers of the area will benefit only a greedy few in such local communities, so the third purpose and need is also bogus. And finally, "There is a need for restored and fire-resilient forested ecosystems." Logging snags and older forests to replant monoculture conifer plantations is not natural restoration, and it would tend to increase rather than decrease catastrophic or other fire danger	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter quoted the purpose and need of the project, as described in Chapter 1. See Chapter 3 of the final EIS for a disclosure of effect by resource area, including fuels, aquatics and hydrology. Monoculture planting is not being proposed; see Chapter 2 of the final EIS for a description of proposed actions, including site preparation, planting, and release.
102.02 - Position, No Rationale	#18918-16	It is clear that continued liquidation management practices in the Klamath National Forest will lead toward more catastrophic fires - not less. The National Institute for the Elimination of Catastrophic Wildfire is obviously a joke (unless one wants to cement most of our national forests!). It likely was invented to give the timber industry a cloak of inclusiveness but still pandering to their every whim. Without delving into its formation, one assumes it is primarily a timber industry front groups alleged collaborative. Need I remind you that national forests are public land, and is not supposed to be primarily for private plunder and liquidation. Thus, what Siskiyou County interests would want to do with the areas impacted by the 2014 fires should not be given any more heed than what a housewife in Imperial County's preferences for the area would be	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Scoping comments from the public, other agencies, and tribes were used to formulate issues concerning the proposed action. Based on the issues identified through public comment on the proposed action, and in accordance with 40 CFR 1502.14, the Forest Service developed Alternatives to the proposed action. See Chapter 1 of the EIS for details of public involvement. The Forest did not give any preference to issues identified from any one agency, tribe, group or individual. See Chapter 1 and 2 of the EIS for how public scoping comments and input from other agencies and governments have been addressed.
102.02 - Position, No Rationale	#18918-18	Clearly, any mitigations are woefully inadequate to prevent a deterioration of old-growth forest habitat (majorly impacting the Northern Spotted Owl), to prevent major silting of native salmon streams and rivers, and to allow forest carnivores enough canopy so that they can still survive in northwestern California.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 of the final EIS for a description of effects to northern spotted owl, Coho salmon, and hydrological conditions. The project's purpose and need include the restoration of wildlife and watershed conditions, as described in Chapter 1 of the final EIS.
102.02 - Position, No Rationale	#18918-2	I urge rejection of all action alternatives except perhaps for the proposed Karuk alternative. Recall that the Karuk have no land-base, so basically the Klamath National Forest is the center of their culture and universe. They also have a traditional sacred relationship with the salmon of the area, so any further deterioration of the watercourses of the Klamath River or its tributaries threatens not only nutritional vitality for the Karuk people, but impacts their way of life by further threatening Coho salmon, Spring Chinook, and various other native salmon stock in the watersheds of Siskiyou County.	Thank you for your comments on the Westside Fire Recovery Project. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Consultation with the Karuk Tribe is ongoing.
102.02 - Position, No Rationale	#18918-20	In summary, this document tries to further the myth that conifer plantations and more intensive logging and roading operations will somehow bring about resource protection and restoration. The timber industry and their lackeys at land management agencies will not improve the fire regime and will not improve community safety	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See EIS Chapter 3, Responsible Opposing Views and Agency Response.
102.02 - Position, No Rationale	#18918-22	Need I remind the Klamath National Forest that you are supposed to uphold environmental laws, not just pander to the worst in the timber industry. I guess I need to remind the White House Council on (so-called) Environmental Quality about that supposed guidance as well. This is a national disgrace! Stop your callous, greedy, destructive proposal and behavior! Follow the Northwest Forest Plan and the Aquatic Conservation Strategy. Larger trees that have survived fire ARE the resilient ones, or may help the next generation along naturally. Stop the sham, and reject all action alternatives (while considering some important points made by the historically-abused Karuk tribe. Sincerely concerned, Bruce Campbell	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Westside Fire Recovery project was developed to meet standards and guidelines of the Northwest Forest Plan, the Klamath Forest Plan, and Aquatic Conservation Strategy objectives and desired watershed conditions from the Forest Plan.
102.02 - Position, No Rationale	#18918-4	The USFS should cease in championing the "junk science" that acts like the older forests (including snags) are the problem, whereas unbiased observers would see the combination of fire suppression along with massive clearcutting and conifer plantations as what has made habitat for many species go downhill in the Klamath - Siskiyou bioregion.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Project design and analysis incorporates best available science, as referenced throughout the final EIS and supporting documents. Also see Chapter 3 of the final EIS for a discussion of opposing points of view.

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102.02 - Position, No Rationale	#18918-5	Looking at the three things that the KNF proposes to do, it is clear that the first and third points / proposals are bogus, and the proposed action alternatives are all about timber industry profits. A number of trees were removed from road areas during the wildfires, and those were nearly all the trees that could be considered a "safety hazard" "to the public and forest workers." Snags generally hold hillsides together, so there is less danger with them standing in general.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#18918-6	The claim of the third thing that KNF proposes to do (according to October 8, 2014 letter), which is to "increase the likelihood and speed by which burned forested areas are regenerated", turns reality on its head. When there is major truck, bulldozer, and logging equipment (heavy vehicle) disruption - especially on steep slopes - the odds of regeneration decreases rather than increases. However, the KNF claim would be the case if what they seek is more conifer plantations (all the same age and all the same species) which are a tinder-box for fire so that it can grow toward a catastrophic intensity, but it is clear that leaving burned areas alone are best method to have natural generation and this would certainly help in protecting our already strained river and stream habitat.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#18918-9	Clearly, there is too much scheduled logging of Northern Spotted Owl habitat to guarantee its survival. I see this as the case even if the Barred Owl was not making serious inroads into some of the NSO's territory.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See the effects of this project and other cumulative actions on northern spotted owl habitat in Chapter 3 of the EIS. Other logging of northern spotted owl habitat is outside the scope of this project and its analysis.
102.02 - Position, No Rationale	#18926-15	Wildlife Unessecarily Put At Risk of Extinction! Several species of wildlife are unnecessarily put at risk, including threatened and endangered species, survey and manage species, indicator species and others. The cumulative effect alone of the hardwoods will be 1,318 acres of hardwood habitat being removed and would not function as habitat in the near future.! Species recognized on the KNF as being associated with hardwoods are the Acorn woodpecker and the Western gray squirrel. The KNF forest plan standards require that pure hardwood stands be managed for !	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 18918-22. Affects to hardwood-associated species are detailed in the Terrestrial Wildlife section in Chapter 3 or the draft EIS.
102.02 - Position, No Rationale	#18926-16	Neo-tropical Migratory Birds! The regional decline of migratory birds is a significant issue. Numerous studies have reported local and regional trends in breeding and migratory bird populations throughout North America. These studies suggest geographically widespread population declines that have provoked conservation concern for birds, particularly neotropical. The 2005 report from the Klamath Bird Observatory indicates that several species of songbirds are suffering declining population trends at the regional level.! The DEIS states the project would result in up to 21,650 acres of habitat being affected but fails to consider the actual impacts of proposed treatments on neo-tropical migratory birds.! ! Salvage in Late Successional Reserve (LSR) Inconsistent with the Northwest Forest Plan and Unacceptable!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 18918-22. Affects to Migratory Birds are detailed in the Terrestrial Wildlife section in Chapter 3 of the draft EIS.
102.02 - Position, No Rationale	#18926-33	In the DEIS the preferred alternative violates the Clean Water Act, including provisions of the Basin Plan and national forest waiver permit. ! ! Proposed Action Violate the Endangered Species Act - The preferred alternative in the DEIS threatens Coho salmon because of the large amounts of sediment it would deliver to streams in addition to sediment delivered because fire suppression actions. The negative affects on the Norther Spotted Owl and the fisher are unscientifically directed and not acceptable. The preferred alternative would violate the Endanger Specie Act.! !	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 18918-22. The Westside Fire Recovery project complies with regulations implementing National Environmental Policy Act, which further require that to the fullest extent possible, agencies shall prepare EISs concurrently with and integrated with environmental analyses and related surveys and studies required by the Endangered Species Act of 1973, the Clean Water Act of 1948 (as amended in 1972 and 1987) , and other environmental review laws and executive orders.

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102.02 - Position, No Rationale	#18927-1	CalWild and Friends of the River are very concerned about the Project's potential impact on water quality and threatened salmon, old growth forests and the Northern spotted owl, existing and proposed Wild and Scenic Rivers, and roadless areas (some of which were proposed in legislation introduced by Senator Barbara Boxer in 2002 and 2006 as additions to the Marble Mountain and Russian Wilderness areas). The level of logging and road building proposed is simply too much. The preferred alternative and its supporting analysis is a perfect example of the old axiom: "Man plans, god laughs." Although we appreciate the detailed and methodical approach taken by the USFS in this analysis, the decision to proceed with Alternative 2 fails to take into account external factors such as continued drought, future flood, additional fires, and even shortfalls in the federal budget. Any of these factors, individually or combined, could easily result in increased and unacceptable environmental impacts and ultimately, the failure of this project to meet its ambitious objectives. Adherence to plan direction, standards, and guidelines is no substitute for caution. It's like assuming you will be impervious from harm as long as you operate your automobile according to all traffic laws. We all know that outside factors can and will often intrude sometimes catastrophically.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Cumulative effects analysis was conducted in accordance with 40 CFR 1508.7. Current and future foreseeable actions considered for analysis for the Westside Fire Recovery Project boundary are listed in the draft EIS. Reasonably foreseeable future actions are defined in 36 CFR 220.3 as those Federal or non-Federal activities not yet undertaken, for which there are existing decisions, funding, or identified proposals. Identified proposals for Forest Service actions are described in §220.4(a)(1). See response to comment number 18878-16 about implementation funding.
102.02 - Position, No Rationale	#18930-1	this logging proposal endangers key ecological processes. The road construction, harvest quotas, and overall impact of the operation has the risk of detrimentally affecting both the future forest ecology and the salmon population. The severity of this burn has already put regeneration and erosion at a serious risk. Let the record reflect that the community was aware of the risks and potential costs of this logging operation and that sufficient effort was made to communicate these risks to those in control of said operation. There can be no claim of good faith should it be proven that this logging operation detrimentally impacted the salmon run or the ecological recovery of this area.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The effects of this project on vegetation and aquatic resources, including fish such as Coho salmon, are disclosed in Chapter 3 of the EIS. The project has some long-term beneficial effects on Salmon and its habitat. Mitigations to minimize negative impacts of the project on Salmon and other resources have been incorporated into project design; see the watershed project design features in Chapter 2 of the EIS. As described in Chapter 3 of the EIS, negative indirect impacts of salvage harvest on aquatic species and their habitat is expected to be discountable.
102.02 - Position, No Rationale	#18931-2	Regarding Management Direction (DEIS pg. 7) : "Direction for this project comes from the KNF Land and Resource Management Plan (Forest Plan) of 1995, as amended." Comment: Unfortunately, the "problem statement" in the DEIS under Purpose and Need (DEIS pg iii), namely: "The Westside Fire Recovery project was developed in response to changes to forested habitat resulting form the 2014 wildfires on the KNF," implies that the Forest Plan did not achieve the optimistic predictions of the previous 1995 Forest Management Plan, as amended: From the KNF Fire Management Plan; Desired Conditions (LRMP pages 4-15 through 4-16) states the following: "The Forest will continue to be one of the most biologically diverse areas in the Nation. Biological diversity, although variable within natural limits at the stand and landscape levels, will be essentially the same as it is today at the Forest level. There will be a mosaic of vegetative patterns across the Forest. The composition and structure of forest, rangeland, and aquatic ecosystems will be within the natural range of variability. These ecosystems will function in a healthy manner and be resilient to changes, including repeated fires. (emphasis mine) Quality habitat will be present for aquatic and terrestrial species. Habitat will be conducive to the movement and interaction of species and to movement across landscape and Forest boundaries. The distribution of species will help insure perpetuation of healthy populations. "The amount of acres burned in high intensity wildfires will have decreased significantly due to the large, aggressive fuel management program reducing fuel loading throughout the Forest. There will be more acres of lower intensity fires similar to conditions prior to 1900. These lower intensity fires will begin to create a more open forested condition in many areas. "The landscape will appear to be primarily shaped by ecological processes, rather than management activities. Openings in the forest canopy created by vegetation management will not be readily evident. Existing clear-cut units that are apparent today will blend into the surrounding vegetation in the future, as planted trees mature and visual restoration projects soften sharp contrasts in line, form, and color."	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project is designed to be consistent with the goals and standards and guidelines of the Forest Plan. The objectives of the Westside Fire Recovery project dovetail with the desired future conditions of the Forest Plan in that both seek to create and maintain fire resilient ecosystems and diverse habitat conditions. Although some of the high severity patches created during the 2014 fires are likely attributable in part to the delayed implementation of projects designed to achieve the desired future conditions of the Forest Plan, the Westside Fire Recovery project should create conditions that facilitate achievement of Forest Plan goals.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#18934-1	We are very disappointed that the Klamath National Forest has chosen to pursue a preferred alternative for the Westside Fire Recovery Project that disregards so much of the positive work over the past two year accomplished by the Western Klamath Restoration Partnership (WKRP). While the WKRP cannot provide comments as an entity to this project (the Forest Service and other federal agencies are participants), the values, threats, strategies, and collaboratively developed zones of agreement provide a road map for developing upslope management projects that are supported by the diverse array of WKRP participant groups and individuals. The preferred alternative (Alternative 2) appears to more closely resemble the salvage logging timber sales that followed the 1977 Hog Fire and Siege of '87 Fires.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#18934-3	While the Purpose and Need address portions of these values, it is critical to remember that participants in the WKRP agreed to only work on projects that positively affect all of these shared values. We request that you utilize the good work accomplished through the WKRP and analyze in the Final EIS how the various alternatives and the selected alternative affect these values. This analysis should look at the social, cultural, ecological, and economic effects of proposed actions in light of recent published literature and research on these topic as they relate to the values above. Specifically, the National Cohesive Wildland Fire Management Strategy defines a new paradigm for preparing for, managing, and recovering from wildfires, that strongly supports the Karuk Alternative and the strategies identified in the Western Klamath Restoration Partnership plan that was funded by the Klamath National Forest (online at: http://karuk.us/images/docs/dnr/2014%20Western%20Klamath%20Restoration%20Partnership_Restoration%20Plan_DRAFT_FINA%20%20%20.pdf).	Thank you for your comments on the Westside Fire Recovery Project. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Environmental effects of the Westside Fire Recovery proposed action and Alternatives follow regulations in 40 CFR 1502.16 and uses the best available science. The Forest received an additional Alternative from the Karuk Tribe on March 5, 2015, which has been incorporated into Appendix G of the draft EIS.
102.02 - Position, No Rationale	#18935-1	The DEIS overlooks relevant factors and fails to account for scientific information regarding effects of salvage logging to wildfire behavior and effects	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Effects of the proposed action and Alternatives to fire and fuels are described in Chapter 3 of the draft EIS.
102.02 - Position, No Rationale	#18937-1	On behalf of Klamath Riverkeeper, we are gravely concerned that the preferred alternative published in the DEIS for the Westside Project threatens sensitive salmon habitat and thereby our communities who depend on the Klamath River and tributaries in the Klamath River and its tributaries for jobs, recreation and cultural survival. In addition, the preferred alternative in the preferred alternative in the Westside Project would log on three sides of the Marbled Mountain Wilderness and directly along the Pacific Crest Trail.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 for a disclosure of effects by resource area and Alternative.
102.02 - Position, No Rationale	#18937-10	A perspective to consider: The Westside project surrounds three sides of the Marble Mountain Wilderness, a national treasure. The terrain is extremely rugged and steep with slopes commonly reaching 65 percent. The ecological and monetary costs of fire suppression actions were extreme, upwards of $200 million tax-payer dollars. Fire suppression constructed nearly 200 miles of bulldozed ridge top fire breaks, dumped thousands of gallons of fire retardant in sensitive areas including at least one under-reported misapplication directly into in the Klamath River.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#18937-4	Unfortunately, the DEIS fails to allow for this sound alternative to prevail. The DEIS fails to provide adequate or consistent analysis, fails to account for connected actions (like future fire suppression and current logging plans), relies on antiquated models and science, and fails to adequately analyze for cumulative impacts. In addition, the rush to "get the cut out" has led to sloppy accounting within the DEIS, including inaccuracies within summary tables, misleading maps and contradictions between documents and referenced studies.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 18934-3 and number 18927-1.
102.02 - Position, No Rationale	#18937-7	The preferred Alternative 2 in the DEIS, which appears to be the predetermined outcome for the project decision, undermines existing protections for healthy fisheries, rivers and streams, wildlife, forest ecosystems, vegetation, cultural traditions and local communities.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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102.02 - Position, No Rationale	#18937-8	The project proposal also disregards the planning priorities identified by the Western Klamath Restoration Partnership (WKRP) (see attached plan). In addition, the project defies the Karuk Tribe's proposed Eco Cultural Resource Management Plan by continuing a regime of fire exclusion, artificial regeneration and widespread commercial logging on steep slopes in sensitive, post-fire landscapes.	Thank you for your comments on the Westside Fire Recovery Project. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.See response to comment number 18907-4.
102.02 - Position, No Rationale	#18937-9	Legal violations and concerns The preferred action will violate the Aquatic Conservation Strategy (ACS) in a variety a ways, including ignoring Northwest Forest Plan ACS objectives for designated Geological Riparian Reserves to allow for salvage logging and road building in Key Watersheds (see commenter George Sexton's detailed explanation submitted 4/9/2015 #45579). The Westside DEIS also violates the National Environmental Policy Act, Clean Water Act, Endangered Species Act, Northwest Forest Plan, KNF Land Resource Management Plan, Northern Spotted Owl Recovery Plan and the recommendations in Late Successional Reserve and Watershed Assessments. We urge decision-makers within the KNF to consider the consequences of project approval on future collaboration efforts with Tribes, restoration organizations and other partners in the Klamath and beyond. We recommend that KNF immediately consult with the Karuk Tribe and WKRP to completely rework the proposal into a community-supported post-fire recovery project. Otherwise, the KNF will imply through action that Forest priorities will continue the antiquated regime of proposals beholden to special industrial timber interests and fire exclusion politics. Klamath Riverkeeper would like to re-assert the entirety of the careful analysis and bibliography submitted into the Administrative Record by hereby referencing commenter George Sexton on 4/9/2015 (#45579). In addition, we agree with and hereby reference the entirety of the content of commenter Kimberly Baker's addendum to Mr. Sexton's comments, submitted 4/27/2015 (also #45579).	Thank you for your comments on the Westside Fire Recovery Project. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.See response to comment numbers 18898-1, 18926-33,18918-22 and 18907-4.
102.02 - Position, No Rationale	#18939-5	Position Statement: Forest Management Siskiyou County California, Klamath National Forest Let us look first where we've been to see where we're at. In the early days Native people and then cattlemen with regimens of natural fire burn systematically to create a mosaic of 25-30% grasslands, multi-age class areas of brush, hardwoods, and conifers. The country was balanced and it worked for man, fish and wildlife. Forest Service management brought an end to system-wide burning. They initiated maximum timber harvest (The Klamath Cut) with large blocks of mature timber harvested and also mandated forest timber quotas. Which led to soil instability, watershed dysfunction, and massive fuel loading. The '70's saw new people, ideas, and untested philosophies. The Flower children had arrived. Protests were popular along with the use of litigation based in the much maligned establishments legal system halted legitimate management. Timber harvest and other projects declined to almost nothing. These tactics made management projects to costly and slow to be effective. Mills closed, economy slumped, communities declined, schools closed, and fuels continue to grow. Catastrophic fire occurred in '29, '55, '77, '87, '04, '06, '08, '13, and '14. Management tactics employed '77 through '08 that work in Arizona, Colorado, and Southern California are imported. Fire on the ground on lower slopes produce hot devastating burns in drainages well in excess of the original fire's potential. Late '87, '13, and '14 fires in Salmon River saw a more patient approach and reduced firing efforts. Altered tactics produced cooler underburns and a mosaic effect. Excessive salvage in '77 and '87, left untreated, created massive light and medium fuel loading. In '04, '06, and '08 there was little to no salvage. Untreated produced massive light, medium, and also very heavy fuels throughout the landscape. Some areas have burned multiple times since. The fire of '13 saw salvage and restoration efforts similar to proposals presently considered. Completed projects on the Salmon River show promising results. The White's fire of '14 saw a similar fire control approach with many positive components and a constructive restoration outcome is expected. With aggressive treatment the goal of multi species varied age class mosaic is possible. The Happy Camp burn managed in Southern California style again produced catastrophe on a massive scale.	See Chapter 1 for a discussion of the historic fire regime of the Klamath Province. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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102.02 - Position, No Rationale	#18939-6	Policy changes that direct toward historic mosaic conditions * Move management emphasis away from timber harvest towards wildlife, watershed, fuel reduction, and native cultural goals. * Veto black line theory, within the box burn theory, and replace with a more patient approach. Avoid fire on the ground on the lower 2/3 of slopes * Create and maintain pre-attack on a landscape basis. * Redraw and revise the FMP, LSR, and designated roadless areas to able to manage these areas. * Go back to using available fire resources other than just agency's crews, including but not limited to, non- agency, fire and rescue, "pick-up" firemen, and non-fire Forest Service personnel. * Fight fire at night with all available resources. * Rapid initial response and reassess "let-burn" policy * Keep supervisors with local experience in place during a fire incident. * Build top-level managers with a depth of local experience. Replace managers going out with local experience. * Holistic Watershed Management o Get away from single species management (i.e. timber, spotted owl, salmon, yellow legged frog) o Revise ESA o Streamline NEPA to speed project preparation and let the Forest Service get to work. o Government needs help fighting radical opinion litigation o Help educate an uninvolved public on management decisions and forest conditions o Public consultation with government agencies on projects * Focus on Fuels Reduction o Use important topographical features for fuels reduction projects o Focus on the backlog of old clear-cut maintenance for fire and wildlife management o Form landscape sized pre-attack linear system o Design with planned re-entry for maintenance on completed projects o Cohesive linear projects	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the final EIS for what is being proposed. See Chapter 3 for a disclosure of effects by resource area and Alternative.
102.02 - Position, No Rationale	#19073-3	Most of the taxpayers and local citizens would prefer to see as many acres treated as possible within the framework of regulatory restrictions and short times frames required to accomplish some level of restoration. This has been seen in past public poling of citizens in the Northwest in the past.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#19075-3	It appears that the USFS is using this proposal as an opportunity to convert roadless areas into log farms. The logic here may be that log farms produce more revenue than roadless areas, unless they burn up before harvest.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Roadless Areas will not be converted into log farms. The only logging proposed in Roadless Areas is roadside hazard treatments (where roads intersect Roadless Areas). See Chapter 2 for a description of proposed actions. See Chapter 3 for a disclosure of effects to Roadless Areas.
102.02 - Position, No Rationale	#19076-7	It is erroneous to claim that a local mill will benefit, as there are none.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#19112-8	Please keep the Regional Office, Washington Office, Congressional representatives, and OGC in the communication loop and on good terms. Without their support, the risk of losing the project is high. We do not need a repeat of the Megram Fire Recovery litigation scenario.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#19112-9	If during the appeals and litigation processes concessions must be made to see the project through fruition, we would recommend altering prescriptions in remote areas far from communities. Examples would be burn only, no salvage; deleting helicopter units with long flight turns; deleting units with primarily small diameter trees; deleting units with large green tree components. Again, these recommendations are only if needed to see the rest of the proposal implemented, and only in areas far from communities and other improvements. Hopefully no concessions need to be made. Diligent timber sale administration and post-salvage clean up must be tended to. Please allocate the resources needed to accomplish these tasks. Thank you and staff for your hard work. Sincerely, John and Sheryl Allen Seiad Valley	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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102.02 - Position, No Rationale	#19-5	To meet your stated objectives, it will be important to complete your NEPA analysis as quickly as possible to allow for salvage logging to take place in the 2015 operating season. There will likely be only five months that operations cab feasibly take place on this project, (July 2015-November 2015). This means that each one month delay in starting timber operations will reduce the amount of work that can be accomplished on this project by 20%!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please refer to comment number 18747-3 regarding Emergency Situation Determination.
102.02 - Position, No Rationale	#19-7	Salvage harvesting will play an essential role in successful establishment of the new stand of trees. As stated earlier, removing the standing trees will eliminate the potential for large amounts of fuel remaining on the site, possibly leading to re-burns. Additionally, there is less potential damage to seedlings as snags deteriorate and fall to the surface. Parties that submit comments about this project or state otherwise are simply anti-logging and are not truly interested in restoration/rehabilitation.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#20-1	I am shocked by the extreme clearcut logging of "late-successional" old-growth reserves and geological riparian reserves proposed by the Klamath National Forest in the Westside Salvage Project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 6924-1. No clear-cutting is being proposed. Salvage harvest is proposed in geologic Riparian Reserves. No salvage harvest is proposed in hydrologic Riparian Reserves; however, roadside hazard treatments (where roads intersect Riparian Reserves), fuels treatments, and site preparation and planting are proposed within hydrologic Riparian Reserves. See Chapter 2 of the final EIS for a description of proposed actions.
102.02 - Position, No Rationale	#20-2	Fire is an inevitable and natural occurrence in this planning area.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#21-3	Fire is a natural and, indeed, essential element of the ecology of the Klamath National Forest, but to log in late-successional areas that have been burned would turn the net positive of recent fires into a devastating ecological catastrophe.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#23-2	The Draft Environmental Impact Statement proposes Salvage Logging which I believe is necessary and ecologically important to hasten the natural state. I encourage the management of the Klamath Forest to also thin the forest to reduce the amount of water being diverted by the trees at the expense of our watersheds. Your original master management plan called for a forest that has less board feet than currently exists. This not only increases the fuel available for a catastrophic fire, as was experienced, but it also decreases the amount of water captured in the streams and rivers. In a drought, as we are currently experiencing, this exhausts are watersheds. There are additional reasons why it is important to Salvage Log this fire-damaged landscape, they are: * Post-fire landscapes are ripe for the spread of pests and disease; * Post-fire landscapes provide a greater risk of another catastrophic fire to re-engulf the region and destroy the entire forest. The sooner the forest can return to a natural, healthy growing state the greater the benefit for the watershed and all living beings that inhabit and recreate in it.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Reducing the amount of water being diverted by the trees from local watersheds is beyond the cope of the Westside Fire Recovery EIS.
102.02 - Position, No Rationale	#23-4	I hope you and your staff will consider the hypocrisy the environmental groups (such as EPIC, KS Wild, NEC, Riverkeeper, Klamath Forest Alliance, etc.) present to millions of acres of public lands - of which I believe precludes any standing in these forest-related matters. These environmental groups, and others like them, will line up to produce vast anti-logging campaigns and do everything possible to prevent any action in the Klamath Forest while allowing and participating in marijuana grows. They stand silent and do nothing to fight the true scourge to our forests -marijuana grows. It is a little known fact that some of the members and staff of these groups are actually the growers. These growers bring poisons and fertilizers, and litter the area with dead animals and trash. * These same environmental groups have no problem with any sediment when decommissioning roads or removing invasive species but will not allow for any forest management practices.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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102.02 - Position, No Rationale	#3679-2	As for reforestation, I like the plan of planting in clusters to mimic natural units. Also I am pleased to see that hardwoods are finally being considered as "trees". That is, green hardwoods will be included in the average spacing. I do hope that the burned oaks already sprouting back will be considered "green".	Hardwoods would be counted in tree stocking as noted in the comment.
102.02 - Position, No Rationale	#4-6	Reforestation o Wider spacing for planned reentry and maintenance o Leave some areas unplanted o Vary conifers and hardwoods with respect to original species	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#5-1	With all the parts that have to be balanced for any region, this can be very big to deal with. Live vibrant forest need some dead trees and brush. Small animals use this to live in and other live in the dead trees. Dead plant matter creates dirt. Simple. Small plants / grasses, etc are needed as well as trees. The replanting also has to deal with less water, as it looks like there will be more drought. Balance between what grows there now and what will grow better with out so much water, so there would be a better transition	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#5873-101	[S]alvage may be desirable in the wildland-urban interface zone …	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#5873-131	Jerry Franklin has said of salvage logging in LSRs that “Salvage would be completely antithetical to the goals of reestablishing late-successional forest habitat. Retention of the large snags and logs are essential to natural recovery processes and none of this material can be viewed as in excess to ecological needs.” Jerry Franklin, Comments on the Siskiyou NF’s Biscuit Fire Salvage DEIS, Jan. 20, 2004.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#6199-1	the ignorance of men is the enemy of mama nature, why is it that the most educated people commit the worst crimes against nature and humanity. men has turn earth into a painful place for all living beings...this means	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#6924-1	So "late-successional" Old-Growth reserves and geological riparian reserves survived the Wild Fires as nature intended and you use it as an excuse to clear cut!?	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Clearcutting is an even-aged management silvicultural system applied to green forest stands for the purpose of regenerating a new age class. No clearcutting is proposed for the Westside Fire Recovery project. See Chapter 2 of the final EIS for a description of proposed actions.
102.02 - Position, No Rationale	#6947-1	"Our duty to the whole, including to the unborn generations, bids us to restrain an unprincipled present-day minority from wasting the heritage of these unborn generations. The movement for the conservation of wildlife and the larger movement for the conservation of all our natural resources are essentially democratic in spirit, purpose and method." -- Theodore Roosevelt	General quote. It is unclear how this quote relates to the project design or analysis.
102.02 - Position, No Rationale	#6947-2	"Our government is like a rich and foolish spendthrift who has inherited a magnificent estate in perfect order, and then has left his fields and meadows, forests and parks to be sold and plundered and wasted." -- John Muir	General quote. It is unclear how this quote relates to the project design or analysis.
102.02 - Position, No Rationale	#6947-3	It is horrifying that we have to fight our own government to save the environment." -- Ansel Adams	General quote. It is unclear how this quote relates to the project design or analysis.

Code	Comment Number	Comment Text	Response
102.02 - Position, No Rationale	#6947-4	"Every man who appreciates the majesty and beauty of the wilderness and of wild life, should strike hands with the farsighted men who wish to preserve our material resources, in the effort to keep our forests and our game beasts, game-birds, and game-fish-indeed, all the living creatures of prairie and woodland and seashore-from wanton destruction. Above all, we should realize that the effort toward this end is essentially a democratic movement." -- Theodore Roosevelt	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#6947-5	"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." -- Aldo Leopold	General quote. It is unclear how this quote relates to the project design or analysis.
102.02 - Position, No Rationale	#7-1	We appreciate the efforts of the USFS to move forward quickly on the Westside Fire Recovery Project. The salvage logging is very much needed, so that 10-15 years from now we do not have even more devastating fires after the brush has grown up amid these fire-killed trees. Thank you.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.02 - Position, No Rationale	#7-2	One thing that our community desperately needs is more clearing on USFS public lands that are adjacent to private lands in our community. During the past ten years, we have conducted several clearing projects to provide defensible space around residences, and also to clear larger tracts of private land in and around our community. Much of this has been funded by grants in coordination with the Northern California Resource Center, and many of our residents here have also done extensive clearing on their own effort. However, when public lands adjacent to our residences remain overgrown, this greatly reduces the effectiveness of efforts to keep our community safe and defensible from wildfire because these overgrown areas can serve as conduit to bring fire right into our community.	A primary purpose and need of the Westside Fire Recovery project is to address the need for safe conditions for firefighters performing fire suppression for community protection. Proposed activities to address this include, salvage of fire-killed and other hazard trees along roadways and near infrastructure and removal of roadside hazard trees to maintain current and future safe ingress and egress from the forest. See the discussion in Chapter 1 for more detail.
102.02 - Position, No Rationale	#7580-1	I am shocked by the extreme clearcut logging of "late-successional" old-growth reserves and geological riparian reserves proposed by the Klamath National Forest in the Westside Salvage Project. This is exactly the kind of ill-conceived plan that has been exposed time and time again in recent decades as harmful and exploitive and has been stopped before it could damage the land and its inhabitants. I trust science and sense can carry the day once more ... but it is discouraging that those who seek profit at the expense of the earth keep coming back again and again for another run at it.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is proposed; see Chapter 2 for a description of proposed actions.
102.02 - Position, No Rationale	#8821-1	The following is a viable response to what you are considering. I'll add my own words. What are you thinking? We've already pushed California to the tipping point. Are you truly willing to gamble the state's (and country's) future on such short-sighted, profit-based actions? If so, start packing your family's bags. Good luck in finding a safe place to land that's not being ravaged by others thinking the same way. You can make a difference now, and still live a good life. Either that, or you can gamble.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
102.05 - Procedural, already addressed through project design	#17111-10	Snags, Logs, and Coarse Woody Debris (CWD) The role of CWD in the development of late-successional forest habitat is an important factor to consider in evaluating the appropriateness of salvage activities in the Westside project area, particularly within the LSRs. Most of the salvage proposed in the LSRs is on PAGs where large volumes of snags and logs following wildfire are characteristic. Large snags and logs are the most important surviving structural elements or biological legacies of a forest disturbance (Franklin et al. 2002), excepting only surviving large live trees. Importance, in this case, refers to the roles of these structures in: (1) Providing essential habitat for an immense array of species; (2) Maintaining important ecosystem functions; and (3) Stucturally enriching the young forest stand, making it possible for mid- and late successional species to re-colonize the stand much earlier in its chronological development than would otherwise be the case (Franklin et al. 1987). The importance of large snags and down wood for a broad array of species is recognized in the EIS document. These structures provide habitat for early as well as late successional species and sustain many important ecosystem processes (e.g., Harmon et al. 1986). However, the long persistence and multiple roles played by the large pulse of snags, logs, and other CWD provided by the stand-replacement event (Harmon et al. 1986; Maser et al. 1988) do not appear to be adequately recognized in the analysis of how much of this wood should be retained. For example, large Douglas-fir logs continue to fulfill important ecological functions, such as habitat for small mammals and salamanders, for 200 to 250 years after their death. Cedar snags can persist for at least as long as I Yi centuries and as logs for over twice that long. The massive input of large dead wood is characteristic and critical to stand development processes and the ultimate provision of habitat for late-successional species following stand replacement fires (Maser et al., 1988; Franklin et al. 2002). As noted these wood structures may persist and play functional roles for several centuries, particularly in the case of decay resistant species. Large pines may also persist as snags for several decades and additional periods as logs on the forest floor. In fact, the entire recovering forest ecosystem will depend upon this pulse of CWD until it reaches a point in its development where the new stand begins to generate snags and logs of comparable size and heartwood content-generally between 100 and 200 years (Maser et al. 1988; Franklin et al., 2002). Consequently, basing snag and CWD retention following salvage on levels of these structures found in existing mature and old forests is not appropriate; all of this initial pulse of wood is needed to reach those levels one to two centuries ji-0111 now! Indeed, the use of mature forests as a standard for CWD is pmticularly inappropriate since this is the period when CWD levels are at their lowest level during the entire natural developmental sequence from stand-replacement fire to old growth (see diagram in paper by Spies in Maser et al. 1988). It certainly does not appear to me that the approach taken in the DEIS reflects an appreciation of the fact that this one-time input oflarge and decay resistant CWD is all that the recovering forest ecosystem is going to get for the next 100 to 200 years. The importance of snags, logs, and other CWD is recognized in FEMAT's (1993) scientific analysis. For example (my underlining for emphasis): Because of the important role of dead wood in late-successional and old-growthforest ecosystems, and because there is much to learn about the role of dead wood in the development offorests, only limited salvage is appropriate in Late-Successional Reserves . . . The Final Dra ft Recover y Plan (for the NSO Z would allow removal o[small-diameter snags and logs, but would also require retention of snags and logs likely to persist until the new stand begins to contribute significant quantities of coarse wood y debris. " FEMAT 1993, p. IV-37. Snags provide a variety of habitat benefits for a variety of wildl(fe species associated with late-successional forests. Accordingl y, {ollo·wing stand-re placing disturbances. management should focus on retaining snags that are likel y to persist until late successional conditions have developed and the new stand is again producing large snags. FEMAT 1993, p. III-37. Following a stand replacing disturbance, management should retain adequate coarse woody debris quantities in the new stand so that in the.f i1ture it will contain amounts similar to natural regenerated stands. The analysis that determines the amount of coarse wood y debris to leave must account for the Iii/ I period o{/ ime before the new stand be gins lo contribute coarse wood y debris .... FEM AT 1993, p. III-37.	We acknowledge the importance of course woody debris, snags and other legacy components on the landscape. Project design features for course woody debris, snag, and other legacy components under watershed and wildlife address this concern and meet Forest Plan direction for these resources. Project design features for watershed and wildlife have been updated since the draft EIS to improve mitigations for these resources. See response to comment number 18918-22. With the exception of the incidental tree, no green trees are proposed for harvest; see response to comment number 12346-55 or chapter 2 for what is being proposed. See the beginning of Chapter 3 for responsible opposing points of view. Also see Chapter 1 for a discussion of salvage harvest in Late Successional Reserves. See Chapter 3 under aquatic resources, vegetation, fuels, soils and wildlife for the effects of the proposed actions.

Code	Comment Number	Comment Text	Response
102.05 - Procedural, already addressed through project design	#17387-4	"Concentrate salvage in areas where permanent strategic fuelbreaks are needed to control and contain future planned and unplanned ignitions: salvage to create 300 foot wide fuelbreak along existing dozer firelines on ridges that are in strategic locations for future burn control. Design treatments to allow for use of prescribed fire in high severity burned areas. Plan strategic controlled burns that can use recent fire footprints as control features.	Procedural statement. Chapter 2 in the draft EIS describes and compares the Alternatives considered for the Westside Fire Recovery project. Already addressed through project design. Ridgetop fuels treatments, underburns, and salvage near ridgetop fuels treatments are all proposed treatments in the Westside Fire Recovery Project. Salvage units of high severity fire areas, where adjacent to ridgetop fuels treatments, are proposed for many areas across the project area. In the Fire and Fuels Report under the "Fire Suppression Capability" heading it states that "Fuels treatments identified along strategic ridge and road systems will enhance future fire management activities including fire suppression, managing unplanned ignitions, and implementation of prescribed fire. Maintaining these treatments provides opportunities for fire managers to focus resources on priority locations, such as the WUI. These treatments also provides opportunities to utilize confine and contain strategies on future fires where untreated areas still contain high densities of snags and inhibit safe work areas for fire suppression resources."
102.05 - Procedural, already addressed through project design	#17387-8	Clean up all activity fuels and existing excess fuels in salvage units so that fuels/fire hazard is low after salvage is completed.	Procedural statement. See response to comment number 17387-4.
102.05 - Procedural, already addressed through project design	#18907-22	The Karuk Tribe alternative in Appendix G deserves a thorough analysis.	Procedural statement. Chapter 2 of the EIS includes a section of Alternatives considered through consultation. Where portions of the Karuk alterative have been incorporated into the proposed actions, Chapter 3 of the EIS discloses the effects of those actions.
102.05 - Procedural, already addressed through project design	#18907-23	The Salvage Harvest definition on pages 30 and 31 of the DEIS states: "In determining what individual trees will be harvested, standing dead trees 14 inches in diameter at breast height or greater will be considered…". Does this mean that all trees dead or alive less than 14 inches in diameter will be left in all treatment areas?	Procedural statement. In salvage treatment areas only standing dead trees greater than 14 inches in diameter will be considered for salvage if they meet the 70 percent or greater chance of dying within the next 3 to 5 years. This is describe in Chapter 2 of the draft EIS. After salvage treatment, trees less than 16 inches in diameter will be treated using site preparation treatments as described in Chapter 2 of the draft EIS in units that are proposed for mechanical yarding or skyline yarding. For units proposed for manual site prep or mastication trees that are not removed by salvage will remain in the stand unless there is a concern for safety.
102.05 - Procedural, already addressed through project design	#18907-27	The Scoping Proposal released 10/8/2014 indicates on Table 4 that salvage harvesting would occur in 2618 acres of Inventoried Roadless Areas which is completely inappropriate as these areas may be further protected as part of Wilderness or other roadless use in the future. Page 11 of the same document states: "No salvage harvest is proposed within Wilderness, Backcountry, Research Natural Areas, Recommended Wild Rivers, Inventoried Roadless Areas, or Riparian Reserves". Why has the Forest Service in the DEIS reversed its previous Scoping Proposal decision against allowing harvesting in Riparian Reserves?	Procedural statement. No salvage harvest is proposed within inventoried Roadless Areas, or Riparian Reserves associated with stream channels (hydrologic Riparian Reserves). Chapter 2 in the draft EIS clarifies the statement from page 11 of the scoping letter by differentiating treatments in hydrologic Riparian Reserves from treatments in geologic Riparian Reserves. Salvage is proposed in geologic Riparian Reserves, not hydrologic Riparian Reserves.

Code	Comment Number	Comment Text	Response
102.05 - Procedural, already addressed through project design	#18918-13	Some areas are called "roadless" for a reason. Stay the hell out of there - and don't helicopter-log either! Have some respect! Zero roads and logging in roadless areas	Procedural statement. See response to comment number 18907-27. No road building or salvage harvest is proposed within any inventoried Roadless Areas. See Chapter 2 of the EIS for a detailed description of proposed actions.
102.05 - Procedural, already addressed through project design	#18918-17	Also, there is inadequate attention of the documents toward some negative ecological impacts of fire breaks. What will hold the soil together? Is soil liable to erode downhill and silt native salmon streams from some of these areas? Will herbicides be used on fire breaks? Which herbicides - and with what inert ingredients? Will any plants be tolerated on fire breaks? Which ones? Would some areas be considered "too steep" for a fire break (either due to likelihood of erosion impacting a stream / river below, or otherwise)? I also object that the DEIS mentions herbicide use on private timberland in the region more than it does use of herbicides by the USFS. Does the proposal to "release" some areas under the WFRP mean herbicides will be applied. Which ones -- with which inert ingredients?	Procedural statement. See response to comment number 17387-4. None of the Alternatives include the use of pesticides, herbicides or fertilizers. Effects to soil and aquatic resources are described in Chapter 3 of the draft EIS.
102.05 - Procedural, already addressed through project design	#18926-12	The DEIS states that "Alternative 2 proposes construction or reconstruction of temporary roads, installation and removal of stream crossings, and construction of log landings in Riparian Reserves" (Chapter 3, p. 201-202). This seems counter-intuitive to the established goal of protecting riparian reserves, since salvage logging has already been excluded from these areas, and only hand-methods of site preparation will be used. The additional disturbance created by the construction of roads, stream crossings, and landing sites will undermine the U S Forest Service's efforts to minimize disturbance in these areas. It is recommended that alternative sites for roads and landings be established, if possible. Some stream crossings are inevitable, but they should be minimized in number and placed strategically to provide access to the greatest possible area of the treatment unit while minimizing adverse effects on Riparian Reserves.! ! Non- Strategic Roads Should Be Clearly Identified in the DEIS or FEIS !	Procedural statement. See the response to comment number 17387-4. While effects of these activities on channel morphology is minor to undetectable at the watershed scale, site-scale effects are anticipated from some infrastructure. Further detail on site-scale effects is provided in the Hydrology and Aquatic resources reports. Your editorial suggestion for the final EIS is appreciated.
102.05 - Procedural, already addressed through project design	#19076-14	What happens Up-River is key to water quality. This proposal must use the best available science.	Procedural statement. See response to comment number 1737-11.
102.05 - Procedural, already addressed through project design	#19076-2	We do not understand why the boundaries are defined by the 3 fires, instead of the watershed boundaries.	Procedural statement. The Westside Fire Recovery project was developed in response to landscape-level changes to forested habitat resulting from the 2014 wildfires on the Klamath National Forest. The project boundary was extended beyond the fire perimeters in order to incorporate hazardous fuel reduction treatments and fire breaks within one-quarter mile of private property structures. Although project boundaries were established based on 2014 fire perimeters, hydrologic analysis considered existing conditions and potential effects of project Alternatives in all of the watersheds that contained a portion of the fire area. This framework resulted in effects analyses being performed for ten 5th field watersheds, for example.
102.05 - Procedural, already addressed through project design	#20-6	Follow the Northwest Forest Plan. Focus logging along major access roads and protect the most important and vulnerable recovering areas: the late-successional and geological reserves.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 18918-22.

Code	Comment Number	Comment Text	Response
102.06 - Procedural, already addressed in DEIS	#12348-1	My comments are submitted as a concerned citizen who went through the Beaver fire and the fact that I have seen the devastation of the Scot Bar section of the Happy Camp Complex while assisting to replace a water system destroyed be the fire there. The burned trees that remain have been thoroughly burned in to the cambium layer and as a result the trees are dead. They have brown needles and are beginning to fall. When they do, they will be the dead fuel providing the continuous layer for the next fire. The few remaining that did not die have been weakened to the point that they will not survive the rush of bugs that they do not have the system remaining to fight. They will then die adding to the dead fuel loading on the land. All of this adds to the fire danger that we can reduce now. While reducing the fire danger, the US Forest Service can get back to a critical job of conservation of resources by LOGGING the dead and dieing trees providing: 1. Jobs critical in this county 2. Additional revenues for the local and federal government 3. A place for new trees to be planted to renew the land 4. Allow the renewed land to reinvigorate the animal populations displaced by the fires. In a way, we were lucky to have had a mild winter following the burning of the hundreds of thousands of acres. While not providing us the water that we need, the short number of days of heavy rain showed us the devastation that is still possible while not creating more widespread devastation. This year was the first that I had to clear 30 - 36 inch culverts in my road. In all, I had to clear seven (7) culverts backed up by the silt and rock washing down from the heavily burned areas above my land. Through this winter, I was awakened by waters rushing down the draws near my house for the first time in the ten (10) years that I have owned the property. I lost about seventy-five (75) chords of dry standing firewood but it was replaced by newly dead Oak and Madrone trees killed by the fire. I've spent a lot of time cutting and hauling these dead trees to places that are maintained for the purpose of splitting the wood. As I do this on my land and see the private timber companies clearing up the devastation on their properties, I always wonder at the continuing losses as the public lands, blackened by the fires, just sit idle and die providing nothing to anyone except the next fire. There has been enough devastation and loss! We must approve a plan to maximize the good for PEOPLE from these fires. Alternative five provides this!! It will improve the vistas, provide some protection from the next fire and allow us to get something back in the way of jobs and financial gain for the local and federal government from the devastation of last year.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.06 - Procedural, already addressed in DEIS	#12364-6	Do not increase the risk of future fires becoming catastrophic by establishing thousands of acres of highly flammable tree plantations.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 18918-14.
102.06 - Procedural, already addressed in DEIS	#12365-2	Secondly, the Happy Camp Fire area provides an opportunity to improve owl and other wildlife habitats. Previously many sites were overstocked with plantations in need of thinning not providing likely owl habitat now or in the future. The plan for replanting in lower density stands makes good sense especially if underbuying management becomes a more commonly used practice. This I highly favor and have expressed interest in working with the new District Ranger on using low intensity fire even in the Marble Mountains where relatively easy opportunities exist now. I have extensive experience in such burning even in old-growth conifer forests.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
102.06 - Procedural, already addressed in DEIS	#16957-1	The implementation of salvage logging on these areas damaged by stand replacing fire will only further damage the fragile soils that are devoid of vegetative cover. When a high intensity fire sweeps through a landscape, the logs left behind are an essential component to reestablish an organic, duff layer over the soil. Salvage logging at the scale proposed will remove tremendous amounts of carbon, and other nutrients out of the system just as the landscape needs those nutrients the most. How will the forest service quantify how salvage logging with effect the natural regeneration of the forest, and the effects of removing this level of biomass from the ecosystem when the slopes are at their most fragile state?	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment 18927-1. Effects to soils, snags and downed wood, and vegetation are summarized in the draft EIS, and detailed in the individual resource reports.

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102.06 - Procedural, already addressed in DEIS	#17387-5	Retain all green trees at time of salvage logging.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 6733-1. See Chapter 2 of the EIS for clarification about live or green trees as it relates to prescriptions. This suggestion was received during scoping and considered as part of an Alternative. See description of Alternative C under "Alternatives considered but eliminated" in Chapter 2 of the EIS. See Chapter 2 of the EIS for a description of the treatments proposed by Alternative. With the exception of an incidental tree, none of the action alternatives in this project propose green-tree removal. Green trees will be retained; see response to comment number 12346-55.
102.06 - Procedural, already addressed in DEIS	#18878-82	In regards to any proposed hazardous fuels treatments we are in tacit agreement to the following with the inclusion of: 1) Protection of infrastructure (500ft radius); 2) Roadside treatment (150-300 ft buffer); 3) Fire Fighter Safety; 4) Protection of private property; 5) Utilization of a local workforce to cooperatively accomplish planned activities within and adjacent to landscapes defined by reasonably identifiable control features, and 6) Facilitates the restoration of cultural burning practices and establishment of areas available for managing fires for resource benefits in the interest of restoring natural fire regimes and reducing the cost of needed suppression efforts.	Utilization of a local workforce to accomplish planned activities and the restoration of cultural burning practices is beyond the scope of the Westside Fire Recovery EIS. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. See Chapter 1 for a summary of consultation.
102.06 - Procedural, already addressed in DEIS	#18907-23	The Salvage Harvest definition on pages 30 and 31 of the DEIS states: "In determining what individual trees will be harvested, standing dead trees 14 inches in diameter at breast height or greater will be considered…". Does this mean that all trees dead or alive less than 14 inches in diameter will be left in all treatment areas?	In salvage treatment areas only standing dead trees greater than 14 inches in diameter will be considered for salvage. These trees will be cut if they meet the 70 percent or great chance of dying within the next 3 to 5 years “Marking Guidelines for Fire-Injured Trees in California.” This is describe in Alternative 2 section of the draft EIS. After salvage treatment the trees less than 16 inches in diameter will be treated using site prep in the site preparation in units that are proposed for mechanical yarding or skyline yarding of dead trees less than 16 inches in diameter. For units proposed for manual site prep (less than 10 inches) or mastication (less than 12 inches) trees that are not removed by salvage (trees between 14 inches and 12 inches) will remain in the stand unless there is a concern for safety.
102.06 - Procedural, already addressed in DEIS	#18909-1	The Westside DEIS considers four action alternatives: The agency's Preferred Alternative 2, Alternative 3 in general considers Northern spotted owls, Alternative 4 considers Coho and Alternative 5 considers Late-Succesional Reserves (LSRs). It is not appropriate for the agency to separate these alternatives as it has a responsibility to all species and to protect, maintain and enhance LSRs and Riparian Reserves. The Wildlife Biological Assessment (BA) and the Fisheries BA both consider different alternatives, which are a mix and match of different alternatives and select additions and omissions of different types of treatments in different places.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Procedural statement. The proposed action and all Alternatives for the Westside Fire Recovery project were developed following the requirements for 40 CFR 1502.14 and were developed to be consistent with standards and guidelines of the Forest Plan and other law, regulation and policy, protecting northern spotted owl, Coho Salmon , and Riparian Reserves, for example. Alternatives may be developed to address more than one significant issue, and no specific number of Alternatives is required. Reasonable Alternatives to the proposed action that fulfills the purpose and need and address unresolved conflicts related to the proposed action were analyzed in detail in Chapter 3 of the draft EIS. Alternatives continued to be modified as the agency consulted with U.S. Fish and Wildlife Service and National Marine Fisheries Service under Endangered Species Act; this progression resulted in the development of a modified Alternative 2 and then the modified Alternative 3 (preferred), as described in the final EIS.
102.06 - Procedural, already addressed in DEIS	#18909-16	We remind the agency that the vast majority of the larger units and approximately half of all other treatments are within Late-Succesional Reserves, designated to maintain and protect species. The conclusion of the Shatford study at page 144 states, "In contrast with previous observations (Hayes 1959, Stein 1986), our findings suggest that the prognosis for achieving reasonable conifer densities are fair to excellent, even on sites with high cover of broad-leaved shrubs and hardwoods. Although conifer growth may be delayed by competition over the short term, benefits in terms of wildlife habitat and site fertility should be considered. Viewing ecosystem recovery as a variable and dynamic process highlights the limitations of short-term studies (Donato et al. 2006) that provide an incomplete picture of the regeneration process. In addition, assertions that burned areas, left unmanaged, will remain unproductive for some indefinite period (Sessions et al. 2004) seem unwarranted. A more complete understanding of the tradeoffs among management options is necessary to resolve current controversies."	There is no disagreement that over time, trees will become reestablished within severely burned areas, but as noted in responses to the literature below, in some places this may take many decades. We note that guidelines for risk-reduction salvage in Late Successional Reserves and were provided in the Forest Plan and that recommendations for management were provided in the Forest's Late-Successional Reserve Assessment. (See Appendix E). The Project as proposed is consistent with both the recommendations of the Late-Successional Reserve A and the guidelines of the Forest Plan. Because Late Successional Reserves have been established to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions (Northwest Forest Plan C-14; Late-Successional Reserve A 1-24). Research has shown that the quickest way to reestablish a coniferous forest after stand replacement fire is by active reforestation (Zhang et al. 2008). Research has also shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less severity and intensity or not at all (Thompson, Spies and Ganio, 2007; Weatherspoon and Skinner, 1995; Omi and Kalabokidis 1991). Without site prep and planting, we agree that trees will become reestablished over a period of years to decades, even in severely burned areas. Distance from seed sources will significantly influence the amount of time for trees to become established. There are several patches that are well in excess of 1,000 acres in Walker and Grider Creek where reestablishment of trees may take decades. Given the fire frequency in the Klamath Province it is probable that areas

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			where fuels are not treated will go through several cycles of stand replacement fire until surface fuels created by the 2014 Westside fires have been reduced to the point that a low to moderate fire severity regime has been reestablished. This fire cycle would maintain areas where fuels have not been reduced in semi-permanent brush fields for decades rather than accelerating the development of late-successional stand conditions. Even in Alternative 2, the most intensive salvage harvest Alternative, about 14,500 acres (6,630 salvage, 7,860 site prep and plant) or 28% of 52,000 acres of moderate-high severity burn would be replanted; over 70% of the moderate-high severity burn area would proceed unimpeded through the long early seral plant community phase described by the commenter. Green trees will be retained; see response to comment number 12346-55. Forest Vegetation Simulation (FVS) modeling (Appendix E, Attachment 1) shows that reforestation will establish forested conditions more rapidly by treating surface fuels and planting trees than by natural succession. It also shows that where surface fuels have been treated by salvage logging and site preparation, the ensuing stand is more resilient to fire than untreated areas. If surface fuels are treated, the risk of future stand replacement fires would be reduced, increasing the probability that planted conifers can persist into the future. In the FVS model, planted stands where fuels had been reduced began to show late-successional stand conditions typical of the Klamath Province with 40% canopy closure and 18 inch diameter at breast height trees in 90 years compared to over 200 years for untreated stands to reach the same stage. The planted trees in areas where fuels have been successfully reduced are expected to provide “islands” of coniferous forest in a sea of brushfields perpetuated by reburns where fuels have not been reduced. This would provide a measure of vegetative diversity that would not otherwise be present on the landscape. These planted stands have a much higher probability of achieving and sustaining the desired late successional stand condition for the Late-Successional Reserve than do unplanted areas as shown in the FVS modeling (Attachment 1). In response to Shatford, et al. 2007 as in Chapter 3 Vegetation of the EIS: "...the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites". Response to: "Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk" The review of Donato et al 2006 by Newton et al 2006 (M. Newton, S. Fitzgerald, R. R. Rose, P. W. Adams, S. D. Tesch, J. Sessions, T. Atzet, R. F. Powers, C. Skinner) is applicable to Westside Resource Recovery Project EIS reforestation circumstances. As per the findings of Newton et al in the review of Donato et al, they noted the following: “Donato et al. (1) recently concluded that logging 2 to 3 years after wildfire kills natural regeneration and increases fire risk. The research may make a valuable contribution, but the study lacks adequate context and supporting information to be clearly interpreted. Here, we discuss the papers methods and conclusions in the context of relevant management objectives and the forestry knowledge base concerning natural regeneration processes, mortality from logging, and fuel accumulations in southwestern Oregon and northwestern California. Donato et al. (1) made inferences about natural regeneration processes, mortality from logging, and fuel accumulations without presenting key information regarding (i) agency postfire management directives for reforestation or downed wood levels (2), (ii) implications of delays in postfire plan implementation, or (iii) important environmental and disturbance descriptors such as plant associations, fire intensity, seed tree proximity, and weather patterns. Results from their study cannot be readily extrapolated because it was a short-term observational study of site-specific forest operations governed by agency management objectives. Other management plans, operations, or conditions could yield different results (3). In the case of the 2002 Biscuit Fire, logging was postponed for 2 years, allowing more seeds to germinate and increasing seedling exposure to injury during logging (4). Donato et al. cite a lack of scientific data regarding the management of public forests after large fires. However, it should be noted that conifer reforestation (planted and natural) and vegetation ecology have been widely studied in the region. Studies show variable responses with plant association, competing vegetation, local climate, soils, and other factors (5, 6). Hobbs et al. (5) provide a synthesis of 13 years of research in southern Oregon and northern California. Fewer studies have examined reforestation after wildfire, especially over longer periods (4, 7–9), but damage to natural regeneration after delayed salvage logging was reported more than 50 years ago (4, 8)…” Natural regeneration affects analysis is described in Chapter 3, Vegetation of the EIS: "Successful natural regeneration in one to two decades, though highly variable, has been documented following stand-replacing fires in the Klamath Province within white fir, Douglas-fir, and Douglas-fir/tanoak stand types (Shatford, Hibbs and Puettman 2007; Joint Fire Science Program Final Report, Project 05-2-1-40 2009). Pine and mixed conifer associations were not sampled in the Shatford et al. study. More typically, vegetation is likely to go through an extensive time-period of hardwood- and brush dominated site occupancy (Zhang, Webster, Powers and Mills 2008). Reforestation will slowly occur naturally but may take many decades to replace brushfields (Zhang et al. 2008). In larger patches where the majority of the trees were killed by the fire, reestablishment of forest cover would rely on natural regeneration and may take decades or longer. For the larger, contiguous areas of high-

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			severity burn, distance from seed sources may further delay natural regeneration. In some cases of high-severity burn, there are no living conifer trees available to provide potential seed for potential natural regeneration for several miles."
102.06 - Procedural, already addressed in DEIS	#18934-15	The responsible official should consider issuing a decision in multiple RODs that separate contentious timber salvage actions from fuels treatments and prescribed fire actions so that litigation against salvage actions do not prevent actions that will actually improve forest conditions and reduce future fire risk. Late-Succesional Reserves The Northwest Forest Plan (NWFP) created Late-Succesional Reserves (LSRs) to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth forest related species including the northern spotted owl. By clear intent and design, LSRs were allocated separately from lands managed for the production timber products. In fact, the NWFP states that, in LSRs, "Salvage will not be driven by economic or timber sale program factors." (NWFP SFEIS F-21). Further, "salvage guidelines are intended to prevent negative effects on late-successional habitat, while permitting some commercial harvest" (NWFP S&Gs, C-13), and, one of the primary objectives of LSRs is "development of old-growth forest characteristics including snags" (NWFP S&Gs B-5). The Westside DEIS does not substantiate how salvage logging in LSRs will prevent negative effects on late-successional habitat nor how the proposed salvage logging will meet NWFP guidelines that "salvage operations should not diminish habitat suitability now or in the future" (NWFP S&Gs, C-13). In fact, by its very nature, salvage logging in LSRs will remove snags that are essential to the development of old-growth characteristics. In summary, the NWFP does allow limited salvage operations in LSRs for the express purpose of ecological benefit and the establishment or preservation of late-successional habitat and forest conditions. Economic is relegated to an ancillary benefit, not the driving purpose. The DEIS has not demonstrated the ecological benefit of salvage logging in LSRs and, in fact, the vast majority of scientific studies have concluded that such salvage logging actually causes ecological harm and increases fuel loading and susceptibility to future high-intensity fires. Similarly, site prep and planting is antithetical to the purpose of the LSRs by artificially created even aged stands with an unnatural density of trees (even at the lower than typical densities proposed in this project). There are no burned areas in the Whites Fire footprint that are not situated within sufficient distance of adequate natural seed stock from surviving trees and, as such, the entire burn area will naturally regenerate without intervention. The natural time frame for development of forest in the region is upwards of 100 years. LSRs were created to be of adequate size and distribution on the landscape to be able to sustain natural disturbances, such as the 2014 Westside fires, and recover naturally. The DEIS discloses the areas to be planted but does not provide convincing scientific basis for interrupting the natural process of recovery after fire nor does it disclose the potential for intensifying future wildfire behavior by creating densely stocked forests via the site prep and planting activities. All salvage harvest should be limited to matrix land and any replanting should be limited to existing plantations that have proven successful and are in locations that will not impede the future management of fire for beneficial purposes.	With respect to decision documents, the Deciding Official has discretion for organization of the Record of Decision and whether there will be one record of decision (ROD) or multiple RODs. At the time of this writing, that had not been determined. The Record of Decision for the Westside Fire Recovery FEIS will follow regulations from 40 CFR 1505.2. Within the Record of Decision, the responsible official will determine whether to implement the proposed action, an alternative to the proposed action, or choose no action at this time. See response to comments # 18878-12, # 16957-1, and # 18918-14. The Whites fire burned approximately 42,400 acres in the project area. Of those, approximately 26 percent exhibit very high vegetation burn severity effects. Areas of high severity burns experienced 75 percent or greater vegetation mortality, loss of canopy and understory cover, and loss of duff layers and large woody debris.An extensive discussion of salvage in Late Successional Reserves (LSRs) is provided in EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised. Please refer to that discussion for questions concerning salvage in LSRs. See also Appendix E. Retaining all of the fire-killed trees currently on the landscape is likely to create future surface fuel loading that would actually increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; Figure 7; Fuels Report – Chapter 3). Also, as noted by Taylor and Skinner (1997) and Skinner (2002), dead wood in the Klamath province rarely lasted long enough, even in a low to moderate fire severity environment, to actually decompose because snags and down logs are receptive to embers, and once partially rotted, are easily consumed by fire. The Westside Fire Recovery Project seeks to meet the objective described in Guidelines for salvage in the Forest Plan by:• Retaining large "legacy" trees wherever they occur. By virtue of their location and / or inherent resistance to fire, these trees are most likely to persist until the next stand can develop large structures.• Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less severity or less frequently. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in association with hydrologic Riparian Reserves (see map packet) or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity.• Reducing fuels around hydrologic Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Appendix A, Figure 7). • "Treating small fuels in Riparian Reserves by broadcast burning at the time that activity fuels are treated. This reduces the small surface fuels that readily ignite and carry fire but is unlikely to harm most larger snags because they will not yet have developed the punky surface that is receptive to embers."While the risk of loss of snags and down wood from future fires cannot be eliminated, implementation of these measures would provide a higher probability of retaining surviving green trees, snags and down wood similar to the patterns described by Skinner (2002) and Taylor and Skinner (1996) typical of the Klamath Province, than leaving areas completely untreated.Natural regeneration affects analysis is described in Chapter 3, Vegetation of the EIS: ""Successful natural regeneration in one to two decades, though highly variable, has been documented following stand-replacing fires in the Klamath Province within white fir, Douglas-fir, and Douglas-fir/tanoak stand types (Shatford, Hibbs and Puettman 2007; Joint Fire Science Program Final Report, Project 05-2-1-40 2009). Pine and mixed conifer associations were not sampled in the Shatford et al. study. More typically, vegetation is likely to go through an extensive time-period of hardwood- and brush dominated site occupancy (Zhang, Webster, Powers and Mills 2008). Reforestation will slowly occur naturally but may take many decades to replace brushfields (Zhang et al. 2008). In larger patches where the majority of the trees were killed by the fire, reestablishment of forest cover would rely on natural regeneration and may take decades or longer. For the larger, contiguous areas of high-severity burn, distance from seed sources may further delay natural regeneration because of long distances to trees capable of producing seed.

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102.06 - Procedural, already addressed in DEIS	#18937-2	The Westside DEIS considers four action alternatives and a map of the Karuk Alternative. Three of the action alternatives specify increased considerations for controversial impacts within the logging plan, specifically habitat for Northern Spotted Owls (Alternative 3), impacts to Coho salmon (Alternative 4) and effects on Late-Succesional Reserves (Alternative 5). These alternatives are an inappropriate because the agency has a responsibility to improve conditions for wildlife including habitat, water quality and soil productivity as defined under the purpose of the National Forest Management Act (NFMA).	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.See response to comment number 18909-1.
102.06 - Procedural, already addressed in DEIS	#19079-3	Cumulative effects must be considered.	Procedural statement. See response to comment number 18927-1.
102.06 - Procedural, already addressed in DEIS	#5873-10	Extensive road use and road construction will cause unacceptable cumulative watershed effects, including erosion, sediment production, habitat fragmentation, etc.	Procedural statement. The Forest used standardized Cumulative Watershed Effects models (Equivalent Roaded Area, Universal Soil Loss Equation, Mass Wasting) to assesseffects of past, present, and reasonably foreseeable activities for the Westside Fire Recovery project. The Cumulative Watershed Effects model results by 7th field watershed for direct and indirect effects, and forcumulative effects, for analysis indicators are in the appendices of the hydrology report, or see Chapter 3 in the draft EIS for a summary of Cumulative Watershed Effects and other related effects. See Chapter 2 of the EIS for project design features designed to minimize impacts on resources.
102.06 - Procedural, already addressed in DEIS	#5873-19	Numerous studies also document the cumulative impacts of post-fire logging on natural ecosystems, including the elimination of bird species that are most dependent on such conditions, compaction of soils, elimination of biological legacies (snags and downed logs) that are essential in supporting new forest growth, spread of invasive species, accumulation of logging slash that can add to future fire risks, increased mortality of conifer seedlings and other important re establishing vegetation (from logs dragged uphill in logging operations), and increased chronic sedimentation in streams due to the extensive road network and runoff from logging operations."	Procedural statement. See response to comment number 18927-1. Effects to Migratory Bird species, soils, snags and downed wood, vegetation, aquatic systems, and roads are summarized in the draft EIS.
102.06 - Procedural, already addressed in DEIS	#5873-9	Salvage logging will delay vegetation recovery and will retard watershed recovery and will violate the Aquatic Conservation Strategy of the Northwest Forest Plan.	Because Late Successional Reserves have been established to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions (Northwest Forest Plan C-14; Late-Successional Reserve Assessment 1-24). Research has shown that the quickest way to reestablish a coniferous forest after stand replacement fire is by active reforestation (Zhang et al. 2008). Research has also shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less severity and intensity or not at all (Thompson, Spies and Ganio, 2007; Weatherspoon and Skinner, 1995; Omi and Kalabokidis 1991). Forest Vegetation Simulation (FVS) modeling (Attachment 1) shows that reforestation will establish forested conditions more rapidly by treating surface fuels and planting trees than by natural succession. It also shows that where surface fuels have been treated by salvage logging and site preparation, the ensuing stand is more resilient to fire than untreated areas. If surface fuels are treated, the risk of future stand replacement fires would be reduced, increasing the probability that planted conifers can persist into the future. In the FVS model, planted stands where fuels had been reduced began to show late-successional stand conditions typical of the Klamath Province with 40% canopy closure and 18 inch diameter at breast height trees in 90 years compared to over 200 years for untreated stands to reach the same stage. Without planting, trees will slowly become reestablished over a period of 10-50 years in severely burned areas, but the probability of a late-successional coniferous forest becoming established is low because of probable reburns. It is probable that areas where fuels are not treated will go through several cycles of stand replacement fire until surface fuels have been reduced to the point that a low to moderate fire severity regime has been reestablished. This would maintain areas where fuels have not been reduced in semi-permanent brush fields for decades rather than accelerating the development of late-successional stand conditions. The comment also provides no evidence that risk reduction salvage would violate the Aquatic Conservation Strategy. A complete Aquatic Conservation Strategy assessment is found in the Project Record and is summarized in Chapter 3.

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102.06 - Procedural, already addressed in DEIS	#6733-1	I urge you to cancel the Westside project as it proposed in the Draft Environmental Impact Statement. Salvage logging is highly controversial and all of the action alternatives propose logging green trees and a great amount of disturbance on very fragile and steep slopes in over 67 watersheds. Eliminating and harming habitat for imperiled species is contradictory to your responsibilities. Late-Succesional Reserves are in place to enhance and maintain habitat for species that are dependant on complex natural older forest habitats. Further, salmon streams are already choked with sediment as a result of fire suppression efforts and last summers fires. I value post-fire ecosystems, Wild and Scenic Rivers, large legacy trees, wildlife corridors and the rare and endemic species living in these forests and rivers. Please allow for natural recovery and choose an alternative that best protects our watersheds, wildlife and river communities for the long-term.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See responses to 12414-1 and 6924-1. The EIS analyses the effects of the proposed actions and the no action for comparative purposes. See Chapter 2 of the EIS for proposed actions of each Alternative--the project does not propose the logging of green trees with the exception of green trees necessary to access snags for harvest (when cable logging) and hazard trees that pose an immediate danger; see response to comment number 12346-55. The portions of the project in Late-Successional Reserve are designed to meet the goals of Late-Successional Reserve, as stated in the Forest Plan. Chapter 2 of the EIS includes project design features for the protection of watersheds, salmon habitat, wild and scenic rivers, and terrestrial wildlife. See Chapter 3 of the EIS for the disclosure of effects of the no action and proposed action Alternatives in comparative format. See the affected environment section of Chapter 3 for a description of the post-fire condition by resource. See Chapter 3 of the EIS for effects of the proposed actions on resources by resource area. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. We have actively been undergoing consultation with National Marine Fisheries Service and U.S. Fish and Wildlife Service for actions that may impact federally-listed species. This consultation has resulted in the modified Alternative 3 being the preferred Alternative in the final EIS. Also see a discussion of salvage in Late Successional Reserves in Chapter 1 of the EIS and the Appendix about salvage in Late-Successional Reserve that was submitted to the multi-agency Regional Ecosystem Office (who concurred with the Forest Service proposal and findings). See Chapter 1 for the purpose and need statements, which include improvements to watershed and wildlife habitat. The project has been designed to mitigate for the protection of Wild and Scenic Rivers, legacy trees, wildlife corridors and rare/endemic species; see Chapter 2 of the EIS for project design features.
102.07 - Procedural, addressed through no action alternative	#17387-7	but see no need to fell hazard trees or conduct roadside fuels treatment on roads that are currently not open or drive-able.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.. See response to comment number 18878-80.
105 - Editorial	#18878-11	Pg. 6 Table 1-1and1-3 are confusing and do not match.	Editorial comments are appreciated and were considered in the updates for the final EIS.
105 - Editorial	#18878-17	Table 1-6: Existing and Desired Conditions DEIS: Progressively increasing fuel loadings where potential flame lengths are projected to exceed four feet. Flame lengths over four feet are resistant to fire suppression tactic (Pg 13) Comment: This statement is repeated twice.	Editorial comments are appreciated and were considered in the updates for the final EIS.
105 - Editorial	#18878-6	The text and table S-1 describing acres of land impacted by the 2014 Fires do not match and should be corrected.	Editorial comments are appreciated and were considered in the updates for the final EIS.
105 - Editorial	#18909-39	Inconsistency in Baseline Habitat Like analysis indicator 1, there are massive inconsistencies between tables. For example, in table 3-7 on page 142 of the DEIS, KNF states there are 41,513 acres of Critical Habitat in the analysis area. Included in this are 7,944 acres of nesting/roosting habitat, 8,466 acres of foraging habitat, and 7,967 acres of dispersal habitat. Table 3-8 on page 145 of the DEIS likewise states there are 41,513 acres of Critical Habitat in the analysis area. However, table 3-8 has 6,921 acres of nesting/roosting habitat, 8,074 acres of foraging habitat, and 7,925 acres of dispersal habitat. Table 3-9 on page 149 purports to show the change in Critical Habitat under alternative 2. According to table 3-9, there only 36,408 of Critical Habitat in the analysis area.	Editorial comments are appreciated and were considered in the updates for the final EIS.

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105 - Editorial	#18909-40	It is impossible to analyze the project impacts because of the numerous inconsistencies in the DEIS and supporting documents. According to DEIS table 3-9 on 149, Alternative 2 will remove a total of 536 acres of nesting and roosting habitat, 605 acres of foraging habitat, and 617 acres of dispersal habitat. The text discussing the changes to Critical Habitat from Alternative 4 on page 149 of the DEIS does not make sense in light of the stated changes under Alternative 2. The DEIS states: "The effects of alternative 4 on critical habitat are similar to alternative 2 except fewer acres of critical habitat will be removed." However, the same paragraph then states under Alternative 4, "There is a loss of 1,195 acres of nesting/roosting, 2,642 acres of foraging and 2,781 acres of dispersal." In other words, though we are told in one sentence that Alternative 4 will remove fewer acres of Critical Habitat than Alternative 2, the number provided by the Service state that Alternative 4 will remove 659 more acres of nesting/roosting, 2,037 more acres of foraging, and 2,164 more acres of dispersal habitat than Alternative 2. Table 2-34 states that Alternative 1 would have cumulatively impact 552 acres of Critical Habitat. However, the test on page 147 states that Alternative 1 would only affect 452 acres. Table 3-10 also states that Alternative 1 will cumulatively impact 442 acres. Again, the DEIS is so faulty that it makes the comparison of alternatives impossible.	Editorial comments are appreciated and were considered in the updates for the final EIS.
105 - Editorial	#18926-13	Page 284 of the DEIS states, "Indirect short-term increase in use from firewood cutting of felled (non-merchantable) trees left along non- strategic roads from roadside hazard treatments." Please clearly identify all of the non-strategic roads in the project area.! !	Table 3-37 on page 284 of the draft EIS states, "Increased short-term use of burn areas for firewood cutting and deer hunting."
110.02 - Coordination, Consultation	#17764-3	If you don't make serious changes and consult more directly with the Karuk Tribe, there will be a large backlash from the community and your job security will be in jeopardy.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
110.02 - Coordination, Consultation	#17910-9	Collaboration with the Karuk Tribe Natural Resources Department.	See responses to 17910-10 and 19710-11. Consultation is described in Chapter 1 of the EIS. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.
110.02 - Coordination, Consultation	#18852-18	It has been discussed that the Karuk Tribe was not fully involved and engaged in the planning of the project, which is another oversight threatening the validity, design and long term benefit associated with this project.	The Forest initiated government to government consultation with federally recognized tribes in response to this project that included the Confederated Tribes of the Grand Ronde, Confederated Tribes of the Siletz, Karuk Tribe, and the Quartz Valley Indian Reservation. The Karuk Tribe has raised specific concerns regarding salvage and reforestation actions and project timelines. Meetings with Forest line officers and staff, and Karuk Department of Natural Resources staff and council members are occurring on a weekly basis. The Forest will continue consultation efforts with all parties to ensure there is a full understanding of the project and that the resource concerns of these groups are recognized and addressed.
110.02 - Coordination, Consultation	#18878-66	The Karuk Alternative demonstrates that we do not oppose the salvage of trees that are hazards to human safety and infrastructure; however, we do oppose post-fire salvage logging for purely economic-political purposes at the expense of water quality, fisheries, and cultural resources. We remain concerned that very little of our input provided in the consultation process have resulted in any significant alterations of the proposed action. In our view, the Klamath National Forest failed in its obligations to engage in true government-to-government consultation.	Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.The purposed and need, relevant issues, and effects analysis demonstrate that salvage harvest is not being purely done for economic reasons and that there are resource benefits to the treatments proposed. See response to number 18852-18 about consultation.

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110.02 - Coordination, Consultation	#18878-67	According to the USDA Departmental Regulation 1350-002, Tribal consultation is the timely, meaningful, and substantive dialogue between USDA officials who have delegated authority to consult, and the official leadership of Federally recognized Indian Tribes, or their designated representative(s), pertaining to USDA policies that may have tribal implications. It is our view that KNF's consultation was neither timely, meaningful, or substantive. Despite our concerns with the consultation process, we still believe that there is time for KNF to address our concerns and to provide assurances that project implementation, including but not limited to contract management and post implementation monitoring, can be conducted in accordance to the agreed terms and conditions. Finally, the need to reintroduce more natural fire regimes to the landscape cannot be overstated. It is critical that we work together to make our forests more fire resilient in the face of a changing climate and the need to protect our local communities from the risks associated with catastrophic wildfire. Any project proposed which does not include 20 of22 this component is contrary to our past practices, present needs, and future vision for the Klamath Basin.	Thank you for your comment on the Westside Fire Recovery Project. Please refer to comment number 18852-18 regarding consultation with federally recognized tribes. We agree with the need to reestablish a low-moderate severity, frequent fire regime. Restoring a fire resilient ecosystem is one of the objectives of the project.
110.02 - Coordination, Consultation	#18909-115	Below are excerpts from the Pacific Southwest Research Station22 concerning planning and decision making after large wildfires, with emphasis in bold print. 22 Olsen, Christine S.; Shindler, Bruce A. 2007. Citizen-agency interactions in planning and decisionmaking after large wildfires. Gen. Tech. Rep. PNWGTR- 715. Portland, OR: U.S. Department of Agriculture, Forest Service,Pacific Northwest Research Station. 37 p. Participatory Processes Are Essential to Long-Term Success Public responses and support are intricately linked to the processes used to involve (or exclude) citizens. After all, a major wildfire event has affected everyone's forest community, not just the forest management agency responsible for managing these lands. How citizens are incorporated into decisions that affect their livelihood and quality of life is critical to their judgments (Shindler et al. 2002). One route is to listen to individual preferences and attempt to assuage individuals or interest groups independently. Another is to structure public processes to determine what a community of people acting together believe is right, not just merely what vocal individuals prefer. Policies based on shared community values often require engaging all relevant parties about what is best for a particular setting (Sagoff 1988). It follows that the public's idea of fair treatment includes the quality of these procedures and the ability to be active participants (Tuler and Webler 1999). This ultimately translates to how citizens will feel about the decisionmakers. Conclusion: By its nature, and the promise of more large wildfires in our future, the problem of post-fire decision making will be a continuing, long-term concern. It will require arrangements for innovation, experimentation, and collaboration that contribute to our knowledge base and influence our collective judgment. We are disheartened that after two years of collaboration with the Western Klamath Restoration Partnership (Partnership) the agency refuses to recognize or engage local communities with such a large scale planning effort. Rather than offer to give a presentation five or six months into planning, the agency could have started a conversation with the group about how our watersheds should be managed post-fire. Regardless, the Partnership, in which the KNF is a partner, has agreed upon shared values. These values include: 1. Fire Adapted Communities 2. Restored Fire Regimes 3. Healthy River Systems 4. Resilient Bio-diverse Forests/Plants/and Animals 5. Sustainable Local Economies 6. Cultural and Community Vitality We believe that the Westside project as proposed would harm or hinder all of the values the Partnership shares. Despite missed past opportunities the agency still has the opportunity to do "what a community of people acting together believe is right."	From the initiation of the project through release of the final EIS the Forest consistently engaged the public, local officials, federally recognized tribes, state, local and federal regulatory agencies, and local organizations. The Forest used typical means of engaging the public, such as legal notices, public open houses, news releases, information on the web, social media, and field trips to the project area. Additionally, the creation of two local collaborative groups were formed, which included a Citizens' Advisory Committee that was approved by the Siskiyou County Board of Supervisors, and The Westside Klamath Steering Committee that was formed by National Institute for the Elimination of Catastrophic Wildfire. Both collaborative groups were charged to serve as advocates for actions regarding the recovery and restoration of the Westside Fire Recovery project area that are reflective of, and responsive to, the needs of the residents of Siskiyou County; help evaluate the draft EIS; and to suggest guidance for finding balance between protecting resources (such as wildlife, fisheries, and water quality) and protecting human life and safety, public infrastructure, private property, and communities.
110.03 - Trust, Credibility	#12254-1	Kindly remember that your job is to Protect, not destroy, the forests that belong to All Americans. You are supposed to be working for us, Not for the timber companies.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest Service is an agency that strongly promotes sustainable conservation land management practices. We are mandated by law to achieve quality land management under the "sustainable multiple-use management concept" to meet the diverse needs of people while protecting the resource.

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110.03 - Trust, Credibility	#12346-4	Page 32 of the DEIS reveals the Forest Service proposes to salvage log 7,560 acres of large-diameter wildlife snags located in units within the Reserves while page 35 of the DEIS indicates that an additional 10,630 acres of roadside logging are planned in the LSRs. Page 63 of the DEIS acknowledges that all action alternatives developed for consideration by the Forest Service involve the logging of LSRs. While the "summary" introduction to the DEIS acknowledges impacts to LSRs from salvage logging as a "significant issue" necessitating analysis in the DEIS, no actual analysis of project activities on the LSRs is provided in the document. In contrast to this omission, the DEIS does contain short analysis sections addressing some project impacts on Wild and Scenic Rivers and on Inventoried Roadless Areas, neither of which were (self) identified by the agency as "significant" issues necessitating analysis and disclosure in the document. The DEIS does not even contain a map illustrating the location of the LSR land use allocation.	Late-Successional Reserves (Late-Successional Reserve) are a land allocation in the Forest Plan of the Klamath National Forest. The Draft EIS disclosed proposed actions in the Late-Successional Reserve in numerous locations. Table 1-5 identifies goals for management of Late Successional Reserves. Multiple tables in Chapter 2 identify proposed salvage, fuels treatments, roadside hazard reduction and site prep and plant activities that would occur in Late Successional Reserves in each Alternative. Table 2-12 identifies concerns about impacts on late successional habitat in Late Successional Reserves and how that concern was addressed. Table 2-23 identifies various measurement indicators for the effects of salvage harvest and site preparation in Late Successional Reserves by Alternative. Other activities in Late Successional Reserves were identified as potential cumulative effects in Chapter 3. Table B-1 identified Late Successional Reserves as a potential concern. Alternatives 3 and 5 were developed to have less impacts on Late Successional Reserves than the Proposed Action. Environmental consequences of an action are the same regardless of the land allocation where they occur so the statement that environmental consequences in Late Successional Reserves were not addressed is not correct. The draft EIS clearly displays the actions in Late Successional Reserves in Chapter 2 and the environmental consequences of those actions in Chapter 3. A simple comparison between Alternatives displays this.
110.03 - Trust, Credibility	#12346-44	In March 2015 the Roseburg BLM signed a decision record to implement the Rabbit Mountain Fire Safe Cow post-fire project located in the LSR land use allocation. That decision is attached to these comments. Unlike the KNF, the Roseburg BLM must adhere to the Oregon and California Land Act which the BLM interprets as a "timber primacy" 1 The Westside DEIS states "the actual area where harvest will occur will not be known until hazard tree evaluations are completed." DEIS, 33. NEPA requires the Forest Service to analyze the effects of the proposed action now, not after the ROD is signed. 16 statute. Despite this, the BLM has taken a much different approach to LSR roadside logging then have KNF timber planners. Unlike the KNF, the BLM is limiting roadside "hazard tree" logging to a distance of "1.5 tree heights below roads, 1.5 tree heights above roads on slopes less than 35 percent, and 2.5 tree heights above roads on slopes greater than 35 percent." Further, "[o]nly trees that are dead will be felled" and "[w]here physically and operationally practicable, topping of dead hazard trees will be considered as an alternative to felling." The KNF roadside LSR timber grab contains none of these sideboards. Instead, trees up to 250' feet above and below roads will be removed regardless of slope and live trees contributing to NSO suitable and critical habitat will be felled and removed.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest Service is an agency that strongly promotes sustainable conservation land management practices. The Rabbit Mountain project is outside the scope of this project's analysis. The Westside Fire Recovery Project analyses the effects of the project, as proposed. The draft EIS described the larger area being evaluated and the GIS analysis used to refine the area of evaluation. The final EIS further refined those areas considered for roadside hazard treatment for the purposes of analysis. In all cases, the analysis in the final EIS analysis the greatest possible impacts based upon the actions proposed, including roadside hazard treatments. Site-specific concerns and conditions were reviewed and considered during develop of the proposed actions and its analysis. Also see project design features in Chapter 2 for roadside hazard treatments that addressed on a unit basis where such mitigations will be applied. The description of roadside hazard treatments has been updated in the final EIS to clarify green tree removal. With the exception of the incidental tree, no green trees are proposed for harvest; see response to comment number 12346-55.
110.03 - Trust, Credibility	#12346-48	Our scoping comments on proposed fire salvage logging in this planning area contained an extensive list of attachments and an exhaustive bibliography. Yet most of these studies are not relied upon or meaningfully addressed by the agency. Instead the Forest Service elected to cherry-pick a small handful of studies that have questionable utility to the actions being proposed. How did the agency select these studies? Why are they more relevant than the body of literature submitted previously by our organizations? Does the Forest Service contend that scientific controversy does not exist regarding the effects of post-salvage logging on firefighter safety, reforestation, and ecological health? Unlike the Zhang article (located in the Cascades, on private industrial forestlands, in which no actual research or plots were used) a 2007 article by Shatford et al. from the Journal of Forestry involved research in the Klamath Siskiyous regarding reforestation of public lands after wildfire disturbance. The article is entitled, Regeneration after Forest Fire in the Klamath-Siskiyous: How Much, How Soon? We provided the article to the Forest Service during project scoping.	Direct, indirect, and cumulative effects to wildlife, watershed, soils, fuels, sensitive plants, and aquatic species, among other resources, as well as management requirements to minimize adverse effects, are addressed in the EIS, with appropriate references to the scientific literature. The Forest Service acknowledges that there is uncertainty and conflicting science for some of the management actions. However, impacts to forest resources have been analyzed based on the rational presented and input from Pacific Southwest Research Station scientists. Numerous scientific publications are cited and utilized in the assessment of effects, showing both positive and negative effects. The literature reviews listed in the comment are referenced and cited in the EIS in the discussion of effects of the Alternatives on various resources. The existence of diverse thought in scientific literature does not equate to scientific controversy nor does a scientific controversy exist because the commenter has a differing opinion than the Agency about a project. Such a controversy exists when scientific evidence specifically evaluating the environmental effects of the action calls into question the analysis or findings in the EIS. The paper noted in the comment, Shatford et al. (2007) is cited several times and their findings carefully considered in Chapter 3, Vegetation. In considering Shatford et al. (2007), there is no disagreement that trees will become reestablished over time without planting but it may take several decades in large burn areas that are far removed from seed sources (EIS Chapter 3 – Vegetation). We note that approximately 80% of the Project area that burned with moderate to high severity will not be planted and will go through the natural regeneration process described by Shatford et al. (2007). The Forest Service has acknowledged scientific controversy where it exists and has responded to adverse opinions concerning the effects of the West Side Fire Recovery held by respected scientists. See Chapter 3, Responsible Opposing Views and Agency's Responses. See also comment 17910-2.

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110.03 - Trust, Credibility	#12346-6	In other words, KNF timber planners are not alone in their desire to circumvent the NWFP in order to place economic objectives above ecological objectives within the Reserve land use allocation. However, unlike the BLM, rather than amend the Forest Plan to place economic considerations above all other resource values, here the Forest Service is instead simply proposing to ignore the ecological function and purpose of the LSRs that it proposes to clearcut.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The comment is not supported by rational or evidence. As described in Chapter 1 and 3, the project is consistent with the Forest Plan and considers and addresses the protection and improvement of resource conditions. Effects, positive or negative to resources are disclosed in Chapter 3 of the EIS. The proposed action within Late Successional Reserves is designed to protect and promote Late-Successional Reserve habitat. Effects on Late-Successional Reserve by the varying amounts of proposed treatment in the action Alternatives is disclosed in Chapter 3 of the EIS.
110.03 - Trust, Credibility	#12368-4	It is a sad state of affairs when private land in the area, and I am speaking of the Fruitwood Growers properties, is better taken care of than our National Forest!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
110.03 - Trust, Credibility	#17764-4	If any part of this plan does get approved and you are granted an Emergency Situation Determination on the project, there will be a lot of eyes watching the actions of the people who work in the forest under contract.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. An Emergency Situation Determination has been approved by the Chief of the Forest Service. Pursuant to the emergency situation determination the Final EIS and Record Of Decision will be released at the same time, eliminating the requirement of an objection period, pursuant to 36 CFR 218.21. See response to comment number 17501-2.
110.03 - Trust, Credibility	#17910-11	If our past experience in the Klamath-Siskiyou is any indication, political expedience and getting out the cut will win the day over science, and we will once more watch the degradation of our already seriously impaired watersheds as salvage logging proceeds.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
110.03 - Trust, Credibility	#17910-2	FIRE RISK: Without slash removal and ONGOING MAINTENANCE (which our experience tells us rarely happens due to lack of budget), it is highly questionable whether salvage logging will reduce or increase future fire risk. This is especially true in the case of salvage sales, which are generally sold cheaply and then use 40-60% for admin. Any remaining money from the sale is woefully inadequate for the cleanup of slash that is necessary, much less ongoing maintenance. Furthermore, cleanup is all but impossible in roadless areas and helicoptor units. After the Hog Fire of 1977, the area between the Salmon River and Godfrey Ranch was salvage logged. In 1987 the same area burned, but this time it took 3 hours rather than the 3 days it took for the fire to cover the same ground in 1977, and it burned at high intensity. This is not an unusual scenario. In the KNF, fires blew up in the logging slash in the Hog Fire, the Yellow Fire, the Specimen Fire, the Glasgow Fire, to name but a few. The Biscuit Fire of 2002 burned more severely in areas that had been salvage logged and replanted, compared to similar areas that were also burned in a 1987 fire but had been left to regenerate naturally, according to a new Oregon State University study. It found that fire severity was 16 to 61 percent higher in logged and planted areas, compared to those that had burned severely and were left alone in a fire 15 years earlier. The study was done in areas that had burned twice -- once in the 1987 Silver Fire, and again in the massive 2002 Biscuit Fire, one of the largest forest fires in modern U.S. history. "Many forest managers in the past have assumed that salvage logging after a severe forest fire, along with replanting new trees, will reduce future fire severity," said Jonathan Thompson, a doctoral student at OSU in the Department of Forest Science, and lead author on the study. "This is based on the assumption that removing dead trees reduces fuel loads and planting conifers hastens the return of fire resistant forests." "However, those assumptions have never really been tested," Thompson said. "This analysis showed that, after accounting for the effects of topography, Silver Fire severity and other environmental variables, the Biscuit Fire severity was higher where they had done salvage logging and planting."	We agree that without follow-up activity fuel treatment, salvage logging would increase fire risk and intensity because it would convert smaller diameter limbs and tops to surface fuels that readily carry fire (Thompson et al. 2007). All Alternatives include the treatment of salvage-created slash for this reason. See Chapter 2 of the EIS for the acres proposed for treatment in the action Alternatives. (Refer to comment number 18878-16 for a discussion funding for slash treatments.) In the cited Thompson et al. study the authors note: "Records of site preparation and their effectiveness in reducing fuels in the plantations are incomplete; however, at least 17 of the 44 plantations are reported as ''broadcast-burned.'' In a separate analysis, we found that these 17 plantations also burned with higher severities than comparable unmanaged stands. The planting component of the system is intended to promote long-term regrowth of conifer trees, but it also creates dense or continuous fuels that are at elevated risk of high severity fire." This finding by Thompson et al. is important because it describes the very condition we don't want to create in the Westside Fire Recovery Project. Stocking in the Thompson et al (2007) study typically ranged from 600 to 1,100 trees per hectare (240-440 trees per acre). These are much higher than proposed stocking levels in the Westside Fire Recovery Project. From Thompson et al., we conclude that the plantations described were dense continuous fuels. We agree that plantations of that nature are at risk of being consumed in future fires, and can in fact help propagate high intensity fire. What is unknown in this discussion is the amount of slash present from previous salvage operations, or how slash from competing vegetation release was handled. We do know that when dense young stands are combined with untreated, or inadequately treated logging slash, the result is a volatile mix that is prone to high severity fire. In the Westside Fires, 70 percent of plantations exposed to fire survived. The common denominator in plantations that survived was treated activity fuels (Varak, personal communication). This is consistent with findings of Weatherspoon and Skinner (1995). In the Westside Fire Recovery, we propose to treat the activity fuels (slash) from salvage logging, and plant at lower densities and variable spacing to create stands with discontinuous fuel that would be resilient to fire and could tolerate low to moderate severity fires typical of the Klamath Province. Thompson et al (2007) note that "reducing connectivity of surface fuels at landscape scales is likely the only way to decrease the size and severity of reburns until vertical diversification and fire resistance is achieved." That is exactly the objective of the Westside Fire Recovery Project in salvage harvest units. The reforestation stocking objective after planting in the Westside Fire Recovery Project is a stand of 75 to 225 variably spaced young trees with treated, discontinuous activity fuels, not densely stocked regularly spaced plantations that form continuous fuel beds. Stand density would vary with slope position and aspect with lower stocking on upper slopes and south and west aspects and higher stocking on north and east aspects that would form a closed canopy on lower slopes. Hardwoods would be included in the target stocking levels so the number of conifers would be less where hardwoods occur. Most reforestation units in the Westside Fire Recovery would be planted at lower densities as most of the units are on upper slopes. We also anticipate there would losses from future fires that would further reduce stand density. Our long term objective is 30-50

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			large, variably spaced, fire resilient trees per acre with openings as described by Taylor and Skinner (1996). Text has been added to Chapter 2 of the EIS and silvicultural prescriptions to make this point clear. Although future management of plantations is beyond the scope of this document, our goal is to create stand conditions where low intensity fire can be reintroduced at an early age and fuel discontinuity maintained. The Forest Plan for the Klamath National Forest specifically provides for the reintroduction of fire to accomplish this objective (Forest Plan 4-8). We also acknowledge that slash removal and maintenance of fuels treatments are important in reducing future fire risk. The Westside Fire Recovery Project has fuels reduction and maintenance activities to remove excess fuel loading to reduce fire hazard and increase suppression capability. The Fire and Fuels Report (summarized in Chapter three of this EIS) provides an in-depth analysis of the fuel loading and predicted resistance to control that will result from fire killed trees under the no-action and action Alternatives. The Fire and Fuels Report displays projected surface fuel loads predicted over a 50-year period, based on completion of implementation actions and are also described in graphs within the EIS. Fuel loading reduction actions are also described in the EIS and are projected to significantly reduce surface fuel loading. The fuels strategy for this project looks at roadside fuels treatments, hazardous fuels treatments (WUI, prescribed burns, and strategic ridgetops), and salvage and site preparation. All fuels treatments are aimed at reducing fire hazard into the future. Thompson et al. (2007) conclude that “The decision to salvage-log and plant, or not, after fire depends on a number of management considerations including risk of future high-severity fire, reducing hazards to fire fighters, timber revenue, and conservation ofbiodiversity.” These are considerations in the development of the Westside Fire Recovery Project.
110.03 - Trust, Credibility	#18878-7	DEIS: "The Karuk Tribe has raised specific concerns regarding reforestation actions and project timelines" (Pg V) Comment: This statement is, at best a clumsy paraphrasing of our Scoping Comments. To ensure there is no misperception of our initial and in some cases ongoing concerns, we are re-submitting our original scoping comments for the record.	Comments received during the scoping period from the Karuk Tribe were incorporated into the draft EIS in Appendix G with the Karuk Alternative was available for public review and comment. Aspects of the Karuk Tribe Alternative were incorporated into other proposed action Alternatives, including the preferred Alternative 2. Consultation has been ongoing to address concerns of the tribes surrounding reforestation and project timelines. In response to Karuk concerns, the proposed action has been clarified regarding reforestation. There is also response / discussion about this concern in Chapter 2 of the EIS under review of the Karuk Alternative. The agency is proceeding in accordance with National Environmental Policy Act regulations and other required timelines. The Forest is working with the Karuk and other federally recognized tribes on a programmatic agreement prior to decision. Consultation is ongoing. Consultation is summarized in Chapter 1 of the EIS. These concerns are being addressed through on-going tribal consultation. See EIS Chapter 3, Responsible Opposing Views and Agency Response for a discussion of reforestation.
110.03 - Trust, Credibility	#18878-8	It is readily apparent the "issues determined to be relevant" coincide with the obvious desire by the Klamath National Forest (KNF) to extract as much revenue from this proposal as possible. This predetermined outcome is glaringly clear in the Preferred Alternative 2.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The comment is not supported by rationale or evidence. No Alternative has been predetermined, which is evidence by modified Alternative 3 becoming the preferred Alternative in response to Forest Service consultation efforts and in response to public comments during the comment period.
110.03 - Trust, Credibility	#19092-4	Take a cue from the wildlife and nature and do not let fast tracking ruin your reputation for thoughtful, scientific, professional evaluation. Big timber companies do the clear-cut method, your agency is for the people, please act intelligently. If you don't then it just gives the rabid, unscientific public an excuse to go to court over the environment again.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The comment is not supported by rationale or evidence. The Forest Service developed an EIS in accordance with the National Environmental Policy Act and all applicable federal and state laws and regulations. The action Alternatives were developed through a public process that included scoping, public meetings, a public comment period for the draft EIS and consultation efforts with tribes and regulatory agencies.
110.03 - Trust, Credibility	#20-3	It is unacceptable to exploit wildfire to fast-track controversial and illegal logging of protected forests that belong to all Americans. The Northwest Forest Plan becomes meaningless if reserves are only protected until timber planners decide to log them.	The Forest Service developed an EIS in accordance with the National Environmental Policy Act and all applicable federal and state laws and regulations. The EIS included a no action Alternative, a proposed action and three action Alternatives that were analyzed in detail by subject matter scientists with all known environmental impacts disclosed based on the best information and data available. The action Alternatives were developed through a public process that included scoping, public meetings, a public comment period for the draft EIS and consultation efforts with tribes and regulatory agencies.
110.03 - Trust, Credibility	#20-5	Klamath National Forest timber planners are not above the law. The Forest Service needs to meet its obligation to be a good steward of the land.	The Forest Service takes our responsibility as stewards of public lands as a core mission value. As such, the Klamath National Forest abides by the Code of Federal Regulations, Forest Service Manual and the Forest Land and Resource Management Plan to implement objectives of sustainable multiple-use management practices.

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110.03 - Trust, Credibility	#34-2	I shudder at the ecological carnage that the Westside timber sale would wreak on over 60,000 acres, including precious roadless areas and old-growth forest, consisting of both living trees and snags. Contrary to the falsehood implicit in the term 'salvage,' these dead trees are extremely valuable as reservoirs for moisture and nutrients. In designating them for 'salvage' logging, a term that clearly implies a negation of these ecological values by 'salvaging' their economic value as the only extant one, the Forest Service confuses and undermines the public understanding of forest ecology that it attempts to communicate elsewhere. The FS, if it were reading its own studies and public literature concerning forest ecology, would not plan or enact so ecologically fallacious a management construct as "salvage logging" after a fire. Moreover, this project would damage the fragile soils that need to be left alone to regenerate, not subject to mechanical shear and friction from heavy machinery in their unclothed condition, not buffered from physical stress as is soil with normal vegetative detritus.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We recognize the importance of retaining snags and woody debris on the landscape and protecting soil resources. For this reason, the project incorporates snag retention and woody debris retention; see watershed and wildlife project design features in Chapter 2 of the final EIS. The salvage harvest is a fuels reduction activity that will, over time, help protect the remaining adjacent forest habitats and promote that late successional character by accelerating the regeneration to a forested stand that will eventually regain those 'old growth' characteristics. The fuels reduction and the timber sale components of this project are tools to achieve the overall goals of a healthy forest, including improvements to habitat. Management requirements to implement the proposed action were designed to protect water quality and watershed conditions and are derived from Regional and National Best Management Practices, Riparian Conservation Objectives, and are in compliance with the Forest Plan. See Chapter 2 of the final EIS for a description of the acres proposed for treatment in the modified Alternative 3 (and other action Alternatives), as it has been clarified since the draft EIS. See response to comments 12346-55. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
110.03 - Trust, Credibility	#3679-4	I am concerned that in the units with lesser mortality, the prep crews will mark too heavily. This has happened many times in the past. This would pertain to roadside hazard removal as well (i.e. don't be overzealous in deciding what is a hazard	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The comment is not supported by rationale or evidence. See Chapter 2 of the EIS, "In determining which individual trees will be harvested, guidelines in Report #RO-11-01 "Marking Guidelines for Fire-Injured Trees in California" (Smith & Cluck, 2011) will be used by marking crews. These guidelines were developed using peer-reviewed scientific literature to evaluate tree species in northern California for mortality. " Net salvage harvest proposed does not include Riparian Reserves, snag retention areas, or areas with less than 50% mortality. Live trees (those with greater than 70% probability of survival) within units are leave-tree marked for retention and will not be harvested. Most patches where more than 50% of the trees are alive (RAVG 1 and 2) have been flagged out of stands in Alternative 3 Modified. Significant mortality continues to occur in stands that were 25-50% mortality (RAVG 2) at the time the RAVG data was generated last fall so RAVG mapping in GIS may no longer reflect on-the-ground conditions. This is snag retention areas within the salvage harvest units, as described in Chapter 2 of the final EIS. See response to comments 12346-55. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
110.03 - Trust, Credibility	#7794-1	As a frequent visitor to KNF, especially its relatively intact areas, and studying ecological and biological issues I have come to understand that the "Westside Fire Recovery Project" in the Klamath National Forest is merely an institutionalized and rather corrupt practice that has done severe damage to indigenous species, and results in improper clearcutting of old-growth trees.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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110.03 - Trust, Credibility	#7831-1	How greedy! It' YOUR job to protect the Forests, not succumb to the CORRUPTION of our society. "Westside Fire Recovery Project" in the Klamath National Forest is actually a plan to clearcut old-growth trees. Prove to US citizens and the world that you will do the RIGHT THING and protect old growth trees. For your children, and your children's children. Forever.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The comments are not supported by rationale or evidence. The purpose and need for the Westside Fire Recovery Project includes fuel reduction, restoration of wildlife habitat and watershed condition, and public safety as major components of ecosystem recovery, in addition to recovering value from deteriorating timber. See Chapter 1 of the EIS for the rationale on why salvage harvest is proposed in Late Successional Reserves. The Forest Service is an agency that strongly promotes sustainable conservation land management practices. We are mandated by law to achieve quality land management under the "sustainable multiple-use management concept" to meet the diverse needs of people while protecting the resource. There is a distinction between clear-cutting and salvage logging treatments. Clearcutting is an even-aged management silvicultural system applied to green forest stands for the purpose of regenerating a new age class. Trees are selected and removed in groups up to 40 acres in size followed by artificial and/or natural regeneration. On the other hand, salvage logging involves removing dead trees after wildfires in order to remove hazards to public safety, capture the economic value of burned trees, and remove excessive fuel accumulation. Tree mortality is a result of the wildfire. Dead trees exceeding those needed by other resources are removed. The intensity of the fire and the size of the burned areas is highly variable. Some salvaged areas may appear similar to clearcuts but the difference is that the salvaged trees were killed and their size and location was determined by the wildfire. Some openings caused by wildfires are large. Salvage is generally followed by artificial and/or natural regeneration. An objective of the preferred action Alternative identified in the EIS will incorporate timber salvage treatments that will be limited to areas of moderate to high severity vegetation mortality. Management direction for salvage in Late-Successional Reserves will follow the Forest Plan. (EIS Chapter 2, Alternative 2) The salvage harvest is a fuels reduction activity that will, over time, help protect the remaining adjacent forest habitats and promote that late successional character by accelerating the regeneration to a forested stand that will eventually regain those 'old growth' characteristics. The fuels reduction and the timber sale components of this project are tools to achieve the overall goals of a healthy forest.
110.0401 - Violates Law/Regulation/Policy	#12549-4	The Westside DEIS is contrary to many environmental laws and violates the National Environmental Policy Act by failing to take a hard look at cumulative effects, failing to use plain language, failing to consider the difference or benefits of moderate and high severity fire, fails to consider geologically unstable areas as Riparian Reserves, fails to consider visual quality from the Pacific Crest Trail, fails to honestly consider climate change, fails to consider public trust resources such as clean water, carbon storage, wildlife and recreation and fails to adequately consider culturally significant wildlife and plants, increased fire risk or the ecological costs.	The Westside project meets the requirements of the CEQ National Environmental Policy Act regulations at 40 CFR 1500 et. seq. and the Forest Service National Environmental Policy Act regulations at 36 CFR 220. See Chapter 3 for a discussion of the project's effects, including cumulative effects to geologic resources, visual resources including the PCT, climate change , fire, and cultural resources.
110.0401 - Violates Law/Regulation/Policy	#13-2	The FS preferred alternative is also illegal. It would violate the Clean Water Act, including provisions of the Basin Plan and national forest waiver permit. The FS preferred alternative would also threaten Coho salmon because of the large amounts of sediment it would deliver to streams in addition to sediment delivered because of ill-conceived and largely ineffective discretionary fire suppression actions. Therefore, the FS preferred alternative would violate the ESA.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The preferred Alternative and other action Alternatives was designed to meet standards and guidelines of the Forest Plan and to meet applicable law, regulation, and policy. Through consultation with regulatory agencies, including the U.S. Fish and Wildlife Service for Endangered Species Act compliance, the Forest Service developed a modified Alternative 3 as the preferred Alternative. The effects of the Alternatives for these resources are described in Chapter 3 of the EIS in comparative format.
110.0401 - Violates Law/Regulation/Policy	#17111-21	I would conclude that the salvage activities proposed within LSRs as part of the Westside Fire Recovery Plan are inconsistent with NWFP intent and direction for management of LSRs, includi ng their treatment following a major disturbance.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter doesn't describe how the project is inconsistent with the Northwest Forest Plan. The project complies with NFMA through consistency with the Forest Plan. The Forest Plan incorporates the Northwest Forest Plan. Therefore, by being compliant with the Forest Plan, the project is consistent with the Northwest Forest Plan. Salvage in Late Successional Reserves is permitted with the Forest Plan; see Chapter 1 of the final EIS for a discussion of salvage in Late Successional Reserves. Also see correspondence with the Regional Ecosystem Office regarding proposed treatments.

Code	Comment Number	Comment Text	Response
110.0401 - Violates Law/Regulation/Policy	#18909-2	The Westside DEIS should be fully rescinded because of its arbitrary and capricious nature, the count of inconsistencies, scientifically unsound assumptions and the lack of any cumulative effects analysis. The purpose of the National Forest Management Act, or "NFMA," is to ensure that planning on National Forests appropriately considers and protects the needs of wildlife, wildlife habitat, water quality, and soil productivity. 16 U.S.C. § 1604 (a)-(i). The forest program emphasis for the biological environment in the KNF LRMP at page 4-6 states: "Manage for desired compositional, structural, and functional attributes of biologically diverse forest, rangeland, and aquatic ecosystems consistent with ecological processes in the province. Recognize the importance of the interactions of ecosystems at the regional, landscape, and site levels. Maintain diverse and productive wildlife, fish, and Sensitive plant habitats as an integral part of the ecosystem." The Westside DEIS violates the National Forest Management Act, National Environmental Policy Act, Clean Water Act, Endangered Species Act, Northwest Forest Plan, KNF Land Resource Management Plan and the recommendations in the Northern Spotted Owl Recovery Plan, Late Successional Reserve and Watershed Assessments.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Position statement, not supported by rationale or evidence. The commenter fails to describe how the project is arbitrary and capricious, inconsistent, or scientifically unsound. The project complies with NFMA through consistency with the Forest Plan. The Forest Plan incorporates the Northwest Forest Plan. Therefore, by being compliant with the Forest Plan, the project is consistent with the Northwest Forest Plan. Salvage in Late Successional Reserves is permitted with the Forest Plan; see Chapter 1 of the final EIS for a discussion of salvage in Late Successional Reserves. Also see correspondence with the Regional Ecosystem Office regarding proposed treatments. The project does not result in inconsistencies with the referenced standard and guideline. Best available science is cited throughout the final EIS and supporting documents.
110.0401 - Violates Law/Regulation/Policy	#19078-1	I wish to express my disapproval of the Westside Timber Sale due to impacts to the Klamath River's key salmon refugia, cumulative impacts to forest and watershed, and violations of the Clean Water Act, the Endangered Species Act, NEPA and California's Porter Cologne law. I incorporate by reference the comments of the Klamath Siskiyou Wildlands Center, the Center for Biological Diversity, the Karuk Tribe and the Environmental Protection Information Center and the Klamath Forest Alliance.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Note that cumulative impacts are analyzed and disclosed by resource area in Chapter 3. The commenter does not specify how the proposed project violates the listed laws.
110.0401 - Violates Law/Regulation/Policy	#5873-43	In a January 3, 2014 letter to the Forest Service following the Rim Fire, several scientists said: We are also concerned that your proposal under-estimates the cumulative impacts of postfire logging and its potential effects on ecological integrity and forest health. In particular, the proposal seems to violate the National Forest System Land Management Planning Rule of 2012 (36 CFR Part 219) that directs the Forest Service to maintain the ecological integrity of a planning area as it relates to “the completeness of wholeness of an ecosystems composition, structure, function, and connectivity.” Postfire logging is inconsistent with the intent of the planning rule as it would greatly diminish ecological integrity of important postfire wildlife habitat while removing habitat for at-risk species, as noted.	This project, including salvage harvest, is consistent with NFMA through it's consistency with the Klamath Forest Plan. The 2012 planning rule (at 36 CFR 219) directs the development of forest plans since 2012. All impacts are analyzed and disclosed in Chapter 3 by resource.
110.0401 - Violates Law/Regulation/Policy	#7136-1	I am writing in response to the proposed logging in the Westside Salvage Progect. Having been around clearcut logging, I am convinced there is no other reason for it than greed. It is my understanding that it is illegal in these protected forests. I have spent time in other countries where the wildlife and wild landscapes have been categorically destroyed by human hands. Wildfires are destructive, yes, but the biological diversity is still constructive after a fire, whereas landscapes and wildlife become desolate after a clearcut. Please consider what we have to lose, and conversely, what we have to gain by these decisions.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Position statement, not based on rationale or evidence. This project involves salvage harvest not clear-cutting. Clearcutting is an even-aged management silvicultural system applied to green forest stands for the purpose of regenerating a new age class. Trees are selected and removed in groups up to 40 acres in size followed by artificial and/or natural regeneration. On the other hand, salvage logging involves removing dead trees after wildfires in order to remove hazards to public safety, capture the economic value of burned trees, and remove excessive fuel accumulation. Tree mortality is a result of the wildfire. Dead trees exceeding those needed by other resources are removed. The intensity of the fire and the size of the burned areas is highly variable. Some salvaged areas may appear similar to clearcuts but the difference is that the salvaged trees were killed and their size and location was determined by the wildfire. Some openings caused by wildfires are large. Salvage is generally followed by artificial and/or natural regeneration. Effects to resources, including wildlife are disclosed in Chapter 3 of the EIS.
110.07 - Appeals, Objections, Litigation	#18859-4	As I'm sure you are aware, litigation of any and all of KNF projects is a tactic employed by many groups in an effort to preclude any type of management from our forests. This litigation is not about making a better project, but to delay the project long enough so that all the value of the products has been lost, thus making the project economically difficult to implement.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. It is up to a court to decide the merit of any lawsuit.
110.08 - Forest Plan Consistency	#12346-2	The DEIS provides no compelling rationale to support the agency's focus on commercial logging and road construction within protected LSRs. The DEIS fails to analyze and disclose the impacts of the proposal to focus logging and road construction in the Reserves. While the DEIS at least discusses (some) of the impacts and issues surrounding Riparian Reserve management, it is silent regarding impacts to LSR structure, function and objectives.	The final EIS has been updated with more information on the topic. See Chapter 1 for a discussion of salvage harvest in LSRs. See throughout Chapter 3 for a discussion of the effects of roads and salvage logging. See Chapter 3 for a review of Forest Plan consistency for LSRs.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#12346-3	The DEIS limits its discussion of LSRs to a few sentences disclosing the massive acreage of Reserve logging that is proposed while avoiding any substantive or qualitative analysis or disclosures regarding the effects of such logging on late-successional forest structure, ecological processes or ecological recovery. Indeed, the DEIS utilizes the term "recovery" to exclusively refer to the desire to "recover" the maximum economic value from the Reserves by logging them at the soonest possible date, which is inconsistent with the NWFP. NFP SFEIS F-21 ("Salvage will not be driven by economic or timber sale factors" in LSRs).	See response to comment number 12346-2. See Chapter 1 of the final EIS for a discussion of salvage harvest in Late Successional Reserves. The purpose of the Westside Fire Recovery is to reduce fuel within burned areas and accelerate recovery to a late-seral condition while also generating an economic product. The project is consistent with the Forest Plan, which incorporates direction from, and is consistent with the Northwest Forest Plan. Position statement, not supported by scientific rationale; the term recovery is not solely referring to economic value. The question of salvage in Late Successional Reserves was anticipated in the development of the Northwest Forest Plan and was squarely addressed in the Northwest Forest Plan ROD. The report of the Forest Ecosystem Management Assessment Team provided the basis for the Northwest Forest Plan. Forest Ecosystem Management Assessment Team considered salvage with three different prescriptions, ranging from no salvage, to salvage with minimum guidelines. Prescription 2, (Forest Ecosystem Management Assessment Team II-18) which limited salvage in Late Successional Reserves was carried through to the Northwest Forest Plan ROD. "Valuable trees that are dead can be used for commercial purposes with the attendant employment and economic benefits. …Increased fire danger or risk to insect and disease resulting from large accumulations of dead trees can be reduced in an economically feasible fashion. Avoided are the perceptions of economic waste if patches of dead trees are not salvaged." (Forest Ecosystem Management Assessment Team II-18) The topic of salvage in Late Successional Reserves generated public responses in the Northwest Forest Plan requesting salvage be restricted only to Adaptive Management Areas. The Secretaries of Agriculture and Interior, the signing officials for the Northwest Forest Plan, noted their logic for salvage in Late Successional Reserves in the Response to Comments (Northwest Forest Plan ROD, Page 66): "Salvage is not required to be beneficial, but is designed to permit recovery of a timber volume in those instances where catastrophic events clearly kill more trees (resulting in more snags and down logs in the short and long term) than are needed to maintain late successional conditions."
110.08 - Forest Plan Consistency	#12346-32	All action alternatives developed for consideration by the Forest Service call for post-fire road construction in Key Watersheds. Alternative 4 would reduce (but not eliminate) road construction in Key Watersheds. During the scoping process for this project commenters requested that the agency develop an alternative that implemented the "Beschta Recommendations" that would prohibit road construction in sensitive recovering post-fire forests. The KNF refused to develop such an alternative to its road building plans. By identifying previously closed or decommissioned roads in Key Watersheds as available for both roadside logging and log haul, the KNF establishes that it has not in fact "banked" credits for alleged road density reductions in Key Watersheds. Hence all projects that rely on allege road closures in Key Watersheds to mitigate for the ubiquitous construction of logging roads in KNF timber sales are in violation of the ACS and the NWFP. Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv., 524 F.3d 917, 935-36 (9th Cir. 2008) (federal agency may not rely on this speculative activity to off-set adverse effects); NFP, C-37 (WR-3: Do not use mitigation or planned restoration as a substitute for preventing habitat degradation). The Westside DEIS "Forest Plan Consistency checklist" contends that the project is "compliant" with Key Watershed road standards because allegedly "the project will not increase the amount of system roads in Key Watersheds." Emphasis in original. The word "system" (italicized or not) never appears in the LRMP Key Watershed standard 6-24. Instead 6-24 clearly requires that "there will no be increase of roads in Key Watersheds" and "for each mile of new road constructed one mile of road should be decommissioned." It does not appear that the KNF has met standard 6-29 in any Key Watershed within the Westside planning area. Instead of following the direction to "prioritize roads for relocation and restoration or closure, based on the impact to Forest resources" the agency is proposing to re-open previously closed and decommissioned roads in order to maximize timber harvest.	Chapter 2 of the EIS describes the road access Connected Actions associated with each action Alternative. See Chapter 2 of the EIS under Alternative considered but eliminated from detailed study, which includes an Alternative responsive to the Beschta report. See response to comment number 12346-26 about the consideration of an Alternative using the Beschta recommendations. See response to comment 17403-1 that describes the development of Alternative 4 that reduces road construction and identifies some of the trade-offs. Existing roadbeds are not being used to maximize timber harvest as suggested by the comment, but to minimize or avoid the environmental consequences associated with the construction of new roads.None of the action Alternatives would add roads to the National Forest Transportation System. There is no prohibition on the construction and use of roads in Key Watersheds in the Forest Plan so long as the temporary road is "put to bed" after use, and it does not prevent attainment of Aquatic Conservation Strategy objectives. Temporary roads would be used in each of the Alternatives in varying amounts (see EIS Table 2-31: Comparison of miles of roads and acres of treatment). Temporary roads would either be newly constructed, utilize existing roadbeds, or reopen previously decommissioned roads. All temporary roads, regardless of their origin, would be closed and hydrologically stabilized after salvage logging activities are completed (see Project Design Features: Watershed - 5 and Watershed - 24). In other words, the road density in Key Watersheds would be the same when operations are concluded as it was prior to implementation. This fully complies with Forest Plan 6-25. The project interdisciplinary team considered these actions in compliance with Forest Plan Guidelines 6-29. The commenter speculates that the project fails to comply with Northwest Forest Plan. Arguing that the Project fails to comply with Guideline WR-3 (MA 10-12 in the Forest Plan) by closing temporary roads is illogical. Forest Plan MA 10-12 is intended to prevent watershed restoration projects from being used to justify a project, not to prohibit the mitigation of impacts by actions such as closing a temporary road. Also see response to comment number 12364-1.
110.08 - Forest Plan Consistency	#12346-8	In the Westside Project the Forest Service has taken the exact opposite approach recommended by the NWFP. The agency is proposing extensive (rather than limited) salvage logging across tens of thousands of acres in the Reserves and is proposing to remove large diameter snags from logging units while leaving the least valuable (for wildlife and mills) small diameter snags in the units.	See Chapter 1 for a discussion of salvage harvest in Late Successional Reserves. See the Appendix of the EIS for a review of project's consistency with the aquatic conservation strategy objective, related to treatments in Riparian Reserves. See Chapter 2 for a description of what is proposed, including project design features, including snag, legacy component, and coarse-woody-debris retention. The Forest Plan incorporates direction from, and is consistent with, the Northwest Forest Plan. The project is consistent with the Forest Plan.
110.08 - Forest Plan Consistency	#12467-4	Follow the Northwest Forest Plan. Focus logging along major access roads and protect the most important and vulnerable recovering areas: the late-successional and geological reserves.	Procedural statement. See response to comment number 18918-22.The project complies with the Forest Plan, which incorporates direction from, and is consistent with, the Northwest Forest Plan. See Chapter 1 of the EIS for a discussion of salvage harvest in Late Successional Reserves. See Chapter 3 of the EIS under geology for a discussion of geologic reserves, as applicable.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#15118-1	California is in its fourth successive year of its worst drought in history, and you want to cut down more trees; trees which create a watershed. No one can help that kind of stupid. Here's a philosophical question for you. If it's justifiable to do one thing which is illegal (i.e. illegal logging) then are all illegal acts justifiable? I would use a modus ponens paradigm to solve this and the logical answer comes out as yes. So, we don't want to hear your loggers whinning about getting shot. What you're planning is illegal. Climate change is real. Stop being stupid.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter to of the final EIS for a description of proposed actions; no clear-cutting is proposed. Effects to wildlife and aquatic species from the project and Alternatives are disclosed in Chapter 3 of the EIS. The agency recognizes that we are in the fourth year of drought; however, the trees proposed for salvage harvest include areas of high to moderate vegetative mortality; see Chapter 2 of the EIS for a description of what is being proposed. The project is consistent with Forest Plan direction, law, regulation, and policy. See response to Comment number 16695-4.
110.08 - Forest Plan Consistency	#16756-1	We're watching! Follow your own rules that protect important wildlands, wildlife and watersheds.	The project is consistent with Forest Plan direction, law, regulation, and policy.
110.08 - Forest Plan Consistency	#17387-2	A summary is provided at the beginning of these comments. I would conclude that the salvage activities proposed within LSRs as part of the Westside Fire Recovery Plan are inconsistent with NWFP intent and direction for management of LSRs, including their treatment following a major disturbance. Salvage will make no positive contribution to the reestablishment o f late-successional forest habitat or to the early successional ecosystems that provide habitat for NSO prey species, among many others.	The project complies with the Forest Plan, which incorporates direction from, and is consistent with, the Northwest Forest Plan.
110.08 - Forest Plan Consistency	#18851-3	The Klamath National Forest, and much of the Western US is known to be Highly Departed from its ecological Reference Conditions (primarily due to historic wildfire suppression). It would seem essential to demonstrate how well the project's alternatives would support the attainment of the Forest's ecological target conditions (The Historic "Reference condition" plus necessary adjustments to compensate for climate change, etc). Could it be that some areas should be reforested in approaches that are adjusted to meet the KNF's target conditions ? Isn't that the true purpose of Klamath Forest Plan Biological Diversity S&Gs 6-1 and 6-14, to identify how well a project would attain this target ?	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See responses to 12414-1 and 6924-1. The intent of the Westside Fire Recovery is to accelerate burned stands towards a late-successional condition and to reduce risk of wildfire to developing stands in the future. The agency recognizes that the area has departed from historic conditions, including but not limited to fire return intervals--see Chapter 3 of the EIS. The project is consistent with the goals and standards and guidelines of the Northwest Forest Plan, as incorporated into the Forest Plan, including ones related to biological diversity. The agency recognizes the importance of the resources found within the Klamath Province and Klamath-Siskiyou Bioregion. Project design features in Chapter 2 of the EIS are designed to mitigation resource impacts and meet legal requirements. See Chapter 3 of the EIS for a disclosure of effects by resource area, including botany, climate change, air quality, aquatic resources, vegetation, and fuels.
110.08 - Forest Plan Consistency	#18851-4	The project proposal does not adequately protect the Scenery values of the forest, or its local residents and tourists, primarily because it fails to apply standard wildfire restoration scenery protection measures, such as those recently applied on the Mt Hebron Fire Recovery Project. These include: 1) Retention of a representative pattern of standing dead trees within all High and Moderate Sensitivity views, with the specific purpose of retaining the forest's natural scenic character, and retaining visible evidence of the forest's natural wildfire processes. 2) Reduce the height and scenery impacts due to project-created stumps, skidding and yarding activities. These protection measures have proven to be fully implementable, produce negligible effects upon other resource objectives, and consistently benefit resources such as wildlife and watershed. If these measures are not applied, adverse LONG TERM scenery impacts would persist along many of the Forest's most highly valued recreational settings and tourism attractions. The project's Scenery report is helpful and informative in many respects, however has some important shortcomings that have very likely adversely influenced the Project's scenery outcomes:	The Westside Fire Recovery is consistent with all direction regarding scenery and visual quality objectives provided in the Forest Plan.
110.08 - Forest Plan Consistency	#18858-9	The Forest Plan issues raised by Dr. Franklin must also be confronted squarely.	Procedural. The agency has responded to comments provided during the comment period.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#18909-4	Northwest Forest Plan Ecological Principles for Management of Late-Succesional Reserves Basis for Forest Management - Standards and Guidelines: "One goal of these standards and guidelines is to maintain late-successional and old-growth species habitat and ecosystems on federal lands. Another goal is to maintain biological diversity associated with native species and ecosystems in accordance with laws and regulations." "The intent is to maintain natural ecosystem processes such as gap dynamics, natural regeneration, pathogenic fungal activity, insect herbivory and low intensity fire." B-1 "Structure and Composition- Four major structural attributes of old-growth Douglar-fir forests are; live old growth trees, standing dead trees (snags), fallen trees or logs on the forest floor and logs in streams." B-2 "In some cases, however, natural reburns occurred, resulting in relatively little carryover of live trees as a legacy from old-growth condition. Where considerable live and dead material was left following fires, young stands contained many old-growth structures and presumable old-growth associated organisms, including organisms associated with coarse woody debris on the forest floor." B-3 "These reserves represent a network of existing old-growth forests that are retained in their natural condition with natural processes, such as fire, allowed to function to the extent possible. The reserves are designed to serve a number of purposes. First, they provide a distribution, quantity, and quality of old-growth forest habitat sufficient to avoid foreclosure of future management option. Second, they provide habitat for populations of species that are associated with late-successional forests. Third, they will help ensure that late-successional species diversity will be conserved." B-4 "Tree mortality is an important and natural process within a forest ecosystem. Diseased and damaged trees and logs are key structural components of late successional and old-growth forests. Salvage of dead trees affects the development of future stands and habitat quality for a number of organisms. Snag removal may result in long-term influence on forest stands because large snags are not produced in natural stands until they become large and begin to die from natural mortality. Snags are used extensively by cavity-nesting birds and mammals such as woodpeckers, nuthatches, chickadees, squirrels, red tree voles, and American marten. Removal of snags following disturbance can reduce the carrying capacity for these species for many years." B-8 Intensely burned forests continue to provide for a suite of species including old-growth dependent species. The proposal to log large snags from the reserves would disallow them to function naturally and would curtail the conservation of diversity. The proposed project would eliminate late-successional species habitat and would remove rare and valuable ecosystems. Removing large snags and green trees as proposed would remove biological legacies and diversity associated with native species and ecosystems and does not comply with the National Forest Management Act, Northwest Forest Plan, KNF Land Resource Management Plan, Northern Spotted Owl Recovery Plan or the recommendations in Late Successional Reserve Assessments.	Citations provided are from the Northwest Forest Plan, not from the Klamath Forest Plan which incorporated it. Page numbers for the quotes were not provided. The language that is not standards and guidelines may not be incorporated into the Klamath Forest Plan. The Westside Fire Recovery is consistent with standards and guidelines presented in the Forest Plan, which incorporates, and is consistent with, the Northwest Forest Plan. Retention of snags and Coarse Woody Debris are addressed through project design features (Chapter 2 of the EIS). Effects to species are disclosed in the Wildlife, Aquatic Resources, and Botany sections of the EIS. With the exception of the incidental tree, no green trees are proposed for harvest; see response to comment number 12346-55.See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
110.08 - Forest Plan Consistency	#18909-6	Felling and removal of large trees, whether they are alive or dead, removes large material that is normally handed down from one stand to the next. The loss of this material has serious adverse consequences for wildlife, hydrology, soil, etc. These legacies are often described as "lifeboats" that allow species to persist in post-disturbance forests and/or return more rapidly to post-disturbance forests. The Northwest Forest Plan (NFP) contains numerous standards and guidelines (S&Gs) constraining post-fire management options, especially within Late-Successional Reserves. See generally, S&Gs C- 13 - C-16. The Forest Service must comply with these and other S&Gs in developing and implementing the proposed project, and must document how it is complying with each of these provisions. See Or. Natural Res. Council Fund v. Brong, 492 F.3d 1120 (9th Cir. 2007) (holding post-fire logging within two LSRs unlawful for failure to comply with NFP provisions); see also Or. Natural Res. Council Fund v. Brong, No. 04-693-AA (D. Or. filed July 2, 2004); League of Wilderness Defenders v. Forest Service, No. 05-1246-JO (D. Or, filed Aug. 11, 2005).	Legacy trees are retained to the degree that they occur within the project area (see wildlife project designed features, final EIS Chapter 2). See Appendix E for a discussion of salvage within Late Successional Reserves and documentation that the project is consistent with Forest Plan direction. See also Response 17111-1 which addresses retention of large wood and persistence of that material on the landscape. See also EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#19-2	The Final EIS should include a discussion of the impacts that land management allocations had on the severity of the fires, and the associated change to wildlife habitat. Areas within Late-Succesional Reserves, Inventoried Roadless, and Critical habitat for the northern spotted owl burned at much higher intensities than areas outside of these designations. This result is most evident within the Happy Camp Complex. Furthermore, these land allocations severely limited the effectiveness of the small amount of management that had taken place within these designations in the last few years prior to the fires,(i.e. Seider Timber Sale). Only a miniscule amount of acreage was treated within these areas, and only very limited reductions in density took place. The result was arbitrarily high levels of basal area and canopy closure were left post harvest due to the management restrictions. More specifically, these land allocations directly resulted in high intensity, stand replacing fire behavior. Since the intent of these management areas is primarily to maintain or improve larger diameter trees and late successional wildlife habitat, it must be recognized that the net effect of these land allocations had a direct influence on the intensity of the fire behavior.	The impact of [presumably the past management of] Forest Plan land allocations on the severity of the 2014 fires is beyond the scope of this project and the analysis of it. The EIS is required to disclose the impacts of the proposed action on the affected environment, as described in Chapter 3 of the EIS. The project is consistent with Forest Plan direction, including meeting the standards and guidelines for treatments within management areas (or land allocations). Chapter 1 and 2 of the EIS include some discussion of these considerations in terms of treatment.
110.08 - Forest Plan Consistency	#21-2	The Westside Salvage Project is illegal under the Northwest Forest Plan.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Position statement, not supported by rationale or evidence. The commenter fails to describe how the project is illegal. The standards and guidelines of the Northwest Forest Plan are incorporated into the Forest Plan. The project is consistent with the Forest Plan, and indirectly, also with the Northwest Forest Plan. By being consistent with the Forest Plan, the project meets the legal requirements of the National Forest Management Act.
110.08 - Forest Plan Consistency	#33-1	I have become aware of yet another salvage logging scheme in the Klamath National Forest-----The Westside Salvage Project------ that may be excused in the name of cutting wood that is "dead" and would otherwise "go to waste." I hate salvage logging and I even suspect those who use fire as an excuse to log. Fire is natural, and gradually decaying wood holds and rebuilds precious soil on our mountain slopes. According to the Northwest Forest Plan, this proposed salvage logging is not allowable. Please act mindfully and with an eye toward preservation of our forests. Too much is being logged already. The Forest Service needs to do its job and not bow to "timber planners."	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Statements not supported by scientific rationale. The standards and guidelines of the Northwest Forest Plan are incorporated into the Forest Plan. The project is consistent with the Forest Plan, and therefore, also with the Northwest Forest Plan. The question of salvage in Late Successional Reserves was anticipated in the development of the Northwest Forest Plan and was squarely addressed in the Northwest Forest Plan ROD. The report of the Forest Ecosystem Management Assessment Team provided the basis for the Northwest Forest Plan. Forest Ecosystem Management Assessment Team considered salvage with three different prescriptions, ranging from no salvage, to salvage with minimum guidelines. Prescription 2, (Forest Ecosystem Management Assessment Team II-18) which limited salvage in Late Successional Reserves was carried through to the Northwest Forest Plan ROD. “Valuable trees that are dead can be used for commercial purposes with the attendant employment and economic benefits. …Increased fire danger or risk to insect and disease resulting from large accumulations of dead trees can be reduced in an economically feasible fashion. Avoided are the perceptions of economic waste if patches of dead trees are not salvaged.” (Forest Ecosystem Management Assessment Team II-18) The topic of salvage in Late Successional Reserves generated public responses in the Northwest Forest Plan requesting salvage be restricted only to Adaptive Management Areas. The Secretaries of Agriculture and Interior, the signing officials for the Northwest Forest Plan, noted their logic for salvage in Late Successional Reserves in the Response to Comments (Northwest Forest Plan ROD, Page 66): “Salvage is not required to be beneficial, but is designed to permit recovery of a timber volume in those instances where catastrophic events clearly kill more trees (resulting in more snags and down logs in the short and long term) than are needed to maintain late successional conditions.” See Chapter 1 of the EIS for more discussion of salvage in Late Successional Reserves.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#5873-128	LSRs provide habitat for cavity dependent species. Diminishment of the habitat for species associated with dead wood will violate the Northwest Forest Plan. The Northwest Forest Plan clearly anticipated that salvage logging within LSRs must be limited to provide quality habitat for Black-backed woodpecker, white-headed woodpecker, and Williamson's sapsucker. To benefit the black-backed and white-headed woodpeckers, and Williamson's sapsucker in the Eastern Cascade Range, potential mitigation measures would be to reduce harvest and salvage in old-growth areas. Because of the strength of Late-Succesional Reserves under the selected alternative, standards and guidelines limiting salvage and thinning in those reserves, and matrix management standards and guidelines that specifically incorporate mitigation for white-headed and black-backed woodpeckers, we conclude that these potential mitigation measures are not necessary. NWFP ROD page 31. Salvage logging will clearly diminish habitat for these three species. If the agencies certainly can't claim to be providing abundant high quality habitat for cavity associated species in the Matrix, so if they don't provide for snag associated species in the reserves, then they really don't provide sufficient habitat for cavity dependent species anywhere, so a new programmatic EIS would be required to rework the regional management framework to provide adequate habitat for viable populations of snag associated species.	The Forest Plan incorporates direction from, and is consistent with, the Northwest Forest Plan. Forest Plan Standards and Guidelines include retention of coarse woody debris and snags on the landscape. See Chapter 2 for a list of applicable project design features. Analysis of effects to wildlife species is presented in the wildlife section of the EIS. See Chapter 1 of the EIS for a discussion of salvage harvest in Late Successional Reserves.
110.08 - Forest Plan Consistency	#5873-13	Salvage logging that removes large old trees for fuel reduction will violate LRMP standards, such as MA5-28 "Silvicultural activities aimed at reducing risk shall focus on younger stands in LSRs. … Salvage activities should focus on the reduction of catastrophic … fire threats." Post-fire landscapes are not particularly prone to reburn and the best available science shows that salvage logging and replanting will make fire hazard worse, not better.	See response to comment number 18926-7. See the wildlife project design project design features in Chapter 2 of the EIS; legacy components are being retained within salvage harvest units as described in the project design project design features. Further, Riparian Reserves and snag retention units within and immediately adjacent to salvage harvest units are being used to meet snag retention requirements. The Forest Plan does not limit silvicultural management or salvage only to younger stands. The full quote of the standard and guideline provides a more accurate portrayal of the Forest Plan and its intent, as follows: "Silviculture activities aimed at reducing risk shall focus on younger stands in Late Successional Reserves. The objective will be to accelerate development of late-successional conditions while making the future stand less susceptible to natural disturbances. Salvage activities should focus on the reduction of catastrophic insect, disease and fire threats. Treatments should be designed to provide effective fuel breaks wherever possible. However, the scale of salvage and other treatments should not generally result in denigration of currently suitable owl habitat or other late-successional conditions. See Chapter 1 of the EIS for a discussion of salvage in Late Successional Reserves and compliance with the Klamath National Forest Late Successional Reserve Assessment and Forest Plan. The "Fire Synopsis" section of the Fire and Fuels report analyzes fire hazard and shows that proposed salvage activities followed with site preparation fuels treatments will reduce fuel loading and fire hazard. In anticipation of controversy over salvage in Late-Successional Reserve, Chapter 1 of the EIS discusses direction consistent with law, policy and guidelines for salvage harvest. The primary reason that salvage harvest is proposed within the Late-Successional Reserve is to reduce future heavy fuel accumulations that will result from fire killed trees and thus reduce the risk of future high severity fire that would delay the development of late successional stand conditions. The Ninth Circuit Court of Appeals ruled in the Timbered Rock decision that salvage could proceed in certain circumstances in an Late-Successional Reserve; which are consistent with the Westside Fire Recovery project. Further information on this can be found in Chapter 1 of the Essie response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#5873-133	The Northwest Forest Plan ROD (p B-8, 9) says Salvage of dead trees affects the development of future stands and habitat quality for a number of organisms. Snag removal may result in long-term influences on forest stands because large snags are not produced in natural stands until trees become large and begin to die from natural mortality. Snags are used extensively by cavity-nesting birds and mammals such as woodpeckers, nuthatches, chickadees, squirrels, red tree voles, and American marten. Removal of snags following disturbance can reduce the carrying capacity for these species for many years. Coarse woody debris is a necessary component of forest ecosystems. This wood provides habitat for a broad array of vertebrates, invertebrates, fungi, mosses, vascular plants, and micro-organisms. Arthropods, salamanders, reptiles, and small mammals live in or under logs; woodpeckers forage on them; and vascular plants and fungi grow on rotting logs. Provision for retention of snags and logs normally should be made, at least until the new stand begins to contribute coarse woody debris. Many natural disturbances do not result in complete mortality of stands. For example, recent fires in the Oregon Western Cascades Province killed 25 to 50 percent of trees within the areas burned, leaving 50 to 75 percent of the stands intact. The surviving trees are important elements of the new stand. They provide structural diversity and provide a potential source of additional large snags during the development of new stands. Furthermore, trees injured by disturbance may develop cavities, deformed crowns, and limbs which are habitat components for a variety of wildlife species. The ROD also says that the intent of salvage in LSRs is to "prevent negative effects" ROD page C-13, but the EA does not identify any negative effects and this project would be preventing. In fact, when viewed from a landscape perspective, there are no negative effects to be avoided, and if there were this project would not do so. The Northwest Forest Plan ROD also says that "salvage operations should not diminish habitat suitability now or in the future." But this project will diminish habitat quality by removing standing trees for safety reasons and by putting adjacent forests at risk from damage from edge effects. The ROD says that "all standing live trees should be retained" ROD page C-14, but standing trees and snags may need to be cut for safety reasons. The NEPA document failed to consider just keeping workers out of the safety zone around hazard trees.	The project adheres to Forest Plan standards and guidelines, which incorporate direction from the Northwest Forest Plan. Forest Plan Standards and Guidelines provide for retention of snags and Coarse Woody Debris. The EIS clearly describes the nature of fuel conditions after the fire, and indicates that those elevated fuels conditions pose a substantial potential risk of severe burning to developing forest stands. With the exception of the incidental tree, no green trees are proposed for harvest; see response to comment number 12346-55. See Chapter 1 for a discussion of salvage harvest in Late Successional Reserves.
110.08 - Forest Plan Consistency	#5873-134	In considering the perceived conflict between public safety and LSR objectives around Lake of the Woods, the Rogue River National Forest has said, "The dead and dying trees that are typically identified as hazards to public safety are exactly what LSRs were created to protect, as these are the types of trees that provide habitat for many old growth dependent plants and animals."	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest Service recognizes the benefits of snags to wildlife habitat, as disclosed; however, the purpose and need of the project includes improvement to public and worker safety, as disclosed in Chapter 1 of the EIS. Project design features have been incorporated; see Chapter 2. Effects of treatment on wildlife and safety are disclosed in Chapter 3 of the EIS.
110.08 - Forest Plan Consistency	#5873-143	The Northwest Forest Plan ROD states "salvage to reduce such risks should focus only on those areas where there is a high risk of large-scale disturbance." The EIS has not documented the existence of high risk or made a credible case whether and how each of the proposed actions will reduce such risks.	Comment provides no evidence other than the opinion of the commenter. Risk posed by fuel accumulation from fire-killed trees is described in Chapter 3 - Fuels. See also Appendix E. The project is consistent with standards and guidelines in the Klamath Forest Plan, which incorporates and is compliant with the Northwest Forest Plan. The project meets the standards under both risk reduction and salvage harvest disclosed in the late successional reserve assessment and the Forest Plan, as incorporated from the Northwest Forest Plan. See Chapter 1 of the EIS for a discussion of salvage harvest in Late-Successional Reserve and how this project meets those standards.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#5873-181	The FEMAT scientists recognized that … Salvage of dead trees has significant effects on the development of future stands and the suitability as habitat for a number of organisms. Snag removal results in long-term impacts on the forest community because large snags are not produced by the new stand until trees become large and begin to die from natural mortality (often a period of 50-100 years). Snags are used extensively by cavity nesting birds and mammals such as woodpeckers, nuthatches, chickadees, squirrels, red tree voles, and American marten. Removal of snags following disturbance can significantly reduce the carrying capacity of these specie for many years. … … Salvage policies of options generally ranged from no salvage to limited salvage as permitted by the Final Draft Recovery Plan for the Northern Spotted Owl (USDI 1992). This plan would allow removal of small diameter snags and logs but would also require retention of snags and logs likely to persist until the new stand begins to contribute significant quantities of coarse woody debris." FEMAT page IV-37. The May 6, 1994 Scientific Analysis Group Q&As clearly indicated the intent of the NFP ROD that salvage for risk reduction in LSRs must be consistent with the salvage recommendations in the Final Draft Recovery Plan for the Northern Spotted Owl (December 1992). See below. The agency must retain all large snags because they are the most likely to last the longest and fill the snag recruitment gap as the post-fire landscape recovers from the fire. The so-called "brain book" that agency staff use to clarify the direction in the Northwest Forest Plan ROD urges the agency to use the requirements from the final Draft Recovery Plan for the Northern Spotted Owl which requires retention of all scorched trees that "may live" as well as all snags over 20 inches because these live trees and larger snags are most likely to last more than 100 years and help to fill the temporal gap in snag recruitment as the post-fire stand develops. Denton K, 1994. "SEIS Team/Scientific Analysis Group Qs &As [Summary]" May 6, 1994 ("[T]hese responses represent what the SEIS Team intended for many of the standards and guidelines… The following document is a compilation of those SEIS Team questions ands SAG responses that relate to standards and guidelines contained in the final Record of Decision."). "Salvage in LSRs to Reduce Fire Risk (SAG2;Q#9): Under Alternative 9, is salvage [in Late-Succesional Reserves] permitted to reduce fire hazard or risk? How and who defines acceptable risk? "SAG response: Salvage can be used to reduce risk throughout the range of the owl based on the salvage guidelines adapted from the final draft recovery plan. Silvicultural prescriptions can be used to reduce risk in areas subject to large scale disturbance (east side) using guidelines for reducing large scale disturbance adapted from the final draft recovery plan. (S&Gs pages C-13 and C-12)"	The project adheres to Forest Plan standards and guidelines, which incorporate direction from the Northwest Forest Plan. Forest Plan Standards and Guidelines provide for retention of snags and Coarse Woody Debris. The EIS clearly describes the nature of fuel conditions after the fire, and indicates that those elevated fuels conditions pose a substantial potential risk of severe burning to developing forest stands. With the exception of the incidental tree, no green trees are proposed for harvest; see response to comment number 12346-55. See Chapter 1 of the EIS for a discussion of salvage harvest in Late-Successional Reserve and how this project meets those standards.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#5873-182	The salvage recommendations in the Final Draft Recovery Plan for the Northern Spotted Owl (December 1992) provide: 1. "Diseased and damaged trees are key structural components of suitable owl habitat... planning must acknowledge the considerable value of retaining dead and dying trees in the forest" 2. "salvage should not diminish the suitability for owls now or in the future" 3. salvage should be limited to areas with less than 40% canopy closure, and >10 acre disturbances, 4. "Surviving trees provide a significant residual of larger trees in the developing stand... Consequently, all standing live trees should be retained, including those injured (e.g. scorched) but likely to survive." 5. "focus on retaining snags likely to persist until suitable owl habitat has developed and the new stand is again producing large snags," 6. "snag retention guidelines should be developed for each physiographic province based on the general guidance provided in this section... Retention of all 20-inch dbh snags should be a starting point... Snags larger than 20 inches dbh are important to cavity nesters in all provinces, and have relatively slow decay rates. Smaller diameter snags are generally less important to cavity nesters and are less likely to persist until suitable habitat develops. Thus, the salvage of these smaller diameter snags should not impair the development of suitable habitat" 7. "guidelines are intended to prevent negative effects on owl habitat" 8. "because there is much to learn about the development of owl habitat, it seems prudent to allow only conservative quantities of salvage material from suitable owl habitat" 9. "although there is some uncertainty concerning the optimum density of snags to be provided for spotted owls, management to provide maximum likely benefit for owls and their prey is an appropriate strategy" 10. "retain adequate CWD quantities in the new stand so that in the future it will still contain amounts similar to naturally regenerated stands," etc. 11. "In addition to the stand level salvage guidelines, the cumulative effects of any proposed salvage should also be considered at a larger scale. One focus of the analysis should be on spotted owl activity centers known before the disturbance and thought to still be occupied after the disturbance. Where owls are still thought to be inhabit the area to be salvaged, the possible effect of the salvage around their activity centers should be considered. In particular, special consideration should be given to stands that could again provide foraging opportunities for owls in the near future. For example, small disturbances or the edges of large disturbances may provide habitat for owl prey and access to that prey by owls. Also, denser clumps of residual dead trees may offer foraging opportunities by owls. The most current knowledge of prey species should be considered in these cases, and special guidelines developed for these areas. The cumulative impact of salvage in these area should be considered." The final draft recovery plan salvage guidelines are partially excerpted in the Feb 1994 Spotted Owl FSEIS Volume II Appendix B, pages B-75 to B-77. The response to comments in Appendix F (page F-37) of the 1994 FSEIS makes clear that the salvage Standards & Guidelines in the NWFP ROD are derived from the Final Draft Northern Spotted Owl Recovery Plan (1992). The FEMAT report also spelled out the consequences if excessive salvage is allowed in LSRS, that is a. “the short- and long-term contributions of salvaged areas to Late-Succesional Reserves would be decreased. b. “There would be greater risks to watersheds [than if salvage were more limited] c. “There would be high levels of distrust of agency motives.” FEMAT page II-18. These are serious adverse consequences that are not disclosed and considered in the DEIS. Proposed activities, especially commercial log removal, will violate requirements to maintain long-term soil productivity. Soil compaction and erosion, loss of coarse woody debris, and erosion all adversely affect long-term productivity. Removal of a major fraction of the available organic matter through salvage of large trees will adversely affect soil productivity for decades or centuries. All the commercial removal activities will impede development of high quality LSR habitat in violation of the NFP ROD and violate the requirement to focus LSR salvage on long-term LSR objectives. See NFP ROD p. C-14. Salvage logging that removes most of the large material from extensive areas will prevent development of complex young forest reduce options to develop complex old forest. LSRs were set aside primarily for spotted owls and other species associated with late-successional old-growth. Salvage logging will adversely affect spotted owls and their prey. Proposed activities, especially commercial log removal, will violate the requirement to maintain optimal late-successional habitat, (such as by reducing cavity nesting opportunities for spotted owl prey such as flying squirrels and reducing woody debris far below optimal levels for ground-dwelling spotted owl prey species	The project adheres to Forest Plan standards and guidelines, which incorporate direction from the Northwest Forest Plan. Forest Plan Standards and Guidelines provide for retention of snags and Coarse Woody Debris. The EIS clearly describes the nature of fuel conditions after the fire, and indicates that those elevated fuels conditions pose a substantial potential risk of severe burning to developing forest stands. With the exception of an incidental tree, green trees are not proposed to be harvested; see Chapter 2 for a description of what is being proposed. See response to comment number 12346-55. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#5873-3	Northwest Forest Plan standards allowing salvage logging in LSRs are 20 years out of date and need to be updated to respond to the best available science showing that development of complex old forests should start with complex young forests, not young forests simplified by salvage logging that removes structure, truncates succession, and homogenizes vegetation composition.	Revision of the Northwest Forest Plan is outside the scope of this EIS. The existing Northwest Forest Plan provides management direction until revision does occur. The impacts of salvage harvest are disclosed throughout Chapter 3 of the EIS. Analysis is based upon best available science as cited in the final EIS and supporting documents. See Chapter 1 of the EIS for a discussion of salvage harvest in Late Successional Reserves. Also see correspondence with the Regional Ecosytem Office regarding consistency of this project with the Forest Late Successional Reserve Assessment.
110.08 - Forest Plan Consistency	#5873-4	Salvage logging is contrary to the desired objectives for all reserve land allocations, including LSRs and riparian reserves. The Klamath Forest Plan says that the desired condition of LSRs is "Snags are common…" (Klamath LRMP p 4-83) In the decades after fire, snags are NOT common, and salvage logging will make that much worse.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Only a small portion of the fire affected area is being salvage harvested (Chapter 2 of the EIS, modified Alternative 3). See the wildlife section of Chapter 3 for a discussion of snags being left on the landscape. See response to Comment number 16695-4.
110.08 - Forest Plan Consistency	#5873-44	Current studies also have concluded that complex early seral habitat, created by higher-severity fire, has declined substantially since the era of fire suppression . Yet there are no forest plan provisionsto protect this habitat. Thus, in closing, there is a consensus of scientific opinion that post-fire logging and artificial conifer plantation establishment is one of the most ecologically damaging activities that could occur after mixed-severity fire. DellaSala, Hanson, Bond, Hutto, Halsey. 1-3-2014 letter to the USFS regarding Rim Fire salvage. http://www.californiachaparral.org/images/rimfirescientistsignonletter12_13_2013.pdf	Direct, indirect, and cumulative effects to wildlife, watershed, soils, fuels, sensitive plants, and aquatic species, among other resources, as well as management requirements to minimize adverse effects, are disclosed in Chapter 3 of the EIS, with appropriate references to the scientific literature. The Forest Service acknowledges that there is uncertainty and conflicting science for some of the management actions. However, impacts to forest resources have been analyzed based on the rational presented and input from Pacific Southwest Research Station scientists. Numerous scientific publications are cited and utilized in the assessment of effects, showing both positive and negative effects. See the beginning of Chapter 3 of the final EIS for a discussion of responsible opposing points of view. The Rim Fire actions and effects are outside the scope of this project.
110.08 - Forest Plan Consistency	#5873-72	The federal forest agencies now recognize that current methods and assumptions concerning snag habitat standards are outdated, and the old snag standards do not ensure enough snags to meet the intent of the standard, yet the agencies have not adjusted their management plans to account for this new information nor have they developed new standards that are consistent with the latest scientific information. As explained on the DecAID website: Why is DecAID needed? National Forest LRMP standards and guidelines for management of snags and down wood in the Pacific Northwest were based on wildlife species models and tools that were developed in the 1970s and 1980s (Thomas et al. 1979, Neitro et al. 1985, Marcot 1992, Raphael 1983). New information about the ecology, dynamics, and management of decayed wood has been published since then, and the state of the knowledge continues to change. Rose et al. (2001) report that results of monitoring indicate that the biological potential models are a flawed technique (page 602). There has been an evolution from thinking of large woody material as habitat structures, to thinking of decaying wood as an integral part of complex ecosystems and ecological processes. This paradigm shift has made the management of dead wood a much more complex task. We can no longer expect to go to our LRMPs or the biological potential model to get one number for the amount or size of snags and down wood that we can apply to all projects and to all acres. We are directed to use the best available science to manage ecosystems, and the best available science simply will not support business as usual for managing dead wood. http://www.fs.fed.us/r6/nr/wildlife/decaid-guide/ A few of the problems with the old standards are: • They failed to account for the fact that the number of snags needed for roosting, escape, and foraging can exceed the number of snags needed for nesting; • They failed to recognize that the number of snags needed to support viable populations of secondary cavity users may exceed the needs of primary cavity excavators; • The old standard failed to account for the size height of snags favored by some species; • In applying the old standards the agencies often fail to account for rates of snag fall and recruitment; • The old standards fail to recognize non-equilibrium conditions in our forests, i.e. some species rely on the natural large pulses of snags associated with large disturbances; • The old standards fail to account for the differential use of space and population density of different species; • The old standards ignore other important habitat features of dead wood, e.g. loose bark, hollow trees, broken tops, etc.	We agree that thinking on dead wood in the Klamath Province has evolved since the Forest Plan was signed in 1995 however that does not mean the Forest Plan as written does not provide for the needs species found on the Forest. We note that the Forest Plan was updated in 2010. The Klamath National Forest's Forest Plan incorporated the best available science at the time it written. Although there are many opinions and science-based findings from Mt. St. Helens and other locations, those findings are not necessarily applicable to the Klamath because fire regimes, and thus snag persistence, may be different than that found in the Klamath. No evidence other than general statements is presented that the Klamath's Forest Plan is not adequate. As a practical matter, roadside hazard cleanup (estimated 1,300 acres of concentrated mortality) and proposed salvage harvest in Alternative 3 Modified (estimated 5,800 acres) would likely affect less than 15% of the moderate to high severity burn areas (about 52,000 acres) in the Westside Fire Recovery Project area. Within all of those areas where salvage harvest or hazard tree removal would occur, Forest Plan standards for snags and coarse woody debris would still be met.An important vein of research in recent years has been the cycling of dead wood (including snags) and fuel loading created by stand replacement fire. Central in this discussion is the fire regime of the Klamath Province. Many reviewers presume the fire regime of the Klamath is the same as the more mesic forests of western Oregon Cascades and Coast Range. The fire regime of old-growth Douglas fir dominated forests of the Klamath Mountains differs from more mesic old-growth Douglas fir forests of Oregon and Washington (described in Franklin et al. (1981)) in fire frequency, fire severity, and structural attributes such as amount and persistence of snags and coarse woody debris (Taylor and Skinner 1997). The characteristic fire regime of the Klamath Mountains is actually one of frequent low to moderate intensity fire with low to moderate severity effects (Skinner et al. 2006), not "stand-replacement or mixed" that is typical in the Coast Range and western Oregon and Washington Cascades. , as noted by Taylor and Skinner (1997) and Skinner (2002), dead wood in the Klamath province rarely lasts long enough to actually decompose because snags and down logs are receptive to embers, and once partially rotted, are easily consumed by the frequent fires typical of the province. In a fire regime dominated by low to moderate severity effects, tree mortality with wildfire is by definition generally low. In the Klamath Mountains, patches of moderate to high severity fire, when they did occur historically, were more likely on upper slope positions and on south and west-facing aspects (Skinner et al. 2006). Patches of high severity would produce a pulse of snags and then eventually down logs, until those logs were consumed by subsequent fires. Because frequent low-moderate severity fires consume wood, it is unlikely that coarse woody debris accumulated to levels seen in more mesic old-growth Douglas fir forests of Oregon and Washington (Taylor and Skinner 1997). In the Klamath Mountains snags and logs were likely clustered in time and space, with long intervals and large areas where dead wood was sparse (Skinner 2002). Since the LRMP was developed in 1995, research has shown that even the amounts of snags and coarse wood debris noted in the LRMP may be excessive for the Klamath Province when compared to historical norms. Skinner et al. (2006) observed that: "Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values.

Code	Comment Number	Comment Text	Response
			Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve."This suggests that even the amounts shown in the Forest Plan may exceed the historical amounts of wood found in the frequent, low severity fire environment of the Klamath Province. Under historical conditions, an event with the amount, large patch size and geographic extent of high severity fire that occurred in the Westside Fires would have been highly unlikely to occur because there would have been substantially less surface fuel, less fuel continuity and lower stand density compared to contemporary conditions. The limited surface fuels and discontinuous canopy that existed prior to the fire suppression era made it more likely that fire would burn on the ground rather than traveling into the tree canopy. Under historical conditions, there would have also been much less dead wood (both snags and down logs), with large areas on upper slopes and south and west aspects where there would have been little dead wood. The late successional stand structure under historical conditions would have been shaped by frequent low to moderate intensity fire that consumed most of the dead and down wood on upper slopes, and created a patchy stand structure with complex mosaics of age, size and structure (Wills et al. 1994). Large dead and down wood would have been present on lower slope positions, but at much lower densities than today. Beardsley and Warbington (1996) noted that "Fire suppression has altered the forest structure and created a buildup of fuels to such an extent that a natural fire in such an unnatural situation might put any remaining old growth forests at risk." Simply put, at the time of the Westside Fires there was a higher density of continuous surface fuels and trees because of fire suppression. As a result, the post-fire environment has a far higher density of standing snags than would have existed naturally in a post-fire environment. Retention of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current LSR land allocation (EIS Chapter 3 – Fuels). Therefore, we do not agree that all fire killed trees, or all large fire killed trees must be retained. To determine how much dead wood should be retained on the landscape, we use the Guidelines provided by the Forest Plan for snags (4-30, Table 4-4) and coarse woody debris (4-23). The LSRA (1-5, Table 1-1) also provided metrics for snags and coarse woody debris that closely match the metrics in the LRMP. These metrics were developed from studies of late successional and old-growth forests in northern California.An often express standard is that large structures (snags and down wood) should be retained until the next stand is capable of producing them. That standard cannot be met without breaking up the large areas of continuous fuels created by the Westside Fires (EIS Chapter 3 – Fuels; See also Appendix E). The Westside Fire Recovery Project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by• Retaining large "legacy" trees wherever they occur. By virtue of their location and / or inherent resistance to fire, these trees are most likely to persist until the next stand can develop large structures.• Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less intensity. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in association with Riparian Reserves (see map packet) or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity.• Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Figure 7). • Treating small fuels in Riparian Reserves by broadcast burning at the time that activity fuels are treated. This reduces the small surface fuels that readily ignite and carry fire but is unlikely to harm most larger snags because they will not yet have developed the punky surface that is receptive to embers.Peterson et al. (2015) observed that: "post-fire logging can serve as an effective tool for managing fuel loadings in forests regenerating after high severity wildfires. By strategically applying and varying post-fire logging treatments within landscapes, post-fire logging could reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects. If applied using best management practices and with consideration for possible environmental impacts and meeting other management objectives, post-fire logging could serve as an effective option – along with mechanical thinning, prescribed fire, and managed low to mixed severity wildfires – for reducing fuels.See also, EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised.
110.08 - Forest Plan Consistency	#5873-76	Back in the early 1990s the Forest Service recognized the their forest plans were not adequate to maintain populations of spotted owls and they tried to develop plans to conserve spotted owl without following NEPA and NFMA procedures. The courts said they had to stop cutting owl habitat until they had complied with environmental laws. This is the same situation we find ourselves in today with dead-wood associated species. The agencies should stop harming dead wood habitat until they have a legal plan to conserve associated species over the long-term. Seattle Audubon Society v. Epsy, 998 F.2d 699, 704 (9th Cir. 1998) (an agency must re-examine its decision when the EIS "rests on stale scientific evidence and false assumptions").	See response to 5873-72. It is an extension of this comment, and is responded to there.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#5873-8	Salvage logging will not meet standards & guidelines for snag habitat. Leaving just a few snags after salvage logging will meet standards for just a few years, until those few retained snags fall down and are not replaced. 9. The current snag habitat standards in the Northwest Forest Plan are based on outdated science ("potential population" methodology) and these standards do not provide enough habitat for the diverse life needs of many different species that use snags and dead wood. Meeting ecosystem objectives requires more snags than are called for in current standards, and more green trees are needed to recruit those higher snag levels. The FS needs to follow NEPA and NFMA procedures to consider new science, consider alternative standards, and finally adopt new standards that meet all the needs of wildlife (and other ecological functions) provided by snags and dead wood. Reducing snags on such a grand scale as this (and with such long-term impacts on the snag gap) is not permissible until the FS adopts new standards.	See Response to 5873-72 and 12346-55.
110.08 - Forest Plan Consistency	#6271-1	I appreciate your work in developing the Northwest Forest Plan since it balances the need to protect "late-successional" old-growth reserves and geological riparian reserves, and focusses logging along major access roads. I was dismayed to learn that these well developed policies are to be ignored so that recently burned areas in the KNF can be logged. Such logging on steep unstable slopes will damage the ecological values of the area and go against settled policy in the Northwest Forest Plan. Please follow your plan and stop this irresponsible logging project.	The Westside Fire Recovery project is project-level National Environmental Policy Act, not planning level analysis under NFMA. The development of the Northwest Forest Plan is completed, per the 1994 record of decision. The Klamath Forest Plan, signed in 1995 incorporated the Northwest Forest Plan. The project is consistent with standards and guidelines in the Klamath Forest Plan, and therefore, the Northwest Forest Plan. See Chapter 2 of the EIS for a description of proposed treatments (modified Alternative 3) and associated project design features for resource mitigation.
110.08 - Forest Plan Consistency	#6277-2	Bird nesting is severely curtailed: Haggard, M., and W. L. Gaines. 2001. Effects of stand-replacement fire and salvage logging on a cavity-nesting bird community in eastern Cascades, Washington. Northwest science 75, no. 4 (2001): 387-396. Saab, Victoria A., Robin E. Russell, and Jonathan G. Dudley. "Nest densities of cavity-nesting birds in relation to postfire salvage logging and time since wildfire." The Condor 109, no. 1 (2007): 97-108. I am profoundly disturbed by the danger to indigenous and threatened species which will most likely be exacerbated by the continuing and extreme loss of forest interior habitat and its most probable effects on forest species of this clearcut logging of late-successional old-growth reserves and geological riparian reserves proposed by the Klamath National Forest in the Westside Salvage Project. Fire is an inevitable and natural occurrence in this planning area. It is unacceptable to exploit wildfire to fast-track dangerously fragmenting, controversial and illegal logging of protected forests that belong to all Americans. The Northwest Forest Plan becomes meaningless if reserves are only protected until timber planners decide to log them. I take grave exception to this policy pandering only to private logging interests at the expense of species diversity, healthy conservation policies, and endemic populations of species at risk from loss and fragmentation of interior habitat blocks of sufficient size through devastating "salvage" which depauperates all and all the future. Please recognize the scientific work of fire ecologists, assist the ecological grounds of a nnonconsumptive future for impacted communities and sufficiently respect and consider the tradition and resource-understanding of local tribes. Please focus on restoration and fire safety instead of pushing clearly deleterious and unscientific, divisive and controversial clearcut logging proposals on steep slopes in key watersheds and in critical wildlife habitat. Klamath National Forest timber planners appear to be acting contrary to best known practices, and this Timber Sale must NOT be approved. The Forest Service needs to meet its obligation to be a good steward of the land. Follow the Northwest Forest Plan. Focus logging along major access roads and protect the most important and vulnerable recovering areas: the late-successional and geological reserves. Please deny the Westside Timber Sale, and any further salvage logging policies.	Salvage harvest is proposed to reduce fire risk and promote the regeneration of future habitat. We disagree with the assertion that salvage in LSRs in inappropriate or inconsistent with plan direction; see the Salvage in Late Successional Reserve section of Chapter 1 of the final EIS. Also see the beginning of Chapter 3 for a discussion of responsible opposing points of view. 5873-72 The Westside Fire Recovery is consistent with the Forest Plan, which includes standards and guidelines from, and is consistent with, the Northwest Forest Plan. The Westside Fire Recovery project maintains snags and coarse woody debris on the landscape for use by wildlife species through project design (see Chapter 2 of the EIS). No clear-cutting is proposed. See watershed project design features in Chapter 2 of the final EIS; logging on steep slopes is not proposed. The EIS incorporates best available science. Tribal consultation has been ongoing. Effects to resources are disclosed in Chapter 3 of the EIS.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	#6646-1	I'm writing because I'm very concerned that the "Westside Fire Recovery Project" in Klamath National Forest may cause undue harm to our local forest resources. As an environmental scientist, born and raised in Oregon, I have come to understand that fire is an integral part of ecosystem functioning, as are old growth trees. Post-fire logging will stunt the natural recovery processes of the forest and remove essential ecosystem elements. Salmon, one of our area's most charismatic and prized species, will be negatively impacted, not to mention numerous other organisms and ecosystem function overall. While economic development is important to the success of many communities, it is not an excuse to exploit the ecosystem resources on our reserved lands. Post-fire logging would cause undue harm for years to come, and leave our forests beyond a recoverable state. Please, if you value our forest resources, which make the Pacific NW so unique, please implement the Northwest Forest Plan and withdraw the proposal to clearcut up to 6,800 acres of burned forest in the Westside project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We acknowledge the importance of old growth characteristics; see Chapter 2 of the final EIS for wildlife project design features that retain legacy components. As described in the purpose and need, the project will promote restoration of habitat and watersheds. See Chapter 2 for a description of legacy site treatments and treatments in Riparian Reserves for this purpose. See Chapter 3 of the final EIS for a discussion of effects by resource area and Alternative. See the beginning of Chapter 3 of the final EIS for a discussion of responsible opposing points of view.
110.08 - Forest Plan Consistency	#7563-1	I am shaking my head, by the extreme clearcut logging of late successional and old growth reserves as well as geological riparian reserves proposed by the Klamath National Forest in the Westside Salvage Project. I'm hoping it doesn't happen however, Fire is a possible and natural occurrence down the road in this planning area. A great reason why I am including my letter. It is unacceptable allowing this illegal logging of protected forests that belong in the hands of earth loving Americans. The Northwest Forest Plan becomes meaningless if reserves are only protected until timber planners deciding on logging them. This needs immediate change. Also, a program start up of take a tree / plant a tree, must be in place immediately. From the damage already occured on previous deforestations. It takes much time waiting on a tree growing upwards in the direction of adulthood, giving us all their benefits of oxygen, medicines, music and protecting wildlife's home base. Kindly join us now, with fire ecologists, forestry specialists, impacted communities and local tribes focusing on restoration and fire safety instead of what seems like pushing divisive and controversial clearcut logging proposals on steep slopes in key watersheds and critical wildlife habitats. Klamath National Forest timber planners should not be allowed acting above the law. The Forest Service needs meeting of the minds, in betterment with its obligation, practicing being a good steward of the land. Follow the Northwest Forest Plan. Focus logging along major access roads and protect the most important and vulnerable recovering areas: the late successional and geological reserves.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. This comment is not supported by scientific rationale. In areas proposed for salvage harvest, site preparation and planting are also proposed. The project does not proposed clearcutting; see Chapter 2 for a description of proposed actions, including project design features for resource protection. The Forest Plan, which incorporates all direction from the Northwest Forest Plan, does allow for salvage harvest in Late Successional Reserve. The project also meets other law, regulation, and policy. See Chapter 1 for a discussion about salvage harvest in Late Successional Reserves. See the Chapter 1 sections on Purpose and Need for the proposed treatments and Management Direction for information on how the proposed treatments comply with all law, regulation, policy, and Forest Plan direction in an effort to reach the desired conditions.
110.08 - Forest Plan Consistency	#8435-1	I'm writing out of concern that the "Westside Fire Recovery Project" in the Klamath National Forest is in fact a plan to clearcut old-growth trees. Such clearcutting is irresponsible, and seems economically driven rather than science-driven -- which is counter to the purpose of reserved lands. I would expect any biologists worth their salt to advise against such clearcutting, as it disrupts the natural post-fire recovery in such late successional forests, and would degrade salmon habitat. Do not exploit last summer's wildfire to push through short-sighted practices such as clearcutting of old growth. Rather, allow this naturally burned habitat to achieve true recovery, including recovery of at-risk species such as coho, northern spotted owl and the Pacific fisher. Please adhere to the Northwest Forest Plan and withdraw the proposal to clearcut up to 6,800 acres of burned forest in the Westside project.	The Forest Plan, which incorporates all direction from the Northwest Forest Plan, does allow for salvage harvest in Late Successional Reserve. See Chapter 1 of the EIS for a discussion of salvage harvest in Late Successional Reserves. No clear cutting is planned. See Chapter 2 of the EIS for what is being proposed, including project design features for mitigation. Snags are being retained as are legacy components, as consistent with project design. See Chapter 3 for a discussion of project impacts by resource area. This is not a "green" timber sale but a salvage harvest and restoration project in response to the effects of the 2014 wildfires. The project has been designed in response to the purpose and need statements in Chapter 1 of the EIS and in consideration of best available science, as described throughout the final EIS and supporting documents. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. See response to comment number 6271-1.

Code	Comment Number	Comment Text	Response
110.08 - Forest Plan Consistency	5873-129	The Northwest Forest Plan ROD page 66 says that "Salvage is not required to be beneficial" but the February 1994 Biological Opinion for the Northwest Forest Plan disagrees. The Northwest Forest Plan Standards & Guidelines must be interpreted to err on the side of caution and retain all large trees. The BiOp says: a. "ASSUMPTIONS: To ensure that the analysis under section 7 of the Act had a measurable baseline, or starting point, the following assumptions were identified to assist in the development of this opinion: 1. Riparian and Late-Successional Reserves (LSRs) will retain reserve status and will not be available for timber production other than as provided in Alternative 9 (i.e., salvage and silvicultural treatments beneficial to the creation of late-successional conditions)." P 4. b. "the alternatives presented in this SEIS propose a network of designated areas managed primarily to protect and enhance habitat for the northern spotted owl and other late-successional and old-growth forest related species" p 5. c. "Late-Successional Reserves would be managed to protect and enhance habitat for late-successional and old-growth related species including the northern spotted owl and marbled murrelet. Some level of silvicultural treatment (such as thinning young stands) is permitted in certain age stands to accelerate the development of old-growth habitat characteristics, subject to review by the Regional Ecosystem Office…. Stand and vegetation management of any kind, including prescribed burning, is considered a silvicultural treatment and is subject to review." p 5. d. "SPOTTED OWL ACTIVITY CENTERS: … Salvage of dead trees would be based on guidelines adapted from the Final Draft Spotted Owl Recovery Plan…" p 7. e. "CONSERVATION RECOMMENDATIONS: … Restricting harvest activities in LSRs to thinning and other silvicultural treatments that are beneficial to creation of late successional forests as identified in Alternative 9 is believed, at the present time, to be necessary to promote the conservation and recovery of listed species consistent with Section 7(a)(1) of the Endangered Species Act." P 48.	The Westside Fire Recovery intends to accelerate recovery of burned landscapes into forests with late-successional characteristics while maintaining habitat values in the interim. Salvage harvest proposed within Late Successional Reserves is for the promotion of future habitat and for the reduction of fire risk in Late-Successional Reserve and for northern spotted owl habitat. See Chapter 1 for a discussion of salvage harvest in Late Successional Reserves. The Forest Plan incorporates direction from, and is consistent with, the Northwest Forest Plan. The project is consistent with the Forest Plan and the Late Successional Reserve assessment. See correspondences with Regional Ecosytem Office in Appendix E of the final EIS. See Chapter 1 for a discussion of salvage in LSRs. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. See the Wildlife section of Chapter 3 for a discussion of Forest Plan consistency.
110.08 - Forest Plan Consistency	5873-129	The Northwest Forest Plan ROD page 66 says that "Salvage is not required to be beneficial" but the February 1994 Biological Opinion for the Northwest Forest Plan disagrees. The Northwest Forest Plan Standards & Guidelines must be interpreted to err on the side of caution and retain all large trees. The BiOp says: a. "ASSUMPTIONS: To ensure that the analysis under section 7 of the Act had a measurable baseline, or starting point, the following assumptions were identified to assist in the development of this opinion: 1. Riparian and Late-Successional Reserves (LSRs) will retain reserve status and will not be available for timber production other than as provided in Alternative 9 (i.e., salvage and silvicultural treatments beneficial to the creation of late-successional conditions)." P 4. b. "the alternatives presented in this SEIS propose a network of designated areas managed primarily to protect and enhance habitat for the northern spotted owl and other late-successional and old-growth forest related species" p 5. c. "Late-Successional Reserves would be managed to protect and enhance habitat for late-successional and old-growth related species including the northern spotted owl and marbled murrelet. Some level of silvicultural treatment (such as thinning young stands) is permitted in certain age stands to accelerate the development of old-growth habitat characteristics, subject to review by the Regional Ecosystem Office…. Stand and vegetation management of any kind, including prescribed burning, is considered a silvicultural treatment and is subject to review." p 5. d. "SPOTTED OWL ACTIVITY CENTERS: … Salvage of dead trees would be based on guidelines adapted from the Final Draft Spotted Owl Recovery Plan…" p 7. e. "CONSERVATION RECOMMENDATIONS: … Restricting harvest activities in LSRs to thinning and other silvicultural treatments that are beneficial to creation of late successional forests as identified in Alternative 9 is believed, at the present time, to be necessary to promote the conservation and recovery of listed species consistent with Section 7(a)(1) of the Endangered Species Act." P 48.	This comment is largely a recitation of the assumptions of the Biological Opinion for northern spotted owl on the Northwest Forest Plan and is not specific to the environmental consequences of the proposed Westside Fire Recovery Project. Management direction for the Westside Fire Recovery Project is found in the Forest Plan of the Klamath National Forest, not the Biological Opinion for the Northwest Forest Plan. The Westside Recovery Project seeks to protect and enhance late successional forest habitats by reducing the probability of future stand replacing fire and accelerating the development of late successional stand condition in the fire area. The Forest Service must consult with, and receive a Biological Opinion from the U. S. Fish and Wildlife Service on any actions that may affect northern spotted owls. See correspondences with Regional Ecosytem Office in Appendix E of the final EIS. See Chapter 1 for a discussion of salvage in LSRs. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. See the Wildlife section of Chapter 3 for a discussion of Forest Plan consistency.

Code	Comment Number	Comment Text	Response
111 - Public Involvement	#17501-1	Despite the fact that the public comment period was extended for an additional fifteen days, I believe that the comment period should be extended even further to allow for further public review of this massive, landscape scale project. The fact that the KNF has not completed botanical or wildlife surveys for this project I do not see how the public can make informed and meaningful comments according to NEPA standards and guidelines. Without the relevant data and scientific review that normally goes into a project of this scale, the public will be left out of this process, or at least will only be able to comment on the portion of the project that has so far been completed.	The Forest Service developed an EIS in accordance with the National Environmental Policy Act and all applicable federal and state laws and regulations. From the initiation of the project through release of the final EIS the Forest consistently engaged the public, local officials, federally recognized tribes, state, local and federal regulatory agencies, and local organizations. The draft EIS and supporting documents were released for public review during the comment period. There is no requirement for surveys to be completed at the time of public comment. In fact, many surveys are ongoing through implementation of the project. Project design features are developed, as appropriate, to address the need to protect resources as information is determined; see botanical project design features in Chapter 2 of the EIS for an example of this. Forest Plan consistency was reviewed by the IDT and included in analysis. In accordance with 36 CFR 220.3,"Adaptive management. A system of management practices based on clearly identified intended outcomes and monitoring to determine if management actions are meeting those outcomes; and, if not, to facilitate management changes that will best ensure that those outcomes are met or re-evaluated. Adaptive management stems from the recognition that knowledge about natural resource systems is sometimes uncertain."
111 - Public Involvement	#18852-10	It is unfortunate that professional input from esteemed ecologists and cultural specialists (i.e. conservation biologists, academia, scientific studies, cultural input et. al.) is not incorporated in greater detail, and specifically referenced in the DEIS.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The proposed action and action Alternatives were developed through a public scoping process in strict accordance with the National Environmental Policy Act and all applicable federal and state laws and regulations. The action Alternatives were analyzed in detail by subject matter scientists with all known environmental impacts disclosed based on the best information and data available. Impacts to forest resources have been analyzed based on the rational presented and input from Pacific Southwest Research Station scientists. Numerous scientific publications are cited and utilized in the assessment of effects, showing both positive and negative effects. The literature reviews listed in the comment are referenced and cited in the EIS in the discussion of effects of the Alternatives on various resources. Best available science is considered throughout the EIS and supporting documents and is responded to throughout response to comments on the draft EIS.
111 - Public Involvement	#18852-56	I am concerned that the final determination of alternatives & management for the "Westside Recovery" project will not allow for necessary input, partially as a result of the shortening of the period from the "Draft Environmental Impact Statement" to the "Record of Decision". As stated within the "Westside Fire Recovery Project" Draft Environmental Impact Statement (DEIS): "There would be no provision for administrative challenge (objection) prior to issuance of a Record of Decision". As there is a stated flexibility from the Klamath NF Forest Supervisor (Patricia Grantham) to integrate aspects of multiple alternatives, this final "recommendation" should also be available for public comment and review.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please refer to comment number 17501-1. An Emergency Situation Determination was issued by the Chief of the Forest Service for this project. See response to comment number 17501-2.
111 - Public Involvement	#18865-1	How may I stay involved?	The formal comment period for the draft EIS has now closed, however the Forest encourages public engagement from project initiation through implementation.
111 - Public Involvement	#18907-1	The Draft EIS public comment period should be increased by at least additional 60 days to allow for reading and commenting. The 450 page document is very detailed with 5 major alternatives and 1 alternative provided by the Karuk Tribe. The public deserves more than a 45 day period to comment.	The Forest Service developed an EIS in accordance with the National Environmental Policy Act and all applicable federal and state laws and regulations. This project is compliant with the regulations at 40 CFR 1500-8. From the initiation of the project through release of the final EIS the Forest consistently engaged the public, local officials, federally recognized tribes, state, local and federal regulatory agencies, and local organizations. The draft EIS and supporting documents were released for public review during the comment period. There is no requirement for surveys to be completed at the time of public comment. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Please refer to comment number 17501-1. An Emergency Situation Determination was issued by the Chief of the Forest Service for this project. See response to comment number 17501-2.

Code	Comment Number	Comment Text	Response
111 - Public Involvement	#18918-3	I am appalled that the Klamath National Forest has the nerve to contact the White House Council on Environmental Quality to ask for smaller time frames within which one can comment about the major plans by the action alternatives to severely damage habitat and watercourse quality in the Westside "Fire Recovery" Project area. Apparently, it might really be the White House Council on Pandering to Timber Industry Interests, but that group should be focused on enforcing rather than skirting our environmental laws. (IN THE FINAL EIS, PLEASE EXPLAIN WHO EXACTLY FROM THE KLAMATH NATIONAL FOREST WORKED WITH WHOM AT THE WHITE HOUSE COUNCIL ON ENVIRONMENTAL QUALITY TO WORK OUT THIS ARRANGEMENT TO GET LESS TIME FOR INPUT ON THIS WORST PROPOSAL FOR NATIVE SALMON WATERSHEDS THAT THE LOWER 48 STATES HAS SEEN IN RECENT DECADES.)	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Alternative arrangements are consistent with National Environmental Policy Act regulations per 40 CFR 1506.11. Rationale for why it was requested and the approved, including the names of who approved it, can be found on the project's website and in the record. Forest Supervisor Patricia Grantham extended the comment period by 15 days (from 30 to 45 days) after receiving Alternative arrangements that reduced the required timeline from 45 to 30 days. This adjustment was made in order to provide additional time for public review and comment. Since the draft EIS comment period, the agency decided not to seek Alternative arrangements to eliminate the requirement of the 90-day wait period between draft and final EIS or the 30-day wait period between the final EIS and ROD, as originally considered. See Chapter 1 of the EIS for more details about Alternative arrangements as it relates to this project.
111 - Public Involvement	#18934-10	Alternative Arrangements The Council on Environmental Quality (CEQ) granted an expedited comment period for the DEIS and is considering eliminating the requirement for 90 day period between the publication of the Draft EIS and the Record of Decision (ROD), as well as the 30 day period between the publication of the Final EIS and the ROD, pending the Forest address the issues raised in their letter March 6, 2015. In reading this letter, it is clear CEQ is strongly encouraging the Forest to enhance public stakeholder engagement, improve government-to-government consultation with area tribes, and actively discuss several of the key issues raised by conservation groups and tribes since this project's inception, through the process to formulating the Final EIS. We have spoken with CEQ and clarified that while the WKRP can't be engaged like other collaborative groups, since the Forest is a participant along with other federal agencies, the WKRP strategies mutually agreed to by a diverse group of stakeholders should have been formulated into an alternative for analysis. The Karuk Tribe created an alternative based on collaboration with MKWC, SRRC, and environmental groups, and other local individuals that demonstrates how the WKRP strategies apply to the Westside Project. Should the Karuk Alternative, or some very similar alternative be chosen for implementation, we would consider supporting the expedited timeline for this process with CEQ.	Since the draft EIS comment period, the agency has decided not to seek additional Alternative arrangements for the Westside Fire Recovery project. This includes not seeking exception to the 90-day wait period between the draft and final EIS or the 30-day wait period between the final EIS and the ROD. See Chapter 1 of the EIS for a discussion of Alternative arrangements. See the public involvement section of Chapter 1 of the EIS and the consultation discussion under Chapter 1 of the EIS. The Forest has engaged the public through scoping and comment periods in accordance with the regulations at 40 CFR 1500; see Chapter 1 of the final EIS. The Forest's consultation efforts with the Karuk tribe have been unprecedented on this Forest; see Chapter 1. See the end of Chapter 2 (under Alternatives considered through consultation) for details on how the Karuk Alternative has been considered and incorporated to the extent practical. See response to number 18934-8 regarding the WKRP strategy.
111 - Public Involvement	#18934-7	The two local collaborative groups formed to provide input on this project to the Klamath NF on this project (one by Siskiyou County, the other by the National Institute for the Elimination of Catastrophic Wildfire) lacked members of the environmental community or the Karuk Tribe. While these collaborative efforts did capture the thoughts of local participants with deep land knowledge born from living in this place, the membership in these groups shared a common belief that salvage logging should be maximized for the greatest social, economic and ecological good. Unfortunately, the dialogue and mutual understanding that could have taken place had the diversity on these collaborative groups been more inclusive did not occur. These two collaborative groups appear to be wholeheartedly supporting the Forest in implementing Alternative 2, or some more aggressive alternative as yet to be defined. This does not fairly represent many residents of Western Siskiyou County.	The collaborative groups were not developed by the agency and their membership and mission is not determined by the agency. The creation of two local collaborative groups were formed, which included a Citizens' Advisory Committee that was approved by the Siskiyou County Board of Supervisors, and The Westside Klamath Steering Committee that was formed by National Institute for the Elimination of Catastrophic Wildfire. Both collaborative groups were charged to serve as advocates for actions regarding the recovery and restoration of the Westside Fire Recovery project area that are reflective of, and responsive to, the needs of the residents of Siskiyou County; help evaluate the draft EIS; and to suggest guidance for finding balance between protecting resources (such as wildlife, fisheries, and water quality) and protecting human life and safety, public infrastructure, private property, and communities. From the initiation of the project through release of the final EIS the Forest consistently engaged all members of the public, local officials, federally recognized local tribes, state, local and federal regulatory agencies, and local organizations. See Chapter 1 of the EIS for a description of the public involvement efforts made by the agency in accordance with 40 CFR 1506.6.Comments and recommendations from the two collaborative groups will be considered along with all of the other public comments that were received in response to the draft EIS, including many from local residents. The Forest will continue to work closely with the Karuk Tribe and other tribes prior to making a decision on this project. The collaborative groups were developed outside of agency control; their membership was not determined by the agency. In response to consultation and public comment, the Forest Service has developed a modified Alternative 3, which is the preferred Alternative of the final EIS. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.
111 - Public Involvement	#18934-8	We are disappointed that several comments suggesting the Forest utilize the values and strategies outlined in the Cohesive Strategy and the WKRP to restore historic fire regimes were not considered relevant to alternative development. How we manage fires in the future on this landscape is directly tied to whether or not this project creates strategic fuelbreaks around communities, re-plants moderate and high severity fire areas to produce even-aged conifer stands, and prepares for the re-introduction of prescribed fire (or managed wildfires) into these burn footprints.	The Forest Service developed issues and Alternatives in response to public comments from scoping. See Chapter 1 and 2 for issues and Alternatives developed, respectively. The project incorporates concepts mentioned in this comment, including strategic fuel breaks, re-plantings where appropriate, and prescribed underburning. Treatment areas within the Westside Fire Recovery Project are anticipated to make resilient ecosystems and make communities within the project area safer. These are components of the Cohesive Strategy and the Western Klamath Restoration Partnership. The treatment design of the Westside Fire Recovery Project will assist in future wildland fire suppression efforts as well as areas in which prescribed fire and other treatment activities can take place. The Vegetation and Fire and Fuels Reports, Chapter 3 of the EIS, describes proposed treatments and analyzes their effects.

Code	Comment Number	Comment Text	Response
111 - Public Involvement	#18937-5	Also worthy of note is the discrimination that occurred during the public comment period. Some people could easily access a printed version of the DEIS and associated planning appendixes and maps, but others relied on public sources of information, which were often difficult to navigate and/or access. In other words, attaining a large document with comparable alternatives and obscure maps became an obstacle for public participation.	The agency made documents available to the public in accordance with 40 CFR 1506.6. The agency did not discriminated. Contact information of where to request additional information was provided in all draft EIS distribution material; see federal register publications and distribution material in the project record and project website. The Forest Service posted the draft EIS and supporting documentation on the project's website, which is accessible to anyone from the public. From the website, the public had the choice of reviewing it electronically or printing documents. Hard-copies of the draft EIS were also made available at Klamath National Forest offices, libraries, and community centers as well as shared at some public meetings (after publication). Hard-copies were also made available upon request, and the Forest Service did share copies as requested. Because of the number requested, the Forest Service printed more copies for distribution. See Chapter 1 for more information about public involvement.
111 - Public Involvement	#18937-6	In addition, maps included in the DEIS were duplicative and difficult to read. Unique and significant features of the landscape, including rivers, streams, roads and landmarks were difficult to discern without additional resources. These features of the project's promotion incurred cost and contributed to local public involvement. In addition, public meetings hosted by project managers to discuss the Project were facilitated with methods that discouraged programmatic understanding and relied on individual discussion with Project managers for information. This, in addition to the "get the cut out" priority voiced by KNF, tainted the public process for evaluation and involvement required under NEPA. As a member of the local community and on behalf of my constituency at Klamath Riverkeeper, I can attest to a lack of knowledge among affected citizens of this the proposed large salvage logging and roadside logging project. Very few local people understand the number and location of clearcut logging units, riparian area logging, road building and hauling of commercial logs through small communities. Frankly, people do not understand the scale, scope or seriousness of the Westside Project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Scoping of the Westside Fire Recovery project was carried out in accordance with the requirements of 40 CFR 1501.7. The Forest provided maps for public project review and involvement compliant with 40 CFR 1506.6(b). Landscape features and roads were provided on the maps. Maps were provided in the back of the draft EIS, which was available on the project's webpage and hard-copy at several locations and by request. 11X17 map booklets by Alternative were also posted online. Also posted were 8.5 X 11 map booklets by Alternative that were 1: 63,360 scale. All electronic maps were provided in .PDF format and were georeferenced (meaning you can search by latitude and longitude), searchable (e.g. by key word search of site locations or roads), capable of being zoomed-in to see details at larger scales, and color blind friendly. The Forest Service conducted multiple public meetings and provided presentations at other group meetings, as invited. See Chapter 1 of the EIS for details. The intention of the agency is clear in the purpose and need described Chapter 1 of the EIS. Chapter 2 of the EIS describes the proposed actions, including the modified Alternative 3 which has become the preferred.
111 - Public Involvement	#18942-1	I am writing to express my support the Westside Fire Recovery Project on the Klamath National Forest. To ensure this project is successful, I urge you to issue an Emergency Situation Determination (ESD) as soon as possible. An ESD is critical to allowing both the Forest Service and our communities to successfully salvage burned timber, reduce safety hazards, and increase the likelihood and speed of reforestation. If the ESD is not issued, the value of the burned timber will significantly diminish, making the recovery process much more difficult and expensive. I am concerned that if you don't issue this request, communities near the Klamath National Forest will see major forest hazards, increased dry fuels buildup and additional costs for salvage logging and roadside hazard tree removal. It would also deny communities the opportunity to raise much-needed revenue for critical local services. Our communities and local National Forest are at risk. Please issue an Emergency Situation Determination for the Westside Fire Recovery Project without delay.	Statement of support. Position statement; see response to comment number 16695-4. An Emergency Situation Determination was issued by the Chief of the Forest Service for this project. See response to comment number 17501-1 and 2. See response to number 12368-1.
111 - Public Involvement	#18978-1	Dear Tom, The Klamath NF (R-5) has requested an Emergency Situation Determination allowing them to proceed with the Westside Fire Recovery Project. I know you are not inclined to listen to retirees on these matters, but I would be negligent not to speak out. As retired R-5 Regional Forester I am unable to stand back and not support a timely recovery plan for this area. Too many instances within the National Forest System have been improperly denied reasonable response to the need for fire restoration. Right here in my back yard in Oregon there are devastating examples of neglect that will extend the damage to watersheds and restoration of the natural ecosystem for several generations. I urge you to do what is right and not simply listen to those who insist that these devastating events should be left to nature. Our National Forests do not deserve such neglect.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. An Emergency Situation Determination was issued by the Chief of the Forest Service for this project. See response to comment number 17501-1 and 2. See response to number 12368-1.
111.01 - Outreach/ Education	#17481-18	Public information needs to be reader friendly. More direct mailings would reach more people with the facts.	Thank you for your suggestion regarding the Westside Fire Recovery Project. The Forest did distribute direct mailings for scoping and comment period. See Chapter 1 of the EIS and the project record for distribution details.

Code	Comment Number	Comment Text	Response
111.01 - Outreach/ Education	#17481-6	One more comment is about public involvement. I know what a pain it is to involve adjacent property owners, especially with a large project like this on the fast track. A PO Box newsletter (something more attractive to readers than a scoping letter) could go a long way to keep the public informed. My impression is that the public in and around the proposed action have no clue what is going on. My environmentalist neighbors think "they are going to log it anyway" and those interested in economics think nothing is being done.	Thank you for your comment and suggestion regarding the Westside Fire Recovery Project.
111.01 - Outreach/ Education	#18879-8	Alternative 2 will conduct salvage logging and fuel treatment/site prep/reforestation near or directly adjacent to the Pacific Crest Trail (PCT). This is appropriate recovery treatment for those sites. What appears to be missing is a serious, well designed interpretive effort to explain the rationale behind these activities and the objectives being accomplished. The PCT is heavily used by a broad array of local, regional, national,and international hikers who are not familiar with the short term/long term costs and benefits of management. It is likely that the movie "Wild" will trigger an increase in use over the next several years. Without an effective explanation of the objectives being accomplished by the recovery treatments a lot of these users will have a negative reaction to what they see. There is a BIG OPPORTUNITY here.	Thank you for your suggestion regarding the Westside Fire Recovery Project. The Forest will post a simple one page flyer at Cold Spring Trailhead and Grider Creek Campground outlining the 2014 fire event, the project's purpose and need, and recovery objectives and treatments.
111.01 - Outreach/ Education	#19079-7	Why was the Yurok Tribe not included in the list of tribal people consulted? What effort was expended to notify the tribe?	The Yurok Tribe was not included in government to government consultation with local federally recognized tribes because the Yurok's territory doesn't include any of the lands managed by the Klamath National Forest.
111.01 - Outreach/ Education	#6425-1	I attended one of your open house's on this project and came away very disappointed with the way it was presented. It was as if you didn't want to have to face questions. A group of people looking at multiple maps which may or may not be one of the alternatives, then taking questions about what they were seeing to each other and to the FS personnel everyone talking at once only to find there were no answers forthcoming. Sound confusing? It was!	The Forest Service sponsored six open houses, six presentations and field trips for the public prior to the release of the draft EIS with the intent to inform, consult, and involve interested parties in an interactive, in-person manner. Multiple open houses were also provided by the Forest Service during the comment period. See Chapter 1 of the EIS and the project record for details. It was the intent of the Forest Service that these preliminary open houses, presentations and field trips provide information for the public so that when the draft EIS was published, interested parties were prepared to make informed comments on the proposed action and Alternatives. Input from the public open houses were captured and included in the draft EIS and project record for consideration in the decision.
111.02 - Collaboration, Meetings	#17481-42	Regarding page v of DEIS, The Westside Klamath Steering Group, Bruce Courtright clarified a statement about the group's purpose which states "The purpose of the group is to generate, through a collaborative process, consensus recommendations to the Forest Service". Bruce stated this is misleading and clarified that while the group will generate recommendations it will include individual comments regardless of consensus. Can this section be altered? The group consists of experienced and qualified persons that can make recommendations. Although, he did mention that so far no one from group has objected to any of the concerns or comments of fellow participants. Larry Alexander added that group members in attendance or participating through phone or email will help to determine any recommendation decisions moving forward.	Thank you for your comments regarding the Westside Fire Recovery Project, clarification to the purpose of The Westside Klamath Steering Committee has been added to the final EIS to reflect individual comments from the group will be considered in determining recommendations.
111.02 - Collaboration, Meetings	#17481-49	Would like to see input similar to the Eddy Gulch LSR project, and more work like it. CWPP became part of the design.	This recommendation is beyond the scope of analysis for this project.
111.02 - Collaboration, Meetings	#17481-50	A representative of our Steering Group should be invited to all of these meetings. There should be transparency for all consultation meetings between the USFWS, NOAA Fisheries and the FS regarding our Westside Recovery.	Thank you for your comment regarding the Westside Fire Recovery Project.
111.02 - Collaboration, Meetings	#18852-32	15) Public meetings were not as informative as they should have been, using an "open-house" format versus a thorough presentation of alternative actions and a description of management objectives clearly stated by "Line-officers". This format did not create an atmosphere of informative education, clear description of purpose, nor a venue where public input would be best informed and respected.	Thank you for your comment regarding the Westside Fire Recovery Project. Please refer to the response to comment number 6425-1.

Code	Comment Number	Comment Text	Response
111.02 - Collaboration, Meetings	#18918-7	I object that "project specific meetings" or "field trips" were not scheduled prior to scoping. When a project has such a major impact on listed species which federal land management agencies are supposed to be protecting, one should give extra time rather than reduced time for field trips and comment periods	Thank you for your comment regarding the Westside Fire Recovery Project. Please refer to the response to comment number 6425-1.
111.03 - Comment Period	#18852-1	It is difficult to feel fully informed and adequately express the totality of my concerns and hopes for the "Westside Fire Recovery Project" ("Westside Recovery"), this is in large part due to the enormous scale of the project area and also to the rapidity in which this project is being planned and implemented.	Procedural question. The Forest Service has provided notifications and public involvement opportunities to encourage public understanding of the project and comments. See Chapter 1 of the EIS for public involvement efforts. The Forest Service hosted several open houses in order The Forest Service developed an EIS in accordance with the National Environmental Policy Act 40 CFR 1500-8 and all applicable federal and state laws and regulations. From the initiation of the project through release of the final EIS the Forest consistently engaged the public, local officials, federally recognized tribes, state, local and federal regulatory agencies, and local organizations. The draft EIS and supporting documents were released for public review during the comment period. There is no requirement for surveys to be completed at the time of public comment.
111.03 - Comment Period	#18918-7	I object that "project specific meetings" or "field trips" were not scheduled prior to scoping. When a project has such a major impact on listed species which federal land management agencies are supposed to be protecting, one should give extra time rather than reduced time for field trips and comment periods	There is no requirement to schedule meetings prior to scoping. The Forest Service notified the public by email, news releases, and the website and other means of all public meeting opportunities.
111.04 - ESD, in favor	#12368-1	Please adopt the Emergency Situation Determination in this regard.	The Emergency Situation Determination was granted by the Chief of the Forest Service for this project (reference). See response to comment number 17501-2.
111.04 - ESD, in favor	#17287-1	I am a resident of Siskiyou County and I reside on the Klamath River. I was in the midst of the Wildfires of 2014. I am writing to give my support for the Westside Fire Recovery Project. I would like to see as much harvesting of the burned trees as possible. I do support the emergency efforts that need to be done immediately. Please do not wait until the wood is unusable and the fire risk in our area increases.	See response to number 12368-1.
111.04 - ESD, in favor	#18941-2	Our communities and local National Forest are at risk. Please issue an Emergency Situation Determination for the Westside Fire Recovery Project without delay. Without that prompt determination, the tactics of delay we have repeatedly witnessed around efforts to restore these lands will succeed and ultimately set the course for irreparable damage.	See response to number 12368-1. See response to comment number 17501-2.
111.04 - ESD, in favor	#19019-1	Dear Forest Supervisor Grantham, I am writing to express my support the Westside Fire Recovery Project on the Klamath National Forest. To ensure this project is successful, I urge you to issue an Emergency Situation Determination (ESD) as soon as possible. An ESD is critical to allowing both the Forest Service and our communities to successfully salvage burned timber, reduce safety hazards, and increase the likelihood and speed of reforestation. If the ESD is not issued, the timing delay will significantly diminish the value of the burned timber, compromising the recovery process. The area in question burned so severely that it is just unbelivable that anyone would argue against efforts to help restore lost habitats. Many of the same folks currently protesting this project are responsible for delaying past green timber sales that certainly would have limited the expanse of this wild fire event by reducing overstocked stands and providing opportunities to safely combat the wildfire more directly. I am concerned that if you don't issue this request, communities near the Klamath National Forest will witness inactivity in response to such large landscape wide damage. There would be no local employment or forest products generated and the losses to the communtity would be exacerbated. It would also deny communities the opportunity to raise much-needed revenue for critical local services. Our communities and local National Forest are at risk. Please issue an Emergency Situation Determination for the Westside Fire Recovery Project without delay. Sincerely, Henry T. James	Position statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please refer to comment number 17501-1. An Emergency Situation Determination was issued by the Chief of the Forest Service for this project. See response to comment number 17501-2.

Code	Comment Number	Comment Text	Response
111.06 - ESD, against	#13535-1	1. A long-sighted, long-term plan be implemented - not a quick sale for clearcut salvage which is very likely to *increase* the fire danger to the region. 2. Proper procedure should be followed in forming this plan. The democratic process is in place for a reason, and should not be shorted regardless of increased sale value. On both points, long-sighted, well formed plans beat short-sighted ones any day. To this end, I strongly disagree with premise #2 of this project, "The project will seek to obtain the *maximum economic value from burned timber* by offering a sale while the wood is still marketable." I have no objection to timber sale while the assets are still valuable - but, according to several recent studies, to "maximize" the economic value is to automatically handicap long-term fire control. This is *not* a plan for the long term.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Clear-cutting is not proposed in this project. See Chapter 2 of the EIS for a description of proposed actions. Procedural statement, the agency has followed required procedures in accordance with National Environmental Policy Act regulations at 40 CFR 1500-8. The purpose and need as stated is described in Chapter 1 of the EIS. The project is addressing the need of reducing fire risk on the landscape. Both short and long term effects of the project have been disclosed in Chapter 3 of the EIS. See Chapter 3 of the EIS under fuels for a discussion of how the project will impact fuels.
111.06 - ESD, against	#17460-11	A request seeking an Emergency Situation Determination (ESD) pursuant to 36 CFR 218.21 has been made for the Westside Project. The case for an emergency situation declaration has not been convincingly made: 1. Road hazard treatment and fuels treatments in the WUis fulfill the need for worker and public safety and access, and firefighters performing fire suppression for community protection. 2. A project this large and complex needs to be a good project, not just an expedient one, and that requires adequate time for the public to participate and, if necessary, raise administrative challenges to issues the project has failed to properly account for. 3. Outside ofroadside hazard areas and the WUis, this is is a misguided attempt to try and design and justify a "fire-resistant forested ecosystem," within an ecosystem that, according to the DEIS documents and studies, has historically depended on fire for its health and regeneration: the impacts to current and nearfuture habitat are many, and not sufficiently mitigated by "project design features" as claimed. 4. Roadside salvage and ongoing fuels treatment satisfies the need to be economically viable and benefit local communities. 5. Part of the reasoning published in the DEIS for an ESD is "avoiding a loss of commodity value sufficient to jeopardize the agency's ability to accomplish project objectives directly related to resource protection or restoration." Yet, since salvage logging in the LSRs cannot be a driving factor for management in the LSRs, any ESD, if granted, should specifically exempt salvage proposals within the LSRs.	See response to comment number 17501-2. In response to specific comments, 1) an emergency situation determination is needed for roadside hazard treatments through contract; 2) this project has followed National Environmental Policy Act other required regulations, including scoping and comment periods and consultation, which have shaped this project and informed the decision-maker; many changes have been made in response to public comments and consultations; 3) the agency recognizes that fire is plays an important role in the ecosystem of the Klamath province, as described in the fuels section of Chapter 3 of the EIS. Effects to habitat are disclosed in Chapter 3 of the EIS under fish and wildlife sections. Project design features, in Chapter 2 of the EIS, have been developed and are incorporated into project design to mitigate resource impacts and to meet Forest Plan standards and guidelines and other law, regulation, and policy. 4) position statement, not supported by rationale; the project is designed to meet all components of the purpose and need, as described in Chapter 1 of the EIS. See Chapter 3 under economics for a discussion of economic impacts 5) see Chapter 1 of the EIS for a discussion of salvage harvest in Late Successional Reserves and how the actions proposed in Chapter 2 of the EIS meet Forest Plan standards and guidelines for Late-Successional Reserve.
111.06 - ESD, against	#17501-2	There is no real reason for an Emergency Situation Determination for this project and I urge you not to ask for such a determination. There is no emergency here. Wildfire is a natural occurrence, and if nothing is done than the forest will recover naturally on its own, just as burned forests in fire-adapted ecosystems have done for millennia. Studies have shown that burned snags in wildfires can stay viable for commercial logging for a number of years post-burn, so there is no need to rush the timber to the mill without doing the legally required environmental review that is normally undertaken in such a project. To declare an Emergency Situation Determination may fast-track the logs to the mill and please the timber industry, but you may also be fast-tracking an end to natural landscapes and fire-effected landscapes. The science is clear: fire-adapted ecosystems need fire. Why then would you want to log and destroy the very thing that makes the forests of the KNF so biodiverse and healthy?	Position statement, not supported by rationale or science. See the supporting documentation with the submittal of the emergency situation determination. The commenter mentions "the science" but doesn't provide any specific science or scientific points for agency review. See Chapter 2 of the EIS for a description of the proposed actions of the project and Chapter 3 for a discussion of effects. On May 13, 2015, the Forest received from the Chief of the Forest Service an Emergency Situation Determination pursuant to 36 CFR 218.21, which was determined to be necessary in order to achieve relief from hazards threatening human health and safety; mitigation of threats to natural resources on National Forest System or adjacent lands; avoiding a loss of commodity value sufficient to jeopardize the agency's ability to accomplish project objectives directly related to resource protection or restoration. See Chapter 1 of the EIS and the project record, including the request and approval documentation, for more details about the emergency situation determination. See response to comment number 17501-2.

Code	Comment Number	Comment Text	Response
111.06 - ESD, against	#18934-14	The use of a greatly expedited project timeline reliant on the use of CEQ Alternative Arrangements and an HFRA Emergency Situation Determination (ESD) for a project of this scope and scale makes it difficult for the public to comprehensively review and provide meaningful input. Further, it has virtually eliminated prospects for genuine collaboration between the Klamath National Forest and interested parties. Given that CEQ's alternative arrangements (40 CFR § 1506.11) are limited "to actions necessary to control the immediate impacts of the emergency" while "other actions remain subject to NEPA review" and that an ESD may be applied to portions of a project rather than its entirety, a genuine collaborative approach could have been taken by the Klamath National Forest in developing a true fire recovery project aimed at setting the forest up for fire resiliency and a return to a more natural fire regime while actions needed to control immediate impacts of the wildfires could still be implemented more expeditiously (i.e., roadside hazard tree removal). Fast-tracking the project at the expense of diverse and varied collaborative input undermines tenuous community trust with the Forest Service and perpetuates the unproductive paradigm of pitting polarized interests against one another rather than productively working within areas of mutual agreement. This fast-track all-or-nothing approach creates contention and virtually guarantees litigation. There is a significant risk that all components of the Westside project will be hung up in court and potentially set aside in legal rulings. A better approach would be to work collaboratively in a reasonable timeframe to accomplish genuine fire recovery actions while also producing salvage timber volume in a manner agreeable to a wide range of stakeholders while avoiding unnecessary contention.	We appreciate the concern held by the commenter that pursuit of Alternative Arrangements and the emergency situation determination may limit the chances for the public to participate and comment on the Westside Project. As we have discussed many times in the course of this project, fire-killed timber deteriorates and loses value quickly, and our ability to accomplish these projects diminishes rapidly the longer the National Environmental Policy Act process takes to accomplish. Alternative Arrangements and the emergency situation determination are provisions in the regulations that can be used to speed up the National Environmental Policy Act process when these types of needs arise. To make up for any lost opportunity that the public may have had to comment on that compressed timeline we undertook an unprecedented series of scoping meetings and open houses in affected communities before the publication of the draft EIS. These meetings included presentations of draft proposals that were very specific and fostered many energetic discussions with those who supported the project, those who opposed it and those who just wanted more information. Once the draft EIS was published, we revisited those same communities to provide information about the project and receive public comments on the draft EIS. In addition, we held meetings in Redding and Arcata, California and in Medford, Oregon to reach communities of interest who lived outside of the area impacted by the fires. We also used the internet to post draft documents for public review in advance of publication to extend the time available to review comments although that is not the normal practice of the Forest Service. Even though we were granted a shorter 30 day comment period by CEQ on the draft, we extended that back to the normal 45 day comment period as result of concerns raised by the public about their ability to provide meaningful project input. Throughout this project, we have attempted to strike a balance between moving expeditiously to achieve important time-delimited project purposes with seeking public input and engagement. We also note that many other publics, particularly those in communities closely affected by the 2014 fires supported the Alternative Arrangements and the emergency situation determination in order to move the project forward to implementation, who were perfectly satisfied with the information presented, and appreciated the accelerated timelines in the hope the Westside Fire Recovery Project can be implemented in a timely manner. See response to comments number 17501-2 and number 18918-3 . See also the supporting documentation with the submittal of the emergency situation determination and Alternative arrangements in Chapter 1 of the EIS.
111.06 - ESD, against	#18934-9	Emergency Situation Determination Our organizations strongly oppose the granting of an ESD for this project. The emergency of lost economic value should not trump sound management of burned areas that take into account applicable social and ecological objectives from these treatments. Given the amount of deviation from our historic fire return intervals, the lack of fire on this landscape over the past century, and persistent drought, we can expect large campaign fires such as those in 2014 to become the new normal and not an emergency. The real emergency is there has never been so little fire in the Western Klamath Mountains since the last Ice Age. We should not be focusing our efforts on maximizing the economic value from burned timber, but should instead be focusing all available resources on establishing a series of strategic fuelbreaks through manual and mechanical treatments, followed by large scale prescribed burns that bring good fire back to the fire deficit landscapes before the next wildfire. More substantial cost savings will be realized through reduced expenditures on fire suppression in the future with this treatment model.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Comment is not supported by rationale or science. The emergency situation determination is not solely based on commodity value but is also based on hazards to human health and safety. Commodity value is needed in this project in order to accomplish the restoration objectives including those that are mentioned in this comment (fuelbreaks and prescribed fire treatments). An Emergency Situation Determination was issued by the Chief of the Forest Service for this project. See response to comment number 17501-1 and 2. See the supporting documentation with the submittal of the emergency situation determination. The commenter mentions "the science" but doesn't provide any specific science or scientific points for agency review. See Chapter 2 of the EIS for a description of the proposed actions of the project. Note that the project proposes strategic fuel breaks and prescribed underburning and that the project, including roadside hazard treatments and salvage harvest, are largely proposed for the purposes of reducing future fire risk and promoting and retaining habitat. See Chapter 3 for a discussion of effects. Fire suppression is outside the scope of this project's analysis.
111.06 - ESD, against	#19075-1	I also disagree with USFS in thinking that this is an "emergency situation". No need to rush this through.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please refer to comment number 17501-1. An Emergency Situation Determination was issued by the Chief of the Forest Service for this project. See response to comment number 17501-2.
111.06 - ESD, against	#34-1	I urge you to withdraw the biologically catastrophic "Westside" timber sale and the "Emergency Determination" giving it special privilege against scrutiny, on lands affected last summer by the Beaver, Whites, and Happy Camp fires. This logging project ignores what the Forest Service should have learned from a number of studies, including those conducted by its own agency scientists, concerning post-fire forest regeneration and the deleterious effects of post-fire salvage logging.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Chief of the Forest Service has approved an emergency situation determination consistent with regulations at 36 CFR 218.The statements of the commenter are unsupported by science or rationale and warrant no further response. See response to comment number 17501-2 about the emergency situation determination. It is a position statement that the project is biologically catastrophic, as the commenter noted; no rationale or science was provided to support this statement. The commenter mentions "studies" in general terms, but doesn't specifically provide any studies for agency consideration. The Forest Service considered best available science, as referenced throughout the EIS and supporting documents.

Code	Comment Number	Comment Text	Response
111.06 - ESD, against	#34-4	Moreover, If the Klamath logs these trees, it would condone and facilitate the persistent hopes of certain economic factions for periodic influxes of large-diameter timber, which will remain until the Forest Service commits to stop logging these largest trees. By proposing to log these trees, the FS is implicitly endorsing a model of ecosystem management that will lead only to greater social conflict and tension with the emerging science of fire ecology. This will certainly not be the last fire to occur in the Klamath's roadless forests, inside or outside its old-growth and roadless jewels. In addition, the market for wood and pulp is currently low, and many recent FS sales have been under-priced due to the attendance of only one or a few bidders. This FS contribution of subsidized, supply-side timber is profoundly unhelpful to a country that should be seeking greater efficiency and conservation of our wood and fiber resources, rather than wasting these resources at artificially low prices. As a former resident of southwest Oregon, I wish the Forest Service accept fire as a normal component of nutrient cycling and succession, and I continue to do so, starting with its response to the 2014 fire season. Please withdraw the this absurd and scientifically vacuous proposal to fast-track the "Westside" timber sale, and grossly misnamed "Emergency Determination." Instead, listen to your own ecologists, and let these stands regenerate naturally, as they have for millennia before any meddling or "salvage logging" by humans. Thank you for your attention to this issue.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Statements not supported by sound rationale or science. We acknowledge the role of fire as a natural part of the ecosystem; however, the scale and severity of the 2014 fires warrant treatments to address the purpose and need of this project, including the improvement of watersheds and wildlife habitat. See Chapter 2 of the EIS for the actions proposed, including mitigations for resource protection. Some statements are outside the scope of this project (e.g. how fires were previously addressed or may be addressed in the future). The Forest Service has considered market conditions during the development of this project. The agency agrees that fire plays a natural role in the ecosystem; this project actually proposes some prescribed underburning, as described in Chapter 2 of the EIS. See response to comment number 17501-2 about the emergency situation determination. The project has been designed to meet the purpose and need, as described in Chapter 1 of the EIS. The Forest Service considered best available science, as referenced throughout the EIS and supporting documents. The Chief of the Forest Service has approved an emergency situation determination in accordance with 36 CFR 218.
112.01 - Funding, General	#17343-1	This was what RAC was all about all the money do fire safety and we need to clean up this mess before it starts again.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. How other programs are funded and operated are outside the scope of this project.
112.01 - Funding, General	#18849-5	With each passing day, economic value is lost from hazard and salvage timber, meaning the private sector will lose interest in participation and necessary work will be solely dependent upon the difficult and unlikely allocation of taxpayer funds.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest Service understands that value is being lost, but is responsible for meeting National Environmental Policy Act and other regulatory requirements prior to implementation. How project implementation is funded is outside the scope of the project. See Chapter 1 for the purpose and need of the project, which includes project viability.
112.01 - Funding, General	#18852-23	5) Restoration and fuels reduction funding has not been committed (USFS personal communication, Happy Camp open-house meeting), the project is primarily designed for commodity production purposes.	The project was designed to meet the purpose and need, including restoration and fuels reduction work. Implementation funding is outside the scope of analysis in this EIS. See response to comment number 18878-16 about project funding.
112.01 - Funding, General	#18852-42	25) Restoration and related maintenance associated with this project should be budgeted within a 5-20 year time frame. Forest fuels thinning and prescribed fire should be emphasized over this period to complete the intent of the project (forest restoration, fire resiliency, job creation, fire-fighter and forest worker safety). 26) Noxious weed surveys, monitoring and eradication should be funded for the duration of project effects (5-20 years).	See response to comment number 18878-16 about project funding for implementation.
112.01 - Funding, General	#18852-44	28) Road maintenance must be budgeted for multiple "out" years following project implementation. The cost of maintenance and road system upgrades resulting from increased industrial and commercial traffic should be fully funded for 5-10 years following implementation. A lack of long term road maintenance funding commitment is a key indication of poor follow through on stated objectives.	See response to comment number 18878-16 about project funding for implementation.

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112.01 - Funding, General	#18878-16	DEIS: There is a need for a project that is economically viable, meeting project objectives and benefiting our local communities (Pg. 10). Capturing the marketability of the fire-killed trees and hazard trees provides the agency a viable means of fully implementing the project and funding restoration, including reforestation for future wildlife habitat and the improvement of watershed conditions for fish habitat. Otherwise, the Forest Service will need to use appropriated dollars to remove only the snags and hazard trees most critical for public and worker safety and access. Much of the proposed project will not happen if appropriated dollars are the only funding mechanism. Alternatives Considered but Eliminated from Detailed Study (Pg. 102) There is a need for the project to include receipts from treatments to be economically viable and help pay for fuel treatments. Strategic fuels treatments are proposed in all action alternatives, and salvage logging helps treat fuels on the acres on which it is implemented. Comment: In Appendix A of the Socio-Economic Report it is stated that only 32.6 percent of the total post salvage treatments will be realized from the projected timber receipts. This should be analyzed as to the effectiveness of proposed objectives. The reliance on congressional appropriations to accomplish post salvage treatments which would provide long term employment beyond the 1-2 year short term salvage efforts should not be "buried" in an appendix of a 467 page document. It has been our past 4 of 22 experience salvage projects fail to implement the fuels reduction portion on projects much smaller than the Refined Proposed Action. If restoration of roads, landings, and salvage units is not guaranteed from timber receipts and must be supplemented by federal appropriations and grants, then we have great concern that the forest will be left in worse condition after the salvage logging occurs.	This is an important comment because it questions whether the proposed work can actually be accomplished. The comment notes that "much of the proposed project will not happen if appropriated dollars are the only funding mechanism" and if slash disposal work is not completed, a "concern that the forest will be left in worse condition after the salvage logging occurs." The implication here is that doing the logging without doing the follow-up slash work will result in exacerbating fuel loads and fire risk rather than decreasing them. We agree that salvage logging without treating activity fuels would make on-the-ground fuel conditions worse and would not meet project objectives. All of the action Alternatives include treatment of activity fuels (Chapter 3 - Fuels). The comment cites a figure of 32.6% of post-fire slash and reforestation costs that would be covered by funds generated from the sale of fire-killed trees. That figure was calculated by dividing the total projected receipts by the projected costs of implementation. The presumption is that all of the receipts can be used for post-project work. For the purposes of economic modeling and to avoid overestimating the restoration funding available for the project, and thus the economic impacts of these activities, this analysis assumed that only funds collected from timber sales would be available to fund restoration service contracts. Timber sale revenues were estimated by Forest timber staff based on values for fire-damaged timber determined by the California Board of Equalization for timber yield tax purposes, as shown in EIS Chapter 3. This is the most conservative approach we could take to forecast economic benefits. This was done to avoid challenges that economic benefits were overstated. While our analysis is based just on timber receipts to model a conservative approach, those funds should not be viewed as the limiting factor to accomplish work, or the only source of funds that will be available. There are two questions in this comment that need to be addressed: The first question is how much revenue is the sale of fire-killed trees likely to generate (some would call this business planning). The second question is whether there is a reasonable plan for funding the work needed if timber sale receipts are not available or adequate. In order to understand the possible revenue balance sheet, we did a standard economic analysis using IMPLAN, a state-of-the-art economic analysis tool. Like most national forests, the Forest collects revenues from timber sales to pay for reforestation and other forest management activities. The highest priority is selling the fire-killed timber from the proposed salvage units and roadside hazard areas so that maximum value for the timber is recovered and available for slash disposal and reforestation. Once salvage logging and roadside hazard work is completed, activity fuels must be treated and then salvage units must be planted. We view the slash treatment and reforestation as mandatory parts of the salvage operations. Timber sale receipts and collections can be used to fund all or part of this work depending on the amount of money received. The amount of those dollars available will not be known until the timber sales are completed. The values shown in the economic analysis are a reasonable estimate. Any of the slash disposal and reforestation work that cannot be accomplished with timber sale receipts will be accomplished with appropriated or other funds. To the extent that federal appropriations or grant monies are forthcoming for restoring the project area, the economic effects of project restoration activities would exceed those estimated in this analysis (Socio-economic section of Chapter 3 of the final EIS). The second question whether the necessary work would get accomplished if the receipts from timber sales do not pay for it. For catastrophic wildfires, such as the 2014 fires in the project area, national forests usually require additional funding based on Congressional appropriations to fund fire recovery activities. Grant monies for fuel reductions in the WUI are also a possible source of funding. One of the most important questions when seeking additional funding for a project is whether there is a signed decision document. The Record of Decision for this EIS would fulfill that requirement, and allow the forest to immediately move to implementation with any funds received. Work proposed happens at different stages of the project and will take up to eight years to complete. Assuming that reforestation is paid for by the collection of Knutson Vandenburg (KV) funds from timber sale receipts, slash disposal costs would range from $200 acre for broadcast burning with a helicopter to $1,000/acre for handpiling. If we assume an average cost of $500 to $600/ acre for all treatments, that comes out to about $2.9 to $3.5 million dollars for slash disposal for Alternative 3 Modified. That is above the Forest's average base budget for this type of work; however, the Klamath has been successfully competing for additional funding that would cover this amount of slash disposal. In 2015, the Forest received $3 million dollars in additional fuels funding. The Forest expects to continue at that level through implementation of the salvage phase of the Westside Fire Recovery Project. Typically that work is completed within 1-2 years after logging is completed. Because so much of the proposed salvage is in large, contiguous blocks, we anticipate that work can be efficiently completed with lower unit costs. Completion of these activities is a priority for the Forest. Our regional and national headquarters are aware of these potential needs. WUI fuel treatments, site preparation and planting units in burned plantations, fuel breaks and underburning are not so time constrained as slash disposal and planting in areas that are salvage logged and can be accomplished over a period 2-8 years as funding becomes available. Underburning as proposed would occur 5-8 years in the future because tree and brush killed in the 2014 Westside Fires needs to fall to the forest floor before a low intensity fire would carry in these areas. Completion of this EIS makes it possible to request appropriated funding to accomplish

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			this work. If we consider the cost of doing necessary work without timber sale receipts, the real cost of no action becomes apparent. The Forest estimates that it would take $9 million dollars to accomplish roadside hazard abatement and cleanup alone if that work cannot be accomplished with a timber sale contract.
112.01 - Funding, General	#18878-76	The Karuk Tribe believes any funds or receipts derived from any salvage should be utilized for restoration actions which enhance the ability for fire to once again play a natural role on the landscape and to reverse other current and past management decisions which continue to negatively impact culturally significant resources.	. Any timber sale receipts will go towards restoration actions to extent allowed by law and regulation.Consultation with the Karuk Tribe is ongoing.
112.01 - Funding, General	#18878-81	The Karuk Tribe has consistently advocated for strategic hazardous fuel treatments. The Karuk Tribe also firmly believes this is a proactive approach to reducing astronomical fire suppression cost while providing for truly local workforce employment. Unfortunately, we have encountered time and time again a lack of project funding for implementation on part of the USPS. It appears all effort and expense is garnered for the salvage portion of projects while the fuel treatments languish for years in a never ending loop of the USPS not having funding, personnel or burn windows to accomplish the fuels treatment. We find it increasingly difficult to support any salvage proposal when we know from past experience the most critical aspect of returning fire to its proper role is left out at the end of the day.	. See Chapter 1 of the EIS for a description of consultation with the Karuk Tribe. See Chapter 2 of the EIS under Alternatives considered through consultation for a discussion of how the Karuk Alternative has been considered and incorporated into project design. See maps in the Appendix that compare the Karuk Alternative to modified Alternative 3 (preferred Alternative of the final EIS). See response to comment number 18878-16 about project funding for implementation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.

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112.02 - Staffing	#18852-12	There is a legitimate question of the professional capacity within the Klamath NF organization to implement this project in accordance with the National Forest Management Act, National Environmental Policy Act, Endangered Species Act, Clean Water Act, Northwest Forest Plan, Klamath National Forest Land Management Plan (et.al.) requirements. Staffing at our local ranger station (Happy Camp / Oak Knoll Ranger District) has been diminishing incrementally over the last decade or two. We do not have a district ecologist, wildlife biologist, soil scientist, geologist, entomologist, nor even a dedicated transportation "road system" supervisor. Our technician grade staff have been often left vacant (botany, wildlife, recreation, archeology, brushing crew) and it appears we do not even have a trails or wilderness ranger staff funded for this coming field season (2015). The professional capacity to implement this project and provide the necessary oversight must be questioned.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Implementation staffing is outside the scope of analysis in this EIS. The project has been developed to meet law, regulation, and policy, including but not limited to the laws referenced.
112.02 - Staffing	#18852-22	4) Insufficient USFS human resource professional capability is available for proper planning, implementation and oversight.	Implementation staffing is outside the scope of analysis in this EIS.
120.01 - Purpose and Need	#13-1	The FS's preferred alternative does not meet the purpose and need, it does not promote forest and watershed "recovery" but instead would substantially INCREASE the risks from future fires. This is so because the FS preferred alternative includes 2,640 acres of helicopter logging (DEIS page 31). Studies and experience on the ground both clearly indicate that helicopter logging leaves behind "jackpots" of highly flammable logging slash. Timber sale economics make it impossible to deal with these fuel jackpots. The same could be true for ground based systems. Furthermore, the project would reestablish highly flammable tree plantations which will result in greater risks to forest and watershed values - and greater risks for future firefighters - for many years to come. Finally, most of the stands you've identified for "salvage" logging are older stands where the natural wildfire under-burned thus improving them. If you salvage log you will take the best green trees and destroy the work the fire did to create healthy older forests.	In response to consultation and public comment, the Forest Supervisor Patricia Grantham has adjusted her preferred Alternative to be a modified Alternative 3, as presented in the final EIS. The Purpose and Need for this project states that "There is a need for restored and fire-resilient forested ecosystems." (EIS, Purpose and Need Section). In the draft EIS, Table 2-32 compares the Alternatives in relation to the purpose and need. See a similar table at the end of Chapter 2 of the final EIS related to purpose and need and alternative comparison. Quotes from the draft EIS related to Alternative 2 are as follows. While the proposed helicopter logging would leave a greater accumulation of surface fuels post-harvest (EIS, Vegetation Section, Alternative 2, Direct and Indirect Effects), the treatments as a whole would still meet the objectives for fire hazard and resistance to control (draft EIS, Table 3-4). Salvage harvest would occur on about 4% of the National Forest System land within the project area (draft EIS, Vegetation Section, Alternative 2, Direct and Indirect Effect) and are only proposed for areas that experienced moderate to high severity vegetation mortality (units with greater than 50% fire killed trees)(EIS, Vegetation Section, Affected Environment). See Chapter 3 of the EIS for effects analysis related to fuels for modified Alternative 3. Also see response to comment number 5873-14.See response to comment number 12346-55 about green trees.
120.01 - Purpose and Need	#14-3	Alternative 1 – No Action This alternative will not meet the purpose and need since no recovery will occur. This alternative will actually create conditions for long-term adverse effects as the untreated landscapes will once again be consumed by catastrophic wildfire as down fuels accumulate, over the next 10 - 15 years, from all of the untreated material. This has been the case on all of the past wildfire areas that have not been treated. Eventually, this area will burn again creating environmental effects greater than those from first fire. We don't believe this is what the public wants and is not in the best interest of taxpayer owned public lands.	The commenter is correct that Alternative 1 would not meet the purpose and need (draft EIS, Table 2-32. Effects to Fire and Fuels from Alternative 1 are disclosed in the EIS, Fire and Fuels section). Position statement; see response to comment number 16695-4.
120.01 - Purpose and Need	#17280-1	However, in this case I believe the project as proposed (alternative 2) has a number of very significant problems and will not meet the stated purpose (from the DEIS summary p. iii),: "There is a need for restored and fire-resilient forested ecosystems".	The commenter accurately quoted the purpose and need from Chapter 1 of the draft EIS. Positon statement; see response to Comment number 16695-4. All of the Action Alternatives (2-5) meet the Purpose and Need to some degree as displayed in the draft EIS, Table 2-32. The Forest Service has developed this project within the sidebars of required law, regulation, and policy. Thank you for your comment on the Westside Fire Recovery Project.

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120.01 - Purpose and Need	#18857-2	Purpose and Need for Action: The stated "Purpose and need for action" appears to be economic rather than ecologically based. I understand that you must manage the forest for various competing interests. As someone who has derived the bulk of my livelihood as a forest products producer and/or consumer I have concerns about this stated need for action. I spoke at the meeting with your staff regarding bidding qualifications to participate in the sale of the proposed project and it was clear that the qualifications due to bonding capacity and performance capacity in general are unattainable for the local small forester and timber business owner to truly participate in a way that directly benefits them. To be clear, I personally don't have interest in bidding on this project or its units. My concern is that the Forest Service is painting the false picture that somehow the economic benefits of this project are designed to be beneficial to the local communities economically. I'm not sure how that is possible when the treatment required can only be undertaken by large out of area corporations? The stated purpose of "a project that is economically viable…and benefiting our local communities" should come with some baseline criteria. If the desired result of the forest "recovery" is truly as you have stated please undergo some sort of formal review and/or sidebar development with the community as it pertains to economic recovery and community benefit. For instance, I propose the following questions be answered yes to truly satisfy the stated need: * Are the majority of project bid winners residing in the community? * Do the bid winners pay taxes in the local community? * Are the bid winning companies required to hire local labor? * Is the majority of the resulting harvest available for purchase within the bioregion? * Are the bonding requirements low enough to allow for local and regional business to participate? * Does the project support the local economy as it now functions? * Does the project support and strengthen other local and regional economic activities including Tourism? * Are there restrictions on log exports? I'm sure the community would willingly add to this list. Without a framework to manage the true benefit to the community, the desired results are really just talking points to divide the factions of the community that are pro salvage vs. pro environment. This has worked for the Forest Service in the past, but these issues are far more nuanced than currently being described in the various alternatives. The community and the forest stakeholders, including the Timber Industry really deserve more from the Forest Service in this regard.	The commenter has expressed a general comment, opinion, or position statement. Comments that state a position for or against the project are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. The full purpose and need for action is disclosed in Chapter 1 of the EIS. As described, there are three parts of the purpose and need, including ecological, economic, and social/safety needs for action. Contract development and awards for implementation are outside the scope of the analysis for this EIS; however, it is likely that the project will be split into multiple sales, which could address some of your concerns related to bonding or the feasibility of implementation within required time frames of contract(s). The comment regarding economic benefits and the local community is a position statement, not supported by scientific rationale. In terms of benefits to the local communities wildfire protection is addressed in the fire and fuels section of Chapter 3 of the EIS; benefits to safety and to the economic returns to Siskiyou County are addressed in the social and economic section of Chapter 3 of the EIS .As shown in Table 3-26, Alternative 2 would provide the greatest number of jobs as well as the most amount of revenue from timber sales and to the county.
120.01 - Purpose and Need	#18883-2	The Purpose and Need for action on pages 5 and 6 of the DEIS states: • The purpose and need of the project is to address the following: • There is a need for worker and public safety and access. • There is a need for safe conditions for firefighters performing fire suppression for community protection. • There is a need for a project that is economically viable, meeting project objectives and benefiting our local communities. • There is a need for restored and fire-resilient forested ecosystems. The potential for dead trees to fall on people driving vehicles on public paved or unpaved roads is infinitesimal. The Forest Service and Caltrans will remove any trees that fall on these roadways. Wind, rain and snow will cause dead trees to fall down gradually over a period of many years. Providing “safety” for people who work or visit in forested lands cannot justify the need for the project. What is a purpose and need for the project is taking measures to make the forest ecosystem resilient and sustainable. This should be the single greatest purpose of the project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The full purpose and need of the project, as referenced by the commenter, is described in Chapter 1 of the EIS. As described, the purpose and need of the project has multiple components, including ecological and forest health needs. All of the action Alternatives must meet the Purpose and Need for this project, there is no hierarchy unless otherwise described by the responsible official under rationale in the record of decision. The agency and its responsible official have discretion to determine the purpose and need of a given project. As trees continue to decay and fall, the likelihood of potential injuries or death to the public and forest workers would increase (EIS, Purpose and Need and Recreation Sections), especially in areas where people are know to travel or recreate.
120.01 - Purpose and Need	#19-1	None of the five analyzed alternatives actually meet all four of the listed purpose and need for the project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. All of the Action Alternatives (2-5) meet the Purpose and Need to some degree as displayed in the draft EIS, Table 2-32. The Forest Service has developed this project within the sidebars of required law, regulation, and policy.

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121.01 - Alts. Not Analyzed In Detail	#12346-53	The Council on Environmental Quality (CEQ) regulations that implement NEPA "define the circumstances under which multiple related actions must be covered by a single EIS." Thomas v. Peterson, 753 F.2d 754, 758 (9th Cir. 1985). The Ninth Circuit has determined that, while agencies should be given "considerable discretion" in defining the scope of an environmental analysis, an agency is required to consider more than one action in a single EIS if they are part of a single proposal or are 'connected actions,' 'cumulative actions,' or 'similar actions.' Native Ecosystem Council v. Dombeck, 304 F.3d 886, 893-4 (9th Cir. 2002); 40 C.F.R §1508.25(a)(1). The combined effects salvage logging to facilitate future fire suppression, and the impacts of that fire suppression, must be analyzed together in a single NEPA document. Actions are connected when they "cannot or will not proceed unless other actions are taken previously or simultaneously" or when they are "interdependent parts of a larger action and depend on the larger action for their justification." 40 C.F.R §1508.25(a)(1)(ii, iii). Where one project will not proceed but for the completion of another, it is a connected action and NEPA mandates that both actions be analyzed in the same document. Thomas, 753 at 759. The public has pointed out that the scoping notice and DEIS for this project repeatedly indicate that part of the purpose and need for the project (and alleged outcome of project activities) is the increased ability to suppress wildfire in the planning area. Indeed, the agency repeatedly frames the environmental analysis in terms of the impacts of alternatives on fire behavior and fire suppression and dismisses the No Action Alternative as not conducive to connected fire suppression objectives and actions. Given that one purpose of the project is to facilitate additional fire suppression the agency has a duty under NEPA to disclose the connected and cumulative impacts of fire suppression that implementation of the project is designed to facilitate. Attached to our scoping comments was a 2004 article from Conservation Biology entitled Impacts of Fire-Suppression Activities on Natural Communities by Backer et al. The abstract of that paper reads as follows:	The size, intensity, and location of future wildfire events or related agency emergency suppression efforts are an unknown event that is too speculative for the agency to consider in terms of either connected actions or actions considered for cumulative effects. The Fire and Fuels section of the EIS does describe the cumulative effects from current and future known projects and also discloses the general effects to future fire resiliency and fire suppression effectiveness (EIS, Chapter 3, Fire and Fuels Section). Connected actions are considered as part of the proposed actions; see Chapter 2 of the final EIS by alternative. See the Appendix of the final EIS for a description of Alternatives considered but eliminated from detailed study.
121.01 - Alts. Not Analyzed In Detail	#19076-11	The DEIS does not compare the other alternatives to the Karuk Alternative, submitted in March.	As described in the EIS, the Karuk Tribe Alternative was received by the Forest Service at at 4:30 pm, the day before printing (EIS, Alternatives Considered in Detail Section). A detailed response to the suggestions provided by the Tribe has been included in Chapter 2 of the final EIS under Alternatives considered through consultation. Many components of the Karuk Alternatives have been incorporated into the modified Alternative 3 (final EIS preferred Alternative), as described.

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121.01 - Alts. Not Analyzed In Detail	#5873-171	Consider the recommendations of the Society for Conservation Biology The Society for Conservation Biology in 2006 prepared a white paper summarizing the scientific approach to forest management after fire. This report was later peer-reviewed and published in Frontiers in Ecology and Environment 2006; 4(9): 481-487. Forest Management After Wildfire Forest landscapes that have been affected by a major natural disturbance—such as a severe wildfire or windstorm event—are commonly viewed as devastated and biologically impoverished. Such perspectives are usually far from ecological reality. Overall species diversity measured as number of species—at least of higher plants and vertebrates—is often highest following a natural stand-replacement disturbance and before re-development of closed-canopy forest. Important reasons for this include an abundance of biological legacies, such as living organisms and dead tree structures, the migration and establishment of additional organisms adapted to the disturbed, early-successional environment, and temporary release of other plants on the site from dominance by trees. Currently, natural, early-successional forest habitat—naturally disturbed areas with a full array of legacies (i.e., not subject to post-fire logging) and experiencing natural recovery processes (i.e., not seeded or planted)—are among the scarcest habitat condition in some regions, such as the Pacific Northwest.	We agree with the importance of early seral plant communities and the benefits described, however we do not agree that early seral plant communities are scarce on the Klamath National Forest. While the concern expressed for early seral plant communities may be applicable in the context of the Pacific Northwest at a regional scale, the commenter provides no evidence that the Westside Fire Recovery Project area or the west side of the Klamath National Forest has, or will have a shortage of early seral plant communities. Monitoring of the Northwest Forest Plan shows that since the inception of the Plan in 1994, over 200,000 acres of northern spotted owl nesting / roosting habitat has been converted to early seral habitat by stand replacement fire (Appendix E, figure 1) in the Klamath Province of northern California; over 150,000 of those acres are in reserves. In the Westside Fire Recovery Project Area, about 52,000 acres burned with moderate to high severity where more than 50% of the trees present were killed (EIS Chapter 2). Over 100,000 acres burned with low or very low intensity where mortality occurred, but was less than 50%. Considerable secondary mortality in fire damaged trees has occurred in areas that were less than 100% mortality since the fire because of drought stress and insect attack, contributing to a patchy mosaic in areas that did not experience stand-replacement fire. Alternative 3 Modified incorporated this concern in the selection of units for salvage and planting; many smaller salvage units were dropped from consideration to maintain mosaic habitats, as were several hundred acres of isolated site prep and plant units. Risk reduction salvage harvest is proposed on about 5,760 acres, with site preparation and planting proposed on an additional 7,130 acres in Alternative 3 Modified. Combining salvage units and site prep and plant units, a total of about 12,900 acres (25%) of the 52,000 acres of moderate to high intensity burn would be replanted; about 39,000 acres (75%) of the areas where most of the trees were killed would remain untreated and would go unimpeded through the long early seral plant community described by the commenter. This includes smaller mosaic burned areas, and all high mortality burn patches that are less than 20 acres in size. This pattern where no salvage is proposed is more typical of the small patch size of northern California forests described by Wills et al. (1994) and others than the larger patches proposed for salvage harvest and replanting. Leaving these small patches untreated maximizes the heterogeneity that benefits northern spotted owls described by Franklin (2002). Areas that would not be planted also include multiple large patches ranging in size from a few hundred acres to well in excess of 1000 acres of fire-killed older trees in the Grider Creek Inventoried Roadless Area. While not a project objective, this does provide early seral plant communities at multiple scales. Appendix E provides an assessment of the fire area within the Late-Successional Reserve land allocation. Within the Late-Successional Reserves, about 28,700 acres had moderate - high severity fire of which about 3,870 acres are proposed for salvage in Alternative 3 modified. This represents about 5% of the area within the Late-Successional Reserve fire perimeter and about 13% of the high severity burn in the Late-Successional Reserve. Site preparation and planting is proposed on about 3,475 acres of the moderate - high severity burn in the Late-Successional Reserve. Combining salvage and site prep and plant units, about 7,345 acres, or 26% of the moderate to high severity burn in the Late-Successional Reserve would be reforested; about 74% would go through the long early seral plant succession described by the commenter. Even in Alternative 2, the most aggressive salvage Alternative, about 14,500 acres (6,630 salvage, 7,860 site prep and plant) or 28% of 52,000 acres of moderate-high severity burn would be replanted; over 70% of the moderate-high severity burn area would proceed unimpeded through the long early seral plant community phase described by the commenter. Given the frequent, low severity fire regime of the Klamath (See Chapter 1; also Appendix E) it is unlikely that the very large high mortality patch sizes created by the Westside fires in 2014 were typical of the Klamath. It is more likely that the fire history of the Klamath produced a patchy mosaic stand structure (Wills et al. 1994). About 65% of the Westside Fire Areas were very low or low intensity burns that have this mosaic structure. Several thousand acres of high severity burn in small patches (less than 10 acres) are also not included in any salvage proposal as directed by the standards and guidelines for salvage in Late Successional Reserves. Thus, the small patch size texture stand mortality more typical of the Klamath has been retained in all alternatives.An important point that the comment fails to consider is that even areas that are site-prepped and planted will also go through an early seral plant community phase, although that phase in planted areas will be shorter than in unplanted areas by several decades. The comment also fails to consider that the 2014 Westside fires were only a part of the recent large stand replacement fire history on the Klamath National Forest (See Figure 1 Appendix 1). The adjacent Stanza Fire (2000-check date) and the 2008 Panther Fire (2008 - check date) provide tens of thousands of acres of early seral habitat that has not been planted or otherwise treated. From this, we conclude there is no shortage of early seral plant communities on the west side of the Klamath National Forest. See response to comment number 12346-55.The project does include specific project design features to retain legacy trees and snags (EIS, Chapter 2, Project Design Features Wildlife 11 and 12) and no salvage is proposed within wilderness, backcountry, research natural areas, designated or recommended wild rivers, inventoried Roadless Areas, or Riparian Reserves associated with stream channels or high ranked northern spotted owl cores (EIS, Chapter 2, Alternative 2 description).

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121.01 - Alts. Not Analyzed In Detail	#5873-172	Key Findings: • Research by both ecologists and foresters provides evidence that areas affected by large-scale natural disturbances often recover naturally. Post-burn landscapes have substantial capacity for natural recovery. Reestablishment of closed forest following stand-replacement fire characteristically occurs at widely varying rates, providing temporary, but ecologically important and now rare early-successional habitat for a variety of native species and key ecological processes. • Post-fire logging does not contribute to ecological recovery; rather it negatively impacts recovery processes, with the intensity of such impacts depending upon the nature of the logging activity. Post-fire logging in naturally-disturbed forest landscapes generally has no direct ecological benefits and many potential negative impacts from an ecological standpoint. Trees that survive the fire for even a short period of time are critical as seed sources and as habitat that will sustain many elements of biodiversity both above and below ground. The dead wood, including large snags and logs, is second only to live trees in overall ecological importance. Removal of these structural legacies— living and dead—is inconsistent with our scientific understanding of natural disturbance regimes and short- and long-term recovery processes. • Post-fire logging destroys much of whatever natural tree regeneration is occurring on a burned site. This is a fundamental concern since these tree seedlings are derived from local seed sources, which are most likely the best adapted to the site. Furthermore, environmental variables, such as moisture and temperature conditions, are major selective factors in determining which natural tree seedlings survive, which favors genotypes more tolerant of environmental stresses than are nursery- or greenhouse-grown seedlings. • Evidence from empirical studies is that post-fire logging typically generates significant short- to mid-term increases in fine and medium fuels. In some cases this may result in increased reburn potential rather than a decreased reburn potential, as is often claimed. In any case, from an ecological perspective large wood is of demonstrated importance in ecological recovery; removing this wood in an attempt to influence the behavior of a potential reburn event has little scientific support. • In forests subjected to severe fire and post-fire logging, streams and other aquatic ecosystems will take longer to return to historic conditions or may switch to a different (and often less desirable) state altogether. Following a severe fire the biggest impacts on aquatic ecosystems are often increased sedimentation caused by runoff from roads. High sediment loads from roads may continue for years, greatly increasing the time for recovery. • Post-fire seeding of non-native plants generally damages natural ecological values, such as reducing the recovery of native plant cover and biodiversity, including tree regeneration. Non-native plants typically compete with native species, reducing both native plant diversity and cover. Reductions in natural tree regeneration as a result of seeding of non-native plants have also been reported in numerous studies. • Post-fire seeding of non-native plants is often ineffective at reducing soil erosion. Aerial seeding of grasses (primarily non-native) is common on federal lands following moderate- to high-severity fire to reduce postfire erosion. The effectiveness of seeding in reducing erosion is mixed. Grass seeding generally does not mitigate erosion during the first winter following fire, when seeded grasses are not yet well established. Seeding may slow erosion during the second year following fire but is rarely effective during intense storms. • There is no scientific or operational linkage between reforestation and post-fire logging; potential ecological impacts of reforestation are varied and may be either positive or negative depending upon the specifics of activity, site conditions, and management objectives. On the other hand, ecological impacts of post-fire logging appear to be consistently negative. Salvage and reforestation are often presented as though they are interdependent activities, which they are not from either a scientific or operational perspective. From a scientific perspective, policy and practice should consider each activity separately. As noted above, post-fire logging is a consistently negative practice from the standpoint of ecological recovery. Natural tree regeneration is ecologically most appropriate, but intentional reforestation could also be designed to provide significant ecological benefits in some cases. • Accelerated reestablishment of extensive closed forest conditions after fire is usually not an appropriate objective on sites managed with a major ecological focus. Wildfires have been viewed historically as events that destroy valuable standing forest and create undesirable expanses of deforested (i.e., unproductive) landscape. Reestablishment of fully stocked stands of commercially important tree species on burned sites has been a fundamental forest management objective on most private and public forestlands; hence the historic commitment to	This comment provides general literature citations that are not specific to the effects of the proposed Westside Fire recovery Project. Literature citations or opinions that assert an impact may happen are not the same as a site specific analysis that demonstrates probable impacts. We do agree that without follow-up activity fuel treatment, salvage logging would increase fire risk and intensity because it would convert smaller diameter limbs and tops to surface fuels that readily carry fire (Thompson et al. 2007). All of the activity fuels would be treated in any of the Alternatives. In an often cited study of reburns in the Biscuit Fire in southwest Oregon, Thompson et al (2007) concluded that: “reducing connectivity of surface fuels at landscape scales is likely the only way to decrease the size and severity of reburns until vertical diversification and fire resistance is achieved.” That is precisely the objective of the salvage units in the Westside Fire Recovery Project, and the reason that leaving all of the dead wood now present on the landscape would not meet the Project objectives. Reforestation objectives on the Westside Fire Recovery project are not a closed canopy forest. We agree that extensive uniform planting would not create the heterogeneity that we seek to reestablish on the landscape; trees will not be planted uniformly as the comment suggests. The reforestation stocking objective after planting in the Westside Fire Recovery Project is a stand of 75 to 225 variably spaced young trees with treated, discontinuous activity fuels, not densely stocked regularly spaced plantations that form continuous fuel beds. Stand density would vary with slope position and aspect with lower stocking on upper slopes and south and west aspects and higher stocking on north and east aspects that would form a closed canopy on lower slopes. Hardwoods would be included in the target stocking levels so the number of conifers would be less where hardwoods occur. Most reforestation units in the Westside Fire Recovery would be planted at lower densities as most of the units are on upper slopes. We also anticipate there would losses from future fires that would further reduce stand density. Our long term objective is 30-50 large, variably spaced, fire resilient trees per acre with openings as described by Taylor and Skinner (1996). Legacy structures are being retained wherever they occur as are green trees. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. The final EIS and supporting documents incorporate best available science. See also comment response to 12346-55.

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		intensive reforestation. However, timber production is no longer the primary objective on many federal lands, where the focus on provision of biodiversity and ecosystem services equals or exceeds wood production objectives. The ecological importance of biological legacies and of uncommon, structurally complex early-successional stands argues against actions to achieve rapid and complete reforestation except where the primary goal is wood production. In addition, it is also inappropriate to re-establish fully stocked stands on sites characterized by low severity fire—the same sites where managers are trying to restore fuel loadings to their historical range of variability. • Where timber production, other societal management goals, or special ecological needs are the focus, planting or seeding some native trees and other plants using local seed sources may be appropriate. Ecological assessments of the post-burn area and considerations of management objectives should be used to determine appropriate activity. Special ecological circumstances might include a need to restore an uncommon plant species or habitat for a threatened or endangered species. Innovative practices, such as low or variable density planting, will likely be more appropriate ecologically than traditional practices that involve dense tree plantations of one or a few commercial species. Dense uniform conifer plantations are always inappropriate on sites characterized by low-severity fire unless the intent is intensive management of such sites for wood production. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests Reed F. Noss (editor), Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. February 24, 2006. http://www.conservationbiology.org/sections/namerica/FireWhitepaper.pdf See also the published version, Reed F. Noss (editor), Jerry F. Franklin, William L. Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecology and Management of Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. August 2006. http://www.conbio.org/images/content_policy/2006-8_SCB_NA_Statement_Wildland_Fire.pdf	
121.01 - Alts. Not Analyzed In Detail	#5873-85	Please consider at least one non-commercial, restoration-only alternative that invests in restoration and recovery of the fire area by, for instance, eliminating livestock grazing, emphasizing native species recovery, not building any new roads, stabilizing soils disturbed by the fire suppression effort, decommissioning unneeded roads.	The Westside Fire Recovery Project is intended to promote recovery in areas burned during the 2014 Beaver, Happy Camp Complex, and Whites fires. All of the actions proposed are intended to restore the landscape (EIS, Chapter 1 and 2). Eliminating livestock grazing is beyond the scope of the Project. Native species recovery is best accomplished by controlling non-native invasive species and protecting existing meadow ecosystems. Both actions are proposed See Chapter 3-Botany. Only fire-adapted native species would be used in reforestation. Burned Area Emergency Action work stabilized areas disturbed by fire suppression actions. The project does not build any new permanent roads. The project does use old temporary roads that have been previously constructed. These will be put to bed when use is completed (see Chapter 2 - Project Design Features for watershed). There will be no net increase in road density from the Project. Legacy sites that adversely affect water quality are also proposed for treatment (See Chapter 3 - Water Quality and also Waiver Application to the North Coast Regional Water Quality Control Board). Grazing permits are outside the scope of this project; see the grazing report for details. The area that are least likely to meet the conditions described in the Forest Plan are the areas where no treatments are proposed. Also see response to comment number 12346-55. Also see response to comment number 12364-1.
121.01 - Alts. Not Analyzed In Detail	#5873-86	Also, consider an alternative modeled on the recommendations of the Beschta report. Specifically: • prohibit post-fire logging AND roadbuilding on all sensitive sites, including: severely burned areas (areas with litter destruction), on erosive soils, on fragile soils, in roadless/unroaded areas, in riparian areas, on steep slopes, and any site where accelerated erosion is possible. We would add: Late-Successional and Riparian Reserves, and protective land allocations or designations including Botanical and Scenic River Areas; • protect all live trees; • protect all old snags over 150 years old; • protect all large snags over 20 inches dbh; • protect at least 50% of each size class of dead trees less than 20 inches dbh. See Beschta RL, Frissell CA, Gresswell R, Hauer R, Karr JR, Minshall GW, Perry DA, and Rhodes JJ. 1995. Wildfire and Salvage Logging: recommendations for ecologically sound post-fire salvage logging and other post-fire treatments on Federal lands in the West. Corvallis, OR: Oregon State University. Available at: http://www.fire-ecology.org/science/Beschta_Report.pdf.	The Beschata Report is addressed in Table 2-36 of the draft EIS. The Beschta Report was not specific to the conditions of the Klamath National Forest or the Westside Recovery Project. Implementing the recommendations of the Beschta Report would not contribute to the project goal of restoring resilient fire adapted ecosystems typical of the Klamath Province. See response to 12346-55.

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121.05 - Range of Alternatives	#12355-2	I've looked at the Karuk Tribe alternative for this project. I like their ideas on fuel breaks but there is no way we can just leave all the dead and dying burned trees out in the forest as they propose. Those burned trees needs to be removed in order to reduce dangerous fuels that will accumulate over time and make bigger and more dangerous fires in the future. We have to act now to get this work done by selling the burned trees - there's no way that the federal government (tax payers!) can afford to PAY to have them removed after they are rotten and worthless. After their value is gone, the Forest Service will just be leaving a time bomb for future generations in our communities. Why is that a good idea when we can get work done now and make conditions better? Please get this project done as quickly as possible. Please do as much salvage harvest as you can in order to reduce fuels in all areas where the fire burned. Please remove danger trees from along our roads so that the public can use the roads and firefighters can get to future fires safely. Please remove fuels as much as you can around private property and utility lines and other needed infrastructure. Please plant areas to help them recover from the devastation they've been through. In our lifetimes, we will never get our forests back to where they were before the 2014 fires. We can help start them on the right path to recovery for our kids and grandkids with the Westside Fire Recovery Project.	See Chapter 2 for a description of actions proposed by Alternative. A detailed response to the suggestions provided by the Tribe has been included in Chapter 2 of the final EIS under Alternatives considered through consultation. Many components of the Karuk Alternatives have been incorporated into the modified Alternative 3 (final EIS preferred Alternative), as described. The final EIS preferred Alternative includes fuels reduction, fuel break treatments, and wildland urban interface treatments; see Chapter 2 of the final EIS.
121.05 - Range of Alternatives	#12471-1	Clear cutting is often bad for forests because it means that when the forest grows back, the trees will all be of mostly the same age, hence equally susceptible to blights such as the mountain pine back beetle. Forests often do best by having both a diverse mix of tree species as well as age. Selling environmental treasures simply for corporate profit short-changes and robs the public. However, if the proposed logging following an environmental impact study would benefit the environment, I would not be opposed to it.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is proposed; see Chapter 2 of the EIS for a description of proposed actions. The project proposes salvage logging following a wildfire. Green trees that exist in salvage units would be left according to the marking guidelines (EIS, Chapter 2, Alternatives Considered in Detail, Alternative 2; Chapter 3, Vegetation Section). Reforestation prescriptions would vary by unit and be specific to each unit based on historical composition (EIS, Chapter 2, Alternative 2, Reforestation and Release section). The project would provide a benefit to the environment by reducing the amount of time needed to restore the site to a sustainable coniferous forest (EIS, Chapter 3, Vegetation, Alternative 2, Direct and Indirect Effects section).
121.05 - Range of Alternatives	#17482-4	Need to log burned areas, and replant the areas. In doing so would help infestation of bugs. In to live trees, especially in low water years. Help stop soils erosion of burned areas. Need to replant hot burn areas because of natural seeds are gone. Open up areas to fire wood cutting to help remove dead timber. Active log all areas to cut fuels down in future. Replant logged areas to have future forest and a healthy forest. Make the forest a reusable resource that is used for all uses including grazing. Help future fuels and healthier grasses and forests. Bring back a healthy economy and forest and watershed, including wildlife and fisheries.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a description of actions by Alternative. Grazing is outside the scope of the project. The final EIS preferred Alternative includes salvage harvest, planting, and fuels reduction. The Action Alternatives propose various levels of salvage and re-planting (EIS, Alternatives Considered in Detail) and all would include the opportunity for firewood cutting of non-merchantable trees felled during roadside hazard treatments (EIS, Recreation Section). In addition, all of the Alternatives include project design features and Best Management Practices which would minimize erosion from project activities and provide for a healthy watershed. Modified Alternative 3 is the final EIS preferred Alternative. Effects to the economy and watershed are described in Chapter 3 of the EIS under those sections.

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121.05 - Range of Alternatives	#18894-1	EPA supports the use of best management practices to effectively protect water quality. We understand that the Forest Service is working with the State Water Quality Resources Control Board to implement mitigation measures to reduce adverse impacts to watersheds in the project area such as sedimentation and temperature variation. The EPA commends the Forest Service for limiting operations in areas containing species of concern. We recommend that the Final Environmental Impact Statement fully commit to protecting intact critical habitat for species of concern such as the northern spotted owl, coho salmon, eagles and pacific fisher. While salvage of dead trees could destroy some potential habitat, we understand that the Forest Service anticipates that the vast amount of remaining unlogged charred and/or dead trees will be enough to sustain the surviving wildlife species dependent pn ~p~t-fire environments. We recommend that the FEI5 include the results of consultation ~i~tl~ the ~Ji{itè~ States Fish and Wildlife Service and the National Oceanic and Atmospheric Administration if appropriate. We recommend that the FEIS include a closure and restoration plan for the proposed temporary roads and landings when the project is completed. EPA appreciates that the Forest Service cites and uses recommendations in the 2014 Council on Environmental Quality Draft Greenhouse Gas guidance in the DEIS, and we believe it was helpful to include an estimate of greenhouse gas emissions. We also note that estimates of carbon storage were not provided, based on a conclusion that carbon storage "is not well quantified or thoroughly understood, especially at the project level." While a calculation of carbon storage may not be relevant in this particular fire recovery project, we recommend that the Final EIS provide additional information as to why carbon storage was not calculated, recognizing that the Forest Service has several tools and calculators that can estimate carbon storage. Finally, we also recommend that the FEIS include, in addition to estimates of average global temperature increases, estimates from the US Global Change Research Program for average temperature increases in the U.S.	Project specific Project Design Features (EIS, Project Design Features Sections) and Best Management Practices (EIS, Appendix D) have been included in this project. The EIS includes an Alternative that was developed in consultation with the U.S. Fish and Wildlife Service. Project Design Features will be implemented to aid in successful closure and rehabilitation of temporary roads and landings. Specific project design project design features include watershed-20 (proper stock piling of material), watershed-21 (proper spoiling of material), watershed-22 (closure, blocking, and soil cover of temporary roads), and watershed-23 (erosion control and rehabilitation of landings) will be implemented with any project action Alternative. Any project action Alternative requires enrollment in the North Coast Regional Water Quality Control Board's waiver of waste discharge program. Conditions of this enrollment include a legacy sediment site inventory and treatment plan as well as adherence to the Water Board Monitoring and Reporting Program. This program requires assessment and reporting of the implementation and effectiveness of project Best Management Practices. The specific watershed project design project design features outlined above are examples of these Best Management Practices. Additional information has been added to Chapter 3 of the EIS under climate change to clarify why carbon storage was not calculated. Estimates of average temperature increases in the US have also been added.
121.07 - Blended Alternative Suggestions	#10329-1	The Forest Service needs to be a good steward of the land, joining with fire ecologists, impacted communities and local tribes to focus on restoration and fire safety. Please do not push divisive controversial clear-cut logging proposals on steep slopes in key watersheds. Fire is an inevitable and natural occurrence in this area and it is wrong to exploit wildfire to give permission to fast-track controversial illegal logging. These forests belong to all Americans and the Northwest Forest Plan becomes meaningless if reserves are not protected from impulsive decisions. Klamath National Forest timber planners should not be above the law. Please follow the Northwest Forest Plan. Please focus logging along major access roads and protect the most important and vulnerable recovering areas.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.07 - Blended Alternative Suggestions	#12293-2	I am appalled that the Klamath National Forest has proposed clearcut logging of "late-successional" old-growth reserves and geological riparian reserves in the Westside Salvage Project. Fire is natural and inevitable in this area. Wildfire prevention is not why lumber companies want to do this illegal logging. They are trying to wring private profit out of protected forests that belong to all Americans. If reserves are only protected until lumber companies decide to log them, the Northwest Forest Plan is meaningless -- and the officials charged with carrying it out are useless. I trust you are better than that. I trust you will listen to fire ecologists, local tribes and impacted communities and focus your efforts on restoration and fire safety. I trust you will stop any and all clearcut logging proposals on steep slopes of these key watersheds and in critical wildlife habitat areas. Follow the Northwest Forest Plan. Focus logging along major access roads only. Protect the most important and vulnerable recovering areas: -- the late-successional old growth and the geological reserves.	Thank you for your comments not the Westside Fire Recovery Project. Clearcut logging is: an even-aged management silvicultural system applied to green forest stands for the purpose of regenerating a new age class. Trees are selected and removed in groups up to 40 acres in size followed by artificial and/or natural regeneration. Salvage logging is: the removal of dead trees after a natural event, for example after a wildfire, in order to remove hazards to public safety, capture the economic value of burned trees, and/or remove excessive fuel accumulation. Dead trees (or snags) exceeding those needed by other resources are removed. Although, some salvaged areas may appear similar to clearcuts but the difference is that salvaged trees were killed and their size and location were determined by the natural event. Salvage is generally followed by artificial and/or natural regeneration. Salvage harvest is a fuels reduction activity that will over time help protect the remaining adjacent late successional habitat and promote that late successional character by accelerating the regeneration to a forested stand that will eventually regain those "old growth" characteristics. The Westside Fire Recovery Project includes a fuels reduction effort where the timber sale is the tool to achieve those fuels reduction goals.

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121.07 - Blended Alternative Suggestions	#12347-1	We live in Scott Bar, California, at the eastern boundary of the Happy Camp Complex Fire. Alternative #2 is the best of those alternatives offered in the draft EIS. The fire killed vast numbers of trees, and we need as much salvage logging as possible to reduce the threat of future wildfires. Our community has been devastated by these recent fires. If salvage logging is not done, then in 10-15 years when the brush and small trees have grown up and the fire killed trees start to fall, the next fire that comes through here will be truly catastrophic. We also desperately need to have clearing on USFS public lands near our community. We have invested much local effort in clearing private lands to reduce the threat of wildfire, and when public lands remain overgrown they serve as a conduit to bring wildfire right into the heart of our community. Please help us by implementing alternative #2, and adding extra salvage logging in the burned area, and more wildfire fuels reduction on public lands in and around our community. Thank you.	Thank you for your comments on the Westside Fire Recovery Project. As outlined in Chapter 1, Purpose of and Need for the Action, of the EIS, the Project aims to protect worker and public safety and access, provide safe conditions for firefighters performing fire suppression for community protection, and restore the areas to a fire-resilient forested ecosystem.
121.07 - Blended Alternative Suggestions	#12350-1	I respectfully recommend: * Re-planting impacted whitebark pine (with disease-resistant stock available from USFS Dorena). * No salvage logging or planting units within Inventoried Roadless Areas, including the Grider, Tom Martin, Russian, Snoozer, Kelsey, or Johnson Roadless Areas. * No salvage and no tree planting units in Late-Succesional Reserves. * No salvage units in Riparian Reserves. * No salvage in Critical Habitat for NSO. * No salvage logging in designated or recommended Wild and Scenic River segments. * No salvage units in the Grider Creek drainage to protect roadless values, watershed values, scenic values - such as the Pacific Crest Trail (PCT) and connectivity between the Marble Mountains Wilderness and the adjacent LSRs. * No salvage in endemic or rare conifer stands and adjacent available habitat. This would include foxtail pine (Pinus balfouriana), Baker's cypress (Cupressus bakeri), and Brewer spruce (Picea breweriana) to allow for natural regeneration. * No new roads, either permanent or temporary. Minimize tree planting to highest severity frontcountry sites. * No salvage logging should take place in partially burned stands that sustained minimal (less than 70%) mortality. Undamaged or partially fire damaged stands provide disproportionately important roles in ecological recovery and refugia for the survival of particular biota. * No salvage logging in high elevation sites above 6,000', including mountain hemlock (Tsuga mertensiana), red fir (Abies magnifica), and white fir (Abies concolor) plant communities. * Retain the largest live trees and snags in all salvage units. Consider the retention of snags in aggregates with scattered large snags in between the aggregates. Consider retaining groupings of snags around existing live trees.	Thank you for your suggestions for the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter makes suggestions; however, the commenter fails to provide evidence or reasons for the suggestions made. We considered best available science during the development of this proposal plus the ideas and suggestions of many interested groups and individual. Some of the suggestions are being proposed to varying degrees by different alternatives. A variety of tree species are proposed for planting; planting is proposed is some Roadless Areas, salvage and tree planting are proposed in Late Successional Reserves; no salvage harvest is proposed in hydrologic Riparian Reserves; salvage harvest is proposed in NSO Critical Habitat; no salvage logging is proposed in Wild River corridors; salvage harvest is proposed in Grider Creek; project design features are in place for protected plant species; See Chapter 2 of the EIS for a description of what is being proposed, including project design features to mitigate for resource impacts. See response to comment number 12346-55. See Chapter 2 for Alternatives considered but eliminated from detailed study and the reason for it. Also alternative 5 only proposed salvage harvest in matrix (areas not considered to be Late Successional Reserves, Riparian Reserves, or Inventoried Roadless Area, for example); see the effects of Alternative 5, as compared to the other action alternatives.
121.07 - Blended Alternative Suggestions	#12364-3	There is a better way. Please drop the riparian logging (research says the boles of trees provide significant water cooling shade), drop the road construction and leave high risk decommissioned roads decommissioned. Instead implement the Westside Partnership approach which stresses community protection and preparing strategic ridges for the next fire.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No salvage harvest of hydrologic Riparian Reserves are proposed; see Chapter 2 for a description of proposed actions. The project results in discountable negative effects to stream shade (Chapter 3 under hydrology section) for all action Alternatives as a result of watershed project design features for shade for roadside hazard, temp road and landing, and fuels treatments in Chapter 2 of the final EIS. Also see response to comment number 12364-1. The project emphasizes and incorporates fuel management zones, ridgetop fuel break, and other treatments for community protection. Salvage harvest also serves to reduce the amount and continuity of fuels. See fuels analysis in Chapter 3 of the final EIS.
121.07 - Blended Alternative Suggestions	#12364-5	Instead act to restore fire as an essential component of Klamath Forest ecosystems by implementing the Western Klamath Partnerships approach.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.07 - Blended Alternative Suggestions	#14307-1	Follow the Northwest Forest Plan. Focus logging along major access roads and protect the most important and vulnerable recovering areas: the late-successional and geological reserves.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 12467-4.

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121.07 - Blended Alternative Suggestions	#17281-1	Logging along existing, properly maintained road systems. No new road building, nor opening decommissioned roads to facilitate logging. Proper restoration of logged areas, including: Piling and burning Proper replanting of site-appropriate species (white/tan oak and madrone on south-facing slopes, widely spaced mixed conifers (sugar pine, incense cedar, port-orford cedar, ponderosa pine, douglas-fir on north slopes) or no replanting at all. 200-foot buffers along all stream channels, including intermittent and ephemeral stream channels No use of pesticides, herbicides, fungicides, or any chemical agent intended to kill or maim flora or fauna Increased prescribed burning in the fall to increase fire resiliency and fire return intervals to mimic historic practices Dedicated oversight to ensure these practices are implemented. I have been a dedicated volunteer to the Klamath National Forest for the past 8 years, assisting the Happy Camp Ranger District and Karuk Tribe annually to perform needed assessments of summer steelhead, spring Chinook, and pacific lamprey surveys in tributaries all throughout the Westside Fire Recovery Project area. I have stake in the management of the Klamath National Forest as an American citizen and have a deep appreciation and love for the landscape and all the beings that inhabit the skies, slopes, and waters of the Klamath River and its tributaries. I believe that the Karuk Tribe and Mid-Klamath Watershed Council have been doing excellent work to create partnerships with local, regional, and national stakeholders to ensure maximum productivity and fire resiliency to all aspects of the Karuk Tribe's Aboriginal Territory, managed as the Klamath National Forest, and I would like to see the Karuk Tribe's proposed alternative selected as the preferred alternative. Feel free to contact me if you have any questions. Thank you for your time and your work.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.
121.07 - Blended Alternative Suggestions	#17313-3	However, we feel that the criteria for eliminating temporary roads in Alt. 4 is unnecessarily conservative. We urge a site specific assessment of each temporary road. We support temporary road actions in cases where the road would have low environmental cost and would facilitate fuels treatments strategically important for community fire protection. In such cases, we support temporary road actions regardless of the overall condition of the 7th field watersheds, key versus non-key watersheds, or LSR versus General Forest Management Areas. We consider low environmental cost to be roads with no stream crossings or stability problems, or new construction without significant cut and fill (generally flat ground to slopes of 10% or less).	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.07 - Blended Alternative Suggestions	#17313-7	We would like to see the additions of some fuelbreak treatments where gaps have been perhaps unintentionally omitted from Alt. 2. These areas would include gaps between roads 16N04 and 16N39, and between milepost 3 and 4 on road 45N19 in Lower East Fork Elk Creek (between sections 30 and 31).	. Additional fuel breaks have been incorporated from the Karuk Alternative into the new preferred alternative, Modified Alternative 3. See Chapter 2 for a discussion of how the Karuk Alternative was considered and incorporated and for a description of the preferred alternative.
121.07 - Blended Alternative Suggestions	#17313-8	We think that none of the Forest Service alternatives adequately treat the mid-slope burned area between Frying Pan Ridge and Grider Ridge. There are large burned areas with no treatment proposed. There are treatment opportunities along road systems identified in the 2014 Happy Camp Community Wildfire Protection Plan that could be used for control features for a wildfire or prescribed fire in this area. We favor broadcast burning or underburning as a fuels reduction treatment for both natural and activity fuels and as a site preparation method, and would like to see it included as a tool and implemented as often as practical. We generally support no salvage in Riparian Reserves unless there is site specific information that shows a low environmental cost and important benefits from fuels treatments.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 for a description of the proposed actions. Fuels reduction treatments, including underburning are proposed. No salvage in proposed in hydrologic Riparian Reserves; however, fuels treatments are proposed where appropriate.
121.07 - Blended Alternative Suggestions	#17315-1	Please log the Klamath wisely with a light hand. No big roadside equipment etc. that will desecrate and harm the landscape. We can do better. Preservation of the resource comes first.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter provides no rationale in support of these statements. See Chapter 2 of the final EIS for a description of proposed actions and Chapter 3 for a discussion of effects. Treatments are designed to meet the purpose and need of the project per Chapter 1 of the final EIS and to be consistent with law, regulation, and policy.

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121.07 - Blended Alternative Suggestions	#17325-1	As proposed, the Westside project entails too much impact against salmon runs, water quality, old growth forests, and roadless areas that have been proposed as additions to the Marble Mountain Wilderness. Too much logging and too many new or rebuilt roads are in the proposal. We are especially opposed to elements of the project that would damage resource values on the Klamath, Scott and North Fork Salmon wild and scenic rivers and segments of Elk Creek, Grider Creek, and South Fork Russian Creek that have been recommended by the Forest Service for Wild & Scenic Rivers protection. We are opposed to any logging or mechanical entry within roadless areas, including those proposed in Senator Boxer's bills in 2002 and 2006 for addition to the Marble Mountain and Russian Wilderness areas. We are glad to see that the Karuk Tribe has proposed an alternative that will better protect rivers, salmon habitat, old growth forests, proposed W&SR rivers and roadless areas. We favor the Karuk alternative because it uses natural forest regeneration, provides for community safety through fire-adapted activities, and is based on current scientific findings about post-fire recovery. Please designate the Karuk Tribe alternative as your preferred alternative for the Westside Fire Recovery Project. Above all, please protect the irreplaceable values of salmon habitat, proposed wilderness additions, and roadless areas.	See Chapter 2 of the EIS for a description of treatments; no salvage harvest in Roadless Areas is proposed, only roadside hazard (salvage logging) where roads intersect Roadless Areas. Project design features are in place to mitigate impacts to scenery--see Chapter 2 of the final EIS. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.. See Chapter 3 for the effects by resource area.
121.07 - Blended Alternative Suggestions	#17366-1	The Forest Service proposal may well be the largest logging operation ever proposed on the Klamath National Forest in northwest California. They claim that they need to "salvage" timber burned in last year's wildfires, but the proposed project threatens water quality in several existing and proposed Wild & Scenic Rivers and may harm fish habitat and the threatened coho salmon, as well as old growth forests home to the Northern spotted owl. The level of logging and road building proposed is simply too much. While some removal of hazard trees along public roads and strategic fuels treatments are needed to protect local communities, I am concerned that the Forest Service plan overall will continue to perpetuate the agency's century-old exclusion of fire and plantation forestry. I am particularly concerned about proposed activities that could adversely impact the existing Klamath, Scott, and North Fork Salmon Wild & Scenic Rivers and segments of Elk Creek, Grider Creek, and South Fork Russian Creek recommended by the Forest Service for Wild & Scenic protection. In addition, I am opposed to any logging and mechanical entry into roadless areas, including areas proposed in legislation introduced by Senator Barbara Boxer in 2002 and 2006 for addition to the Marble Mountain and Russian Wilderness areas.	Thank you for your comments on the Westside Fire Recovery Project. Information regarding Wild and Scenic Rivers can be located within the Wild and Scenic Rivers Resource Report available on the Project website. Position statement. See response to Comment number 16695-4
121.07 - Blended Alternative Suggestions	#17384-1	Protecting rivers from pollution and over-use has always been the most effective means of ensuring diversity and productivity in our environment. It is especially important during this time of drought. Wise use is more effective than a technological fix later.	Thank you for your comment on the Westside Fire Recovery Project. The purpose and need in Chapter 1 of the EIS includes improvements to watershed. Chapter 2 includes a description of effects, including project design features to mitigate for watershed protection and the treatment of legacy sites for the improvement of watershed conditions. See Chapter 3 of the EIS for a discussion of effects.
121.07 - Blended Alternative Suggestions	#17387-1	I am writing to express my concerns about the proposed Westside Recovery Project. When deciding on a plan of action, please prioritize ecological benefit above economic incentive. While some tree removal may be beneficial to ensure roadway safety and to maintain strategic fire breaks, the ecological health of the burned areas would be best supportive by little or no tree removal. Large snags and downed logs provide habitat and biomass that will seed the natural regeneration of burned areas. Especially the large snags in Late-Succesional Reserves (LSR's) should be left intact. We should not replace burned LSR's with high-density single species plantations. These plantations do little to encourage ecological health or fire safety. There are many such areas already in our region in need of thinning for tree health and fuels reduction. I strongly feel that the Forest Supervisors should focus funds and logging activates on these overcrowded historic plantations instead of harvesting from burned LSR's. Please do not cut corners to push through a recovery plan that has not been fully explored for environmental impacts. Allowing expedited logging of burned areas will only set a precedent in forest management to encourage the catastrophic burning of large areas in order to create an economic product. That type of strategy would be short-sighted, dangerous, and a waste of our natural resources.	Thank you for your comments on the Westside Fire Recovery Project. Information regarding Late-Successional Reserve's can be located in the Wildlife Resources Report located on the Project website.

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121.07 - Blended Alternative Suggestions	#17387-3	Retention of large snags and logs are critical parts of the natural recovery processes and none of this wood legacy can be demonstrated as being in excess to ecological needs on moist forest sites; indeed, all of the scientific evidence is to the contrary. Removal of medium and fine fuels, but not large snags and logs, may be ecologically justifiable on sites characterized by PAGs with Fire Regimes I and II. Issues associated with fire suppression could be addressed by creating snag-free corridors or narrow FMZs. Some limited tree planting may be justified to provide seed sources for tree species otherwise likely to be absent or under-represented but the plantings should be carried out in low numbers and at variable density. Establishment of large areas of plantations, even at low density is inappropriate within the LSRs or on sites characterized by Fire Regimes I and II. Finally, current knowledge regarding the ecology and recovery of the NSO should be considered during revision of the DEIS. "	We acknowledge that snags and large wood are important components on the landscape throughout analysis (Chapter 3 of the final EIS). We have incorporated mitigations for the retention of legacy components, including snags and large woody debris, as described in wildlife and watershed project design features in Chapter 2 of the final EIS. The project proposes fuel management zones and snag free corridors to break-up the amount and continuity of fuels, as described in Chapter 2 of the final EIS. Planting is proposed where appropriate in Late Successional Reserves to facilitate regeneration; it is proposed within the sidebar of specific criteria, as described in Chapter 2 of the EIS. T The commenter fails to provide any clear evidence, opposing the planting proposed in this project. See the beginning of Chapter 3 for a discussion of opposing points of view. Also see responses to comments numbers 5873-72,17111-1, 17280-3, and 17280-2
121.07 - Blended Alternative Suggestions	#17460-5	The environmental issues affecting fisheries and wildlife, addressed separately in Alternative 3, 4, and 5, should be combined into a new alternative. The March 16, 2015 letter from the Council on Environmental Quality states "The preferred alternative that is being developed for the final EIS will draw components from the alternatives that were developed after public scoping. .. " An environmentally sound and comprehensive alternative must combine those aspects used to mitigate he specific concerns addressed by Alternatives 3, 4, and 5. To be clear, it should include the "no salvage logging" aspect in the Beaver Fire area to maintain wildlife connectivity, especially considering the salvage logging being done on private lands adjacent to public lands that will affect fisher habitat and overall connectivity. Combining these aspects provides for greater protections for fisheries and wildlife habitat than Alternative 3, 4, or 5 provides alone.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.07 - Blended Alternative Suggestions	#17478-3	please consider ecologic health along with economic health. this is national forest for the use and protection of many interest groups. a balanced alternative could give recognition to profit makers and conservationists.	The purpose and need of the project includes restoration, as described in Chapter 1 of the final EIS. Best available science has been used during the design and analysis of the project, as described throughout the final EIS and supporting documents.
121.07 - Blended Alternative Suggestions	#17481-37	The project uses a varied approach to essential fuels reduction, including salvage, hand release, mastication, livestock grazing, reforestation, and underburning. In my opinion the planned actions are not aggressive enough, but adequate given the legal and political barriers and also restrictive timelines. Changes in ESA, NEPA, adjustments to LSR, and designated road less areas are imperative to allow professionals to manage the forest in an effective and efficient manner. Constant loud, uninformed, biased, non-local litigations have long delayed or restricted similar restoration actions in the region. I'm sure it's well known and understood that to delay further only compounds an already proven catastrophic situation. It is my hope that good science, history, and professional management can salvage and restore the lands of my grandfathers. Implementing this project is a good start.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.07 - Blended Alternative Suggestions	#17488-2	On roadside hazard the 60% likelihood of mortality in next 5 years - criteria was used in Salmon Salvage. I am very concerned about the # of large, green legacy trees that were removed. These large legacy trees have huge wildlife and cultural value on the land. Removing them if there is a chance that they will survive is relatively criminal. It makes more sense to be precautionary with the legacy trees. If we leave there trees and come back in five years and find that there was high mortality putting in a roadside hazard CE down the road is easy. The wood in these areas will stay merchantable for many more years so there wouldn't be an economic loss. Why not have a 90% likelihood of mortality on trees over 45" in diameter. These trees are irreplaceable, especially in LSR's and we should err on the side of keeping these trees if there is a possibility of their survival.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The treatments of the Salmon Salvage project are outside the scope of the analysis, except where considered in terms of cumulative effects in Chapter 3 of the final EIS. For this project, the removal of green legacy trees is not proposed with roadside hazard treatments. In Alternative 2 Modified, marking guidelines for roadside hazard treatments were adjusted to respond to public comment and adjusted based on consultation with USDI Fish and Wildlife Service. Acres associated with roadside hazard treatments are listed in Table 2 2 and Appendix F. Alternative 2 Modified adjusts the percentage of mortality for fire-injured trees as follows: all trees less than 45 inches in diameter that were burned in the 2014 fires along Forest System roads within the project area will be considered for removal if they are dead or have a 60 percent or greater chance of dying within three to five years; and trees burned in the 2014 fires, that are greater than 45 inches in diameter, will be considered for removal only if they are dead or have a 90 percent or greater chance of dying within three to five years as defined by Report #RO-11-01 “Marking Guidelines for Fire-Injured Trees in California” (Smith & Cluck, 2011). See Chapter 1 for a discussion of changes between draft and final EIS. See Chapter 2 for a description of proposed actions. The commenter's statement about merchantability is erroneous with no supportive evidence presented. See the emergency situation determination submittal for a discussion of merchantability and Chapter 3 of the final EIS under vegetation and economics.
121.07 - Blended Alternative Suggestions	#17499-7	I support selective thinning of small diameter roadside fire-killed hazard trees. I also very strongly support a comprehensive forest management approach of year-round selective thinning and seasonal prescribed burning. I do not support the construction of new roads or reopening of decommissioned roads. I also feel that it is very important that adequate time must be given for complete and comprehensive environmental impact assessments and I do not believe that expediting the recovery plan will allow for such. I have heard it stated that the stands of burned trees are a fire hazard and that their only possible future fate is to be logged or to be burned again. However, I do not believe that these areas necessarily pose an increased fire threat, as evidenced by the fact that the Happy Camp/Frying Pan fire finally went out when it hit upon the footprint of the Panther Fire, especially if they are properly managed with selective small diameter thinning and prescribed burning. I believe that the value of the trees as they stand in supporting the life and health of the forest ecosystem is still extremely high. The decomposition of woody debris is a huge contributor to ecosystem sustainability; what has lived and grown there supports the generation of new life as it deceases and decomposes. Additionally, life in the burned area of the forest is not just in a state of potential regeneration, but active and alive today. I am currently assisting with surveys of the Northern Spotted Owl in the areas covered by the Westside Recovery Project. I have spent many hours this spring hiking through and observing the wildlife habitat in these areas and I have personally located and fed a mouse to a Northern Spotted Owl in an area that had been severely and devastatingly burned. Please allow plenty of time for the completion of environmental impact reports and remove trees selectively, with an emphasis of removal near existing roads and at a large distance from all riparian areas. I am concerned that prioritizing human use by expediting the plan for removal sets the future health of our forests on a dangerous path. Not only because of the potential environmental impact of salvage logging on the area already burned, but also because a precedent is set wherein wildfire becomes the bridge to eventual profit and is therefore, in some ways, encouraged. I watched the fire move across the mountainsides last summer as I sat on my back porch, I drove by it everyday between home and work. I do not support complete suppression of wildfire, but I believe that the occurrence and severity of wildfire can and should be limited by year round thinning and seasonal prescribed burning efforts and I do not believe that wildfire should be encouraged and managed based on an imperative to allow salvage logging.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Roadside thinning is proposed under fuels treatments for fuel management zones in Chapter 2 of the EIS. Forest or program management and the Panther Fire Salvage Project is beyond the scope of this project; however, the comment has been acknowledged.

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121.07 - Blended Alternative Suggestions	#17910-10	If this is the case, the very least that should be done is: ? a strictly written and enforced contract that mandates that ONLY currently DEAD trees under 20" DBH be salvaged ? the work should only take place in the WUI, that is, within ¼ mile of private property or to protect infrastructure. If nothing else, the work should be split into two phases to occur over two years, with the first phase to take place only within ¼ mile of private property or adjacent to infrastucture. ? specify that if the logger hits a live tree, he is billed for the cost of the tree he hit rather than rewarded (in past salvage logging we have witnessed the practice of " "doubling up" which resulted in twice the volume being removed than was specified in the EA, as well as considerable profit for the logger at taxpayer expense.) ? cleanup of slash immediately after logging with a maximum of less than 3' of slash left on the ground anywhere in the unit(s). ? provisions be included for the ongoing maintenance of slash. ? immediate decommissioning of all temporary roads after logging occurs. ? water monitoring of all perennial and intermittent streams before and after logging activity so as to increase our knowledge of the effects of salvage logging. ? make public the science used to determine that this project will aid, rather than hinder, the recovery of the burned area.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Most treatments, including salvage harvest, are proposed to strategically reduce fire risk. See Chapter 2 of the final EIS for a description of fuels treatments. Many of the suggestions made by the commenter have been incorporated into project design.
121.07 - Blended Alternative Suggestions	#18852-19	1) The project area is too large to be considered under one planning document. 2) The project planning time frame from fire event to implementation is too short to allow for detailed site specific and ecological consideration.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The size of the project area is the discretion of the Responsible Official. There is no limit to the size of a project area. Design and analysis of this project has been site-specific and consistent with law, regulation, and policy.
121.07 - Blended Alternative Suggestions	#18852-20	Finally, this project once again appears to pit "environmentalists" against those more interested in resource extraction or proponents of continued fire suppression and management. A more thoughtful plan would have allowed a greater ability to create shared values, such as those created through the Western Klamath Restoration Partnership collaboration.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.07 - Blended Alternative Suggestions	#18852-33	16) There is a concern that the Klamath National Forests intensive focus on the "Westside Recovery" project is distracting from overarching goals of the entire forest landscape and that this is reducing and re-directing key resources from protecting and managing lands outside of the fire perimeter.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.07 - Blended Alternative Suggestions	#18852-37	20) The separation of Alternative 3 (wildlife focus) and Alternative 4 (water quality & fisheries focus) creates competing management plans where shared values should be prioritized. This produces the appearance that one resource value (i.e. wildlife) will be emphasized if Alternative 3 is selected at the expense of watershed and fisheries values (Alternative 5). Ecological process values should have been consolidated into a cohesive alternative, this including other biologically rich components of the ecosystem, i.e. plants, insects, fungi, soil fertility, etc..	The Alternatives were developed in response to issues from scoping. Both were developed for the improvement of watershed and wildlife conditions and were developed to be consistent with the Forest Plan and other law, regulation and policy. Both Alternatives are consistent with the purpose and need to varying degrees. The new preferred Alternative for the final EIS is actually a modification of Alternative 3 with some components of Alternative 4, which was developed in response to public comments and consultation with the Karuk Tribe and regulatory agencies. The new preferred Alternative also incorporates components of the Karuk Alternative and Alternative 5 (for fuels treatments near private in the Beaver Fire area). See Chapter 3 for a discussion of effects by resource area and Alternative.
121.07 - Blended Alternative Suggestions	#18857-21	If you must move forward with this project please consider removing the following units entirely: Unit #506, 508, 510, 511, 535, Section 30 McGuffy Creek Unit, and all of Grider Creek Watershed Units. The site conditions including habitat, slope, soil type, unique location, documented species and diversity, type of fire that occurred in these areas all demand further review and removal from the treatment plan.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.07 - Blended Alternative Suggestions	#18874-3	Maplesden Ranch located on Buckhorn Ridge in T.46N, I OW, Section 2 2. Concerning Roadside Fuels and Wildland Urban Interface Treatments in the SWV4 of the SWV4 of Section 2, T.46N, R. I OW, MD: - Roadside Fuels Treatment is shown in Alternative 5 along Cherry Maple Road adjoining the Maplesden Ranch on the southwest comer: We would like this hazardous fuels treatment added to the preferred alternative. This fuels treatment would reduce fire intensity of future fires, and provide a safer work area and fire access for fire crews in the future. Cherry Maple Road (through the Ranch) was used extensively by fire-going personnel and equipment during the Beaver fire.	We acknowledge that the treatments in this area would help reduce future fire hazard and provide a safer work environment with safer access. For this reason, selected fuel treatments from Alternative 5 have been incorporated into Modified Alternative 3 (the new preferred Alternative), as part of the Final EIS.
121.07 - Blended Alternative Suggestions	#3-2	I am writing to express my approval of Alternative number Two, with the following comments. I am not in favor of the current Forest Service policy related to fire-safing of areas by removal of all softwood trees up to 9 inches and all hardwood trees up to 7 inches. Removal of these hardwood trees, some of which might have taken 50 years or more to reach this size, impacts severely the food sources for deer, squirrels, birds, and other wildland creatures. Further, the hardwoods represent a far lesser fire hazard than the conifers.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please refer to response to comment number 12355-2.
121.07 - Blended Alternative Suggestions	#3-3	I am also disappointed with the Forest Service decision to refrain from harvest the severely burned trees in the Wilderness areas. I would prefer that select harvesting of these trees be done with the intent to replant some of these areas to assist nature in repairing these spots faster. I would also like to see more replanting done in Forest areas outside of the Wilderness areas, using the Forest Service plan of avoiding "Plantation style" replanting by trying to mimic nature better.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Some areas are being replanted; see Chapter 2 of the EIS for a description of proposed actions.
121.07 - Blended Alternative Suggestions	#4-3	Expand treatment adjacent to private property o Rainbow Mine – west and north boundaries o Finley Camp – Westside adjacent o Mouth of Hickey Gulch – both sides of N.F. Salmon River eastward o Uncle Sam Mine – west ridgetop between White's and Eddy's Gulch o Taylor Hole	Alternative 3 Modified proposes additional hazardous fuels treatment proposed by the Karuk Alternative and to address WUI needs adjacent to private property. In Modified Alternative 3, approximately 55 acres of treatment in the Rainbow Mine area are proposed.
121.07 - Blended Alternative Suggestions	#6425-2	It is unacceptable to exploit the recent fires in order to fast-track logging for economic gain when the market is flooded with timber. Remove the burnt timber only if its actually dead and not just the big trees and don't leave a big mess like up the Little North Fork. No more single specie plantations! Use a mosaic approach of multiple species and stages of growth to get back to historical conditions! No more fuels loading! No more clear cuts! Be good stewards of the land. No more forest plans that aren't based on the health of the forest and safety of the forest communities. Follow the Northwest Forest Plan. Focus logging along major access roads and protect the most important and vulnerable recovering areas: the late-successional and geological reserves.	For clarification, the definition of a clear-cut logging is: an even-aged management silvicultural system applied to green forest stands for the purpose of regenerating a new age class. Trees are selected and removed in groups up to 40 acres in size followed by artificial and/or natural regeneration. The definition of salvage logging is: the removal of dead trees after a natural event, for example after a wildfire, in order to remove hazards to public safety, capture the economic value of burned trees, and/or remove excessive fuel accumulation. Dead trees (or snags) exceeding those needed by other resources are removed. Although, some salvaged areas may appear similar to clearcuts but the difference is that salvaged trees were killed and their size and location were determined by the natural event. Salvage is generally followed by artificial and/or natural regeneration. Salvage harvest is a fuels reduction activity that will over time help protect the remaining adjacent late successional habitat and promote that late successional character by accelerating the regeneration to a forested stand that will eventually regain those "old growth" characteristics. The Westside Fire Recovery Project includes a fuels reduction effort where the timber sale is the tool to achieve those fuels reduction and restoration objectives. Information about effects to wildlife species can be found in the wildlife section of Chapter 3 of the final EIS.
121.07 - Blended Alternative Suggestions	#9-1	Sierra Pacific Industries is in favor of Alternative 2 for the Westside Fire Recovery Project. Maximizing the amount of acres treated is the best from both an environmental and a socioeconomic standpoint. Salvage harvest and roadside hazard treatments within 250 feet of either side of the road are good steps towards achieving forest restoration goals while also ensuring public safety. One suggestions that will help maximize your efforts is to raise the minimum diameter limit to 20 inches DBH. Small diameter trees slow production and increase production costs, which will ultimately reduce the number of acres that receive treatment. Additionally, due to the large scale of this fire and the number of acres that will not experience harvest, there is no logical reason to save snags in treatment areas. The abundance of snags that will be left throughout the area will be so large that it is not sensible to retain any extra. This is an extremely large project requiring large amounts of funding and time. Reducing the amount of restrictions imposed on this project will help its success.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.08 - Alt 2 Plus	#12365-1	I support the project. I feel the document could be strengthened considerably with added scientific information on future fire effects without dead standing tree removal. Leonard DeBano who first studied non-wettable soil formation was a colleague of mine. The impacts of the processes he described along with others more recently analyzed on the effects of high severity fire could justify the proposed action much more strongly. This is unusually steep topography and that will foster sediment in runoff from those affected areas.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.08 - Alt 2 Plus	#17328-1	The undersigned request the following be a condition of the Westside Fire Recovery Project. Restrict the use of Engine Brakes (Jake Brakes) on NFTS Road, in the Happy Camp/ Oak Knoll Ranger District, from Eat of the Doggett Creek Corral to Highway 96. Thank you for your consideration.	See project design features in Chapter 2 of the EIS; this suggestion has been incorporated.
121.08 - Alt 2 Plus	#17329-3	It is highly likely some groups and individuals will challenge this project. I ask that it not influence your decision to truly restore as many acres of the burned areas as possible. I want to go on record of support for your efforts on rapidly restoring some of the acres burned in these catastrophic wildfires.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.08 - Alt 2 Plus	#18879-6	Alternative 2 fails to provide any treatment for a large portion of the Happy Camp WUI in the area between Grider Ridge/Horse Creek and Frying Pan Ridge. There are some treatments planned along the upper slopes of Frying Pan Ridge, along China Grade Road,and along the upper slopes of Grider Ridge. However, this leaves a large area laced with dead fuel with no treatment plan in the Horse Creek/Frying Pan Creek/Ottley Gulch/Woods Creek area. This is difficult terrain to treat and it is difficult to suppress wildfire in this area. No treatment pretty well guarantees that future wildfires here are going to become a big problem and be a threat to both the Happy Camp community and the Seiad Valley community. The KNF needs to address this situation promptly.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.08 - Alt 2 Plus	#18939-2	The project uses a varied approach to essential fuels reduction, including salvage, hand release, mastication, livestock grazing, reforestation, and underburning. In my opinion the planned actions are not aggressive enough, but adequate, given the legal and political barriers and restrictive timelines. Changes in ESA, NEPA, adjustments to LSR, and designated road less areas are imperative to allow professionals to manage the forest in an effective and efficient manner. Constant loud, uninformed, biased, non-local litigations have long delayed or restricted similar restoration actions in the region. I'm sure it's well known and understood that to delay further only compounds a catastrophic situation. It is my hope that good science, history, and professional management can salvage and restore the lands of my grandfathers. Implementing this project is a good start.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Changes in law and regulation are outside the scope of this project.
121.08 - Alt 2 Plus	#18939-3	Recommendations * Expand treatment adjacent to private property o Rainbow Mine - west and north boundaries o Finley Camp - Westside adjacent o Mouth of Hickey Gulch - both sides of N.F. Salmon River eastward o Uncle Sam Mine - west ridgetop between White's and Eddy's Gulch o Taylor Hole	Alternative 3 Modified proposes additional hazardous fuels treatment proposed by the Karuk Alternative and to address WUI needs adjacent to private property. In Modified Alternative 3, approximately 55 acres of treatment in the Rainbow Mine area are proposed.
121.08 - Alt 2 Plus	#18939-4	* Wilderness o Trails maintenance and hazards o Erosion control - burned trails o Trailhead and campsite hazards o Livestock grazing as a fuel reduction and meadow retention tool * Salvage o Longer term contracts - to salvage timber that dies after sale is marked o Adjust DBH and top size of timber as wood quality deteriorates - industry indicates that sales would be more attractive o Y.U.M. and treat units for fuel reduction * Reforestation o Wider spacing for planned reentry and maintenance o Leave some areas unplanted o Vary conifers and hardwoods with respect to original species	The timber sale contract has a “percent sound” specification that can be used to adjust utilization as wood deteriorates. Yarding Unmerchantable Material (YUM Yarding) is far too expensive to use for site preparation, and it creates landing piles that exceed storage space. It is more efficient, and provides more soil nutrients, to broadcast burn salvage units, or come back in with a hand piling contract to dispose of slash. Our reforestation prescriptions are more widely, and variably spaced than in the past, and they include retention of hardwoods and the use of native species. We will also be leaving many areas unplanted. The timber sale contracts will be as short as we can reasonably make them because of the need to remove timber before it deteriorates. Hazard Trees associated with trails within the project area will be addressed separately from this project as part of routine trail maintenance. Trail-side hazard trees will be prioritized and treated based on risk level including probability of tree failure and probability of a target. Selective treatment of hazard trees along trails allows for protection of scenery and the recreation setting. Erosion control is part of project design for proposed actions; see chapter 2 watershed project design features.

Code	Comment Number	Comment Text	Response
121.0801 - Salvage Harvest	#12355-1	am writing to support the Westside Fire Recovery Project. This project was created to respond to the community and public threats and damage caused by the 2014 wildfires. During the months of July, August and September 2014, communities around these fires lived through 29 community evacuations notices and advisories. We don't want to do this again! We don't want our kids and grandkids to have to do it in the future either! By treating the hazardous conditions created by the 2014 fires - by harvesting the burned trees and removing the heavy fuels that will feed the next fire WHEN it comes (not !.E) - we can help protect our lives and homes and communities and forests and wildlife and fish into the future. I support harvesting as many of the burned trees as you can. Isupport creating fuel breaks on ridge lines to help control and limit fires in the future. I support doing dead and danger tree removal along our road system. We have to keep our roads open and safe, especia lly so fire fighters can quick ly and safely access the forest to put future fires out. We need to plant trees in fire burned areas so our forests and watersheds can become healthy again.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many of the suggestions of the commenter have been incorporated into the project design. We recognize and acknowledge the hardships that fire can have on our local communities. We intend for this project to do important fuels reduction and restoration work, as proposed.
121.0801 - Salvage Harvest	#12362-1	I am in favor of your salvage efforts. I would like you to state in all your communications how little you are salvaging of the total fire area. More needs to be done, but as it is the general public doesn't understand how few acres will be affected. The enviro's will state over and over again that you are clear cutting the whole forest, and this needs to be countered with facts	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The final EIS is responsive to your comments in that it provides context for the amount of salvage harvest proposed within the broader project area and areas affected by the fires. See Chapter 2 of the EIS, specifically the pie charts for each Alternative.
121.0801 - Salvage Harvest	#17329-1	This letter is in support of the Klamath National Forest's attempt at recovering a portion of the catastrophic fires that occurred last summer. Thank you for your successful efforts to save time by shortening the comment period. Time is of the essence if this project is to be awarded and accomplished in time to recover the most value possible for the public. I would like to see Alternative 2 selected as the Alternative for implementation as it appears to meet the intended purpose and need for the project, however, I urge you to consider economics and the amount of land base considered for treatment. It seems logical that all of the land burned last summer needs some kind of treatment, however, available resources and time frames are understood. It was noticed that Alternative 2 proposed to not treat any of the Beaver Fire. I'm interested to know why that area is not going to be treated especially considering the amount of private property that is adjacent to burned forest land.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.0801 - Salvage Harvest	#17329-2	The draft EIS is proposing to only treat approximately 5% of the total burned area. The selected alternative should treat as many acres as possible on all of the fire areas considered. I want to express the importance of selecting an economical alternative. The selected alternative needs to be implementable if true recovery of these acres is expected. As you know, that can only occur if the project is economically viable. I believe the majority of the taxpayers and county residents would rather see a quick response to the restoration efforts on these fires by producing an economically feasible project that will produce some revenue.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We acknowledge the importance of having an economically viable project with economic benefits to the community, as described in the purpose and need in Chapter 1 of the final EIS.
121.0801 - Salvage Harvest	#17358-1	I'm for the largest amount of logging. You are wasting precious time with extending the comment period. Start logging!	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We are working as quickly as possible towards a decision and implementation.
121.0801 - Salvage Harvest	#17481-2	After analysis of all the alternatives we feel that Alternative #2, the Preferred Alternative while not being all we would hope for will give this project the best chance for success. We urge the Forest Service to move forward with this alternative, making use of the suggestions we have offered, and using all of the authorities offered in the recent Farm Bill and Healthy Forest Restoration Act. We would like to see far more salvage harvest than 4% but recognize the existing constraints.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
121.0801 - Salvage Harvest	#17481-28	Alternative 2: Of the 5 Alternatives this Alternative does the best job of addressing the recovery needs of the burned area. There are certain aspects of the Alternative that cause me concern (These are outlined below in dislikes) but I could live with the alternative as presented. One of the strong points in this alternative is the liberal use of existing road beds to facilitate salvage logging and other recovery activities. These facilities provide valuable access with minimal environmental effects. Another strong point of this Alternative is It has the greatest level of social/economic benefit due to the salvage logging activities, the reforestation activities, and the fuel treatment activities. Plus it will bring in the highest level of timber receipts that can be reinvested in the burn area. The social/economic effects will be felt both locally and regionally. Dislikes - Number 1 dislike is the very low level of salvage activity in the burn area north of Happy Camp, between Elk Creek and Grider Ridge. Much of this area is in the WUI as shown in the All Lands CWPP for Happy Camp completed in the late summer 2014. I believe that given the WUI situation that the salvage effort should be designed to remove every bit of material that is physically/financially possible. I believe that adhering to the 10 acre patch limitation inside the WUI but outside the Late Successional Reserve (LSR) is getting in the way of doing what needs to be done to reduce hazardous fuel in the WUI. I also believe that any salvage logging done in the WUI needs to be accompanied with appropriate fuel treatment. This would include that logging done as a roadside hazard measure. I believe this principle needs to be applied to all the WUI situations for each community in the three fire areas. Number 2 dislike is the apparent lack of mitigation measures to address cleanup needs along the Pacific Crest Trail. There appears to be considerable activity adjacent to the Trail low in Grider Creek which I believe is appropriate to the circumstances but follow-up measures to mitigate the appearance of the disturbances needs to be an integral part of the project and some interpretive signing needs to be included to explain the need for the actions and the objectives being sought. Plus some signing along the trail outside areas of salvage/reforestation to explain fire effects and the need for hazard tree felling and other measures driven by the human use and presence along the trail. Number 3 dislike is the lack of treatment of activity fuel resulting from roadside hazard tree removal. These fuels need to be treated to prevent build-up of problem fuel concentrations along and adjacent to roads since roads are often the anchor points to arrest the spread of wildfire. Solving a hazard problem and creating a fuel problem is not good management!! The design is conservative in the sense it follows the current LMP/PNFP standards and guides along with the recovery plans for T&E species. Following the letter of some of the standards and guides is debatable given the local conditions and circumstances but the balance being sought is to apply them in such a manner that prolonged or successful court challenges are unlikely. This is a judgment call by the ID Team and Decision Maker and my hope is they push the line as far as possible to benefit the fire area without losing the entire effort to the delays of court proceedings.	Statement of support for Alternative 2. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. In response to ongoing consultation and public comments, the preferred Alternative for the final EIS is modified Alternative 3; see Chapter 2 for a description.
121.0801 - Salvage Harvest	#17483-4	I am writing to show my support for Alternative 2. I would also support any additional logging and rehab in the burn areas. I am currently having Crawford log my property inside the burn area and also in the non burn area to thin my over-dense property. My neighbor Luke Wilson at 24905 Scott River Road has had his property logged. The Forest Service has access through his property to Forest land above Luke's place which may be able to be logged. It is currently not included in any of the plans. It may be worth checking out.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.0801 - Salvage Harvest	#17486-2	I am writing to let you know I support all salvage and sale of dead trees that can occur through the Westside Fire Recovery Project: We have lost such a huge amount of our forest to the catastrophic fires of 2014: This project will only scratch the surface of what really needs to get done in our lovely forest - This Project is only the beginning of what must be done! Please go forward with knowledge that most all residents support your efforts to get this done!	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.0801 - Salvage Harvest	#18901-1	As a resident and fire chief with in the effected burn area, I would like to state that I am for the proposal of the USDA selling what salvage they can, as quickly as can be expedited. This is a very time sensitive issue. We need to manage all aspects of our I-Zone community. A lot if resident property owners have been cleaning their land after the fire. And are preparing for the next possible fire. We would like to see active management with in the USFS. Not just prescribed burn management but, mastication and Timco management also. This is our community, our home, we love the beauty and history with in our forest area but we also should not neglect the forest floor. Rehabilitation will not only provide money but allow for new habitat.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.0801 - Salvage Harvest	#19-9	Alternative 2: Some areas within the fires will benefit from the proposed management action. Areas treated with the proposed measures outlined in Alternative 2 will be restored/rehabilitated much fasted than if Alternative 1 was selected. Unfortunately, many areas will not receive treatment under this alternative and over 40,000 acres of salvageable forest stands that were burned with high severity will likely re-burn, and or remain in brush fields for decades or possibly longer. Despite the fact that this alternative does not cover significant portions of the burned area, or meets the purpose and need of the project, this alternative does treat the most acres of all the alternatives listed. Therefore, Timber Products Company would like to go on record of supporting this alternative.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.0801 - Salvage Harvest	#35-1	I urge you to consider the most cost effective and ecologically efficient alternative possible for the Westside project. The sooner the forest heals from the damaging effects of fire, including the removal of dead trees, the healthier the forest will become in providing valuable habitat for wildlife and fisheries. The Draft Environmental Impact Statement proposes Salvage Logging which I believe is necessary and ecologically important to hasten the natural state. I encourage the management of the Klamath Forest to also thin the forest to reduce the amount of water being diverted by the trees at the expense of our watersheds. Your original master management plan called for a forest that has less board feet than currently exists. This not only increases the fuel available for a catastrophic fire, as was experienced, but it also decreases the amount of water captured in the streams and rivers. In a drought, as we are currently experiencing, this exhausts are watersheds. There are additional reasons why it is important to Salvage Log this fire-damaged landscape, they are: *Post-fire landscapes are ripe for the spread of pests and disease; *Post-fire landscapes provide a greater risk of another catastrophic fire to re-engulf the region and destroy the entire forest. The sooner the forest can return to a natural, healthy growing state the greater the benefit for the watershed and all living beings that inhabit and recreate in it. *Consider the economic benefit that would result from Salvage Logging to the immediate and surrounding communities. This economic benefit also includes the increase in the tax base of the area to help pay for needed public services: roads, public safety, schools, and health departments.	General statement. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We acknowledge the importance of the proposed treatments in order to meet the stated purpose and need statements of Chapter 1 of the EIS. See Chapter 3 for a discussion of socio-economic effects.
121.0803 - Site Prep Plant	#18900-1	Dear Supervisor Grantham, Regarding the Westside Fire Recovery Project, I'm writing in support of Alternative 2, with any additional replanting possible. I have read many pros and cons and respect the opinions of all stakeholders, but at some point action is needed and we just have to decide something and go forward. The town of Scott Bar is older than the National Forest and deserves consideration of their safety. They should not have to endure dead trees and flooding on their roads when it could be prevented. The wildlife will return no matter if anything is done. Thank you very much, Kathy Herrera	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.0804 - Fuel Burn	#17313-1	The HCFSC supports the level and types of treatments proposed in Alternative 2 with the exception that we would eliminate some of the road actions as proposed in Alternative 4. Additionally we would add fuels treatments we feel are important for the Happy Camp community and support some of the concepts/actions proposed in the Karuk Alternative.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.0806 - Fuel Rx Other	#17481-40	Alternative 2: Weakness of this alternative is in addressing the WUI.Public safety concern should be a priority.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. This Alternative and the preferred Alternative include roadside hazard and other treatments to address safety and WUI treatments, as described in Chapter 2 of the final EIS. Both of these needs are described in the purpose and need statement in Chapter 1 of the final EIS, as we recognize the importance of these treatments.
121.0806 - Fuel Rx Other	#18901-1	As a resident and fire chief with in the effected burn area, I would like to state that I am for the proposal of the USDA selling what salvage they can, as quickly as can be expedited. This is a very time sensitive issue. We need to manage all aspects of our I-Zone community. A lot if resident property owners have been cleaning their land after the fire. And are preparing for the next possible fire. We would like to see active management with in the USFS. Not just prescribed burn management but, mastication and Timco management also. This is our community, our home, we love the beauty and history with in our forest area but we also should not neglect the forest floor. Rehabilitation will not only provide money but allow for new habitat.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.0901 - Salvage Harvest	#14307-1	Follow the Northwest Forest Plan. Focus logging along major access roads and protect the most important and vulnerable recovering areas: the late-successional and geological reserves.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 12467-4.
121.0904 - Fuel Burn	#3-4	Lastly, I am not particularly in favor of major amounts of Prescribed Burning, as promoted by the Karuk Tribe. Too many times these burns exceed the planned areas, with many of them becoming uncontrolled burns. In these drought years, prescribed burns are just too dangerous. I saw enough fire last summer in our area to last me the rest of my life.	We recognize the inherent risk of prescribed underburning but have proposed some because of the resource and fuels reduction benefits of the treatments. Prior to prescribed underburning, the Forest follows a prescribed burn plan and considers many variables including fuel moisture levels and weather when determining the appropriate time for such treatments. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.
121.0906 - Fuel Rx Other	#12356-1	With one condition, we are in support of Alternative #2 of the Westside Fire Recovery Project. As a condition of the project, please add the following: Restrict use of Engine Brakes (Jake Brakes) on NFTS Road 12, in the Happy Camp/ Oak Knoll Ranger District, from East of the Doggett Creek Corral to Highway 96. This is a very short section of Road 12 and the noise disturbance effects 18 homes in the vicinity.	Project Design Feature (Roads-1) has been added to the project design in response to this comment; see Chapter 2 of the final EIS.
121.0907 - Temp Rds	#17313-2	Under Alternative 4, we support the concept to reduce reopening or construction of temporary roads where those actions would result in a significant impact relative to the benefit of fuels reduction.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#11365-1	Prior to all the restrictions on logging we had forests relatively cleaned of underbrush and fire storm creating material. Dead trees need to be salvaged and sensibly managed forests will grow back with the renewable resource God created and planned for it to be.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#12352-1	While I didn't see any one alternative that fit my preference I do see a combination that would be beneficial to everyone. I was also glad to see a lot of helicopter logging which, while being more expensive, is also less intrusive on our ecosystem. I see our National Forest land surrounding Happy Camp becoming a mass of snags/dead timber due to one reason or another, I have also seen stand after stand of bug killed timber in Colorado and would really hate to see that happen in our forest when it is preventable. I think it is imperative to remove the burned timber and restore or replant where needed and to provide fuels reduction efforts on the intact timberlands to prevent future fires. Most of Alternative 2 and parts of the Karuk Tribe alternative are the two that most appealed to me.	Thank you for your comments on the Westside Fire Recovery Project. The preferred Alternative (modified Alternative 3) for the final EIS incorporates portions of Alternative 2 and the Karuk Alternative; see Chapter 2 for a review of the Karuk Alternative for this project.
121.10 - Alt 2 as is	#12353-1	I am in support of the U.S. forest Service salvage and reforestation plans for the 2014 fires that burned Over 200,000 acres of our forests here in Siskiyou County.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.10 - Alt 2 as is	#12358-1	I feel that your recommended approach given in Alternative 2 is by far the preferred approach in order to achieve a fully recovered forest in the shortest overall time period. The do-nothing approach outlined in Alternative 1, while useful for comparison purposes should not be considered as an action alternative because of the many negative medium to long-term consequences inherent with that approach. While Alternative 3 through 5 address important special needs, the loss in benefit to the overall forest health exceeds any benefit achieves. It is recognized that impact of the fire on native fish and wildlife, while significant for certain species, will, in many cases, constitute a displacement rather than a death knell. The faster and more thorough the forest recovery, the better for all concerned.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#12360-1	I am in agreement that Alternative #2 is the correct Preferred Alternative. Please move forward with the project as soon as possible. Restrain from adding additional requirements to the individual projects that would make them not economically feasible. With all of the work that has and will go into this project it needs to be successful. There is a limited period of time to remove merchantable timber from the project area. You need to move quickly.	Statement of support for Alternative 2. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#14-7	The two remaining alternatives are Alternative 2 (Proposed Action and Preferred Alternative) and Alternative 4 (Reduced impact to watershed, including federally-listed Coho Salmon) have similar treatments. The primary difference between the alternatives are the acres proposed for salvage, acres proposed for reforestation, and miles of temporary roads proposed for use. Alternative 2 proposes to salvage 900 more acres, reforest an additional 900 acres, and use 10 additional miles of temporary roads. Considering the small percentage of acres being treated within the fire areas (less that 5%) the environmental effects between these two alternatives are negligible. With that being the case we see no reason why Alternative 2 should not be selected over Alternative 4. It treats more acres with no significant difference in environmental effects (See Table 2-34).	Statement of support for Alternative 2. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#14-8	Purpose and Need Alternative 1 Alternative 2 Alternative 3 Alternative 4 Alternative 5 Karuk Alternative 1 Not met Similar to other alternatives except worker safety by snag removal is better by 900 acres. Worker safety through snag removal is less effective by 1,000 acres Worker safety through snag removal is less effective by 900 acres Worker safety through snag removal is less effective by 9,400 acres – Not met Not met 2 Not met Met Met, but 1,000 acres fewer large fuels removed Met, but 900 acres fewer large fuels removed Not met Not met 3 Not met Highest income and jobs created 8.7 million $ less income than Alternative 2 and 169 fewer jobs created 8 million $ less income than Alternative 2 and 162 fewer jobs created Not met Not met 4 Not met Best meets purpose and need for acres salvaged, regenerated, fuels reduction 1,000 acres less salvage, reforestation, and fuels reduction Similar to Alternative 3 Not met Not met Alternative 2 best meets the purpose and need statements for the project. It more fully meets all of the statements than any of the other Alternatives. This is another justification why Alternative 2 should be selected.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 of the EIS under the socio-economic section for a comparison evaluation by Alternative. See the end of Chapter 2 of the EIS for comparison table of Alternatives by purpose and need component.
121.10 - Alt 2 as is	#14-9	The proposed action in the Draft EIS is proposing to treat approximately 4% of the total Forest Service burned area with salvage harvesting (a slightly higher percentage when other activities are included). All of the other Alternatives propose to treat even fewer acres. The selected alternative should treat as many acres as possible on all of the fire areas considered, including the Beaver Fire. Upon reviewing how the various alternatives meet the purpose and need and lack of differences in environmental effects we believe Alternative 2 is the only feasible Alternative for implementation. It is apparent that treating only 4% of the burned area does not come close to a complete fire recovery effort given the amount of acreage burned and the large acreage of high mortality. We also understand the regulatory restrictions you are dealing with and time frame issues with NEPA, undertaking an EIS, and required consultation and coordination with other government agencies and groups. Also, the time frame needed in order to adequately implement in a timely manner is a key consideration. We would like to have seen more of the high severity burned areas treated but understand the above restrictions. We will support the selection of Alternative 2. It hopefully is better than nothing. We believe the majority of the taxpayers and county residents would rather see a quick response to the restoration efforts on these fires by producing an economically feasible project that will produce some revenue. Most of the taxpayers and local citizens would prefer to see as many acres treated as possible within the framework of regulatory restrictions and short times frames required to	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Action Alternatives were designed to be consistent with law, regulation, and policy. We acknowledge the timeline considerations in terms of timber value; for this reason, the Forest Service requested an emergency situation determination. Consultation with the Karuk Tribe and regulatory agencies is ongoing.

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		accomplish some level of restoration.	
121.10 - Alt 2 as is	#17112-1	As a senior studying Forest Management and Ecology, I have obtained knowledge and experience in both the technical requirements of forest operations and the silvicultural facets of forest regeneration and development. From my background, it is clear that this DEIS addresses the complexity of issues surrounding the proposed management actions in an informed and encompassing manner, and is based upon sound ecological principles. The DEIS analyzes the Forest Service's proposal to restore fire resilient forests while improving safety in and access to these areas. The report suggests five alternatives addressing a variety of concerns regarding salvage logging, endangered species habitat, and effects on riparian areas. I support the proposed Alternative 2 because it addresses concerns about species habitat fragmentation and connectivity and the effects of salvage logging and site preparation in ecologically sensitive riparian areas. My review of the DEIS addresses some concerns in specificity of detail regarding the potential effects of Alternative 2 on species viability, vegetation, and channel morphology.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#17289-1	This letter is in support of the Westside Fire Recovery Project. The 2014 wildfires were devastating for us all. Now, we need to recover and prepare for the future. The burned trees should be harvested as soon as possible, the roads, and firebreaks cleared and new trees planted. I'm sure that these and other related items are on your future plans for our beautiful Klamath National Forest. You are doing a good job!	Statement of support for Alternative 2. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#17290-1	I am writing to support Alternative 2, because it is the action which will better promote forest health and safety.	Statement of support for Alternative 2. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#17355-1	I'm writing to support your choice of Alternative 2 in the DEIS for this project in order to recover the most timber possible that was burned in the catastrophic wildfires of last summer. I applaud your efforts to clean up our public land while there is still some merchantable value left that will help defray the costs of managing this damaged forest. The sooner it is cleaned up and replanted, the sooner the environment will produce clean water and healthy habitat for all creatures. Economic value in the timber sales you are producing is key to their success. As you know, if there isn't an economic value then the sales will not be purchased, thus the work will not get done. Please make these sales economically feasible to support their implementation.	Statement of support for Alternative 2. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest Service recognizes the need to make the project economically viable; see Chapter 1 of the final EIS for the purpose and need statements and Chapter 3 for a discussion of social-economic effects.

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121.10 - Alt 2 as is	#17357-1	We must get this dead timber out before it gets bugs in it and is no good for lumber. We don't understand why they think all the animals and fish in this area like the forest in this condition. There will be no forest, just brush areas that will burn even hotter next time if they get their way. Yes, we are retired loggers and know more about the forest than they ever will. Everything is not learned from a college book! We must keep the forest clean so it will not burn this hot ever again. Again, please do not let these "overly aggressive and radical" environmentalists beat you down and make you change your decision to get this fire ravaged forest logged	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#17377-1	I feel that the timber harvest sales should be allowed to proceed from the fires, and I leave it to you and the other professionals how much to harvest, when to do it, how to do it, and how to replant. I know that your staff is highly trained, and has only the best of intentions for our forest lands over the long haul. I hope you can convince those who do not want timber harvesting to happen, to be amenable to your preferred alternative. Having lived here for 30 years now, I see that forestry is a long process. Fire is part of our summer here and will be easier to manage if you have adequate dollars for fuels reduction.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#17489-1	In reference to the Westside Fire Recovery Project, I, after review of the maps, figures, and comments of the Forest Planning treatment alternatives, am very complimentary of the quick response that your teams have given to the health and rehabilitation of the fire affected areas outlined in Draft EIS. The salvage removal of dead trees will generate much needed revenue and assist in stimulating restoration and reforestation, reducing very hot burns due to dry heavy fuel levels. The value of the timber will be significantly recovered by an early harvest. I believe that removing a responsible proportion of the dead wood and sending it to mills to create jobs and net revenue for restoration projects will support and improve the economy and ecological health of the affected areas. Our National Parks which have been subject to the devastation of wildfire that were left to nature to regenerate on their own are now overgrown with shrubs and grasses, but few trees (Yosemite, case in point). It's a window as to what will continue to happen if removal of fire-killed timber and reforestation are not allowed. Being able to harvest, replant and control the merchantable areas will speed the health and productivity of these areas, and improve recovery of habitat for wildlife versus waiting years and years for it to heal itself. There are tens of thousands of acres of National Forest lands that are left untouched from wildfires, so it is unreasonable to stipulate that every acre of burned land should not be harvested. It is encouraging to see the desire of the Forest Service to rehabilitate the burned areas instead of leaving it to nature to waste valuable renewable resources and scarring thousands of acres of our National Forests. Careful and professional planned removal of fire-killed timber will provide for adequate dead wood to support wildlife habitat. As fires become more common and intense, it is necessary that we take preventative and recovery measures to reduce heavy fuel levels that result in catastrophic fires. We know from past experience heavy fuels left from wildfires increase the intensity of successive fires destroying all living conifers and wildlife habitat. Removal of excess levels of dead trees throughout the many miles of public roads will improve public safety and support fire prevention, as well as improving the chance of survival for a young forest. The requirements of your current stream protection rules are very and sometimes excessively protective of streams, which is essential to ensure some of your proposed treatments ecological benefits. In your preferred Alternative 2 you appear to be protecting the resources that need to and are required to be protected by laws and regulations concerning threatened and endangered species. The economic benefit created by select logging of fire-killed timber will increase the success of any future reforestation projects and help in the continued support of our wildlife. It appears that the drafted plans to improve the health of the forest and wildlife habitat, mitigate soil and water damage have been carefully thought out and should work out to everyone's' best interest.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#17494-3	proposed alternative is the only Alternative that should be chosen for implementation. This alternative best meets the purpose and need for the proposed project as identified in the draft EIS. Completing salvage harvesting along with site preparation and replanting will benefit our communities long term while supporting local businesses. All efforts to improve safety for workers and recreational users will be beneficial while restoring the fire burned area. Please considers treating as many acres as possible through alternative 2. Thanks for the opportunity	Statement of support for alternative 2. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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		to comment on this project.	
121.10 - Alt 2 as is	#17509-1	Murphy Company supports Alternative 2 (preferred alternative) as it best meets the purpose and need of the project. We believe that Alternative 2 strikes the best balance of treatments with general salvage, roadside hazard treatments, hazardous fuel treatments, and reforestation. We are pleased that reforestation will take place on much of the salvage operated areas, as this will accelerate the growth of a new healthy forest on the site.	Statement of support for Alternative 2. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18-1	The Rotary Club of Yreka supports the draft EIS for the Westside Fire Recovery Project. In 2014, our primary fundraiser, the Siskiyou Century had to be cancelled due to the smoke from the fires. This fundraiser typically raises $10,000 for our club. These dollars go back to our community in the form of scholarships and community projects. There have been many years in the history of the ride that we have been negatively affected by the smoke. Any efforts to mitigate this type of disaster in the future have our support. Our fellow club, the Rotary Club of Montague also had to cancel the Balloon Fire as a result of the fires.	Statement of support for Alternative 2. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18747-1	Add my approval of Alternative 2 since it embraces all aspects of creating treated areas alongside roads and private property.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18849-1	It is all but universally agreed that the forest health conditions on the KNF are extremely poor and in desperate need of restoration. Alternative 2 of the Westside Fire Recovery Project (the Preferred Alternative) reflects the best that the KNF can accomplish in that direction given time and procedural constraints. Any treatment reductions or complications to the Preferred Alternative, which includes salvage harvest on 4% of the burned area, simply perpetuate the major contributory factor to catastrophic wildfire on the KNF: the failure to apply well-proven, active management to existing stand conditions.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18849-6	The SFHC supports the Preferred Alternative. Given the urgency with which post-fire triage and recovery must proceed, we support this project moving forward. We urge every possible expeditious option for implementing the Preferred Alternative, including exercise of authorities consistent with the National Environmental Policy Act that can be used to make sure this project is implemented early in the summer of 2015.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18853-1	Support Alternative Two.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18853-2	We urge that the United States Forest Service approve "Alternative 2": (Refined Proposed Action)	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18859-1	I would like to voice my support for the US Forest Service, Klamath National Forest in the implementation of their Preferred Alternative, Alternative 2, in the Westside Fire Recovery Project. While I would personally like to see more being done in terms of recovery, I understand this is a modest first step and one that will hopefully maximize the potential of implementation.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.10 - Alt 2 as is	#18859-13	I fully support the Preferred Alternative. Given the urgency with which post-fire triage and recovery must proceed, I support this project moving forward. I urge every possible expeditious option for implementing the Preferred Alternative, including exercise of authorities consistent with the National Environmental Policy Act that can be used to make sure this project is implemented early in the summer of 2015.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18859-8	It is all but universally agreed that the forest health conditions on the KNF are extremely poor and in desperate need of restoration. Alternative 2 of the Westside Fire Recovery Project (the Preferred Alternative) reflects the best that the KNF can accomplish in that direction given time and procedural constraints. Any treatment reductions or complications to the Preferred Alternative simply perpetuates the major contributory factor to catastrophic wildfire on the KNF: the failure to apply well-proven, active management to existing stand conditions.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18871-1	The Siskiyou Unit of the California Department of Forestry and Fire Protection (CAL FIRE) is in support of your Westside Fire Recovery Project which will entail approximately 10,000 acres timber salvage and 20,000 acres of hazard fuel reduction within portions of the areas impacted by the Whites, Beaver and Happy Camp Complex fires. The proposed project will directly reduce fire danger by removing hazard fuels and improve firefighter safety by maintaining adequate access for emergency vehicles and facilitate safe public egress during emergency evacuations. I support this proposed project and believe its implementation will benefit the citizens of Siskiyou County.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18875-1	We have reviewed the proposed Action and fully support full implementation of Alternative 2. Implementation will help our local communities with needed jobs and reduce the risk of future catastrophic wildfires in and around our communities. At the same time the project more than adequately addresses the needs of ecosystem functions through retention of snags, green trees, riparian buffers and LOP's for northern spotted owls. Again, we fully support the full implementation of Alternative 2.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 12346-55.
121.10 - Alt 2 as is	#18877-1	Please put me down as vigorously supporting alternative 2 on the DEIS for this project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18879-1	Of the alternatives analyzed in detail in the DEIS Alternative 2 is the best by a wide margin. Alternative 2 best meets the four principle objectives of the project. Given the overall size and nature of the burned area in the 3 fire areas, the activity proposed in Alternative 2 is a very conservative response. The negative environmental effects from activities in Alternative 2 are small incremental increases to the major negative effects from the fires. The constraints imposed by the KNF Land Management Plan, The Pacific Northwest Forest Plan, The T&E Recovery Plans and the Inventoried Roadless Areas severely limit treatment options. Within these confines Alternative 2 strikes the best balance of environmental benefits and environmental costs of treatment	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.10 - Alt 2 as is	#18879-2	Alternative 2 makes the greatest use of salvage logging. Salvage logging as designed in Alternative 2 is a very effective form of fuel treatment. It physically removes large amounts of fuel that otherwise will persist on site for many decades and contribute to high intensity future fires. The post salvage treatments in harvest units involve treatment of logging slash and site preparation for planting and planting of conifer seedlings. This sequence of actions meets all four project objectives by reducing fuels through removal or on site treatment, promoting ecosystem sustainability, obtaining maximum economic value, and reducing safety hazardous. The negative effects on watershed and wildlife from the disturbances associated with salvage and reforestation are minor additions to the effects already imposed on these areas by the wildfire. The project planners have excised lots of caution in order to minimize the negative effects from the salvage/reforestation activity. The positive environmental effects of the salvage sequence are high. The future fire hazards from excessive fuel loading are sharply reduced, the treated areas will have a more balanced plant community of conifers, hardwoods, and shrubs, and the overall quality and sustainability of wildlife habitat will serve a wide range of species over a long period of time. The salvage/reforestation sequence also has strong local and regional economic and social benefits through direct and indirect employment, local tax revenues for schools and roads, and revenues returned to the KNF for investment into the recovery effort.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18879-3	Alternative 2 has the highest level of hazardous fuel treatment outside the salvage harvest units. These treatments are very important steps in reducing the levels of hazardous fuel buildup from the fires. Left untreated,these fuels will contribute to higher resistance to control and higher intensities in future fires. Dollars invested now in these treatments will likely substantially reduce the cash costs and environmental costs of future fires. These treatments are particularly important in the Wildland-Urban Interface (WUI) areas identified in the various Community Wildfire Protection Plans (CWPP). Wildfires within or adjacent to the WUI are very costly in terms of cash,social costs and environmental costs. Treatment investments now are likely to have substantial benefits in the future through reduced occurrence of destructive, out-of control fires.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18879-4	Alternative 2 has the greatest number of acres treated for site preparation and reforestation. The site preparation step will treat the buildup of dead fuels in the areas treated and planting of conifer seedlings will insure and accelerate the development of post fire stands of vegetation with a mix of hardwood and conifer trees along with shrubs and other plants. Stands of this nature offer the widest range of wildlife habitat benefits and promote ecosystem diversity in the forest.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18879-5	Alternative 2 makes the most extensive use of the existing road system on the Forest. While opening roads that have not been used for some time involves a certain amount of disturbance, the negative effects of this activity is very small. The newly opened road beds and the minor amount of newly constructed temporary spurs are carefully chosen to minimize disturbance and negative watershed effects. The benefits gained in acres of fuel treatment/salvage logging I site prep/ and planting are substantial. This is a good balance - low cost/high payoff.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18893-1	Family Water Alliance is 501c3 non profit located in Maxwell California. We are also the Sacramento Valley Fish Screen Program and have a 20 year history of protecting fish in the Sacramento Valley. Fish depend on a health water shed to complete their life cycle. The West Side Fire Recovery Project will protect fish populations by ensuring that excess biomass is removed from the recent fire boundaries. Projects like this will allow fire to be reintroduced to these overstocked forests. Catastrophic wild fire is the biggest threat to the health of our forests. A healthy forest protects the watersheds that we depend on for water. Family Water Alliance supports the West Side Fire Recover Project. I have included a picture of the Lower McCloud after a large rain event. This watershed had no logging and notice the sediment coming from the creek. We cannot continue to ignore the impacts of fire on the landscape.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.10 - Alt 2 as is	#18897-1	I support the implementation of the Westside Fire Recovery Project as outlined in Alternative 2. The scoping and public review process have helped build a balanced approach to Fire Recovery following the catastrophic fires of 2014. As a local resident, frequent wilderness user, and natural resource professional, I appreciate the non-commercial values inherent in these public lands. However, the commercial values available to local industries through logging operations, wood cutting, fuels reduction, and recreation help support my family. I believe both commercial and non-commercial values can be met as outlined in Alternative 2. The system has lost balance with natural processes. We (the forest ecosystem and the people who rely on it) are all exploring and redefining what it means to be "fire-adapted". Historically, the local forest was adapted to frequent fire intervals that did not result in wide spread catastrophic fire. Historically, people could expect frequent lightning caused fire to maintain the quality of the forest and potentially threaten communities. No one knows the "right" answer, but neither the forest nor the community are "adapted" to respond to catastrophic fires. The severe burn sites may have crossed an ecological threshold and may not recover without intervention. The treatments proposed provide an efficient method for safe removal of hazard trees and fuel reduction while also gaining economic benefits where opportunity exists from a small proportion of the burn area. The NWFP governs land use and is the guiding document for Forest decisions. The Forest has an obligation to address the five major goals in the plan (consider human and economic dimensions; protect long term health of resources; focus on scientific evidence; produce timber sales; and ensure federal agencies work together). The DEIS adequately addresses all the environmental impacts and helps inform the decision for Alterative 2 as the preferred alternative. A few comments for improvement: 1. Improve methods of communicating road closures to the public; post notices in advance 2. In addition to identified roadside locations, consider using wood cutters for salvage and road site cleanup if commercial value is lost 3. Include some small scale contracts suitable for local industry; large jobs = large bonds that are outside the capacity of local loggers 4. Provide summary report that compares proposed outcomes from selected alternative in DEIS with what actually happens 5. Establish monitoring plan now to measure outcomes described in DEIS Please DO NOT delay in the harvest of salvage timber. If the comments highlight some items of dispute, please find some way to move forward with the harvest component.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18915-1	While I wish the Forest had looked harder at stand and forest conditions and given more serious consideration to restoring the forest to a more resilient condition, I support the preferred alternative, Alternative 2, of the DEIS. It is critical that the Forest 1) reduce forest fuels, 2) recover the value of the burned timber to the extent possible, and 3) restore the burned area to forested conditions as soon as possible.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18915-2	REDUCE FOREST FUELS. As we have seen in recent years, and especially in 2014, fuel levels on western forests are at extreme levels that threaten the ability of those lands to remain forested and provide the multiple benefits that society expects from their public lands. Additionally, with the increasing severity of wildfires there is an increase in levels of atmospheric pollutants including CO, CO2, methane, and particulates among others. These burned forests are not only having a negative effect on the atmosphere and on local communities, but they are losing their ability to store carbon and act as carbon sinks. As the National Forest System addresses climate change and the interactions of the National Forests and the climate, it is critical that public lands do not become net emitters of carbon, which is where we are currently headed. Therefore, all post-fire project and all forest management projects need to work to reduce fuel loads and reduce the potential severity of the wildfires that will come as part of the natural processes of our western forests.	Procedural. The project does proposed to reduce fuel loading and fire risk, as described in chapter 2 of the final EIS. See Chapter 3 for a discussion of effect to fuels by Alternative. Also see Chapter 3 for a discussion of climate change as it relates to this project.
121.10 - Alt 2 as is	#18919-1	The purpose of this letter is to strongly support the Westside Fire Recovery Project planned by the Klamath National Forest (KNF). While this recovery project will only provide revenues for about four percent of the fire-ravaged timber in Siskiyou County in the impacted area, this is an essential plan that promotes economic recovery and fire safety in Siskiyou County.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.10 - Alt 2 as is	#18919-2	The poor economy here, largely due to the decline of the timber industry, has resulted in higher crime rates and some of the worst drug abuse, alcohol abuse, child abuse, elder abuse, and domestic abuse rates in California. The economy leads to lower productivity, lower tax rates, abject poverty and invariably, destroyed lives and higher crime, especially drug and alcohol-related offenses. Projects like the Westside Fire Recovery Plan should help a county like Siskiyou recover from the impacts of these fires and at the same time enhance access and safety of our visitors and many forest users. I urge you to approve this vital project. I am convinced that this project serves the best interests of all Siskiyou County residents, service providers, and the citizens we serve. Thank you for your consideration. Should you have any questions, please contact me at (530) 842-8300.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#18939-1	I support the Westside Fire Recovery Project (Alternative 2) and the attempts at improving the health and safety of the relevant forests, their residents, and workers. As a resident of Sawyers Bar on the Salmon River of Siskiyou County, CA, a Shasta Nation tribal member, a Salmon River Volunteer Fire and Rescue member, a retired timber faller, a commercial sixth generation packer and guide, hunter, fisherman, former Forest Service firefighter, supporter of watershed management, and a member of both the citizens and county supervisors collaboration groups I feel the need to comment.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#19073-1	Upon reviewing how the various alternatives meet the purpose and need I believe Alternative 2 which is the proposed alternative is the only Alternative that should be chosen for implementation.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#19073-7	The two remaining alternatives are Alternative 2 (Proposed Action and Preferred Alternative) and Alternative 4 (Reduced impact to watershed, including federally-listed Coho Salmon) has similar treatments. The primary difference between the alternatives are the acres proposed for salvage, acres proposed for reforestation, and miles of temporary roads proposed for use. Alternative 2 proposes to salvage 900 more acres, reforest an additional 900 acres, and use 10 additional miles of temporary roads. Considering the small percentage of acres being treated within the fire areas (less that 5%) the environmental effects between these two alternatives are negligible. With that being the case we see no reason why Alternative 2 should not be selected over Alternative 4. It treats more acres with no significant difference in environmental effects (See Table 2-34 in attachment). Alternative 2 best meets the purpose and need statements for the project. It more fully meets all of the statements than any of the other Alternatives. This is another justification why Alternative 2 should be selected.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#19073-8	In closing I want to emphasize that the Alternative you chose to implement will have a great bearing on our communities wellbeing both now and in the future. It will also have very large impacts on the success of businesses in the area, both ours as well as those businesses that will be positively impacted by the work provided by your selection of Alternative 2. I also am a strong believer in the values to recreation and tourism that a healthy well-managed forest provides and I believe that the selection of Alternative 2 will help provide both of those treasured values in the future.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We acknowledge your comments. The effects of action Alternatives on the social and economic environment are provided in Chapter 3 of the EIS and will be considered as factors in making the decision of which Alternative to implement.
121.10 - Alt 2 as is	#19112-1	Dear Patty and Wendy - Please accept the following comments for the Westside Fire Recovery Project DEIS. We support Alternative 2, Proposed Action as crafted. Fuels reduction including fire salvage will help to moderate future fire episodes in the burn areas. Both small and heavy fuels need to be removed to reduce future fire effects and restore some level of forest health and balance. Fire is good in general, but not in areas of heavy dead fuel loadings during dry conditions. The emphasis on public and fire personnel safety including roadside hazard reduction is good and very beneficial.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#19154-1	I support Alternative 2! I think Alternative 2 is the right step toward fire resilient ecosystem and utilize the dead dying trees. I get sad seeing nice timber rot. It seems like a right balance to harvest after a fire. I would think that wood products are a good carbon sink, they won't rot for a while longer than in the woods, and in the spirit of Gifford Pinchot and John Muir harvesting, replanting after a fire is a good choice.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.10 - Alt 2 as is	#19154-4	In regards to restoring the forest to be fire resilient, I know in our region there's not supposed to be a lot of large woody debris. Seems that your Alternative 2 addresses that.	Thank you for your comment on the Westside Fire Recovery Project. We agree and acknowledge the fire return history of the Klamath Bioregion and how that juxtaposes coarse woody debris requirements. The project meets or exceeds requirements for woody debris, as directed in the Forest Plan.
121.10 - Alt 2 as is	#19157-1	Iencourage you to salvage harvest as many acres of burned timber as possible. Iendorse the Alternative 2 as the preferred Alternative.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#24-1	I, we, would prefer Alternative 2 for Project Boundary A, B, & C Draft EIS.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#26-1	Thank you again for presenting this issue to the Yreka Rotary last week. I found your discussion and slide show easy to follow and informative. My comments with regard to the Westside Fire Recovery Project are in support of what is called "Alternative 2 (Refined Proposed Actions)' in the handout you provided. I do have some concerns over the proposed fuel breaks and treatments within 1/4 mile of private property structures unless that is referring to federal lands within 1/4 mile of those structures. I believe that was the intent but if it is including private lands as well, I would want to know how that would be implemented for the sake of private land owners. Overall, I believe you have the right project objectives and seem to be addressing the concerns of stakeholders affected by the fires. I wish you and your department great success in this important endeavor	Thank you for your comments on the Westside Fire Recovery Project. For clarification, fuel breaks within 1/4 mile of private property would be constructed on Federal land.
121.10 - Alt 2 as is	#27-1	I wanted to take the time to let you know how proud I am of you, Patti, and our Klamath National Forest. As you explained in Yreka Rotary today, you have 4 objectives and I am here to tell you that you are focused and spot on. They all seem time sensitive but the one that stands out the most is to salvage that burned timber before it becomes worthless. It will benefit all of the schools in our county as well as the college. Since you are asking for the public's opinion I would suggest that the next priority should be to abate hazardous fuels that exist close to homes and communities. I would suppose that the other two will fill in to priorities as funds and time permits. I did try to do this online but my computer kept telling me that your site will steal my passwords and bank card information. Yea, well, the government nearly owns most of my net worth in taxes yet to be collected. The Klamath National Forest Service has s great workload ahead of them this summer and I feel assured that our Forest Supervisor will make good decisions as caretakers of our land. Keep up the good work Patti	Statement of Support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. As outlined in Chapter 1 of the EIS, the goals of the Project include (1) a need for worker and public safety and access, (2) a need for safe conditions for firefighters performing fire suppression for community protection, (3) a need for a project that is economically viable, meeting project objectives and benefiting our local communities, and (4) a need for a restored and fire-resilient forested ecosystem.
121.10 - Alt 2 as is	#28-1	I am writing to support the Westside Fire Recovery Project. This project was created to respond to the community and public threats and damage caused by the 2014 wildfires. During the months of July, August and September 2014, communities around these fires lived through 29 community evacuations notices and advisories. We don't want to do this again! We don't want our kids and grandkids to have to do it in the future either! By treating the hazardous conditions created by the 2014 fires - by harvestinf the burned trees and removing the heavy fuels that will feed the next fire WHEN it comes (not IF) - we can help protect our lives and homes and communities and forests and wildlife and fish into the future. I support harvesting as many of the burned trees as you can. I support creating fuel breaks on ridge lines to help control and limit fires in the future. I support doing dead and danger tree removal along our road system. We have to keep our roads open and safe, especially so fire fighters can quickly and safely access the forest to put future fires out. We need to plant trees in fire burned areas so out forests and watersheds can become healthy again.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#28-4	Please do as much salvage harvest as you can in order to reduce fuels in all areas where the fire burned. Please remove danger trees from along our roads so that the public can use the roads and firefighters can get to future fires safely. Please remove fuels as much as you can around private property and utility lines and other needed infrastructure. Please plant areas to help them recover from the devastations they've been through. In our lifetimes, we will never get our forests back to where they were before the 2014 fires. We can helps start them on the right path to recovery for our kids and grandkids with the Westside Fire Recovery Project.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.10 - Alt 2 as is	#36-1	I support the alternative with the largest amount of salvage logging and replanting, because it's the right thing to do.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#38-1	I'm in favor of the most salvage logging that we can do. It's the right thing to do and replant trees kin for kind.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#4-1	I support the Westside Fire Recovery Project (Alternative 2) and the attempts at improving the health and safety of the relevant forests, their residents, and workers. As a resident of Sawyers Bar on the Salmon River of Siskiyou County, CA, a Shasta Nation tribal member, a Salmon River Volunteer Fire and Rescue member, a retired timber faller, a commercial sixth generation packer and guide, hunter, fisherman, former Forest Service firefighter, supporter of watershed management, and a member of both the citizens and county supervisors steering groups I feel the need to comment.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#6097-1	Please salvage every log you can!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.10 - Alt 2 as is	#8-1	I do strongly believe that we need this project done. As a local firefighter I know that with all the dead trees and the debris from the fires just laying around will dry out quickly and can cause an even worse fire than last year. We need to get rid of these fuels and quickly. As a resident just driving around and seeing all the burnt timber standing and laying around is not a good sight. The debris needs to be cleaned up to bring our forest back to it beauty.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.11 - Alt 3 plus	#17481-29	Alternative 3: Likes/Dislikes - I like the aspects of this Alternative that involve recovery activities identical to Alternative 2. I dislike the aspects of this Alternative that reduce recovery activities for the perceived benefits to Spotted Owls ,etc. I believe the reduction in salvage logging activity will reduce the long term habitat while gaining a very limited short term benefit of lower disturbance levels.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.1101 - Salvage Harvest	#12367-1	I am in full support of Alternative 2. With the addition of site preparation, planting and grass seeding. Maintain all fire lines and contingency lines for future use by cleaning all burnable debris. All merchantable timber should be sold, whether via timber sales or fire wood sales. Water-bars should be constructed as per Forest Service regulations as required on logging skid trails, these will also aid in wildlife connectivity. The planting of appropriate native grass species will aid in providing both forage for wild and domestic animals as well as increase erosion control. Healthy standing trees should be preserved while native species are replanted for shaded fuel breaks and restocking. Roads should be brought back up to appropriate class standards for use by all forest users as dictated in the KNF Travel Management Plan. Silt fences, straw waddles or other erosion control devices should be implemented to prevent excessive erosion while the land is healing and re-stabilizing. In full plantation areas, open strips should be left to serve as pre-attack fire lines to be used during future wild fires or prescribed burns. They should be treated the same as existing fire and contingency lines. Burned areas should be monitored closely. As short term surviving timber dies it should be put up for sale and logged. Grazing is also an important tool to help control brush and minimize ladder fuels. Grass seeding is a must as many seed banks were obliterated in scorched areas. Without the regrowth of native plants, the forest will be overrun by invasive and noxious plants.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.13 - Alt 3 as is	#17460-3	Retention of habitat for wildlife connectivity, particularly the Pacific fisher; while this concern is mitigated in Alternative 3, it is subsequently discarded in Alternatives 4 and 5.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.1507 - Temp Rds	#3679-3	I appreciate that there will be no new roads. I also question the need for opening up the temporary roads on old road beds. True, these are short segments, but if they have already been "put to bed", does this really need to be done? Can't the work be accomplished without re-opening these roads? I believe this is addressed in Alternate 4. Also in Alternative 4, I am in favor of treating the sensitive watersheds individually to reduce watershed disturbance. It makes sense to not lump together all watersheds as they are not all the same	The commenter is correct that these concerns are addressed in Alternative 4. The preferred Alternative for the final EIS is the modified Alternative 3 which incorporates some components of Alternative 4 into it. This Alternative was developed in response to public comments and consultation efforts.
121.16 - Alt 4 as is	#17285-1	I am concerned about the assumption that widespread salvage logging and replanting is an ecologically sustainable practice. Plantations become extremely flammable as the trees grow and create an increased fire hazard over the long term, which makes the situation worse than no action; I don't favor replanting. It is a waste of time, money and resources. Let the forest recover on its own. Reopening closed and decommissioned roads seems like a really bad idea; those roads were decommissioned for a reason, and reopening them and then re-decommissioning them can't be cost effective or ecologically sound. I also believe that no action should be taken in roadless areas, and that salvage should be confined to areas along roads, on strategic ridges and near communities. Overall, I believe the Karuk Alternative best reflects my point of view. Of the alternatives presented by the Forest Service, I would prefer Alternative 4.	See the beginning of Chapter 3 for a discussion of responsible opposing points of view. See Chapter 2 for a description of proposed actions; salvage harvest is proposed in a limited area of the overall project area. Alternative 4 of the EIS was designed to consider and analysis reduced road actions; some components of alternative 4 have been incorporated into the new preferred alternative (modified alternative 3). Also see response to comment number 12364-1. The only treatments in Roadless Areas include limited, strategic fuels treatments and a limited amount of Roadside hazard treatments (where roads intersect Roadless Areas and there are fire damaged trees that put the road system in danger). In the new preferred alternative, salvage harvest is restricted to a limited amount of areas for fire risk reduction; ridgetop treatments for fuels reduction are emphasized.
121.16 - Alt 4 as is	#17460-4	I also support the steps taken in Alternative 4 to protect the watershed, particularly eliminating any new or temporary roads and their associated salvage and/or plant and release units.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.16 - Alt 4 as is	#18850-2	As a tax payer I am in favor of proposal # 4	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.1701 - Salvage Harvest	#18869-1	Alternative #5 with increased salvage logging.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.18 - Alt 5 minus	#18912-6	You might ask how I think the proposal and alternatives could be changed to accommodate these concerns? I think that many of these watersheds, particularly those within the Late Successional Heritage Preserves, need to be left unlogged, or very selectively cut, with emphasis on road safety and decommissioning and fuels reductions. Water drafting's effects in each watershed should be studied before assigned a "one size fits all" rule for how it should be managed, and a biologist should be on site whenever stream crossings and roads are being re-commissioned, water is being drafted or trees are being cut anywhere near the riparian buffer, to ensure that the loggers are carful of these regulations. I think that monitoring is needed in these watersheds to be logged and control watersheds that were burnt but left unlogged in subsequent years, to document the effects of salvage logging. I hope that an equal amount of reopened roads and built roads are decommissioned as mitigation. I also think that salvage logging and water drafting in the Scott River and other thermally limiting sites should be suspended completely.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Also see response to comment number 12364-1.

Code	Comment Number	Comment Text	Response
121.19 - Alt 5 as is	#12349-4	I am also concerned that the KNF has proposed substantial amounts of salvage logging and planting within Late-Succesional Reserves (LSRs), lands designated for the development and preservation of late seral stage forests and species dependent on forests with those characteristics. If the fires had not burned through the LSRs, these lands would generally be off-limits to logging. Wildfires, even those as extensive and severe as the fires that occurred this past summer, should not be used as a justification to harvest timber within LSRs. Because trees within LSRs would generally not be harvested, the KNF would not lose monetary value that would have otherwise been gained through timber harvests by leaving fire-killed trees on the landscapes. Thus, I urge the KNF to adopt alternative 5 within the DEIS instead of the preferred alternative 2. While not perfect, I think alternative 5 is the best of the five primary alternatives considered in the DEIS, particularly because it excludes almost all salvage logging within LSRs.	See Chapter 1 of the EIS for a discussion about salvage in Late Successional Reserves. The purpose and need for the Westside Fire Recovery project includes ecologic and economic factors as stated in Chapter 1 of the final EIS. With or without fire, it was not intent of the Forest Plan to restrict logging in Late Successional Reserves. Within Late Successional Reserves, the treatments proposed in Chapter 2 of the EIS are consistent with management direction in the Forest Plan for Late Successional Reserves. Also see the Appendix of the final EIS that describes the treatments in Late Successional Reserves, as submitted to the multi-agency Regional Ecosystem Office (who reviewed this proposal and concurred with its consistency with the Forest Plan). Alternative 5 was considered in detail; effects are described throughout Chapter 3 of the final EIS. (This is a position statement; see response to comment number 16695-4.)
121.19 - Alt 5 as is	#12349-5	Two other justifications put forth for the project are the needs for worker and public safety and access, and the need for safe conditions for firefighters performing fire suppression for community protection. I found these justifications more compelling, and think it is a good idea to removal hazardous snags along roadways and around infrastructure. I also like the emphasis on fuels reduction and prescribed fire to help communities within the KNF become fire-safe and to create a more fire-resilient landscape, another reason why alternative 5 appears to be the best alternative. However, these activities should only target brush, downed wood, and small-diameter trees. Salvage logging of large trees is an unnecessary and inappropriate method of fuels reduction.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the final EIS for proposed actions. Strategic fuels treatments along roadways and near wildland urban interfaces include targeting brush and small diameter trees. Additionally, roadside hazard treatments is proposed, as described in Chapter 2 of the final EIS.
121.19 - Alt 5 as is	#16957-3	I am in support of Alternative 5, and the suggestions given from the Karuk tribe. Alternative 5 is the most feasible because it calls for a limited quantity of salvage logging, and a maximization of fuel treatments using prescribed fire. I want the forest service to quantify and compare the revenue created from salvage logging, compared to the costs of suppressing fire in the proposed plantations over the long term. Furthermore, I want local peoples to be involved with the fuel treatments, and restoration efforts. I want the forest service to implement a plan that utilizes traditional ecological knowledge, and the use of local social capital to keep funding dollars in the local economy. An investment in managing healthy ecosystems with the use of small scale logging in conjunction with the return of tribal burning to the klamath mountains is a wise decisions to govern forest management in this areas. An investment in timber plantations and fire suppression is socially unjust and is not a valuable investment of taxpayer money.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest Service involves the local public through the National Environmental Policy Act processes and other fuels and fire prevention programs that are outside the scope of this project, including but not limited to the Rural Advisory Committee program and associated projects for treatments on private land. Modified Alternative 3 is the preferred Alternative in the final EIS and incorporates suggestions from the Karuk Alternative and Alternative 5 into it.
121.19 - Alt 5 as is	#18850-3	with # 5 as my second choice	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.19 - Alt 5 as is	#18874-5	Salvage Harvest & Fuel Breaks: In general, we are in favor of incorporating Alternative 5 into the final EIS. We support salvage harvest on all Forest Service lands primarily managed for timber, particularly where adjoining private lands within the Beaver Fire area. We also support creation of ridgeline and roadside fuel breaks. The 2014 Westside fires have created an opportunity that should be used to put fuel breaks in place to assist with fire control in the future.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
121.20 - Karuk plus	#17496-6	I would support many of the concepts and rational of the Karuk Tribe Alternative with amendments made to minimize the biological and societal impacts. The approach should focus on utilizing the large fire footprint of the 2014 fires to facilitate the restoration of fire through prescribed fire and wildland fire use. The approach should also focus on community protection and the avoidance of practices such as salvage logging, tree planting, and the conversion of natural forest habitats into plantation stands that, in turn, increase fire hazards, impact watershed health, fisheries, and wildlife habitat. The agency should consider a more practical and scientifically justifiable approach to community wildfire protection on the Klamath River. This would include identifying areas adjacent to communities that did not burn in the 2014 fires and implementing prescribed fire and fuel reduction treatments between the community at risk and the 2014 fire footprint. This will maintain appropriate fuel conditions and plant communities. This will allow for very safe and effective prescribed fire treatments that will greatly benefit community protection and fire resiliency. Projects could also target key areas adjacent to communities that did burn in 2014 for future prescribed fire treatments. The agency could also focus efforts on managing strategic ridgelines within the fire area with prescribed fire to prepare for the inevitable future wildfire event and allow for more effect containment and control. This approach will stimulate the local economy, maintain important ecological values, encourage fire resiliency, and provide for improved firefighter safety during the next wildfire event-all goals of the Westside Fire Recovery Project. The Klamath River is a landscape shaped by fire; we must adapt to that reality and manage federal lands for fire safety rather than short-term profits and unsustainable, reckless timber production. The 2014 Fires and post-fire management I believe the discussion of post-fire management in the aftermath of the three large Klamath National Forest (KNF) fires of 2014 - Happy Camp, Whites, and Beaver - should focus on true fire recovery and restoration, rather than salvage logging and plantation management. Both salvage logging and plantation management have been shown to increase fuel loads and fire severity, decrease ecosystem resilience and heterogeneity and hinder ecosystem recovery after widespread disturbance. Interestingly, the 2014 fires burned mostly in characteristic fashion and contributed to ecosystem resilience and heterogeneity while reducing fuel loads and, if managed correctly, future fire severity. The fires of 2014, by and large, require very little "restoration" or facilitated "recovery" on national forest lands, as these fires were natural events with effects that are well within the range of variability. In fact, these fires actually represent restoration or recovery of fire processes and plant communities on a landscape scale; they were, in essence fuel reduction and forest restoration. These fires represent the restoration of fire as a process that, in turn, maintains fire-adapted plant communities and ecosystems. The management of the post-fire landscape should focus on the maintenance of biodiversity, the protection of communities and the restoration of fire and fire-adapted ecosystems. Emphasis should also be placed on mitigating the impacts of active fire suppression and restoring sites impacted during suppression operations. It is my opinion that no post-fire logging operations are desirable from an ecological standpoint. It is also not scientifically justified to claim salvage logging assists ecological recovery and reduces the severity of future fires. This premise is simply false and should be abandoned. The objective of post-fire management should be to manage the landscape in a way that facilitates a natural fire regime and allows for the use of both wildland fire for resource benefit as well as the safe and appropriate use of prescribed fire as a future management tool. The questions to ask are: How do we promote natural fire regimes, fire recovery and fire-adapted ecosystems? How do we manage in a way that allows wildland fire use and prescribed fire to be utilized to manage fuels? What steps are necessary? How do we prepare for the next fire? What treatments will increase resilience and provide strategic opportunities to control fires and moderate fire severity adjacent to communities?	Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.. See EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.2004 - Fuel Burn	#17481-39	Karuk Alternative: Discuss replanting and fire as management tool. While fire is recommended by the Tribe, it does not discuss timing and frequency.	Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Most of the areas recommended for wildland fire use in the Karuk Alternative are in areas that experienced high severity fires in the 2014 Westside Fires. Underburning these areas will not be effective until surface fuels become more continuous in these areas. That won't occur for another 12-15 years, so those actions are not ripe for implementation at this time, or in the life of this EIS. Fire as a management tool is allowed in the Klamath's Forest Plan.

Code	Comment Number	Comment Text	Response
121.22 - Karuk as is	#12351-3	A shift away from commodity production toward native traditional fire resilient landscapes is needed now before precious public funds are wasted on well intentioned, but futile rationalized actions, that will all go up in smoke in future years. I support the inclusion of the Karuk Tribe's Alternative in the Westside Fire Recovery Project, and am willing to work with you to make it a meaningful and timely addition to the Draft EIS.	Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#12363-1	I urge you to please consider the Karuk Alternative to the Westside Fire Recovery Project.	See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#13-4	The Karuk Tribe's alternative represents real "recovery" because it would not increase the amount of logging slash and highly flammable tree plantations which would fuel a future fire and increase future fire intensity for many years to come. By concentrating on community protection, key forest travel routes and strategic ridges which would become shaded fuelbreaks, the Karuk Alternative offers greater community protection and a path to allowing fire to play a more natural role on KNF lands. For these reasons, the Karuk Alternative represents real recovery. Please adopt and implement it!	Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#13-6	But please decide not to prioritize economic value recovery over community protection and healthy forests. Choose the Karuk Alternative as the best path to true "recovery".	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17280-4	I don't know enough about fire to comment on what is really needed, but I believe the Karuk Tribe's idea of returning fire to it's natural position in the landscape, while providing for protection of private property and ridgetop fuelbreaks to allow for control if needed, makes sense. Therefore, I think the best alternative if your priority really is to care for the land would be the Karuk alternative. Fire is a part of this landscape, and "controlling" it is a big part of what got us into this situation. Allow the land to heal itself.	We agree that fire needs to be returned to its natural role on the landscape. That is one of the objectives of the Westside Fire Recovery Project. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17282-3	I support the alternative proposed by the Karuk Tribe, which will protect rivers and water quality, threatened salmon, old growth forests and wildlife, existing and proposed Wild & Scenic Rivers, and roadless areas. The Tribe's proposal encourages natural forest regeneration, increases community safety through fire adaptation, and uses the best available science and traditional ecological knowledge. Please adopt the Karuk Tribe proposal as the preferred alternative for the Westside Fire Recovery Project.	Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.
121.22 - Karuk as is	#17285-1	I am concerned about the assumption that widespread salvage logging and replanting is an ecologically sustainable practice. Plantations become extremely flammable as the trees grow and create an increased fire hazard over the long term, which makes the situation worse than no action; I don't favor replanting. It is a waste of time, money and resources. Let the forest recover on its own. Reopening closed and decommissioned roads seems like a really bad idea; those roads were decommissioned for a reason, and reopening them and then re-decommissioning them can't be cost effective or ecologically sound. I also believe that no action should be taken in roadless areas, and that salvage should be confined to areas along roads, on strategic ridges and near communities. Overall, I believe the Karuk Alternative best reflects my point of view. Of the alternatives presented by the Forest Service, I would prefer Alternative 4.	Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Also see the Appendix A of the final EIS (maps) for a comparison map. Also see response to comment number 12364-1.

Code	Comment Number	Comment Text	Response
121.22 - Karuk as is	#17295-1	Current proposal to log the Klamath Forest is UNACCEPTABLE. I know the area in question intimately and the damage proposed would be irreparable to both land and river. I support the compromise made by the Karuk tribe.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17305-1	NOT return to the old clear-cut, tree farm approach to forest management. The Karuk alternative understands the many values contained in our national forests that go far beyond timber. Please consider their proposal. Remember that the National Forests belong to ALL of us. Fish, animals, and a variety of plants are of great value and should be protected whenever possible. It's time for the Forest Service to start managing the WHOLE forest, not just the trees. As a former commercial and current sport fisherman, I ask you to protect the watersheds and values as embodied in the Karuk proposal for the Westside Fire Recovery Project #45579.	Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. There is no intent in the Westside Fire Recovery to return to dense plantation forestry. Our goal is to reestablish a fire resilient ecosystesm where fire can play its natural role. See EIS Chapter 3, Responsible Opposing Views and Agency Response. Also see the Appendix A of the final EIS (maps) for a comparison map. No clearcutting is proposed; see Chapter 2 for a description of the proposed actions. Effects to resources is discussed throughout Chapter 3 of the EIS.
121.22 - Karuk as is	#17313-6	Karuk Alternative. We like the way the fuel breaks proposed in the Karuk alternative would compartmentalize the landscape into firesheds and encourage inclusion of those fuel treatments where it is practical and feasible to do so on-the-ground. We agree that it would be prudent to have the added fire protection treatments adjacent to private property. We like the underburning proposed in the Happy Camp WUI, especially within the area above China Grade Road from Elk Creek to China Creek.	Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17326-1	I think that the Karuk Indian proposal for the Kalmuth River is a better solution to the problem of removing dead timber. We do not need industrial type logging in this area.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17363-6	drove past the active fire region on Highway 101 several times last summer and was worried at the time that it would end with a large logging giveaway. I'm saddened to know that my concern was warranted. I am particularly concerned about proposed activities that could adversely impact the existing Klamath, Scott, and North Fork Salmon Wild & Scenic Rivers and segments of Elk Creek, Grider Creek, and South Fork Russian Creek recommended by the Forest Service for Wild & Scenic protection. In addition, I am opposed to any logging and mechanical entry into roadless areas, including areas proposed in legislation introduced by Senator Barbara Boxer in 2002 and 2006 for addition to the Marble Mountain and Russian Wilderness areas. I support the alternative proposed by the Karuk Tribe, which will protect rivers and water quality, threatened salmon, old growth forests and wildlife, existing and proposed Wild & Scenic Rivers, and roadless areas. The Tribe's proposal encourages natural forest regeneration, increases community safety through fire adaptation, and uses the best available science and traditional ecological knowledge. Please adopt the Karuk Tribe proposal as the preferred alternative for the Westside Fire Recovery Project. Also, please avoid activities that could harm existing and proposed Wild & Scenic Rivers, water quality and threatened salmon, and roadless areas that provide refuge for wildlife.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map. See Chapter 3 of the EIS for a disclosure of effects by resource area and Alternative. No salvage harvest is proposed in Roadless Areas; however roadside hazard treatments (logging along roadways that intersect Roadless Areas) is proposed, as described in Chapter 1 and 2 of the EIS.
121.22 - Karuk as is	#17368-2	The Karuk Indian Tribe is proposing an alternative to the project that focuses on restoring natural fire regimes and protecting local communities and cultural resources. The Karuk proposal will: *Ensure long term protection for rivers, water quality, endangered salmon, and roadless areas. *Increase safety for local communities through fire adaptation. *Encourage natural regeneration of forests. *Use the best available science and traditional ecological knowledge. *Avoid building of new roads or reopening of decommissioned roads. *Avoid intensive industrial logging.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.. Also see response to comment number 12364-1.

Code	Comment Number	Comment Text	Response
121.22 - Karuk as is	#17385-2	I support the proposal put forth by the Karuk Tribe. The Tribe's plan encourages natural forest regeneration, increases community safety through fire adaptation, and uses the best available science as well as traditional ecological knowledge. Please adopt the Karuk Tribe proposal as the preferred alternative for the Westside Fire Recovery Project. The KNF should avoid activities that could harm existing and proposed Wild & Scenic Rivers, water quality and salmon, and roadless areas that provide refuge for wildlife.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17396-3	Please go with the Karuk Tribe's recommendations	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17397-1	The current proposed plan sounds more like harvesting than removal of wood after a fire. Please work with the plan filed by the Karuk tribe. It's more respectful of the environment and in the end will save resources, some of them to be harvested, for future generations.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17398-1	Please support the Karuk Indian Tribe's proposed alternative that will better manage for future wildfires, protect watersheds with threatened salmon, and restore old growth forests.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17401-6	I write in strong support for the alternative proposed by the Karuk Tribe. Their proposal, with its emphasis on natural forest regeneration and community safety through fire adaptation, reflects a stewardship approach that will protect rivers and water quality, threatened salmon, old growth forests and wildlife, existing and proposed Wild & Scenic Rivers, and roadless areas. The Karuk Tribe proposal draws upon the best available science and traditional ecological knowledge -- an ecosystem management approach that is now recognized as central to insuring ecosystem resilience, and thus is key to climate change adaptation.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17402-1	I agree with Friends of the River and the Karuks in opposing the Forest Service plan and in supporting the Karuk's plan.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.. Also see the Appendix A of the final EIS (maps) for a comparison map.

Code	Comment Number	Comment Text	Response
121.22 - Karuk as is	#17409-5	I am writing to urge you to not adopt the Westside Fire Recovery Project due to its potential negative impacts on water quality, fisheries, endangered species such as the spotted owl, Wild and Scenic rivers in the area, and proposed Wilderness Areas, roadless areas, and proposed Wild and Scenic rivers. In addition, I am appalled that a so-called "recovery" project would include the logging of old-growth trees-----the extensive logging and clear-cutting of old-growth trees with the subsequent "plantation" reforestation would seem to be one of the main reasons we have such critical wildfire problems today. Clearcutting and logging in general require the building of roads and extensive disruption of the surface in the logged areas, resulting in increased erosion and subsequent increased siltation in watersheds utilized by anadromous fishes for spawning. I believe protection for Wild and Scenic Rivers, roadless areas, and Wilderness Areas is vital to the health of the ecosystem------continued intrusion and disruptions will only degrade the health of the ecosystem. I urge you to support the proposal advanced by the Karuk Tribe, a far less damaging plan that is based on the best available science and protects the natural qualities of the area. The Karuk Tribe plan is designed to do the least damage to the environment while at the same time achieving the goals of safety and fire protection for the residents of the area. Please adopt the Karuk Tribe proposal as the preferred alternative for the Westside Fire Recovery Project, keeping in mind to avoid any activities that would degrade Wild and Scenic Rivers, possible proposed Wild and Scenic Rivers, Wilderness Areas, proposed Wilderness Area additions, and roadless areas. All of these areas need our continued vigilance and protection for the value they provide for wildlife and recreation.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Also see the Appendix A of the final EIS (maps) for a comparison map. See Chapter 2 for a description of proposed actions; Clearcutting is a term that The Westside Fire Recovery proposes to salvage dead and dying trees to reduce the risk of future high severity fire.and there are wildlife project design features to retain legacy components, including large dead snags. The project is designed to improve watershed conditions; see the purpose and need statement in Chapter 1 of the EIS and the legacy site treatments proposed in Chapter 2. See Chapter 3 for a discussion of effects by resource areas and Alternative. No salvage logging is proposed in Wilderness areas. In Roadless Areas, only fuels treatments, planting and roadside hazard treatments are proposed---no salvage harvest is proposed. Project design features for scenery and wild and scenic rivers are included in Chapter 2; see Chapter 3 of the EIS for effects.
121.22 - Karuk as is	#17427-3	I am extremely concerned about the proposed Westside Fire Recovery Project, and am flabbergasted that our national forest protection agency would consider extensive clearcut, monoculture plantation and fire suppression strategies at this date in time, when these practices have proven disastrous for some decades now. If this agency is unwilling to learn from past mistakes, then the resultant mudslides and human, biologic and environmental devastation will be on your collective head. Though my family is not native to this continent, we have spent considerable vacation time in the beautiful Klamath watershed, and are aware that you have a thoughtful, reasoned and time-tested alternative in the Kurok Tribe's proposal. For all our sake, do the right thing.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17437-1	The level of logging and road building proposed is simply too much. I support instead the alternative proposed by the Karuk Tribe.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17440-1	I would feel a lot more comfortable if the plan were scaled back to followed more of what the local Native Tribes have put forth.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17441-1	Although the letter below is clearly "cut and paste" it represents my sentiments completely, and I endorse and support every point it makes. Please understand that my inability to write as clear and concisely does not mean I don't mean or care, very deeply, about this issue. This watershed matters, not just to me, but to the world as a whole, and I urge you to take seriously the need for wise stewardship of the the land that the Karuk proposal represents. Thanks.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17442-1	I am very concerned that the currently proposed Westside Fire recovery project keeps repeating the mistakes of the past which led to massive wildfire. I support the Karuk tribe alternative, which takes a different, better, science based approach to managing the forest and coping with wild fire.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.. Also see the Appendix A of the final EIS (maps) for a comparison map.

Code	Comment Number	Comment Text	Response
121.22 - Karuk as is	#17448-3	The Forest Service should know better than anyone what this type of logging will do the watershed the wildlife and the river. Please listen to the local Indians and cut back this project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17450-4	However, I know the Service is determined to proceed and therefore would support the Karuk Alternative. The Karuks and other local Native Americans have lived in this environment for millennia and know how to care for it.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17457-1	I support the Karuk Tribe proposal as the preferred alternative for the Westside Fire Recovery Project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17460-13	Additionally, I support the efforts of the Karuk Tribe to restore prescriptive fire, as proposed in Alternative G. While the Forest Service provided me with detailed more detailed maps of Alternative G on request, they did not make them available on the web site hosting the Westside Recovery documents, despite several requests to do so. The public should have had access to those maps to evaluate and comment on.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17464-1	The Western Klamath Restoration Partnership (WKRP) has intimate knowledge of the land where the Westside Fire Recovery Project will take place. They know how our natural resources in the area will be affected by the project better than the vast majority of people. Have you considered the Karuk Alternative?	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17465-1	As lovers of the out-or-doors, campers, hikers, and birders, my husband and I are VERY upset over your proposed Westside Fire Recovery Project of logging for the Klamath National Forest! We feel that your plans would be extremely disruptive for the plants and animals that call this forest home! Your methods of logging, including building extra roads and working on steep hillsides, are completely unnecessary, damaging to the ecosystem involved, and ruinous for the scenic value of this beautiful area! The work that you are suggesting would not be protective of the local watersheds and would seriously threaten the local fish, especially the salmon! We strongly support, instead, the Kanuk Indian Tribe's proposed alternative plan that we feel focuses on restoration after the previous fires and protection of the watersheds, the local plants and animals, and the native cultural resources that have been there for thousands of years. Their alternative plan does NOT threaten the Wild and Scenic Rivers in the area, nor does it ruin other local rivers that should have this designation in the future! It is far more important to save the ecosystem than it is to log a few thousand board feet of timber. The jobs that your plan creates will be soon gone, but the damage to the Klamath National Forest will remain for decades afterwards! We believe that the Kanuk Indian Tribe's proposed alternative plan for the Klamath National Forest is the correct and proper plan for sustainable reforestation, restoring the forest after last year's fires, and protecting the land and rivers for the myriads of creatures and plants that live there. Their plan does NOT add additional, unnecessary roads to the forest and keeps logging to a manageable minimum, while it will encourage the natural regeneration of the forest. Additionally, their plan gives important long-term protection to the watersheds, salmon and other fish, and keeps the roadless areas as they are now! Please reconsider your plan and adopt the more ecologically sound plan put forth by the Kanuk Indian Tribe!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.. Also see the Appendix A of the final EIS (maps) for a comparison map.

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121.22 - Karuk as is	#17466-4	I support the alternative proposed by the Karuk Tribe, which will protect rivers and water quality, threatened salmon, old growth forests and wildlife, existing and proposed Wild & Scenic Rivers, and roadless areas. The Tribe's proposal encourages natural forest regeneration, increases community safety through fire adaptation, and uses the best available science and traditional ecological knowledge. Please adopt the Karuk Tribe proposal as the preferred alternative for the Westside Fire Recovery Project. Also, please avoid activities that could harm existing and proposed Wild & Scenic Rivers, water quality and threatened salmon, and roadless areas that provide refuge for wildlife.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17474-1	Please do not go forward with this destructive logging proposal. It would be devastating to the ecology of the area. The plan the Karuk Indian Tribe has developed would preserve the area on a long term basis and would be far preferable. Please be responsible.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17501-5	Please closely analyze and consider the Karuk alternative. The Karuk people should have the first say in land management on their ancestral homelands. To do otherwise is disrespectful to the tribe and to their historical connection to the landscape they have managed for thousands of years. They were here first and they should have a say in this project.	Consultatin with the Karuk Tribe has been ongoing and will continue. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#17508-1	I support the alternative proposal put forward by the Karuk Indian Tribe.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#18848-1	I urge you to support the Kurok Tribes' proposal for recovery from the Westside Fire. Their proposal is aimed at protecting the river and water quality,threatened salmon habitat,old growth forest and wildlife.It also respects existing and future proposed Wild and Scenic Rivers and roadless areas. The Karuks' proposal encourages natural forest regeneration through fire adaptation and is based on the best available science as well as traditional ecological knowledge which has served their community for hundreds of years.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#18852-4	Furthermore, I appreciate the ancestral territory and rights of the Karuk Tribe, and would wish that their input and concerns be more fully considered in Klamath National Forest land management. It is pertinent and interesting that the Karuk Tribe's considerations are only attached as an addendum to the Draft Environmental Impact Statement (DEIS).	We have been consulting with the Karuk Tribe and consultation is ongoing in order to consider their input and concerns. The Karuk Alternative wasn't provided to the Forest Service until the evening before publication of the draft EIS. For the EIS, see Chapter 2 of the EIS for a description of how the Karuk Alternative has been considered and incorporated into this project.
121.22 - Karuk as is	#18857-3	Consideration and addition of the Karuk Alternative represents a beginning point for projects of this scope. Thank you for including the Karuk Preferred Alternative as they are obvious stakeholders and stewards within our bioregion.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#18858-6	And the alternatives it provides are unimaginative variations on a single theme. The Karuk Tribe has included the only true "alternative" to the plan, and it warrants your attention.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.

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121.22 - Karuk as is	#18878-19	Chapter 2 Alternatives, Including the Refined Proposed Action Comment: The only alternative we can support at this time is the Karuk Alternative. None of the other alternatives will proactively provide opportunities to allow for fire to play a natural and historical role on the landscape, implement Karuk Management direction, protect cultural resources, provide for community and fire fighter safety, and at the same time have some economic return.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#18878-3	Specific projects such as the Westside Fire Recovery and also for future proposed projects need to be adapted to promote and enhance our fire adapted landscape. To address this we submitted the "Karuk Alternative" which is based on the firm belief that returning fire to its proper place and role on the landscape is imperative. We expect to see the management vision of the Karuk Alternative integrated into the Final Environmental Impact Statement (FEIS) and implementation actions to adequately protect and enhance cultural resources.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#18878-38	Alternative 1 Direct Effects and Indirect Effects The Karuk Tribe advocates the use of the Karuk Alternative in an attempt to pursue management actions which will allow for fire to be used as a management tool to return the landscape to a natural fire regime. However, while we are not advocating for Alternative 1, in this section it seems once again the author is not giving the average reviewer a complete picture and portraying this alternative in as negative terms as possible.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#18913-2	We understand that a certain amount of salvage logging is required to mitigate costs and impacts from catastrophic wildfire, but we support a scaled-back approach as proposed by the Karuk Indian Tribe's proposed alternative, which better manages for future wildfires, protects watersheds with threatened salmon, and restores old growth forests.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#18918-12	I like these aspects of the proposed Karuk alternative. The best available science, not timber industry junk science, should guide the management of KNF. Traditional ecological wisdom from key Karuk tribal members is also key to integrate into an approach for true restoration and protection. They have a preferable approach to fire recovery called natural generation - this was practiced for thousands of years before Europeans came on the scene to liquidate natural and cultural resources.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map. See Chapter 2 of the final EIS for a discussion of how the Karuk Alternative has been considered and incorporated into the project. Consultation with the Karuk Tribe is ongoing.
121.22 - Karuk as is	#18921-2	The indians have an alternative proposal. It has a lighter imprint on the land and river. Go with that proposal.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#18922-1	I am writing to support the Karuk tribe's alternate proposal in regards to the Westside Fire Recovery Project. The Karuk view is more sustainable and broadly beneficial. It provides for better water quality, fewer miles of roads, diversity of natural forest recovery, and better protection of endangered salmon. I encourage you to take advantage of this opportunity to develop and explore more integrated and sustainable forest management solutions that incorporate natural fire regimes and preserve cultural, aesthetic, and recreational resources, along with limited commercial uses. Thank you.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.

Code	Comment Number	Comment Text	Response
121.22 - Karuk as is	#18925-1	Klamath National Forest Supervisor, I am writing in support of the Karuk alternative to the Westside Fire Recovery Project. The plantation-fire-suppression paradigm that the preferred alternative reflects does not pass for ecosystem management in the klamath mountains and is not acceptable. I am a forestry operations student at Humboldt State University and work during the summer as a forestry technician. I have been using the Klamath National Forest for backpacking since I was a kid and consider myself a stakeholder in this project. Lindsey Holm	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#18926-2	The Karuk Alternative or Alternative # 6 Is the Best Alternative as it is Closest to Meeting the Projects' Purpose and Need! The Karuk Tribe of California has an alternative included in the DEIS., entitled the Karuk Alternative or Alternative # 6. The Karuk Alternative should be used as it focuses on the protection of life and by making it a priority to capture the key ingress and egress routes for residents, managers and the pubic. The treatments being proposed in the Karuk Alternative add a significant amount of protection to the private landowners where people live, as compared to the other action alternatives (# 2, # 3, # 4, and # 5). The fuel breaks proposed in the Karuk alternative would compartmentalize the landscape into firesheds and encourage inclusion of those fuel treatments where it is practical and feasible to do so on-the-ground. It would be prudent to have the added fire protection treatments adjacent to private property.! ! The Karuk Tribe's alternative does not propose increase the amount of logging slash and highly flammable tree plantations which would fuel a future fire and increase future fire intensity for many years to come. This condition would threaten worker safety and access and create unsafer conditions for firefighters performing fire suppression for community protection. The Karuk Alternative offers greater community protection and a path to allowing fire to play a more natural role across the landscape as a quicker method to attain a fire-resilient forested ecosystem. This alternative accomplishes these goals through the recovery of the burned areas by concentrating on community protection, key forest travel routes and strategic ridges which would become shaded fuelbreaks. There is more risk reduction in the future fires to human life, property and resources in Alternative # 6 or the Karuk Alternative. This alternative seems to be economically viable, and meets the project objectives adding a benefit to our local communities. The Karuk Alternative is best alternative to meet the purpose and needs offered in the DEIS! !	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map. Consultation with the Karuk Tribe is ongoing.
121.22 - Karuk as is	#18926-35	Any actions taken by the United States Forest Service in regards to the Westside Recovery Project should use the Karuk Alternative as the centerpiece so that protection of lives (individuals and firefighters), property (private, public, or tribal), and resources (forests and watersheds) now and into the future.! ! The Karuk alternative focuses on creating fuel breaks on ridge lines to help control future fires . It also addresses dead and danger tree removal along our key roads. We have to keep our roads open and safe for residents and landowners, businesses, and others. We need the emergency access and escape routes so fire fighters can quickly and safely access the forest to manage the fires. We do not need to plant conifer trees in the fire burned areas because the majority would succumb to drought in prepared landscapes or burn again. This may be the only way so out that these severely burned forests and watersheds can become healthy again.! !	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map. Consultation with the Karuk Tribe is ongoing.
121.22 - Karuk as is	#18926-42	The Karuk Alternative (which is displayed in the DEIS) would provide greater community protection and emergency ingress and egress routes while making it possible for natural wildfire to play a more natural role in the forest.! ! In reviewing the alternatives, I recommend that you make the Karuk Alternative as the preferred alternative or make the Karuk Alternative the central part of any preferred alternative. If funding is needed to pay for the treatments outlined in this alternative then revenues from forest products can be generated for these purposes but the forest products would be taken to expand upon the priority treatments, in prioritized order to protect: life, property and resources.! ! I incorporate by reference the comment letter as an addendum and all scientific papers submitted for the DEIS that was provided to you on April 27, 2015 from Kimberly Baker on behalf of Klamath Forest Alliance, EPIC-the Environmental Protection Information Center, the Klamath Siskiyou Wildlands Center, S.A.F.E. Safe Alternatives for our Forest Environment, Northcoast Environmental Center, Siskiyou Land Conservancy and the Redwood Chapter of the Sierra Club. ! !	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map. . Consultation with the Karuk Tribe is ongoing. Scoping and comment letters are incorporated into the project record. See response to comment number 18878-16 about project funding for implementation.

Code	Comment Number	Comment Text	Response
121.22 - Karuk as is	#18927-4	We recommend adoption of an alternative similar to the one proposed by the Karuk Tribe, with its focus on natural forest regeneration, increasing community safety through fire adaptation, and use of the best available science and traditional ecological knowledge. In addition, this alternative should clearly avoid any mechanical intrusion in roadless areas and within existing and recommended Wild and Scenic River corridors. The alternative should also avoid logging in old growth forest reserves and riparian reserves.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map. Consultation with the Karuk Tribe is ongoing.
121.22 - Karuk as is	#18934-18	In an effort to provide an alternative that addressed the work of the WKRP, the Karuk Tribe collaborated with the Salmon River Restoration Council (SRRC), Mid Klamath Watershed Council (MKWC), environmental groups, and other local entities to develop the Karuk Alternative. MKWC and SRRC urge you to consider choosing the Karuk Alternative as the preferred alternative in the Final Environmental Impact Statement (FEIS) for the following reasons: 1) The Karuk Alternative, with a few possible modifications, has a high likelihood of avoiding litigation completely. This would get us out of the paradigm of the past two decades since the Salvage Logging Rider and Northwest Forest Plan set the stage for the pendulum to swing back and forth from an all or nothing approach to fire and fuels projects on Federal lands. The all or nothing approach precludes development of a sustainable workforce, sustainable outputs to mills, thus eliminating the opportunity to have a sustainable local economy based on forest management. Additionally this approach breeds distrust and thus inhibits landscape level planning and implementation needed for restoring resilient fire regimes, such as a series of fuelbreaks that will allow us more fire management options in the future. In the Westside Fire Recovery Project the Forest Service is seeking to use a loophole in the law to expedite salvage logging projects before the judicial process can play out by enacting an Emergency Situation Determination. This may allow short term increases in harvest quantities, but will ultimately perpetuate future regulations and scrutiny of the agency. Ultimately, our mountain communities and the land will suffer from gridlock, lack of a shared vision, and lack of ability to work together. The Karuk Alternative is a balanced approach that meets to core needs of a diverse array of stakeholders, allows for important work to be accomplished on the ground, and will allow for trust to develop between key parties over time. 2) The Karuk Alternative puts community safety first while simultaneously allowing for the reestablishment of resilient fire regimes and addressing fuel loading in high severity burn areas. It does this by establishing a series of fuelbreaks around communities and along strategic roads and ridges that will allow for reintroduction of prescribed fire in a safe and timely manner to manage high severity burned areas in the Wildland Urban Interface (WUI). The fuelbreaks proposed in the Karuk Alternative will better protect communities from wildfires than any other alternative. This Alternative also includes fuels reduction work around communities that was overlooked in the other alternatives. 3) The Karuk Alternative proposes only planting conifers in high severity burn areas to mimic the patterns of late seral conifers by species across the landscape, with manual fuel reduction in these sites to allow for prescribed fire use in the next decade. In some areas, planting should be delayed for 5-15 years to allow for 1-2 initial entries with prescribed fire to reduce fuel loading. This strategy will most effectively expedite the creation of diverse, fire resilient forests in these high severity areas by retaining large woody debris while creating a mosaic vegetation pattern that are formed under a more frequent, natural fire regime. 4) The Karuk Alternative does not propose any new road construction, nor does it propose to open decommissioned roads, and it minimizes the amount of salvage logging on disturbed soils to the amount needed to establish a series of landscape level fuelbreaks. This will better protect the fisheries resources in both the short term and over time by allowing for reintroduction of fire to manage high severity areas and fuels in the WUI, rather than intensive logging practices. New road construction and the opening of decommissioned roads, especially on sensitive soils like those in Grider Creek, Walker Creek, and Whites Gulch will negatively impact the fishery, increase the likelihood of litigation. 5) The Karuk Alternative is not driven by timber outputs, but instead focuses on the cost savings from reduced fire suppression expenditures over time. By creating fuelbreaks around communities and implementing strategic prescribed burns in the WUI, wildfires burning late in the fire season can be allowed to burn and achieve resource benefits while reducing fire suppression costs. The Karuk Alternative still provides a significant portion of merchantable	Strategic fuelbreaks are an integral part of the Westside Fire Recovery Project. There is considerable overlap with the Karuk Alternative and the Westside Project. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.Also see the Appendix A of the final EIS (maps) for a comparison map. Also see response to comment number 12364-1 and See EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised. .

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		timber for area mills (roughly 35% of the preferred alternative), while minimizing the impacts of these harvest activities by concentrating them along key access routes and ridgetop fuelbreaks. Over $450 million has been spent on fire suppression in the Western Klamath Mountains in the past decade. The strategies developed through the WKRP and demonstrated by the Karuk Alternative can reduce these expenditures by 50-90% over the next 10-20 years if implemented at large enough scales.	
121.22 - Karuk as is	#18934-19	6) The Karuk Alternative is the only alternative that allows for prescribed fire to be utilized in the next 5-10 years to restore historic fire regimes in burned areas within the WUI. This progressive approach will address concerns from Dr. Jerry Franklin and others that salvage logging in Late-Succesional Reserves will degrade habitat for spotted owls and threatened coho salmon, while addressing fire threats to adjacent communities, and helping to tip the balance towards fire resilient landscapes and away from the fire suppression paradigm that has created the conditions we are suffering from now. For all of these reasons, we sincerely request that you consider fully implementing the Karuk Alternative with the minor modifications requisite in such a large, complex project. Patty, as you near retirement, you have the choice to put the forest on the path to restoration of our fire resilient forests, or double down on the status quo of full fire suppression and legal wranglings into the foreseeable future. Our communities have endured enough and need your leadership to achieve the shared values we identified through the WKRP process, including: * Sustainable local economies * Cultural and community vitality - includes food security and balanced human-fire relationship * Fire-adapted communities * Restored fire regimes * Resilient, biodiverse forests, plants, animals, fish * Healthy river system	See Chapter 2 of the EIS for a discussion of how the Karuk Alternative has been considered and incorporated in the project. Consultation with the Karuk Tribe is ongoing.
121.22 - Karuk as is	#18934-4	We believe the Karuk Alternative more adequately addresses the Purpose and Need for this project than the current preferred alternative (Alternative 2). Worker and public safety are addressed in both the Karuk Alternative and the preferred alternative through treatments along critical access and egress routes. The Karuk Alternative includes additional fuels reduction around communities and outlying neighborhoods affected the the 2014 wildfires, better protecting these communities from future wildfires. Safe conditions for firefighters is better provided by the Karuk Alternative, which calls for implementation of prescribed fire around communities during appropriate burn windows. The preferred alternative would wait until wildfires burn through these areas. With fewer contiguous fuelbreaks around communities, firefighters would be exposed to more risk protecting communities from wildfires if the preferred alternative was chosen, additionally the resulting fire suppression activities for the protection of communities would cost more Economic viability of this project is not attainable even if the preferred alternative was fully implemented. There simply isn't the funding available from commercial harvest to pay for needed fuels reduction treatments. Much larger cost savings (by orders of magnitude) will be realized by treatment strategies like those proposed through the WKRP and the Karuk Alternative that mitigate the future costs of wildfire suppression. Additionally, getting out the cut for one salvage sale while sacrificing opportunities for collaboration and building trust will, in the long run, hurt our local economies and communities. The Karuk Alternative, through building trust amongst diverse interests, will promote future economic stability through sustainable outputs of resources from public lands. Large scale salvage logging in Late-Succesional Reserves (LSR's) has been scientifically shown in multiple research papers (Dr. Jerry Franklin's comments on Westside included here by reference) to impede the development of late successional fire resilient forests.	See Chapter 2 of the EIS for a discussion of how the Karuk Alternative has been considered and incorporated in the project. Consultation with the Karuk Tribe is ongoing. See response to comment number 18878-16 about project funding for implementation.
121.22 - Karuk as is	#18937-3	Klamath Riverkeeper supports the generalities proposed in the proactive Karuk Alternative included in the DEIS because it prioritizes healthy fisheries, fire-safe communities, sustained economic growth, natural forest regeneration and increased fire resilience in our shared forest resource contained within the Klamath National Forest (KNF).	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map. Consultation with the Karuk Tribe is ongoing.

Code	Comment Number	Comment Text	Response
121.22 - Karuk as is	#19076-10	The Karuk Tribe's proposal encourages natural forest regeneration, increases community safety through fire adaptation and uses the best available science and ttaditioo.al ecological knowledge.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map. Consultation with the Karuk Tribe is ongoing.
121.22 - Karuk as is	#19078-2	I also wish to state that the Karuk Alternative is the only alternative I would consider supporting	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#19154-5	What little I know about the Karuk Alternative they suggested more or more focus on ridge top fuel breaks that seems good too.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map.
121.22 - Karuk as is	#19156-1	Please give serious consideration to adopt the Karuk Tribes recommendations of a more natural and alternative method of management. With the present state of the planet, we need to do everything to bring in a more balanced approach and protect our forests now.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a review of the Karuk Alternative and how it's been incorporated into the new preferred Alternative. Also see the Appendix A of the final EIS (maps) for a comparison map. Consultation with the Karuk Tribe has been ongoing.
121.22 - Karuk as is	#3680-1	I would like to express my support for the alternative submitted by the Karuk Tribe (see Appendix G). I am a resident of Humboldt County and user of public lands in this region. Thank you for your consideration of this comment.	Position statement; see response to Comment number 16695-4. See Chapter 2 of the final EIS for a discussion of how the Karuk Alternative was considered and incorporated into the project.
121.23 - No Action Alternative	#10336-1	Clearcutting should be only an absolutely last resort. In the case of the Klamath National Forest, it would be the worst possible option. Erosion would result when we need rebirth. Please nurture our national forests, and the animals that live in them, instead of destroying them.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#17359-4	Please withdraw the "Westside" timber sale, and the egregiously misnamed "Emergency Determination" sanctioning it. Instead, require the employees of the Forest Service to listen to its own ecologists, and let these stands regenerate naturally, as they have for millennia before any meddling or "salvage logging" by humans. Thank you for your attention to this issue.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 1 of the EIS for a discussion of the emergency situation determination, which was approved by the Chief. It's available on the project's website and in the project record. See the beginning of Chapter 3 for a discussion of responsible opposing points of view.
121.23 - No Action Alternative	#17386-1	I am 100% opposed to this.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#17450-3	Accordingly, I see no benefit and huge downsides to the proposed massive logging operation. I favor Alternative 1: No action. Nature has been doing a great job of taking care of things for eons without the Forest Service's "help".	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.23 - No Action Alternative	#17472-1	The Klamath is a unique and beautiful place and should not be viewed as a commodity! Since the Klamath watershed and forests are still recovering from all the intensive logging in the past, please consider letting the forest heal on its own! I visit the Klamath and the Smith Rivers every year. These are exceptional recreation areas and should be treated with respect and care instead of clear cutting and degrading the streams and surroundings for logs that probably won't even be milled in America! Why aren't we preserving these beautiful habitats for future generations instead of raping and pillaging the land for a few dollars? The precious salmon and watersheds will not benefit from this project! Please value the natural resources of this place! Let mother nature heal herself.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a description of proposed actions; no clear-cutting is proposed. See the purpose and need statement in Chapter 1 of the EIS; one of the purposes of the project is the improvement of watershed conditions. Project design features for the mitigation of watershed effects are described in Chapter 2 of the EIS along with a description of legacy site treatments for the improvement of watershed conditions. See Chapter 3 of the EIS for a disclosure of effects by resource area and Alternative.
121.23 - No Action Alternative	#17496-1	I would like to begin by first asking that the Westside Fire Recovery Project DEIS be rescinded due to inadequate NEPA analysis of many relevant issues, the scale of the project precluding detailed analysis and oversight, and the extreme biological impacts of the proposed logging project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#17496-3	The Westside Fire Recovery Project is a misnomer that invokes government doublespeak and grossly misrepresents project outcomes, objectives and results. The project serves to recover only one thing: timber volume to the private timber industry. Let us remember it is public land and many public values are threatened. The project, as currently proposed, is not based in the best available science, nor will it restore fire- adapted forest conditions, reduce fuel loads long-term, or promote a more characteristic fire regime. The project has one overarching motive: economic recovery (i.e. the logging of timber in management designations that would otherwise not be available for clearcut logging or the logging of large old trees, snags, and important biological legacies). When reviewing the agency proposal it is very clear that much of the logging proposed would negatively impact LSR forest, special interest areas, recommended and designated Wild and Scenic Rivers, key watersheds, scenic vistas, national recreational treasures such as the Pacific Crest Trail, and biodiversity in one of the most diverse national forests in the country. In fact, roughly half of the proposed salvage logging would take place in LSR forest and 85% of the planning area is LSR forest.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised for a discussion of impacts in LSRs. See Also Appendix E.
121.23 - No Action Alternative	#17496-5	The project also proposes such heavy and widespread logging that the economic benefit of salvage logging will be minimized and diluted as the market is flooded with cheap salvage material, diminishing the price of timber in the region and creating a glut of material that will only serve to reduce the economic impact of the sale, while maximizing the environmental and societal impact. Simply put, the very scale of the project will heavily impact biological and social values, while reducing regional timber values. The KNF will be effectively maximizing impacts while minimizing returns. In that regard the project does not meet the purpose and need of maximizing economic values, nor is the project consistent with land management designations and directives for the Klamath National Forest (KNF). For these and many other reasons the Westside Fire Recovery Project Draft EIS should be rescinded and the KNF should take a more restorative, moderate approach that will sustain the region's ecology and the region's economy. To be forced into one or the other situation, is not reflective of the real options available to this region, nor does it serve the public interest or sustain the regional economy long-term. The boom and bust cycle of irresponsible resource extraction has already heavily impacted this beautiful and vibrant region, to reinitiate and reinforce this cycle will only lead to an ultimate collapse of the rural economy and will severely impact the region's ability to attract recreational visitors and a more diverse economy. For these reasons, among many others, the project should be canceled as it is currently planned. None of the alternatives presented in the DEIS will make the forests or communities of the Klamath River more fire-resilient. A new approach emphasizing prescribed fire, community protection, and the maintenance of the region's many important biological values should be initiated.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#17501-7	The KNF should have included scientific documentation to accompany the No Action Alternative, just as it has for the other alternatives listed for the Westside Project. Without an adequate comparison the public is unable to fully comment on the No Action Alternative. There are very good reasons to pick the No Action Alternative and that reasoning should be as fully developed and analyzed as the other alternatives in the DEIS.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.23 - No Action Alternative	#17939-2	Along with the severe small-scale local habitat/ vulnerable species concerns, I do feel that the No Action Alternative is best	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The decision must balance the effects to resources with meeting the purpose and need of the project. Alternative 1 (no action) is included in this decision process.
121.23 - No Action Alternative	#17955-1	PROTECT the wild lands and rivers around the Marble Mountains, DON'T log them! Set an example and allow this unique area to heal from wildfire.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#18726-1	I am writing to voice my disapproval of the proposed Westside Project. Fire is a natural part of this ecosystem, and should not be used as an excuse to log protected areas such as the Late-Succesional Reserves and Riparian Reserves. Guidelines in the Northwest Forest Plan for post fire logging within Late-Succesional Reserves state that "All standing live trees should be retained and management should focus on retaining snags that are likely to persist until late successional conditions have developed and the new stand is again producing large snags." This plan does not meet these requirements. The proposal to log live trees in the Late-Succesional Reserves is illegal.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to 12346-55; green trees will be retained.
121.23 - No Action Alternative	#18845-1	Please do not approve the massive logging project on the Klamath River. It will destroy the watershed	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#18857-1	My hope is that you will be swayed in favor of honoring ecological process(alternative 1) over the treatments prescribed by remaining alternatives. This model, of honoring ecological processes, represents a proactive and progressive approach that would truly produce the results you desire in a way that wouldn't pit the community against itself in this dysfunctional and reactive "Emergency" state we are now confronting.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#18857-20	Please consider Alternative 1.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#18898-2	Please cancel the Westside Project	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#18907-10	8. No helicopter logging should be allowed because these areas are intrinsically steep and the disturbance of fallers and workers cutting trees and the movement of logs on the ground will accelerate erosion over the already high erosion that is occurring due to fire-loss of ground cover.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See soils effects in Chapter 3 of the final EIS; helicopter logging results in less soil disturbance and associated erosion compared to ground harvest methods.

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121.23 - No Action Alternative	#18907-18	No activity of any kind should occur in Inventoried Roadless Areas. This includes roads across roadless areas to access other areas where equipment or people will do work.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No salvage harvest (logging) is proposed within Roadless Areas; however, roadside hazard treatments (logging of fire-damaged trees that present a hazard to roadways that intersect Roadless Areas) are proposed as is strategic fuels treatments. See Chapter 2 of the EIS for details.
121.23 - No Action Alternative	#18923-1	I am against this logging plan in the guise of ``fire recovery" on the Klamath and its headwaters. It will damage the river quality and the fishing. I spent weeks every summer on the Klamath during my youth and ran a kayak school on it briefly. This plan sounds ruinous . Do not push it forward	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#19074-1	Alternative #1 is the right thing to do. Let nature heal itself and we can learn more about the natural process in doing so. This would be the testing ground to see how future sites and situations should be handled when there are large burn sites.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The No Action does not meet the stated purpose and need. The No Action is included in analysis in order to have a baseline for the comparison of effects between the no action and action Alternatives.
121.23 - No Action Alternative	#19075-5	I am opposed to this salvage logging proposal	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#19155-1	Please cancel the Westside Project and continue to observe due diligence in protecting and preserving the Wild and Scenic River corridors. Salvage logging is detrimental to H20 quality, salmon, soils and wildlife habitat.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project is consistent with Wild and Scenic River corridor direction. The purpose and need of the project includes improving watershed and wildlife habitat. See Chapter 3 of the EIS for effects by resource area and Alternative.
121.23 - No Action Alternative	#20-7	Please join with fire ecologists, impacted communities and local tribes to focus on restoration and fire safety instead of pushing divisive and controversial clearcut logging proposals on steep slopes in key watersheds and in critical wildlife habitat.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#21-5	Siskiyou Land Conservancy is a non-profit conservation organization dedicated to protecting wildlife habitat and biodiversity in the counties of Mendocino, Humboldt, Del Norte, Trinity and Siskiyou. We are aware of, and will vigorously oppose, the Forest's plan to log in burned areas under the proposed Westside Salvage Project	General statement
121.23 - No Action Alternative	#21-6	Please withdraw the proposed Westside Salvage Project	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#31-1	I hope the Forest Service will retract its plans to clearcut in the Klamath. No one's interests are served by it except the timber industry and the Forest Service's allegiance ought to be to what's best for the forest. Fires are far less danger to this precious resource than logging is	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a description of proposed actions; no clear-cutting is proposed.

Code	Comment Number	Comment Text	Response
121.23 - No Action Alternative	#6570-1	I'm writing because I'm deeply concerned that your "Westside Fire Recovery Project" in the Klamath National Forest is actually a plan to clearcut old-growth trees. This is unacceptable. Doing so would undermine natural post-fire recovery in these late-successional reserves and degrade precious salmon habitat. As you know, fire is a natural occurrence in this area. Post-fire logging is counter to natural recovery and the objectives for which these reserved land allocations have been made. Economic use of timber is also not a valid purpose for logging on reserved lands. For all these reasons, I urge you to stop exploiting wildfire to fast-track controversial clearcut logging and allow this naturally burned habitat to support real recovery -- the recovery of the forest's at-risk species, including coho salmon, northern spotted owl and Pacific fisher. Please implement the Northwest Forest Plan and withdraw the proposal to clearcut up to 6,800 acres of burned forest in the Westside project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.23 - No Action Alternative	#7794-2	Attending seminars by Karuk scientist Frank Lake and others, we now know that the future which will sustain and protect forests in perpetuity, is the sophisticated way in which indigenous peoples promoted biodiverse landscapes in forested lands, such as the Klamath River basin. These practices did not require the highly damaging roadbuilding which denies amphibia genetic/reproductive connection. The dense roads called for will seriously fragment the habitats involved, and WILL cause future poaching problems, as well as removal of local habitats, especially if the drought continues. Please do NOT further remove shade, canopy, or understory structure through logging and roading. Local indigenous, again, properly use the small woody debris, reducing fire danger, while logging eith adds to it, or requires too-heavy removal of important carbon/organic material/mineral storage - things the forest needs in the present fast climatic change. Destroying anadromous fish spawning areas will result, and the industrial activity will certainly diminish necessary water quality for salmonid and other fish and ecosystem organisms, whether amphibians, insect larvae that use water and are part of diets of many organisms. This massive destruction for the profit of the logging company is merely wrong. As you know, fire is a natural occurrence in this area. Post-fire logging reduces natural old dead trees, disallowing their important place while standing as well as after falling in intact forests. Along with Northern Spotted Owls, many other organisms REQUIRE the complexity which results from this aspect of forest succession. Without the complexity of materials, fauna cannot persist in an area. Removal of the large trees results in habitat fragmentation which would not otherwise occur for any period, and thus is a significant cause of the trend toward extinction brought on by the logging and roading removal of nesting and resting places. Economic use of timber is NOT a valid purpose for logging on reserved lands. There is a strong consensus among scientists that post-fire logging is detrimental to species persistence, recovery, succession. Please follow the science and abandon the destructive and previously institutionalized practices which are causing species endangerment, loss of biological diversity, and has promoted increased introductions of alien species. For all these reasons, I urge you to stop exploiting wildfire to clearcut, and allow this naturally burned habitat to return to normal regimes. Please withdraw the proposal to clearcut any acreage of burned forest in the burned area, now, and in the future. Clearcut cannot continue if forests are to regenerate in ways that retain biodiversity, and the salvage logging policy must end now.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter fails to provide clear description or evidence about how the analysis in the draft EIS can be improved in terms of disclosure of effects. See the beginning of Chapter 3 for a discussion of responsible opposing points of view; effects are disclosed throughout Chapter 3. The final EIS and supporting documents incorporate best available science. The commenter is encouraged to read Chapter 2 of the final EIS for a description of what is proposed; no clear-cutting is proposed in this project. Alternative 4 was developed in response to concerns regarding watershed disturbance and impacts to water quality and aquatic resources. It proposes the least amount of temporary road construction. For the final EIS, the preferred Alternative is the modified Alternative 3 which incorporates components of Alternative 4; see Chapter 2.
121.24 - Against Alt 2	#10052-1	Please, most of the major forests and rainforests, not to mention animal species lost, around the world are in danger of being lost forever due to logging and illegal logging.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. This comment is not supported by rationale and logging around the world is outside the scope of this project. Actions proposed in this project are not illegal but are consistent with applicable law, regulation, and policy.
121.24 - Against Alt 2	#10197-1	Protecting wildlands, wildlife, and watersheds is the priority in the care of forests, not logging. Our priorities seem to be very confused these days. Some things cannot be "fixed" or "put back", and the wildlife and trees in these forests are in that category	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. This comment is not supported by rationale. This project is consistent with the goals of the Forest Plan.

Code	Comment Number	Comment Text	Response
121.24 - Against Alt 2	#12346-1	Post-fire logging is almost always inappropriate from an ecological standpoint (Lindenmayer et al. 2004, Lindenmayer and Noss 2006), perhaps especially after highseverity fire. Trees that survive the fire for even a short period of time are critical as seed sources and as habitat that will sustain many elements of biodiversity both aboveand below-ground. Removal of structural legacies-living and dead-is inconsistent with scientific understanding of natural disturbance regimes and short- and long-term recovery processes on sites characterized by high-severity fire regimes. Removal of any material is a potential detriment, but removal of mature living trees and the largest and most decay-resistant snags and logs produces the greatest negative impact on recovery processes, slowing the recovery of ecosystem function and characteristic biodiversity. This is without reference to negative effects of the logging process itself, such as impacts of roads on soils and streams." from: Noss, R.F., J.F. Franklin, T. Schoennagel, W.L. Baker and P.B. Moyle 2006. Ecology and Management of Fire-prone Forests of the Western United States. Policy Paper, Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests.	This comment notes potential adverse impacts of post-fire salvage logging citing Lindenmayer et al. (2004) and Lindenmayer and Noss (2006). These papers provide general discussions of potential impacts of post - fire salvage however neither paper is specific to the fire regime of the Klamath Province, or the objectives of the West Side Fire Recovery Project. The purpose and need for the Westside Fire Recovery project includes public and worker safety and restoration of fire resilient ecosystems. Lindenmayer et.al. (2008) also notes that “ecological values are only one of the criteria that society uses in making forest management decisions. Noss et al 2006 is a general literature review of a complicated topic that does not consider much of the recent literature relevant and specific to the Klamath Province concerning fuels and fuel accumulation. As written, the comment does not accurately describe the proposed salvage harvest in the Westside Recovery Project. We agree that removal mature living trees and structural legacies has a negative impact on recovery processes. The Westside Fire Recovery Project does not propose to remove mature living trees or structural legacies, living or dead. The Westside Fire Recovery Project seeks to protect and enhance late successional forest habitats by reducing the probability of future stand replacement fire by reducing fuels and accelerating the development late successional stand conditions by reforesting burned areas. Retention of all of the trees killed by the 2014 Westside Fires would create fuel loading that would actually increase the risk of future high severity fire that would consume snags and down logs and delay development of late successional stand conditions. See EIS Chapter 3, Responsible Opposing Views and Agency’s Responses and Appendix E.
121.24 - Against Alt 2	#12972-1	You are on very thin ice here. Isn't is your job to protect our wilderness? What you are proposing for the fire remediation in the Klamath National Forest sounds more like laying waste on very many levels. Please reconsider. Our wild places are very valuable and irreplaceable. We need to treat them gently.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. he commenter provides no rationale in support of these statements. No treatments are proposed in Wilderness; this is stated in Chapter 1 of the final EIS. Also see Chapter 2 for a description of the proposed actions.
121.24 - Against Alt 2	#13597-1	Withdraw Proposal for Harmful Post-fire Logging	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#14904-1	A National Forest is something special, hence the label "National Forest". These are forests that are meant to be protected and appreciated. In fact, there are laws in place to prevent visitors from taking a piece of that land, whether it be rocks or picking flowers, the National Forest system has a set of rules to ensure that the park stays protected. Up until now, I have had great faith and appreciation for the services you have provided. It is your rules that have been put into place that ensure that there is still nature left for our children and children's children to enjoy. In fact, I believe that it is nature, it is this Earth, this planet, that has sustained the human species, along with all other species around us, for this long. Without our planet and the nature around us, there is no life. While the Earth sustains us, we do very little as individuals to reciprocate the favor. While humans are busy with consumerism, the Earth is suffering. Our species is poisoning our rivers, lakes, and oceans with oil spills, radiation leaks, and garbage and plastic litter that is directly from mass consumerism. Our air is so dirty in some countries you can literally see a layer of filth and smog that choke each sunset and starry night. Today, it's difficult to find a forest that has gone untouched by man. Now, it's happening in our own backyard. That's just too close to home. In this day and age, if any positive change is going to come, if nature is to be preserved for our future generations to enjoy, each of us has to start making changes in our lives and do our part. We also need to start thinking about ourselves as global citizens, one huge community of individuals who all inhabit the same rock in the Milky Way. As a Californian, I am proud to live amongst open-minded, caring and active neighbors. Our state is a positive example for other states and individuals who want to make a change. This was the main reason I chose to live in California. Today we are offered a choice. We can partake in society's consumerism and money motivated pressure, or we can take a step forward into a better future for us all. I'm asking you to greatly consider your role as a Forest Service, and remember that the weight behind this decision is great. It is decisions like this that will literally affect our planet's, and ultimately our species', future. It is up to you to do the right thing.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.24 - Against Alt 2	#15037-1	Do you think people are going to get thirsty in California soon? Your proposed clear cut will likely ensure that they are, sooner rather than later. This sale, this action, is unthinkable, downright thoughtless in fact. Please, for the sake of every living thing down slope or downstream, stop this timber sale.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter to of the final EIS for a description of proposed actions; no clear-cutting is proposed. Effects to wildlife and aquatic species from the project and Alternatives are disclosed in Chapter 3 of the EIS. See response to 3-4.
121.24 - Against Alt 2	#15216-1	please do your job with integrity rather than accept bribes from predatory commercial interests which is the only plausible reason why you would allow the loggers in, as is obvious to everyone who is watching you as you decide which way to go regarding the protected reserves. Thanks in advance.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#15561-1	In what way exactly does clearcutting protect a forest from fire? The proposal to clearcut stands of old growth forest for fire prevention is Orwellian to say the least. The only thing being 'salvaged' in the proposed plan is the bottom line of the logging corporations who are clearly sitting in the drivers seat on this one. Please stick to the very explicit rules governing forest management in the Northwest Forest Plan and deny this 'salvage' plan its permit.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clearcutting is proposed; see Chapter 2 for a description of the proposed actions.
121.24 - Against Alt 2	#16695-1	I urge you to withdraw the proposal to use an "Emergency Determination" to sanction the massive and biologically devastating "Westside" timber sale on lands affected this summer by the Beaver, Whites, and Happy Camp fires.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#16864-1	Please stand with conservation groups, native tribes, watershed councils and fire ecologists to oppose the Forest Service rush to log at any cost. Please follow your own rules that protect important wildlands, wildlife and watersheds.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#16915-1	Please protect the Klamath national forest - clear-cutting is not good for salmon, or for anyone else. Please protect old-growth reserves.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is proposed; see Chapter 2 for proposed actions.
121.24 - Against Alt 2	#16954-1	Yeah, guys, ease up on that logging. We need to leave some of those old trees standing. My opinion.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#17223-1	Clear-cutting forest is not a way to restore it ecologically. Please follow your own precedents and put an end to the madness.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is proposed; see Chapter 2 for proposed actions.
121.24 - Against Alt 2	#17295-1	Current proposal to log the Klamath Forest is UNACCEPTABLE. I know the area in question intimately and the damage proposed would be irreparable to both land and river. I support the compromise made by the Karuk tribe.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.24 - Against Alt 2	#17307-2	Why are we always fighting the Forest Service over and over with the same problems but just a different Forest? What is the plan for the lumber products and will the roads be eliminated and what harm is predicted for the fish that I come to this area each year to fish and release my catch.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Any temporary roads opened for treatment will be closed and hydrologically stabilized following treatments. See Chapter 3 of the final EIS for effects hydrology and fish effects from the proposed actions.
121.24 - Against Alt 2	#17318-1	I am expressing my opinion that the Klamath river logging proposal be disallowed because of the ill effects such salvage logging may have on the river system.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 of the EIS under hydrology and fish/aquatic resources for a discussion of effects.
121.24 - Against Alt 2	#17320-1	No Logging! Enough destruction of the life blood of this earth. Use alternative methods as the ruin of the land is not the answer. Decaying trees provides essential nutrients to our environment, wildlife, plant life and human life alike. Leave our wild lands alone. There is much to be said about these type of logging projects but not enough room for texting on this issue	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 of the EIS for a discussion of effects by resource area.
121.24 - Against Alt 2	#17354-1	am shocked as well as outraged by what you are proposing in the Westside Draft Environmental Impact Statement. Salvage logging is highly controversial and is detrimental to water quality, salmon, soils and wildlife habitat. These steep and highly unstable hillsides have already been negatively impacted by last year's fire. What you are proposing would be devastating to the visual quality of six Wild and Scenic River corridors and beyond. The project would also be detrimental to our struggling salmon runs and would remove critical habitat for imperiled species. The globally significant watersheds of the Klamath National Forest provide vital public trust resources and astounding biological diversity. Complex forest ecosystems following a fire have higher than monetary value! Please cancel the Westside project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Project design features for soils, fish, watershed, and scenery are incorporated into the project design; see Chapter 2 of the EIS. See Chapter 3 of the EIS for a disclosure of effects by Alternative. See the beginning of Chapter 3 for responses to responsible opposing viewpoints. We recognize and acknowledge the importance of the Klamath bioregion and its watersheds and biological diversity and feel that this project helps to improve conditions for watersheds and habitat in the long term by improving the speed at which forests regenerate to provide habitat for late-successional species and addressing future fire risk. See the purpose and need statements in Chapter 1 of the final EIS.
121.24 - Against Alt 2	#17363-4	I am very concerned about the Project's potential impact on water quality and threatened salmon, old growth forests and the Northern spotted owl, existing and proposed Wild & Scenic Rivers, and roadless areas (some of which have been proposed in legislation as additions to the Marble Mountain Wilderness).	See Chapter 3 of the EIS for a disclosure of effects by resource area and Alternative.
121.24 - Against Alt 2	#17379-1	Please, refrain from logging the proposed old growth redwoods and Douglass fir in said location. As a former member of the California department of firefighters, I don't believe that 2000 year old trees need removed, logged or any human intervention. You and I know that this is wrong, so again, please just leave the forest alone. Thank you.	See Chapter 2 of the EIS for a description of proposed actions; no old-growth redwoods are found within the project area. The only trees proposed for salvage harvest are those that are fire-damaged with a high probability of mortality.
121.24 - Against Alt 2	#17401-5	I write to offer comment on the Westside Fire Recovery Project Draft Environmental Impact Statement (DEIS). I have reviewed this document, and I write to express my concern over the potential impacts to biocultural diversity, especially the immense potential that salvage logging and the related infrastructure needed to accomplish these goals will create synergistic assaults on water quality and the salmonoid life that healthy rivers support, on old growth forests and the Northern spotted owl. The plan, with its excursion into roadless areas and activities in steep terrain near and adjacent to existing and proposed Wild & Scenic Rivers, constitutes a cumulative assault on an ecosystem that is already under duress due to so many years of drought. Firescapes present immense opportunity; plans to reap profit wile reducing future fire threat have been impetus for National Forest management for decades. However, given the fragility of our forests in this time of change in climatic norms, this plan reflects a dated notion of priority in determining and weighing relative positive and negative impact. A watershed approach that truly prioritizes biocultural health over short-term economic concerns is needed to insure fire prevention efforts are in balance with watershed and ecosystem recovery needs. This means a coupled bio/social management plan that emphasizes healthy rivers, minimizes disturbance and movement of sediment and related impact on riverine habitat, and prioritizes	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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		cultural flows (managing human activity in ways that support and sustain the culturally diverse ways of life.	
121.24 - Against Alt 2	#17419-2	I am writing in regards to the largest logging operation ever proposed on the Klamath National Forest in northwest California. Intended to "salvage" timber burned in last year's wildfires, the proposed project threatens water quality in several existing and proposed Wild & Scenic Rivers and may harm fish habitat and the threatened coho salmon, as well as old growth forests home to the Northern spotted owl. This area is very special to me. This project will substantially down grade it. I hope you will stop this project before it damages this beautiful area.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#17460-2	I have several concerns with Alternative 2 (the alternative being promoted by the forest service). In addition to those highlighted by Professor Franklin, the first is the effect on Northern Spotted Owls, which are likely to be adversely affected, according to the USFS Wildlife Biological Assessment, dated April 16, 2015.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See the beginning of Chapter 3 for a discussion of responsible opposing points of view, including those of Dr. Franklin.
121.24 - Against Alt 2	#17485-1	As owner of a rafting company on the Klamath and Scott Rivers as well as a land owner on both rivers, I STRONGLY oppose the Westside Fire recovery project as currently proposed. My bachelors degree and masters degree are both in Ecology and the current proposal falls incredibly short of being ecologically sound. My business (and in my opinion many of the legitimate long term business in the area) rely on the improving fishery and natural beauty of the area. It is incredibly shortsighted to put in hundreds of miles of new roads and remove the nutrients needed for the future forest. Have we not learned by now that fire is natural. The entire premise of 'salvage' is flawed. If it is logging fine, but those burnt trees and roadless areas are certainly providing a service.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#17493-2	I am putting my trust in you to protect our precious water and land. I have studied the very harmful effects of salvage logging on fragile environments, squashing new growth and killing more animals. Please, please don't allow salvage logging on California lands. We need more time to comment, please. The erosion this will cause is extreme and we need high quality water, especially in the drought.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#18878-2	The Karuk Tribe supports some level of post-fire landscape treatment through salvage. However, the Alternative 2 Refined Proposed Action in the Draft Environmental Impact Statement (DEIS) is unacceptable and contrary to the Karuk Tribe's management vision, which is to protect and enhance culturally significant resources' management needs.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.24 - Against Alt 2	#18878-38	Alternative 1 Direct Effects and Indirect Effects The Karuk Tribe advocates the use of the Karuk Alternative in an attempt to pursue management actions which will allow for fire to be used as a management tool to return the landscape to a natural fire regime. However, while we are not advocating for Alternative 1, in this section it seems once again the author is not giving the average reviewer a complete picture and portraying this alternative in as negative terms as possible.	Many elements of the Karuk Alternative overlap with the Westside Fire Recovery Project. See Chapter 2 of the EIS for a discussion of how the Karuk Alternative was considered and incorporated into the project.
121.24 - Against Alt 2	#18878-72	The Karuk Tribe supports some level of post-fire landscape treatment through salvage. However, the rationale, restoration objectives, and implementation of past and the proposed salvage are unacceptable and contrary to the Karuk Tribe's management vision. To protect and enhance culturally significant resources management needs to be adapted to promote a fire adapted landscape.	Consultation with the Karuk Tribe is ongoing. See Chapter 2 of the EIS for a discussion of how the Karuk Alternative was considered and incorporated into the project.
121.24 - Against Alt 2	#18883-3	Alternative 2 is the proposed action. It appears to take the most extreme position on removal of trees and is the most adverse action to erosion, sediment production, protection of spotted owl and fisher habitat, habitat connectivity, and legacy components (i.e. old growth trees) and late-successional reserves. A new alternative should be developed and analyzed that incorporates the concepts listed herein.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#18921-1	I do not support the large scale logging operation proposed for the Klamath watershed. The additional roads would cause bad run-off of dirt into the river, silting over salmon spawning areas.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#18923-1	I am against this logging plan in the guise of ``fire recovery'' on the Klamath and its headwaters. It will damage the river quality and the fishing. I spent weeks every summer on the Klamath during my youth and ran a kayak school on it briefly. This plan sounds ruinous . Do not push it forward	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#18925-1	Klamath National Forest Supervisor, I am writing in support of the Karuk alternative to the Westside Fire Recovery Project. The plantation-fire-suppression paradigm that the preferred alternative reflects does not pass for ecosystem management in the klamath mountains and is not acceptable. I am a forestry operations student at Humboldt State University and work during the summer as a forestry technician. I have been using the Klamath National Forest for backpacking since I was a kid and consider myself a stakeholder in this project. Lindsey Holm	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#18926-41	The Westside Fire Recovery Project would destroy the Caroline Creek eagle nest area and would harm imperiled native wildlife, endemic species, wild salmon, water quality Wild and Scenic Rivers, Visual Quality Objectives, soils, geology, botany, cultural resources and vital biological legacies. Fuels treatments may never be funded and would endanger river communities.! ! Most of the impacts are to Late-Succesional Reserves and to Riparian Reserves, Visual Quality Objective areas and Critical Habitat for the increasingly threatened Northern spotted owl and Coho salmon. The KNF cannot legally elect to span snag retention guidelines to average over one hundred acres when it is clear that snag retention is meant for a per acre basis nor can it assume that moderate severity burn areas no longer support habitat for native plant and animal species.! ! The Westside DEIS is contrary to the recovery of threatened species listed under the Endangered Species Act. The project violates the Clean Water Act, the Magnuson-Stevens Fishery Conservation and Management Act, the Northwest Forest Plan and the Klamath National Forest Land Resource Management Plan and is contrary to the recommendations of multiple watershed analysis and Late Successional Reserve Analysis.! ! The project also violates the National Environmental Policy Act by failing to take a hard look at cumulative effects, failing to use plain language, failing to consider the difference between moderate and high severity fire, fails to consider visual impacts from the Wild and Scenic North Fork Salmon River, fails to consider geologically unstable areas as Riparian Reserves, fails to honestly consider climate change, fails to consider public trust resources such as clean water, carbon storage, wildlife and recreation as an economical value, fails to adequately consider the	This comment reflects the opinion of the commenter, not the content of the EIS. The comment provides no information specific to the environmental consequences of the Westside Fire Recovery Project other than the commenter's opinion, and all of the issues noted in the comment were addressed. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. With respect to Caroline Creek, the decommissioned section of Forest Road 46N62 (also referred to as the "Caroline Creek Road") will remain closed. Sections of decommissioned road associated with dropped salvage units were also dropped. These roads include decommissioned sections of 45N56YA, 46N42Y, and 46N78, which will remain closed. See Chapter 3 of the final EIS for a disclosure of effects by resource area and Alternative. Also see response to comment number 12364-1. All Alternatives are consistent with the requirements of the Klamath Forest Plan for protection of eagles (EIS Chapter 3, Wildlife). Alternative 3 modified contains additional reductions in salvage harvest in this area in response to consultation with the U. S. Fish and Wildlife Service. Snag retention both outside and within salvage harvest units is proposed along with the retention of legacy components, as described in the wildlife project design features in Chapter 2 of the final EIS. See EIS Chapter 3, Wildlife, Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised, Appendix E, and comment 5873-72. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

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		ecological costs.! !	
121.24 - Against Alt 2	#18934-5	The preferred alternative proposes more salvage logging on steep, unstable slopes in LSR's with a history of debris flows and impacts to coho salmon streams. This will not achieve the stated goal in the purpose and need, "…for restored and fire-resilient forested ecosystems." Additionally, the re-planting of conifers and obligate fire suppression for the foreseeable future in these logged areas, preclude the restoration of these areas through fire which is the only tool that can achieve these goals at the scale needed.	The commenter is referring to the preferred Alternative from the draft EIS (alternative 2). The new preferred Alternative is modified Alternative 3 in the final EIS, which was developed in response to public comments and continued consultation with the Karuk Tribe and regulatory agencies. Planting does not preclude fuels treatments; in some places, both are proposed in this project. See Chapter 2 for a description of the proposed actions by Alternative and see Chapter 3 for a disclosure of effects by resource area and alternative.
121.24 - Against Alt 2	#37-1	I am strongly opposed to any plans that include post-fire salvage logging. I support letting burned areas recover through natural processes.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#6000-1	As a previous employee Fisheries Biologist on Orleans District (1989 to 1994), I find this exploitation of wilderness and roadless Marble Mountains both despicable and expected. Your lack of funding to care for the logged and abused national lands is not to be born on the backs of our precious resources. Fire happens as a natural cycle of regeneration. Let the land heal without further human alteration and harvest intervening. Those burned trees are providing nature with the shade and minerals to create a successive regeneration. Leave the fire burned land alone. As an owner of these national lands I continue to object to any alterations of wilderness, harvesting trees means roads and increased sedimentation - a double whammy for the aquatic life. Please spend my money thinning and reducing fuels where you have legal access, Start with National lands closest to human dwellings and end with managed road improvement or road deconstruction. Stay away from the Marbles! These are both sacred and irreplaceable microclimates and botanically sensitive mountains. Go harvest fuels from the lands you are already allowed to manage and start managing them properly.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No salvage harvest is proposed in Wilderness or Roadless Areas and fuels reduction is proposed as part of this project; see Chapter 2 of the EIS for a description of the proposed actions.
121.24 - Against Alt 2	#6146-1	P.S. Please, this is not an environmentally sound solution and given all the strain and the rapid degradation of this water shed due to fires and drought and various other insults, we must NOT pile on another man-made event. PLEASE do not allow this to happen.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.24 - Against Alt 2	#6277-1	Numerous reasons to abandon salvage logging as a management tool exist, as scientific review of the practice largely shows deleterious effects. Great differences in post-fire and post-logging effects occur on flora and fauna in our Pacific forests. While western forests and species, especially these of Northern CA and Southern OR, are fire adapted, salvage logging has been proven to inhibit species diversity, and logging appears to change the microbial patterns of soils, inhibiting proper forest succession. Radeloff, Volker C., David J. Mladenoff, and Mark S. Boyce, in "Effects of interacting disturbances on landscape patterns: budworm defoliation and salvage logging." Ecological Applications 10, no. 1 (2000): 233-247, have this to say: "[L]ogging differs from fire, for instance, in its effects on soil nutrients (Weber 1987), carabid assemblages (Beaudry et al. 1997), and surface vegetation (Whittle et al. 1997). " (Radeloff et al. 2000) Salvage logging is highly unscientific, and destroys far more of our public landforests, than any economic advantage can mitigate. For a strong critical overview of the practice, see: McGaughey, Jothan Kelvyn. "MECHANISMS OF POLICY CHANGE: AN ANAYSIS OF SALVAGE LOGGING ON FEDERAL LANDS INCLUDING A CASE STUDY OF THE BISCUIT FIRE SALVAGE SALES " PhD diss., The Evergreen State College, 2011.	We recognize that the effects of fire and salvage logging are not the same as noted in the cited papers. We agree that any material over time would serve an ecological function for the simple reason that there is no “excess” in nature. Retention however, of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current LSR land allocation (EIS Chapter 3 – Fuels). Not all of the project objectives are ecological in nature. The intended purpose of salvage of fire-killed trees is to reduce the amount and continuity of fuels that would be created when those trees break or fall to the ground and become surface fuel. These actions compliment proposed fuel reduction and strategic fuel management zones as part of a landscape scale strategy to reduce the size and severity of future fires (Thompson et al, 2007). Reducing the size and severity of future fires serves to reduce risk to watersheds and wildlife habitat from high severity events like the 2014 Westside fires and improves the likelihood of firefighting success. Our goal is to reestablish the high frequency - low severity fire regime that characterized the Klamath Province so that fire could play its natural role on the landscape. Salvage logging would remove the heavy fuels that would contribute to future high severity fires and move the forest toward that objective in the areas where it occurs Salvage harvest would occur on about four percent of the project area. Within the four percent of the project area that is within a harvest unit, forest plan standards and guideline for coarse woody debris, which are intended to maintain soil fertility and biodiversity must be met. The commenter suggests that salvage logging should be abandoned as a management tool. We recognize that the effects of fire and salvage logging are not the same. Soil organic matter has been used to analyze impacts the impacts of the project on overall soil productivity due to changes in microbial communities. Where the soil organic matter indicator is not met, microbial communities have the potential to be impacted. Impacts to soil microbes and soil nutrients have been analyzed using the soil organic matter indicator. Impacts to soil cover have been analyzed using the soil stability indicator. Impacts of the project on soils are discussed in the soils section in chapter 3 of the final EIS. See the watershed project design features in chapter 2 of the final EIS for project design developed to minimize impacts to soils.
121.24 - Against Alt 2	#6400-1	Fire "leftovers" are a critical part of an ecosystem and critically important to recreating the top soil and duff layers destroyed by a fire. Dead trees and brush help replenish the nutrients needed to regrow a forest system. I am shocked by the extreme clearcut logging of "late-successional" old-growth reserves and geological riparian reserves proposed by the Klamath National Forest in the Westside Salvage Project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a description of proposed actions; no clear-cutting is proposed.
121.24 - Against Alt 2	#6501-1	Dear Forest Service--this may look like a form letter you've already received from many people, but I agree with everything in it and couldn't have said it better myself. PLEASE do the right thing to protect this land from further degradation. More details: , I am shocked by the extreme clearcut logging of "late-successional" old-growth reserves and geological riparian reserves proposed by the Klamath National Forest in the Westside Salvage Project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a description of proposed actions; no clear-cutting is proposed.
121.24 - Against Alt 2	#6508-1	I have seen the results of poor planning and excessive timber cutting throughout the region. My observations are based on experience, not theory and financial objectives. I am shocked by the extreme clearcut logging of "late-successional" old-growth reserves and geological riparian reserves proposed by the Klamath National Forest in the Westside Salvage Project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a description of proposed actions; no clear-cutting is proposed.
121.24 - Against Alt 2	#6545-1	Below is the form letter. I have read it and fully support the content in this letter. I am a Geologist and have worked to evaluate road related erosion (e.g. following the Biscuit Fire) and conducted numerous TMDL sediment budgets in northern California. Based upon my informed views of land management in forests of the Klamath region, I support the following letter.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.24 - Against Alt 2	#6678-1	I'm writing because I'm deeply concerned that your "Westside Fire Recovery Project" in the Klamath National Forest is actually a plan to clearcut old-growth trees. This is unacceptable. Doing so would undermine natural post-fire recovery in these late-successional reserves and degrade precious salmon habitat. As you know, fire is a natural occurrence in this area. Post-fire logging is counter to natural recovery and the objectives for which these reserved land allocations have been made. Economic use of timber is also not a valid purpose for logging on reserved lands. For all these reasons, I urge you to stop exploiting wildfire to fast-track controversial clearcut logging and allow this naturally burned habitat to support real recovery -- the recovery of the forest's at-risk species, including coho salmon, northern spotted owl and Pacific fisher. Please implement the Northwest Forest Plan and withdraw the proposal to clearcut up to 6,800 acres of burned forest in the Westside project. Selective sustained logging of dead dying and diseased trees via low impact persons on the ground with chain saws, using helicopters to lift out the few select trees, harvesting trees of different ages, so that the age of the remaining trees in the forest covers the full spectrum from young to ancient (ancient trees should NOT be harvested) and mandatory replanting of 1:1 or 2:1 are necessary standards to be implemented for healthy forests and all of the life, including us, who are dependent on healthy thriving forests.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment 12414-1 and 6924-1. The Forest Service reviewed the article and acknowledges the role of fire in the ecosystems and the beneficial effects of fire. See Chapter 2 of the EIS for a description of proposed actions of this project. See the affected environment section of Chapter 3 for a description of the post-fire condition by resource. See Chapter 3 of the EIS for effects of the proposed actions on resources by resource area. See the beginning of Chapter 3 for a discussion of responsible opposing points of view.
121.24 - Against Alt 2	#6772-1	As a former backcountry ranger and Redcard-holding firefighter for the National Park Service, I have seen first hand what fire can do and the erosion that takes place afterwards ; I beg you NOT to clearcut in burned acreage! It would be a disaster that would alter these habitats forever, and NOT for the better of the creatures and species trying to recover there!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a description of proposed actions; no clear-cutting is proposed.
121.24 - Against Alt 2	#6853-1	irst of all, fire is a natural occurrence in this area. This post-fire logging plan runs counter to natural recovery; not incidentally, it also makes a mockery of the objectives for which these reserved land allocations have been made. Finally, economic use of timber is absolutely NOT a valid purpose for logging on reserved lands. The Westside project is nothing more that an exploitation of wildfire as a means of fast-tracking controversial clear-cut logging. We urge the Forest Service to follow its own rules in the Northwest Forest Plan. Allow this naturally-burned habitat to support real recovery: that of the forest's at-risk species, including coho salmon, northern spotted owl and Pacific fisher. To reiterate: our recommendation is that you withdraw the proposal to clearcut up to 6,800 acres of burned forest in the Westside project. Implement the Northwest Forest Plan. We trust you will give our comments your most serious and thoughtful consideration.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS; no clear-cutting is proposed. The Forest Service acknowledges that fire is a natural occurrence in the area. In fact, the treatments proposed are to reduce fire risk to late successional habitat and other strategic areas for the protect of the remaining habitat not already removed by fire. See Chapter 1 of the EIS for the purpose and need statements for this project, which include watershed and wildlife habitat improvement. The project is designed to be consistent with the Forest Plan, which incorporates the Northwest Forest Plan. See Chapter 1 for a discussion of salvage in Late Successional Reserves and see the beginning of Chapter 3 of the EIS for a discussion of responsible opposing points of view.
121.24 - Against Alt 2	#6880-1	As you know, fire is a natural occurrence in this area. Post-fire logging is counter to natural recovery!! Forest fire in natural and works into a health ecological balance to this natural environment!! Logging will disrupt and damage the sensitive ecology that is health after forest fires!!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS; no clear-cutting is proposed. The Forest Service acknowledges that fire is a natural occurrence in the area. In fact, the treatments proposed are to reduce fire risk to late successional habitat and other strategic areas for the protect of the remaining habitat not already removed by fire. See Chapter 1 of the EIS for the purpose and need statements for this project, which include watershed and wildlife habitat improvement. The project is designed to be consistent with the Forest Plan, which incorporates the Northwest Forest Plan. See Chapter 1 for a discussion of salvage in Late Successional Reserves and see the beginning of Chapter 3 of the EIS for a discussion of responsible opposing points of view.
121.24 - Against Alt 2	#6880-2	Post-fire logging is detrimental to the objectives for which these reserved land allocations have been made. Economic use of timber is also not a valid purpose for logging on reserved lands. For all these reasons, I urge you to stop exploiting wildfire to fast-track controversial clearcut logging and allow this naturally burned habitat to support real recovery -- the recovery of the forest's at-risk species, including coho salmon, northern spotted owl and Pacific fisher.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS; no clear-cutting is proposed. The Forest Service acknowledges that fire is a natural occurrence in the area. In fact, the treatments proposed are to reduce fire risk to late successional habitat and other strategic areas for the protect of the remaining habitat not already removed by fire. See Chapter 1 of the EIS for the purpose and need statements for this project, which include watershed and wildlife habitat improvement. The project is designed to be consistent with the Forest Plan, which incorporates the Northwest Forest Plan. See Chapter 1 for a discussion of salvage in Late Successional Reserves and see the beginning of Chapter 3 of the EIS for a discussion of responsible opposing

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			points of view.
121.24 - Against Alt 2	#7028-1	Salvage is a euphemism for fake excuse. I have seen many many trees, especially the old ones keep growing after a fire. We all have. You're not fooling anyone here. The rarity of old forests, with all the various events they experience make them invaluable. To destroy this special ecosystem is unconscionable.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#7270-1	After living through two months of being on evacuation advisory last summer/fall, I really don't want to live through months of watching trees being driven down my road that were cut unnecessarily.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#7636-1	We're trashing our planet and destroying the habitats of those who live in these sensitive areas. This misuse of our natural resources, with its accompanying abuse of free-living animals, must stop.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#7643-1	The 'good ol' boy' lumber lobby is acting stupidly once again, trying to make profit from the only environment we have that produces oxygen so we can actually breathe. Fie on them, the unreasonable and perpetually destructive logging industry deserves to be disbanded.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#7850-1	A post wildfire location is not a big clear-cut. It's the stage for a miracle of nature to restore itself when humans keep their feet, saws and machinery off of it.. Please, keep everyone out of the Klamath burn and let it stabilize again with new growth on it's own..	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a description of treatments; no clear-cutting is proposed.
121.24 - Against Alt 2	#8002-1	Please leave Nature to do its natural thing. Man is too intrusive on the lands for many reasons all over the globe. Humanity must give our "home" much more respect. Governments and corporations need to put their foot down about many things and be more conservative.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#8094-1	I'm asking you to scrap the "Westside Fire Recovery Project" in the Klamath National Forest. This project does not appear to contribute to forest recovery	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#8152-1	This is "Un-Lawful". This is a Violation odf the Supreme "Laws of Nature", as described in "America's Declaration of\Independence". These words are True, because, at least in-part, doing so would undermine natural post-fire recovery in these late-successional reserves, and such would degrade precious salmon habitat.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project is consistent with law, regulation and policy.

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121.24 - Against Alt 2	#8196-1	Furthermore, old growth trees are more valuable for their superior ability to sequester carbon from the atmosphere than for their board feet value. Every old growth tree cut down is another nail in the coffin of global warming.	No green old growth trees are proposed for harvest. See Chapter 2 of the EIS for a description of proposed actions; the project includes post-fire salvage harvest which is limited to the removal of dead, fire damaged trees. See Chapter 3 of the EIS under climate change for a discussion of carbon sequestration by Alternative. Also see Chapter 2 under wildlife project design features; the project is designed to retain legacy components, including appropriate large snags.
121.24 - Against Alt 2	#8507-1	Having lived in and studies Northwest forests for forty years, my experience shows me that leaving surviving old growth in a burned area is the best, most efficient and most economical way to insure propogation of a new stand.	This is not inconsistent with the project; see Chapter 2 of the EIS for a description of the proposed actions.
121.24 - Against Alt 2	#8527-1	I live very near the Klamath National Forest and have enjoyed its beauty on many backpacking trips. In no way should anyone be allowed to log that region especially clearcutting old growth trees. We've had enough of that in our region. No one I know supports this!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a description of the proposed actions; no clear-cutting is proposed.
121.24 - Against Alt 2	#8557-1	I learned in High School that forests need to be left alone to recover naturally after a fire. I seriously doubt that has changed, unless you're a logging company that wants to benefit and profit from a disaster.	General comment not supported by rationale. This project incorporates best available science. See the beginning of Chapter 3 for a discussion of responsible opposing points of view.
121.24 - Against Alt 2	#8581-1	Forests must be managed in a way that protects endangered species, preserves clean water and allows the natural ecosystem to heal itself from fire as it has done for millennia and is spelled out in the Northwest Forest Plan.	General statement. The project is designed to protect resources consistent with the endangered species act and clean water act along with the Forest Plan, which incorporates direction from the Northwest Forest Plan.
121.24 - Against Alt 2	#8886-1	California forests belong to the public and provide environmental services for the public's benefit. They provide habitat and watershed. No private interest should be able to rob us of the environmental services that our forests provide.	General comment. The project is designed to protect habitat and watershed; see Chapter 2 of the EIS for a description of proposed actions, including project design features.
121.24 - Against Alt 2	#9310-1	I ash the Forest Service to protect important wild lands, wildlife, and the watersheds that all Americans depend upon. Clear cutting old-growth reserves in key salmon strongholds makes no sense. Some logging is appropriate where it would do the least harm but clear cutting on forest slopes only leads to landslides and unstable slopes.	Position statement; see response to Comment number 16695-4. See Chapter 2 of the EIS for a description of proposed actions and project design features; no clear-cutting is proposed and protection measures are designed to protect wildlife habitat and watershed conditions. Further, the purpose and need of the project includes the improvement of watershed and wildlife conditions. This includes legacy site treatments and treatments proposed within Late Successional Reserves. See the geology section of Chapter 3 for a discussion of unstable slopes.
121.24 - Against Alt 2	#9454-1	What may happen with excessive logging is sad, pathetic and ignorant. There is science and common sense behind the system of perpetual growth.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The final EIS and supporting documents consider best available science.
121.24 - Against Alt 2	#9689-1	Is this a joke or are you people really that uneducated? California is in the worst drought position in history and you are considering allowing the massacre of thousands of TREES??? Let's get clear on this - trees are probably the only thing saving your state, since you are not willing to ban fracking, bottled water depletion of resources or any restrictions on the REAL users/wasters of this valuable resource. I To allow the cutting of these trees at this time is beyond foolhardy, it is inconceivably insane.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.24 - Against Alt 2	#9797-1	I am a senior in high school. Whatever you do, my generation has to spend our time fixing it. Please, PLEASE do what is good for the earth, for the plants and the people. THIS IS NOT OKAY. I am teary-eyed with the thought. This area is supposed to be protected. Please do not do this. You have the power.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the final EIS for a description of proposed actions and Chapter 3 for a disclosure of potential effects.
121.24 - Against Alt 2	#9935-1	As we've already seen in Washington State logging and in Southern California for housing development in recent years, as well as smaller-scale examples of logging on the Pacific Coast, deforestation causes great harms to both people and wildlife habitat, as well as to our climate. Cutting down forests to prevent them from burning is idotic and reflective of the timber industry's greed, regardless of the harms that will result for generations to come. I urge more intelligent, long-term vision. No more unsustainable logging in our states fragile ecosystems.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.24 - Against Alt 2	#9977-1	Cutting down these trees will not really make a difference, will it? What is underlying cause of the fires in the first place? Try focusing on that aspect as well as respecting natural cycles (if any cutting should be done, how about near places that humans live to protect them?). Please stop.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.25 - Against Alt 3	#14-4	Alternative 3 - Spotted owl and fisher habitat, habitat connectivity, and legacy component issue Alternative. Fewer acres are proposed for treatment with only 3% being proposed for salvage harvest. Recovery of burned lands is negligible. The biggest issue is no treatment proposed within the Beaver Fire area. The Beaver Fire contained the highest amount of Matrix acreage affected by high severity of all the fires that burned last summer. Private land adjacent to the Forest ownership has been salvage and will soon be reforested. That should not preclude the Forest from attempting to recover some its land ownership as well. Without doing some work within the burn area, especially adjacent to private property, you will just be setting up a future fire with negative effects to private ownership. We don't believe this is in the best interest of those private landowners. We strongly believe recovery efforts should be made on the Matrix land base within the Beaver Fire area.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.25 - Against Alt 3	#18879-10	Alternative 3, 4,5, and Karuk all reduce the salvage/fuel reduction/reforestation treatment acres. Part of that reduction occurs near the community of Seiad Valley within their WUI zone. Even Alternative 2 falls somewhat short in this regard, but the other alternatives fall way short. This is not responsible management because it significantly elevates the future level of hazard for Seiad and also for Happy Camp.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.25 - Against Alt 3	#18879-13	None of the alternatives to the proposed action do a credible job of describing the long term consequences of the various reductions in activity levels. In Alternative 3, saving heavily damaged timber stands laced with dead fuel seems very short sighted. Those stands are almost sure to be lost inthe next fire and may well contribute to larger future loses because of the heat and intensity they will generate. Treatment now is a better option. The same principle applies to Alternative 4. A reduction in disturbance level now with a small payoff in watershed effects will likely lead to higher intensity future fires with many times more watershed impacts. Treatment now is a better option.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.25 - Against Alt 3	#18879-9	Alternatives 3, 4, 5, and the Karuk Alternative do not achieve the more optimal balance of benefits versus costs when compared to Alternative 2. Each of these alternatives reduces the levels of reforestation, salvage logging,fuel treatment, and road use in an effort to lighten the effect on wildlife or watershed. While this is a noble objective, what is not well recognized is that the long term consequences of less treatment now is a future with more acres of destructive, high intensity wildfire and fewer acres of diverse forest with a desirable mix of conifer, hardwood, and shrub vegetation. The forest that will be sustained in alternatives 3, 4, 5, and Karuk will be more dominated by large, mature brush fields than the forest resulting from Alternative 2. High proportions of large, mature brush fields reduce the overall quality of wildlife habitat on the forest and reduce many of the environmental, social,and economic values present in a forest with a good balance of conifer, hardwood, and shrub/herbaceous vegetation.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.25 - Against Alt 3	#19073-10	Alternative 3 - Spotted owl and fisher habitat, habitat connectivity, and legacy component issue Alternative. Fewer acres are proposed for treatment with only 3% being proposed for salvage harvest. Recovery of burned lands is negligible. The biggest issue is no treatment proposed within the Beaver Fire area. The Beaver Fire contained the highest amount of Matrix acreage affected by high severity of all the fires that burned last summer. Private land adjacent to the Forest ownership has been salvage and will soon be reforested. That should not preclude the Forest from attempting to recover some its land ownership as well. Without doing some work within the bum area, especially adjacent to private property, you will just be setting up a future fire with negative effects to private ownership. We don't believe this is in the best interest of those private landowners. I strongly believe recovery efforts should be made on the Matrix land base within the Beaver Fire area.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.25 - Against Alt 3	#19-12	Alternative 3: This alternative clearly does not meet the stated purpose and need. The most notable issue with this alternative is that is removes any salvage logging and associated site preparation, planting and release treatments within the Beaver Fire. This alternative would have the net effect of severely endangering private lands that are encompassed within the fire area and directly adjacent to USFS lands. As private land owners responsibly salvage and replant their lands, they will be at high risk of losing their reforestation investment due to the likelihood of adjacent USFS lands re-burning and moving onto their private lands. The selection of this alternative would be completely irresponsible not only for the lack of rehabilitation on USFS lands, but also for the danger the USFS lands will have to adjacent private land owners for many years to come.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.26 - Against Alt 4	#19-13	Alternative 4: This alternative further limits the scope of the project by reducing the acres that will be treated by not allowing the use of certain existing roads. More specifically, non-system roads, (existing roads that are not in the USFS road system database) cannot be utilized unless they are located on ridgetops, and not hydrologically connected to the drainage network. Additionally, in Key Watersheds, any use of these roads can't be longer than 250 feet. Also, maintenance level 1 roads cannot be utilized if a stream crossing needs to be reconstructed. This alternative reduces that acres available for restoration by 900 acres compared to alternative 2. In addition to this reduction, this alternative makes the assumption that existing non-system roads will be in better condition if left alone, not utilized for this project, and not maintained. The roads in question for this alternative are not new roads and therefore there is no new net impact to watersheds if they are utilized. In fact, roads that are not maintained typically have the most potential for watershed damage. Failures that end up causing mass wasting and deleterious effect to coho salmon arise from lack of maintenance and proper drainage. Selection of this alternative would likely do the opposite of the stated objective.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.27 - Against Alt 5	#14-5	Alternative 5 - Disagreements about the effects of salvage logging and site preparation on Late-Succesional Reserves, riparian reserves, and inventoried roadless areas by removing all units that overlap these management areas. This alternative does nothing to recover any of the burned area. There is very little being done to recover forested stands lost in the wildlfire, very little in terms of creating worker and public safety, and nothing to insure forests will once again thrive in the impacted areas. The salvage treatments account of 1% of the burned areas. It is a public travesty to not treat 99% of an area that suffered the worst catastrophic event ever seen on the Klamath National Forest. The untreated areas will burn again. Additional green forests will be consumed in the next catastrophic event as the untreated fuels accumulate and once again burst into flames. That is exactly what happened in many of the areas in last summer's fires. Untreated areas from past fires created conditions that consumed thousands of acres of living forests. All this alternative will do is prevent living forests to re-occupy large acreages of the burned areas in the future. In a many cases it will be a minimum of 300 years before mature forests would once again occupy these sites. In some cases forested stands may never re-occupy these sites. We don't believe that is what a majority of the public wants. They want to see green forests that provide recreational opportunities, wildlife habitats for all species, clean and healthy watersheds, visually pleasing landscapes, and commodity removal opportunities. Doing nothing within these burned areas will not allow any of these things to happen for centuries. This Alternative also drastically reduces that amount of reforestation planned. That would be a very big mistake. Relying on natural regeneration is not the best approach. First of all the probability of natural regeneration is very low in those areas that have thousands of contiguous acres of high mortality. There are not enough seed trees around to provide for rapid conifer re-establishment. Secondly, species establishment through natural regeneration may not promote the desired species for many of these sites. Artificial regeneration can insure the right species composition and allow for rapid conifer re-establishment on those areas that are treated.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.27 - Against Alt 5	#17481-31	Alternative 5: Likes/Dislikes - I dislike this Alternative because it limits the land base available for recovery activities with no significant environmental/economic gain	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.27 - Against Alt 5	#18879-12	Alternative 5 restricts salvage and reforestation activities to the LMP Matrix lands which severely reduces the acres treated compared to Alternative 2. This approach is a glaring example of management driven by administrative definition rather than the needs on the ground. There is no biological foundation for this alternative though it does illustrate a weakness in the current LMP land classifications and management direction.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.27 - Against Alt 5	#19073-11	Alternative 5 - Disagreements about the effects of salvage logging and site preparation on Late-Succesional Reserves, riparian reserves, and inventoried roadless areas by removing all units that overlap these management areas. This alternative does nothing to recover any of the burned area. There is very little being done to recover forested stands lost in the wildfire, very little in terms of creating worker and public safety, and nothing to insure forests will once again thrive in the impacted areas. The salvage treatments account of 1% of the burned areas. It is a public travesty to not treat 99% of an area that suffered the worst catastrophic event ever seen on the Klamath National Forest. The untreated areas will bum again. Additional green forests will be consumed in the next catastrophic event as the untreated fuels accumulate and once again burst into flames. That is exactly what happened in many of the areas in last summer's fires. Untreated areas from past fires created conditions that consumed thousands of acres of living forests. All this alternative will do is to prevent living forests from re-occupying large acreages of the burned areas in the future. In a many cases it will be a minimum of 300 years before mature forests would once again occupy these sites. In some cases forested stands may never re-occupy these sites. I don't believe that is what a majority of the public wants. They want to see green forests that provide recreational opportunities, wildlife habitats for all species, clean and healthy watersheds, visually pleasing landscapes, and commodity removal opportunities. Doing nothing within these burned areas will not allow any of these things to happen for centuries. This Alternative also drastically reduces that amount of reforestation planned. That would be a very big mistake. Relying on natural regeneration is not the best approach. First of all the probability of natural regeneration is very low in those areas that have thousands of contiguous acres of high mortality. There are not enough seed trees around to provide for rapid conifer re establishment. Secondly, species establishment through natural regeneration may not promote the desired species for many of these sites. Artificial regeneration can insure the right species composition and allow for rapid conifer re-establishment on those areas that are treated.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.27 - Against Alt 5	#19-14	Alternative 5: This alternative does not meet the stated purpose and need. This alternative is similar to alternative 1 except for the hazardous fuels treatments that are increased within the Beaver Fire area. The main difference between this alternative and the proposed alternative: this alternative removes any salvage logging that would take place in Late-Succesional Reserves (LSR's). Removing these areas from the project simply because they are within the LSR land allocation is simply ridiculous. The acres that are within LSR and proposed for salvage logging in alternative 2 are burned to the same degree (high intensity, essentially 100% kill) as the acres burned in the matrix allocation and proposed for salvage treatment. Areas that are mapped as LSR but have succumbed to high intensity stand replacement type fire are in actuality no longer late seral stands, and management decisions should not be made based on them.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.28 - Against Karuk Alt	#14-6	Karuk Tribe Alternative – Very little narrative is included in the alternative displayed in the Draft EIS. There are some maps. Visual analysis of the maps indicates very little recovery emphasis on the interior portions of the burned areas. The only treatments appear to be concentrated around private lands, the river corridor, and some hazard tree removal on some road systems. That would lead one to believe that thousands of acres of high mortality burned areas would be left for mother nature to take care of. Most of that would involve future catastrophic wildfires within those untreated areas. As stated for Alternative 5, it would be centuries before forested stands would once again occupy these acres, if at all. This alternative also requests that no artificial regeneration occur. Once again this will limit many of the burned areas from being established with conifers or the presence of desired conifer species. The fires from last season contained a much higher level of high mortality burn. This level is extremely higher than that found in natural fires or past wildfires. This makes the likelihood of natural regeneration less likely. As stated in the other alternative discussions, we believe most of the taxpayers, whose land this is, would prefer to see forested stands created in the quickest time frame possible. Our discussion about time frames of conifer re-establishment, future catastrophic events in untreated areas are identical to those stated for Alternative 5. The Tribe Alternative also promotes the idea of restoring many of the areas by reintroducing natural fires through prescribed burning. A realistic approach needs to be taken as too how much prescribed burning can actually be accomplished on a yearly basis. Some groups and individuals appear to have an unrealistic view of how much can actually be accomplished. With current burn restrictions, weather conditions, smoke issues, the amount of actual acreage that can feasibly be accomplished is far less than acreage proposed in any Alternative that promotes the re-introduction of fire as the primary recovery effort. Also, we question the feasibility of actually being able to re-introduce prescribed burning with so much fuel that will be created in the untreated areas. Tremendous levels of fuel loading will occur in those high/moderate burn severity areas as the trees begin to fall to the ground (10 - 15 years). One also needs to consider the effects of burning to natural regeneration that may get established. This would also set back the recovery period to future conifer stands.	The Karuk Alternative was provided to the agency the night before publication of the EIS. For the final EIS, see the how the alternative was considered in Chapter 2 and see the comparison tables and maps of the Karuk Alternative with that of the preferred Alternative (modified Alternative 3). See response to 3-4. Consultation with the Karuk Tribe is ongoing.
121.28 - Against Karuk Alt	#18879-10	Alternative 3, 4,5, and Karuk all reduce the salvage/fuel reduction/reforestation treatment acres. Part of that reduction occurs near the community of Seiad Valley within their WUI zone. Even Alternative 2 falls somewhat short in this regard, but the other alternatives fall way short. This is not responsible management because it significantly elevates the future level of hazard for Seiad and also for Happy Camp.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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121.28 - Against Karuk Alt	#19073-12	Karuk Tribe Alternative -Very little narrative is included in the alternative displayed in the Draft EIS. There are some maps. Visual analysis of the maps indicates very little recovery emphasis on the interior portions of the burned areas. The only treatments appear to be concentrated around private lands, the river corridor, and some hazard tree removal on some road systems. That would lead one to believe that thousands of acres of high mortality burned areas would be left for future fires and insects to manage. As stated for Alternative 5, it would be centuries before forested stands would once again occupy these acres, if at all. This alternative also requests that no artificial regeneration occur. Once again this will limit many of the burned areas from being established with conifers or the presence of desired conifer species. The fires from last season contained a much higher level of high mortality bum. This level is extremely higher than that found in natural fires or past wildfires. This makes the likelihood of natural regeneration less likely. As stated in the other alternative discussions, we believe most of the taxpayers, whose land this is, would prefer to see forested stands created in the quickest time frame possible. Our discussion about time frames of conifer re-establishment, future catastrophic events in untreated areas are identical to those stated for Alternative 5. The Tribe Alternative also promotes the idea of restoring many of the areas by reintroducing natural fires through prescribed burning. A realistic approach needs to be taken as too how much prescribed burning can actually be accomplished on a yearly basis. Some groups and individuals appear to have an unrealistic view of how much can actually be accomplished. With current bum restrictions, weather conditions, smoke issues, the amount of actual acreage that can feasibly be accomplished is far less than acreage proposed in any Alternative that promotes the re introduction of fire as the primary recovery effort. Also, we question the feasibility of actually being able to re-introduce prescribed burning with so much fuel that will be created in the untreated areas. Tremendous levels of fuel loading will occur in those high/moderate bum severity areas as the trees begin to fall to the ground (10 - 15 years). One also needs to consider the effects of burning to natural regeneration that may get established . This would also set back the recovery period to future conifer stands.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for how the Karuk Alternative was considered and incorporated into this project.
121.28 - Against Karuk Alt	#28-2	I've looked at the Karuk Tribe alternative for this project. I like their ideas on fuel breaks but there is no way we can just leave all the dead and dying burned trees out in the forest as they propose. Those burned trees need to be removes in order to reduce dangerous fuels that will accumulate over time and make bigger and more dangerous fires in the future.	See Chapter 2 of the EIS for a discussion of how the Karuk Alternative has been considered and incorporated into the project.
121.29 - Against No Action	#17286-1	As a Happy Camp resident for at least 30 years, and married to a man who has lived here for almost 60 years, I would like to say my husband and I fully support your efforts to log and clean up fire damaged areas from the massive 2014 fires in the Klamath National Forest. I hope you stand fast on this issue, even though you will be getting lots of heat to cease your salvage logging and cleanup efforts. You have the support of many folks who live in this area regarding this project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.29 - Against No Action	#18602-1	Please follow-thru on this post-fire harvest.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.29 - Against No Action	#18861-1	I support this project and applaud the Klamath NF scientists for their efforts to protect aquatic resources, especially salmon and water quality, while actively managing the forest. After reading the project documentation, I found that objections to this project based on issues of "clear cutting" and loss of biodiversity to be inaccurate. Critics of this project do not understand the issues of fire fighter safety and management for long term goals. Action is needed. I support the Klamath NF staff's development of actions that protect fire fighters during future wildfires by addressing the fuels risks now.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
121.29 - Against No Action	#19073-9	Alternative 1 - No Action This alternative will not meet the purpose and need since no recovery will occur. This alternative will actually create conditions for long-term adverse effects as the untreated landscapes will once again be consumed by catastrophic wildfire as down fuels accumulate, over the next 10 - 20 years, from all of the untreated material. This has been the case on all of the past wildfire areas that have not been treated. Eventually, this area will bum again creating environmental effects greater than those from first fire. We don't believe this is what the public wants and is not in the best interest of taxpayer owned public lands.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We acknowledge that the No Action does not meet the stated purpose and need. The No Action is included in analysis in order to have a baseline for the comparison of effects between the no action and action Alternatives.

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121.29 - Against No Action	#19-10	Alternative 1: Does nothing to the areas impacted by the 2014 fires. None of the four purpose and need items will be met. Burned areas and the roads within will be very dangerous for workers of the public to enter. The establishment of a new forest will be very slow, extensive brush fields will develop; wildlife habitat will stay in early seral stage within the high intensity burn areas for decades, many areas will likely re-burn numerous times as excessive ground fuels builds up from decaying, crumbling snags.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We acknowledge that Alternative 1 does not meet the stated purpose and need of the project.
122.01 - Cumulative Effects Analysis	#17111-17	This significant information regardi ng NSO, as well as impacts of the Barred Owl, needs to be acknowledged and considered in the final EIS. Specific consideration needs to be given to the impacts of: (I) salvage on development of the debris-rich Jate-successional conditions characteristic of forested NSO (and prey) habitat; and (2) establishment of conifer plantations on the amount and distribution of shrub-dominated early successional habitat in which the woodrat resides.	Brush and hardwoods are likely to regenerate in the long term if no salvage and reforestation is done because of the high fire return interval and heavy fuels left on the landscape. That habitat type does not meet the needs of northern spotted owl. See effects analysis for northern spotted owl in Chapter 3 of the final EIS.
122.01 - Cumulative Effects Analysis	#17500-2	We must consider the cumulative impact on fish and wildlife, soil erosion, water quality, etc.	Cumulative effects have been considered. See Chapter 3 of the final EIS by resource area and Alternative for a discussion of potential cumulative effects.
122.01 - Cumulative Effects Analysis	#18878-21	DEIS: Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time. Past activities contributed to the existing condition and are considered in the affected environment. (Pg. 107) Comment: We believe the DEIS is in error by not analyzing and disclosing the cumulative effects of the 2014 Fire suppression activities.	The commenter's quote is from the draft EIS and appears to be accurate. The conditions resulting from the fires are considered under the affected environment section by resource area throughout Chapter 3 of the final EIS. IT just isn't discussed as a cumulative effect, as it doesn't meet the definition.
122.01 - Cumulative Effects Analysis	#18883-11	The Draft EIS did not consider project impacts from adjacent lands, public or private, on overall forest health. Cumulative impacts must be considered. Appendix C, “Actions Considered for Cumulative Effects,” does not provide any analysis of the inter-relationships between the Appendix C projects and Alternative 2 feature impacts. If the objective of the proposed action is to provide a resilient and sustainable forest, the proposed and ongoing projects within and around the fire areas need to be analyzed.	This comment is inaccurate. The analysis for this project did consider actions on adjacent private lands; see the Appendix of both the draft EIS and final EIS for a description of actions considered for cumulative effects. See cumulative effects sections by resource area and Alternative throughout Chapter 3 of the EIS for the cumulative effects analysis (of the proposed action when added to other actions).
122.01 - Cumulative Effects Analysis	#18907-13	11. The Draft EIS did not consider project impacts from adjacent lands, public or private, on overall forest health. Cumulative impacts must be considered. Appendix C, "Actions Considered for Cumulative Effects," does not provide any analysis of the inter-relationships between the Appendix C projects and Alternative 2 feature impacts. If the objective of the proposed action is to provide a resilient and sustainable forest, the proposed and ongoing projects within and around the fire areas need to be analyzed.	This comment is inaccurate. The analysis for this project did consider actions on adjacent private lands; see the Appendix of both the draft EIS and final EIS for a description of actions considered for cumulative effects. See cumulative effects sections by resource area and Alternative throughout Chapter 3 of the EIS for the cumulative effects analysis (of the proposed action when added to other actions).

Code	Comment Number	Comment Text	Response
122.01 - Cumulative Effects Analysis	#18931-1	Geographic Area Affected (DEIS Ch. 1, pg1) Comment: The DEIS only evaluates vegetation, precipitation, and other natural conditions. Since Webster defines Geography not only as "The descriptive science dealing with the surface of the earth, its division into continents and countries and the climate,, plants, animals, natural resources," but also, the "inhabitants and industries of the various divisions." (Webster's New World Dictionary of the American Language, Pg. 605) Therefore, the DEIS must evaluate human-caused conditions on the landscape. Regarding Affected Environment and Environmental Consequences (Ch. 3, DEIS, pgs. 107-8) "This analysis relies on current environmental conditions as a proxy for impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects." Comment: Excluding any prior human-caused impacts on the forestry landscape is entirely inadequate in identifying and managing the affects of natural and man-made impacts, thus negating analysis of current or future human-caused impacts on the forest from this project. This circumvents the very intent of cumulative impacts analysis: to identify the natural and man-made causes which together create cumulative impacts over time. The whole point of NEPA is to identify the causes of the problem that needs to be addressed by the "proposed action" and to analyze the causes and effects of those actions in order to "foster and promote a harmonious relationship between man and his environment." For example, according to Forest Service Chief Peterson, 1982, (National Geographic, Sept. 1982, picture above): "Until the 1950s our role was largely custodial….Because private forests filled most of our timber needs, demands on national forests were minimal. By then commercial stands had become mostly stumps and saplings, and industry looked to national forests for supply. That's when the timber a question began to heat up"	Both the draft and final EIS include a discussion of the social-economic effects of the proposed actions. As the draft EIS states in the quoted statement, the EIS doesn't exclude consideration of past actions but considers them in the affected environment. We acknowledge the quote from the National Environmental Policy Act law about fostering and promoting a harmonious relationship between man and the environment; however the commenter is unclear how the Forest Service is inconsistent with this purpose or what adjustment, if any, to the analysis of the proposed actions is necessary. The Forest Service acknowledges the quote from an earlier Chief, but again, the commenter fails to provide any clear evidence or rationale for how the analysis is inadequate as it stands in the EIS.
122.01 - Cumulative Effects Analysis	#19078-1	I wish to express my disapproval of the Westside Timber Sale due to impacts to the Klamath River's key salmon refugia, cumulative impacts to forest and watershed, and violations of the Clean Water Act, the Endangered Species Act, NEPA and California's Porter Cologne law. I incorporate by reference the comments of the Klamath Siskiyou Wildlands Center, the Center for Biological Diversity, the Karuk Tribe and the Environmental Protection Information Center and the Klamath Forest Alliance.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the final EIS for a discussion of how the Karuk Alternative has been considered and incorporated.
122.01 - Cumulative Effects Analysis	#5873-1	This is one of many large salvage logging projects. There is significant new information about the value of complex young forests that develop in the absence of salvage logging and replanting – complex young forests with abundant legacy structure and diverse vegetation composition. The FS needs to prepare a programmatic EIS to consider the cumulative impacts of its salvage logging program.	The Forest Service has considered and incorporated best available science into the final EIS and supporting documents. The commenter fails to provide any scientific evidence to support claims or for Forest Service review. See the beginning of Chapter 3 for responses to responsible opposing points of view. See the Appendix "actions considered for cumulative effects" for the actions considered for cumulative effects analysis. Cumulative effects is analyzed throughout Chapter 3 of the EIS by resource area and Alternative. There is no requirement to prepare a programmatic EIS; the final EIS already provides site-specific, project-level National Environmental Policy Act analysis.
122.01 - Cumulative Effects Analysis	#5873-91	Consider the additive and cumulative effects of salvage logging and associated activities. The agency must consider the additive effects of salvage logging, road construction, log hauling, activity fuel treatment (broadcast burning, pile burning, and mechanical fuel reduction), site preparation, tree planting, OHVs, as well as the cumulative effects of past logging, roads, fire effects, fight fighting, etc. The agency must not adopt the reasoning that the effects of the fire are greater than the effects of the logging and are likely to mask the latter. The Ninth Circuit rejected precisely this type of analysis as faulty and violating NEPA in Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208 (9th Cir. 1998). http://laws.findlaw.com/9th/9835783.html. The Court held that Despite the lack of data, the Forest Service asserts throughout the EA that the expected level of sediment delivery will be small in comparison to that caused by the fire. Whether the increased erosion from logging and roadbuilding is smaller or larger than that produced by the fire is irrelevant. The proper evaluation should identify the impact of the increased sediment from the logging and roadbuilding on the fisheries habitat in light of the documented increases that have already resulted from the fire. 161 F.3d at 1213 (9th Cir. 1998) (emphasis added). Post-fire landscapes are not a high priority for fuel treatment.	Actions that are part of the proposal do not meet the definition of cumulative effects; however they are described in Chapter 2 and considered under direct and indirect effects throughout Chapter 3 of the final EIS. Events such as wildfires and the suppression of them is not considered in cumulative effects. This is because the nature of natural events and their unpredictability precludes them from being analyzed. For example, although fire is recognized to be common in the area, it is unknown when, how large, how severe the next fire will be. It would be even more impossible to predict the nature of suppression techniques that would be required given the uncertain nature of the future event. Appendix C of the EIS includes a description of the ongoing and future foreseeable actions considered for cumulative effects and this includes other similar actions on federal and private land within the analysis area. The effects of the proposed action when added to the effects of other proposed federal and non-federal ongoing and future foreseeable actions has been considered for cumulative effects analysis. Effects from OHV activity have not been discussed because their use is very low within the proposed treatment area and proposed activities are not likely to increase OHV activity. The soil report for the project analyzes impacts to soil erosion using the soil stability indicator and soil erosion would increase for all action Alternatives compared to the no action Alternative. Past actions are incorporated into the affected environment, as described at the beginning of Chapter 3 of the EIS.

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122.02 - Disclosure of Effects	#12346-5	Page 106 of the DEIS acknowledges that an action alternative that focused on hazardous fuels treatments and roadside logging would "meet one part of the purpose and need for this project (to reduce safety hazards to adjacent landowners, the public and forest workers) by including fuels and roadside hazard treatments." But the Forest Service insists upon conducting unit salvage logging in LSRs in order to "obtain the maximum economic commodity and value from burned timber." Ibid. The agency also mistakenly contends that unit salvage logging will "increase the likelihood and speed by which burned forests are restored." Ibid. The Forest Service is not permitted to justify logging the LSRs in order to "obtain the maximum economic commodity and value" from these old-growth reserves. As is shown throughout these comments, and as established by the peer-reviewed literature submitted during the scoping process, unit salvage logging will inhibit, rather than contribute to, restoration of late-successional forest character. Please note the recent 2013 BLM publication entitled the Analysis of the Management Situation for the Resource Management Plans for Western Oregon states that: The 1995 RMPs do not provide management direction in Riparian Reserves or Late-Successional Reserves to salvage after disturbance for economic reasons. Since recent science seems to indicate that an ecological rationale for post-disturbance timber 3 salvage is weak, an opportunity exists to add an economic objective related to afterdisturbance salvage activities to these reserved land use allocations.	The Westside Fire Recovery Project is intended to reduce long-term fire risk from dead trees created by the 2014 Westside Fires, including the areas in Late Successional Reserves. The units selected have been chosen to create large blocks of treated fuels and to tie into the proposed system of strategic fuel breaks (Chapter 3, Fuels; Appendix E Proposed Activities in Late-Successional Reserves Westside Fire Recovery Project Klamath National Forest). The Forest hopes to recover the maximum value of timber offered and use those funds for additional fuel reduction and reforestation of severely burned areas. (See Response 18878-16) That would be accomplished by offering the timber for sale before substantial deterioration occurs. Fire killed trees have marginal economic value to begin with, and delays in harvest can easily make sales uneconomic. Seeking maximum value means that we wish to sell this material before deterioration reduces its value or makes it unmarketable. That reduces our dependence on appropriated funds to accomplish other necessary work. This “avoids the perception of economic waste” (Forest Ecosystem Management Assessment Team II-18). That is a different objective than trying to maximize overall revenue. There is no intent to maximize the funds recovered simply by designing a large project. The project would be designed differently if that was the case. For example, there would be far less helicopter yarding and more emphasis on harvesting large trees if motivations were simply economic in nature. The question of risk reduction by salvage harvest of dead trees in Late Successional Reserves was anticipated in the development of the Northwest Forest Plan and was addressed in the Northwest Forest Plan ROD. The report of the Forest Ecosystem Management Assessment Team provided the basis for the Northwest Forest Plan. Forest Ecosystem Management Assessment Team considered salvage with three different prescriptions, ranging from Prescription 1 - no salvage, to Prescription 3 - salvage with minimum guidelines. The Northwest Forest Plan ROD adopted Prescription 2, (Forest Ecosystem Management Assessment Team II-18) which provided for limited salvage in Late Successional Reserves. The Forest Ecosystem Management Assessment Team report describes the rationale for Prescription 2 as follows:Valuable trees that are dead can be used for commercial purposes with the attendant employment and economic benefits. …Increased fire danger or risk to insect and disease resulting from large accumulations of dead trees (emphasis added) can be reduced in an economically feasible fashion. Avoided are the perceptions of economic waste if patches of dead trees are not salvaged (Forest Ecosystem Management Assessment Team II-18).The topic of salvage in Late Successional Reserves was addressed in the Northwest Forest Plan ROD. Public comments on the Draft of the Northwest Forest Plan opined that salvage should be restricted only to Adaptive Management Areas. The Secretaries of Agriculture and Interior, the signing officials for the Northwest Forest Plan, noted their logic for allowing salvage in Late Successional Reserves in the Response to Comments: Salvage is not required to be beneficial, but is designed to permit recovery of a timber volume in those instances where catastrophic events clearly kill more trees (resulting in more snags and down logs in the short and long term) than are needed to maintain late successional conditions (Northwest Forest Plan ROD: 66). The ROD for the Northwest Forest Plan provided Guidelines to Reduce Risks of Large-Scale Disturbance (Northwest Forest Plan ROD C-12, 13). The Klamath NF Forest Plan incorporated, and is consistent with, management direction contained in the Northwest Forest Plan. The federal Ninth Circuit Court of Appeals clarified the application of standards and guidelines for salvage in Late-Successional Reserve in a published opinion in ONRC v. Brong (number 05-35063; D.C. numberCV-04-00693-AA) also known as the Timbered Rock decision . The Ninth Circuit Court of Appeals ruled in the Timbered Rock decision that salvage could proceed in certain circumstances in an Late-Successional Reserve, noting:…the Forest Service may consider economic interests in choosing how it will conduct Late-Successional Reserve salvage operations; that it may do so is not only a matter of common sense, but it is also something explicitly contemplated by the Plan. See NFP Standard and Guideline at C-13-C-14 (“[M]management planning for Late Successional Reserves must acknowledge the considerable value of retaining dead and dying trees in the forest as well as the benefits from salvage activities.”). However, the NFP does not permit a salvage project in an Late-Successional Reserve for the purpose of recovering the economic value of timber without at least explaining—in the administrative record—how such action is compatible with the NFP’s direction to protect and enhance late-successional ecosystems (8941-42). The Westside Fire Recovery project protects and enhances late successional ecosystems by reducing the risk of future stand replacement fire and accelerating the development of late successional stand conditions.Because Late Successional Reserves have been established to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions (Northwest Forest Plan C-14; Late-Successional Reserve Assessment 1-24). Research has shown that the quickest way to reestablish a coniferous forest after stand replacement fire is by active reforestation (Zhang et al. 2008). Research has also shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less severity and intensity or not at all (Weatherspoon and Skinner, 1995; Omi and Kalabokidis 1991). Forest Vegetation Simulation (FVS) modeling (EIS Chapter 3 Vegetation and Appendix E) shows that reforestation will establish forested conditions more rapidly by treating surface fuels and planting trees than by natural succession. It also shows that where surface fuels have been treated by salvage logging and site preparation, the ensuing stand is more resilient to fire than

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			untreated areas. If surface fuels are treated, the risk of future stand replacement fires would be reduced, increasing the probability that planted conifers can persist into the future. In the FVS model, planted stands where fuels had been reduced began to show late-successional stand conditions typical of the Klamath Province with 40% canopy closure and 18 inch diameter at breast height trees in 70 years compared to over 200 years for untreated stands to reach the same stage. Without planting, trees will slowly become reestablished over a period of 10-50 years in severely burned areas, but the probability of a late-successional coniferous forest becoming established is low because of probable reburns fed by heavy surface fuels from fire-killed trees. It is probable that areas where fuels are not treated will go through several cycles of stand replacement fire until surface fuels have been reduced to the point that a low to moderate fire severity regime has been reestablished. This would maintain areas where fuels have not been reduced in semi-permanent brush fields for decades rather than accelerating the development of late-successional stand conditions.The planted trees in areas where fuels have been successfully reduced are expected to provide “islands” of coniferous forest in a sea of brushfields perpetuated by reburns where fuels have not been reduced. This would provide a measure of vegetative diversity that would not otherwise be present on the landscape. These planted stands have a much higher probability of achieving and sustaining the desired late successional stand condition for the Late-Successional Reserve than do unplanted areas as shown in the FVS modeling (Chapter 3 Appendix E, Attachment 1). See also Chapter 3, Responsible Opposing Views and Agency’s Responses.
122.02 - Disclosure of Effects	#18852-34	17) There is a tendency to underestimate the potential effects from this project, which may negatively impact multiple resource values. This is repeatedly stated in the DEIS as "will not affect", other statements refer to insufficient ability to ground-truth all project areas.	The commenter fails to provide any evidence or rationale to support the claims that project effects have been underestimated.
122.02 - Disclosure of Effects	#18852-35	18) Silvicultural prescriptions (i.e. clearcutting, large group selection harvesting etc.) within the fire footprint and project areas by unit are not clearly stated, nor are specific timber volumes quantified by each unit. This omission of volumes and unit specific forest practices conceals many potential resource concerns.	See Chapter 2 of the EIS for a description of proposed actions; no clear-cutting or large group selection is proposed. This is not a "green" timber sale but a salvage harvest and restoration project in response to the effects of the 2014 wildfires. Prescriptions by unit are provided.
122.02 - Disclosure of Effects	#18852-40	23) The management of "unknown" populations of "Threatened, Endangered or Sensitive" species (T.E.S) is not fully acknowledged. Historic surveys are only partially adequate to determine presence or absence, they cannot verifiably determine that unknown populations will not be detrimentally affected by the proposed alternatives (2-5). Therefore language stating that "no affect" from the proposed management does not consider the probability of disturbance to undetected populations of "T.E.S." species.	We are not solely depending on historic surveys for TES species. See the methodology section of Chapter 3 analysis for TES species. Monitoring and surveys are ongoing, as described in Chapter 2 of the EIS and in supporting documents.
122.02 - Disclosure of Effects	#18858-5	As your editorial makes all too clear, you have already decided that the threat of "reburn" is so great as to render other considerations unimportant, and certainly the focus of this DEIS reflects that. You might be right, but this DEIS does not show you to be right. You have to make the case and be fair to opposing views. NEPA requires you to use up-to-date science, to reveal what you know and do not know, to use information that is "of high quality," with "accurate scientific analysis," and requires you to make a decision that is "based on an 3 understanding of environmental consequences." A shorter way of putting this is that, upon reading a NEPA document, a member of the public should not feel like someone is trying to sell them a car. This DEIS is so dismissive of concerns to aquatics and wildlife, and embraces so readily any excuse for logging, that it cannot be regarded to be a fair analysis of either the existing conditions or the environmental consequences.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
122.02 - Disclosure of Effects	#18883-19	The Karuk Tribe alternative in Appendix G deserves a thorough analysis.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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122.02 - Disclosure of Effects	#5873-16	The DEIS fails to take a hard look at the adverse effects of salvage logging, and the diverse benefits of natural forest recovery. A proper NEPA analysis will better inform the decision-maker and help them choose the no action alternative, or develop and consider another alternative that avoids road construction, retains all large trees (except imminent hazard trees in high use areas), or limit salvage logging to the matrix.	The commenter fails to provide any evidence or rationale to support the claims that the EIS fails to take a hard look at the adverse effects of the proposed actions, including salvage harvest (logging). The Forest Service also acknowledge forest recovery processes; see the effects of the no action. Alternative 4 of the EIS was developed to consider reduced road actions. See Chapter 2 under the section "Alternatives considered but eliminated from detailed study" for the avoidance of all road construction and retaining all large trees. Alternative 5 was specifically designed to eliminate salvage harvest from areas outside of "matrix lands"; see Chapter 2. Existing project design features under wildlife protect legacy components, including large trees.
123 - Technical, Editorial	#17481-3	There is a general concern about the plan focusing on geographic area with little detail about the "what and when".	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter fails to provide specific examples of how the analysis is inadequate. The final EIS includes analysis both in terms of what actions result in what effects and whether those effects are short or long term, as defined under methodology for each resource section.
123 - Technical, Editorial	#18883-23	The Scoping Proposal released 10/8/2014 indicates on Table 4 that salvage harvesting would occur in 2618 acres of Inventoried Roadless Areas which is completely inappropriate as these areas may be further protected as part of Wilderness or other roadless use in the future. Page 11 of the same document states: “No salvage harvest is proposed within Wilderness, Backcountry, Research Natural Areas, Recommended Wild Rivers, Inventoried Roadless Areas, or Riparian Reserves”. Why has the Forest Service in the DEIS reversed its previous Scoping Proposal decision against allowing harvesting in Riparian Reserves?	The draft EIS made a clarification that actions are proposed within geologic but not hydrologic Riparian Reserves, as described in the draft and final EIS. Treatments within geologic Riparian Reserves can improve conditions, as described in Chapter 3 of the final EIS (example, under geology section).
123 - Technical, Editorial	#18907-12	10. The maps provided in the Draft EIS are not readable and have poor scale for interpretation. The existing figures should contain a grid that directs the reader to more detailed maps that are readable and that contain stream, town, road and place names that the reader can orient themselves to. Do not use yellow as it is not readable and provide better locations of distances to nearby communities	The Forest provided maps for public project review and involvement compliant with 40 CFR 1506.6(b). Landscape features and roads were provided on the maps. Maps were provided in the back of the draft EIS, which was available on the project's webpage and hard-copy at several locations and by request. 11X17 map booklets by Alternative were also posted online. Also posted were 8.5 X 11 map booklets by Alternative that were 1: 63,360 scale. All electronic maps were provided in .PDF format and were georeferenced (meaning you can search by latitude and longitude), searchable (e.g. by key word search of site locations or roads), capable of being zoomed-in to see details at larger scales, and color blind friendly.
123 - Technical, Editorial	#18907-16	Please show the Pacific Crest Trail (PCT) and other major trails connecting parking areas to the PCT on all maps.	Thank you for your comments on the Westside Fire Recovery Project. Trails, including the Pacific Crest Trail, have been added to maps and will be available on the Project webpage.
130.01 - Monitoring	#18852-38	21) Access to affected lands has been too short for independent review due to fire closures in the fall and seasonal road closures from the winter through the spring. This has reduced the availability for site specific review or the establishment of third party monitoring efforts. Monitoring efforts to establish pre- and post treatment affects have not been performed, this reduces the opportunity for adaptive land management to be implemented.	The Forest Service has made information available for public review in accordance with National Environmental Policy Act regulations at 40 CFR 1500-8. We exceeded requirements of the National Environmental Policy Act in terms of public involvement. See the public involvement section of Chapter 1 for a discussion of the public involvement efforts by the agency. See the monitoring section of Chapter 2 of the final EIS. The interdisciplinary team reviewed and considered post-fire conditions in the development of the proposal and in analyzing its effects. Post treatment effectiveness monitoring will be conducted. Monitoring is being conducted as consistent with the Forest Plan and other legal requirements. Some monitoring is conducted at the project-level while others are conducted at the program level consistent with Chapter 5 of the Forest Plan. There's no requirement for the monitoring mentioned by the commenter.
130.01 - Monitoring	#18852-43	27) Monitoring must be implemented across multiple disciplines, in order to ascertain changes in forest and landscape characteristics, creating scientific base-lines for adaptive and best management practices.	Monitoring is being conducted as consistent with the Forest Plan and other legal requirements. Some monitoring is conducted at the project-level while others are conducted at the program level consistent with Chapter 5 of the Forest Plan. See Chapter 2 of the final EIS for a discussion of the monitoring that will be conducted.
130.02 - Inventories, Mapping, GIS	#18883-10	The maps provided in the Draft EIS are not readable and have poor scale for interpretation. The existing figures should contain a grid that directs the reader to more detailed maps that are readable and that contain stream, town, road and place names that the reader can orient themselves to. Do not use yellow as it is not readable and provide better locations of distances to nearby communities.	The Forest provided maps for public project review and involvement compliant with 40 CFR 1506.6(b). Landscape features and roads were provided on the maps. Maps were provided in the back of the draft EIS, which was available on the project's webpage and hard-copy at several locations and by request. 11X17 map booklets by Alternative were also posted online. Also posted were 8.5 X 11 map booklets by Alternative that were 1: 63,360 scale. All electronic maps were provided in .PDF format and were georeferenced (meaning you can search by latitude and longitude), searchable (e.g. by key word search of site locations or roads), capable of being zoomed-in to see details at larger scales, and color blind friendly. The Forest Service conducted multiple public meetings and provided presentations at other group meetings, as invited. See Chapter 1 of the EIS for details. The intention of the agency is clear in the purpose and need described Chapter 1 of the EIS. Chapter 2 of the EIS describes the proposed actions, including the modified Alternative 3 which has

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			become the preferred.
136.02 - Fuel Treatment, Reduction	#12549-2	I do not believe the Westside project promotes recovery or that it would protect communities- it would actually hinder natural recovery and increase the fire risk.	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Fire and Fuels Report provides direct and indirect effects for each Alternative. In addition, the report also provides a section for Fire Behavior Synopsis and Fire Suppression Capabilities. The Fire and Fuels Report, which includes community based fuels treatments aimed at protecting communities, states that action Alternatives reduce fuel loading and fire behavior. The Fire and Fuels report also states "Fuel treatments within the wildland urban interface (WUI) promote safer firefighting actions and public evacuation, should a future large fire occur within the project area. Eliminating high snag densities and treating surface fuels within the WUI has an indirect effect on reducing sources for embers, spotting, and receptive fuel beds. These indirect effects are a benefit in Alternative 2, when compared to Alternative 1, where no action is taken to reduce future available material. Additionally, increased spotting and radiation would make structures more difficult to defend from crown fire, as opposed to surface fire (Cohen & Butler, 1996) (Scott & Reinhardt, 2001). Identified treatments in the WUI modify fire behavior such that fires are anticipated to spread slower, with flame lengths less than four feet, allowing responding resources to take direct action to control fires. These direct actions are effective due to the change in composition and structure of fuels, which promotes low resistance to control when compared to Alternative 1." Fuels treatments for reducing fuels and fire behavior, along with overall fire hazard and risk are similar between all action Alternatives. Natural regeneration effects analysis is described in Chapter 3, Vegetation of the EIS: "Successful natural regeneration in one to two decades, though highly variable, has been documented following stand-replacing fires in the Klamath Province within white fir, Douglas-fir, and Douglas-fir/tanoak stand types (Shatford, Hibbs and Puettman 2007; Joint Fire Science Program Final Report, Project 05-2-1-40 2009). Pine and mixed conifer associations were not sampled in the Shatford et al. study. More typically, vegetation is likely to go through an extensive time-period of hardwood- and brush-dominated site occupancy (Zhang, Webster, Powers and Mills 2008). Reforestation will slowly occur naturally but may take many decades to replace brushfields (Zhang et al. 2008). In larger patches where the majority of the trees were killed by the fire, reestablishment of forest cover would rely on natural regeneration and may take decades or longer. For the larger, contiguous areas of high-severity burn, distance from seed sources may further delay natural regeneration. In some cases of high-severity burn, there are no living conifer trees available to provide potential seed for potential natural regeneration for several miles."
136.02 - Fuel Treatment, Reduction	#17111-2	If large fuels are viewed as a critical fire control issue, this could be dealt by creating appropriate Fuel Management Zones or snag-free corridors. In summary, general salvage of large snags and logs is absolutely inconsistent with a goal of assisting recovery of late-successional forest conditions.	We agree that a balance between retaining snags and downed woody material for fire hazard and resource/wildlife value is needed; this is described in Chapter 1 of the EIS. The commenter's suggestion for the use of fuel management zones and snag-free areas for strategic fuel breaks and WUI protection is consistent with project design. See Chapter 2 of the final EIS for a description of proposed actions. Part of the fuels treatment design for the Westside Fire Recovery project includes the creation of strategic fuel management zones for community protection and to break-up the continuity of fuels. Salvage harvest treatments proposed will establish pockets of snag-free areas. Within salvage harvest units and roadside hazard treatments, fuels treatments are proposed as needed to treat activity-generated fuels. The combination of salvage harvest, roadside hazard treatments, and other fuels treatments such as fuel management zones and underburning, will meet project objectives of reducing fire risk and improving future fire protection of local communities. For further information on the effects of fuel management zones and salvage harvest on fuels, see the fuels section in Chapter 3 of the final EIS. Emphasizing fuels treatments over salvage logging was consider as an Alternative but eliminated from detailed analysis, as their is a need for the project to include receipts from treatments to be economically viable to help pay for fuels treatments (see Chapter 2, Alternatives considered but eliminated from detailed study). Without the receipts from salvage the project is not economically viable. The project proposes to retain larges snags and logs as consistent with wildlife and watershed project design features described in Chapter 2 of the final EIS. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. The primary reason that salvage harvest is proposed within the Late-Successional Reserve is to reduce future heavy fuel accumulations that will result from fire-killed trees and thus reduce the risk of future high severity fire that would delay the development of late successional stand conditions. For fire hazard and forest recovery in plantations, see response to 5873-14.

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136.02 - Fuel Treatment, Reduction	#17111-20	Establishment of dense, uniform stands is completely inappropriate in LSRs as well as any PAG identified as fire regime types I and II. We are currently engaged in major programs of variable density thinning in dense plantations in existing LSRs in order to accelerate the development of late-successional structure in these overly dense stands; so, why would we set about creating more acreage of these dense unifom plantations within LSRs? Similarly, establishing uniform stands -even at a relatively low density of 200 trees per acre -on sites characterized by frequent fire is obviously inappropriate; this simply recreates the potential for the next "uncharacteristic" stand replacement fires on these sites!	See response to comment number 17111-5 and 4.
136.02 - Fuel Treatment, Reduction	#17111-5	Establishment of "fully stocked" plantations on sites characterized by Fire Regimes I and II is particularly inappropriate since it simply recreates the potential for the next uncharacterist ic stand replacement fire. This last issue does not appear to have been addressed i n the DEIS.	Research has shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less severity and intensity or not at all (Thompson, Spies and Ganio, 2007; Weatherspoon and Skinner, 1995). The Westside Fire Recovery project is treating slash/fuel loading in plantations. Research has shown that the quickest way to reestablish a coniferous forest after stand replacement fire is by active reforestation (Zhang 2008). The reduction of residual fuels will be necessary to prevent future fire events from becoming stand-replacing fires that destroy planted seedlings. Research has shown fuel treatments increase the likelihood of the planted trees surviving future fires (Weatherspoon and Skinner 1995, Omi and Kalabokidis 1991). Heavy residual fuels need to be reduced substantially to help assure sustainability of plantations. Follow-up reforestation surveys will be completed to assure that the reforestation objectives are achieved." and replacing with: "As described in the Fire and Fuels section of Chapter 3 of the EIS, the Proposed Action has the potential to increase fire resiliency by managing both unplanned and planned fire ignitions across the landscape, as compared to Alternative 1. Furthermore, fire suppression effectiveness is improved as future projects implemented adjacent to and within the project area increase the size and scale of treatments proposed under Alternative 2. At the stand scale, post-fire logging reduces surface fuels over the long term, particularly in the large diameter size classes (greater than 3" in diameter), which should increase management options for applying prescribed fire treatments or allowing future wildfires to burn without causing excessive damage to the forest vegetation and soils (Peterson, Dodson, & Harrod, 2014)."] Fuels reduction actions are further described in the Fire and Fuels Report. Chapter 2 Alternatives, Including the Refined Proposed Action, in the EIS details proposed planting prescriptions. Planting prescriptions are based on historic unit conditions, projected unit composition, and the likelihood of long-term survivability of project units within a fire ecosystem. Overall, species considered for planting in the project area include Douglas-fir, sugar pine, ponderosa pine, incense cedar, white fir, and red fir. A mosaic distribution will be achieved over time due to the spatial variability achieved by micro-site selection for planting. Conifers will not be planted next to green hardwoods; these hardwoods will be included in average spacing. Seedlings will be widely spaced on poorer sites including southerly aspects and/or rocky soils. Trees will be planted in clusters to achieve groups of conifers throughout the landscape to mimic natural units. See EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised for additional discussion of planting.
136.02 - Fuel Treatment, Reduction	#17349-6	Fuel Treatment - We advocate aggressive treatment of activity fuels and other fire killed fuels in the treatment areas. Past experience on the Forest shows a very strong relationship where untreated fuels equate to high future fire intensity and well treated fuels often result in lower fire intensity. Past experience on the Forest would indicate that salvage alone without follow-up fuel treatment often results in future fires of higher intensities. Also, experience gained during the 1987 fire recovery lead to wide spread use of the helitorch method of ignition because the fuel beds lacked fines and were difficult to ignite. A number of the key players that were at Happy Camp during that period are still in the area and would likely be available to share their thoughts and experience should the Forest so desire.	This comment provides anecdotal information that corroborates the underlying conditions and need for action in proposed salvage areas in the Westside Fire Recovery. We agree that untreated fuels, whether fire killed trees that are not salvaged, or activity fuels (slash) from salvage logging can increase long-term fire risk and severity. The Westside Project proposes treatment of activity fuels as part of all of the action Alternatives (final EIS Chapter 3). Slash removal and maintenance of fuels treatments are important in reducing future fire risk. The Westside Fire Recovery Project proposes fuels reduction and maintenance activities to remove excess fuel loading to reduce fire hazard and increase suppression capability. The effects of treatment of activity fuels by various methods are shown in the model outputs in the Fuels Report. The Fuels Report also clearly shows the long-term effect of fuel accumulation from fire-killed trees if no salvage harvest occurs. Model results in the Fuels Report are consistent with findings reported in Peterson (2014) that showed heavy fuels from fire-killed trees can persist for as much as 40 years, and that significant reductions in fuel loading can be accomplished by salvage logging. Knapp (2015"" states ""consumption of both standing snags and Coarse Woody Debris increases fire-line intensity, contributing to extreme fire behavior and more severe fire effects (Page et al., 2013). With Coarse Woody Debris, Brown et al. (2003) speculated that an optimum quantity for warm and dry ponderosa pine and Douglas fir forest types of the western U.S. that would provide for wildlife, nutrients and other ecological benefits, without contributing to excessive risk of an uncharacteristically severe wildfire, would fall within the range of 11.2 to 44.8 Mg ha-1 (5–20 tons ac-1), with the higher fuel loading acceptable if the Coarse Woody Debris was comprised of larger pieces." These are the target levels for the Westside Fire Recovery Project.

Code	Comment Number	Comment Text	Response
136.02 - Fuel Treatment, Reduction	#17387-10	Consider past fire history and slope/aspect before re-establishing plantations in matrix. Poor choices for replanting plantations are: where they have burned up in the past; on dry hot south-southwest-facing slopes; and where plantation "investments" will stymy the reintroduction of fire on the landscape by making it an imperative to suppress fires that threaten that investment. Use of diverse planting species mix based on site characteristics. Plant conifers species in close proximity to old growth snags of same species - and greatly reduce fuels (site prep) around these plantings to allow for future fire use that won't burn up the plantings.	Please see response to comment number 17111-5 and 4. Position statement. See response to Comment number 16695-4. The Forest Service was responsive to scoping comments of this nature by clarifying the description of the proposed actions. Chapter 2 of the EIS describes the criteria for site preparation and planting. Considerations do include site history, slope and aspect. Chapter 2 of the EIS "Site Preparation" section also states that "Fuel Loading after site preparation treatments will mimic that of natural stands and increase the ability of units to survive the historic fire frequencies experienced in the project area." Appendices C and D in the Silviculture report address the reforestation prescriptions and stand evaluation process which identifies the areas within the project boundary where optimal reforestation could occur. Specifics regarding precipitation are not addressed, but wider spacing, microsite planting, and release tactics can ameliorate the potential effects of climate change, particularly drier seasons, on stand development. See Chapter 1 of the EIS under changes to the proposed action since scoping. Chapter 2 Alternatives, Including the Refined Proposed Action, in the EIS details proposed planting prescriptions. "Planting prescriptions are based on historic unit conditions, projected unit composition, and the likelihood of long-term survivability of project units within a fire ecosystem. Overall, species considered for planting in the project area include Douglas-fir, sugar pine, ponderosa pine, incense cedar, white fir, and red fir. A mosaic distribution will be achieved over time due to the spatial variability achieved by micro-site selection for planting. Conifers will not be planted next to green hardwoods; these hardwoods will be included in average spacing. Seedlings will be widely spaced on poorer sites including southerly aspects and/or rocky soils. Trees will be planted in clusters to achieve groups of conifers throughout the landscape to mimic natural units." For fire hazard and forest recovery in plantations, see response to comment number 5873-14.
136.02 - Fuel Treatment, Reduction	#17481-22	There should be alternatives besides fire - manual, mechanical, hand release should be included in the whole suite of tools.	Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Westside Fire Recovery project proposes fuel treatments and continued maintenance of existing treatments including hand thinning, mechanical thinning, and mastication in addition to or in place of burning.
136.02 - Fuel Treatment, Reduction	#18850-6	I would like to see the continued cleanup of the brush and debris piles already along the roadway and private land bordering USFS.	Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. The Westside Fire Recovery project proposes fuel treatments and continued maintenance of existing treatments bordering private property and along roadsides within the project area. The maintenance of these treatments will address future escalation of hazard and risk both within and outside the Wildland Urban Interface. Fuel treatments within the Wildland Urban Interface promote safer firefighting actions and public evacuation, should a future large fire occur within the project area.
136.02 - Fuel Treatment, Reduction	#18852-14	I support thinning of fuels around private lands and communities for fire protection as well as to allow for the widespread use of prescriptive fire during optimal burning conditions, and the creation of strategic shaded fuel breaks.	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Fire and Fuels Report provides direct and indirect effects for each Alternative. In addition, the report also provides a section for Fire Behavior Synopsis and Fire Suppression Capabilities. The Fire and Fuels Report, which includes community-based fuels treatments aimed at protecting communities, states that action Alternatives will reduce fuel loading and fire behavior.
136.02 - Fuel Treatment, Reduction	#18872-10	A priority of projects around communitys and homes plus identifiying and repairing acces routes in the forest and clearing key ridges and maintaining the most valuable forest assests.	All action Alternatives propose treatments around communities. These treatments would be prioritized to protect communities and homes.
136.02 - Fuel Treatment, Reduction	#18878-24	DEIS: Long-term temporal bounding is for an estimated 40-100 years from project implementation and is based on the maximum time for reduction of surface woody fuels following fire (Peterson, Dodson and Harrod 2014) and computer-generated modeling that showed stand conditions approaching the desired late-successional characteristics. (pg. 110) Comment: It is unclear how the cited study reflects on the "maximum time for reduction of surface woody fuels following fire" of 40-100 year long term temporal bounding.	Long-term temporal bounding includes both the maximum time for reduction of surface woody fuels following fire (40 years, as informed by Peterson, Dodson and Harrod (2014)) as well as the time required to show stand conditions approaching the desired late-successional characteristics (100 years, as informed by computer-generated modeling). The analysis period described in Peterson, Dodson and Harrod (2014) extends from 1970 to 2009, equating to 39 years. The results of the study indicate that the majority of the fuels reduction associated with the removal of biomass, rearrangement of the fuel profile and subsequent decomposition that occurs during and after post-fire logging is achieved during the 39-year study period, as evidenced by the asymptotic trend displayed in the Figure 3 graphs pertaining to logged stands. Thus, the long-term effects of post-fire treatments on fuel loads are largely manifest by year 40, providing the lower bound for the long-term effects analysis. Similarly, Forest Vegetation Simulator model runs of post-treatment stand conditions (completed by Westside Fire Recovery project interdisciplinary team members) indicate that achievement of late successional stand conditions is largely underway by year 100, providing the upper bound for the long-term effects

Code	Comment Number	Comment Text	Response
			analysis.
136.02 - Fuel Treatment, Reduction	#18878-39	Alternative 2 Direct Effects and Indirect Effects Salvage, Site Preparation, Roadside, Hazardous Fuels Treatments DEIS: Alternative 2 implements multiple types of activities to reduce snag densities and surface fuel loading. (Pg. 122) Comment: We continue to disagree in regards to the efficacy of the proposed treatments. In particular, we see no analysis of the effectiveness of the proposed treatments in the light of the project shortfall in timber receipts which would fund only about 30% of post salvage treatment for fuel loading from logging slash, tops etc. So, in reality approximately 70% of the acreage will not be treated, thus elevating surface fuel loading.	Calculations based on timber revenues and landscape restoration costs stated on page 257 of the draft EIS indicate that timber receipts would fund 32.6% of the total restoration cost, which includes treatment of fuels outside the footprint of salvage harvest units, as well as activity fuels generated by salvage harvest. Timber receipts are only one of several funding streams available to accomplish the landscape restoration treatments proposed in the Westside Fire Recovery project. See response to comment number 18878-16 about project funding for implementation.
136.02 - Fuel Treatment, Reduction	#18878-40	DEIS: Ritchie, Knapp and Skinner (2012), evaluated salvaged units following the Cone Fire on the Lassen National Forest. They found that after four years higher levels of surface fuel accumulations occurred in lower intensity salvage plots. The highest surface fuel accumulations occurred in un-salvaged plots four to eight years after the fire. Furthermore, the highest levels of large woody debris were associated with un-salvaged areas. A key finding observed by Ritchie, Knapp and Skinner (2012) found no support for the debate that 10 of22 post-fire salvage logging necessitates subsequent fuel treatment for elevated fuels. Under the proposed action, activity generated slash will be piled and burned reducing surface fuels to levels consistent with low severity fire effects. (Pg. 123) Comment:_ While the Ritchie, Knapp and Skinner (2012) may very well apply to the conditions found at the "Blacks Mountain Experimental Forest (lat. 40°40' N., long. 121°10' W.) lies within portions of T. 33 N., R. 7 E. and T. 33 N. R 8 E., MDM., 64 road kilometers northwest of Susanville, Lassen County, about half of the Forest lies in a gently rolling basin. The remainder extends up the moderate slopes of Blacks Mountain to the north and of Patterson and Cone Mountains to the east. Elevations range from 1700 to 2100 meters (5600 to 6900 feet). "(http:Uwww.fs.fed.us/psw/ef/blacks mountainD. From the description provided above and further information from the webpage of the USPS Blacks Mountain Experimental Forest, it becomes clear that the vegetation (Interior Ponderosa Pine Type), topography, climate and fire regime is vastly different than what can be found in the proposed project area. The following was left out of the Discussion and is critically important in being able to compare and contrast management regime. "The whole tree removal system used in this salvage project minimized the loss of tops and limbs during logging, as indicated by the low levels of fine fuels (1-100 h)." However, for the Refined Proposed Action, the salvage logging project design features do not call for whole tree removal. Additionally, approximately 70% of the post salvage treatments and restoration are dependent upon future unpredictable congressional appropriations and/or grants. The above statement regarding there being "no support for the debate that post-fire salvage logging necessitates subsequent fuel treatment for elevated fuels" is disingenuous. It would also be helpful to see the semantic gymnastics to reconcile the diametrically opposed opinion regarding post salvage fuel treatments between the Vegetation and Fire and Fuels Section of this DEIS.	Fire return intervals in the immediate vicinity of Blacks Mountain Experimental Forest vary from 1-49 years depending on spatial extent analyzed, and seasonality varied from early summer to fall depending on the period of time analyzed (Norman and Taylor 2005). Fire return intervals in the vicinity of the Westside Fire Recovery project vary from 4-89 years depending on forest type, and seasonality varied from early summer to fall (Taylor and Skinner 1998). Although there are notable differences in vegetation, topography and climate between the two sites, there is considerable overlap in the range of fire return intervals and trends in seasonality. This indicates that fire regimes are similar enough to apply findings about post-fire fuel dynamics from Ritchie, Knapp and Skinner (2012) to the Westside Fire Recovery project area (i.e. relatively frequent, low to moderate severity fire characterizes both sites). This comment appears to state that follow-up fuels treatment would be needed in salvage units. We agree that without follow-up activity fuel treatment, salvage logging would increase fire risk and intensity because it would convert smaller diameter limbs and tops to surface fuels that readily carry fire (Thompson et al. 2007). All Alternatives include the treatment of salvage-created slash for this reason. See Chapter 2 of the EIS for the acres proposed for treatment in modified Alternative 3 and the other action Alternatives. Our fuels modeling shows that some level of follow-up slash treatment would be needed in most areas to meet the fuels objectives of 7-10 tons / acre. Whole tree yarding is one form of slash disposal, but it's use is restricted to ground skidding units by feasibility and yarding systems. Whole tree removal will be used in ground-based treatment units where it is appropriate to do so, which should result in the low surface fuel loads described by Ritchie, Knapp and Skinner (2012) on those parts of the landscape. Where whole tree removal is not used, follow up fuels treatments will be necessary to reduce activity fuels. See comment 18878-16 for a discussion of economics and funds available to accomplish necessary follow-up slash treatments.Norman, S.P., Taylor, A.H., 2003. Tropical and north Pacific teleconnections influence fire regimes in pine-dominated forests of north-eastern California, USA. J. Biogeography 30, 1081–1092.Taylor, A. H., Skinner, C. N., 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111, 285-301.
136.02 - Fuel Treatment, Reduction	#18879-14	The Karuk Alternative seems to propose high levels of roadside salvage/fuel treatment plus lots of fuel treatment by hand and by prescribed burning. These measures are good but they are expensive and in timbered areas are not effective in dealing with large diameter dead trees. The Alternative appears to be built around a passive forest management strategy that is likely to produce a future forest dominated be large mature brush fields. This Alternative is not compatible with current direction for National Forest management.	All action Alternatives have been designed to be consistent with the Forest Plan. See Chapter 2 of the final EIS for a breakdown of actions proposed by Alternative, including tables with refined acres (compared to the draft EIS). Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Karuk Alternative is discussed in Chapter 2 of the EIS under Alternatives considered through consultation. In this section, there's a review of the Karuk Alternative, including how it's being considered and how is has been incorporated into the new, preferred Alternative

Code	Comment Number	Comment Text	Response
			(modified Alternative 3) .
136.02 - Fuel Treatment, Reduction	#18879-6	Alternative 2 fails to provide any treatment for a large portion of the Happy Camp WUI in the area between Grider Ridge/Horse Creek and Frying Pan Ridge. There are some treatments planned along the upper slopes of Frying Pan Ridge, along China Grade Road,and along the upper slopes of Grider Ridge. However, this leaves a large area laced with dead fuel with no treatment plan in the Horse Creek/Frying Pan Creek/Ottley Gulch/Woods Creek area. This is difficult terrain to treat and it is difficult to suppress wildfire in this area. No treatment pretty well guarantees that future wildfires here are going to become a big problem and be a threat to both the Happy Camp community and the Seiad Valley community. The KNF needs to address this situation promptly.	Most of the Horse Creek/Fryingpan Creek/Ottley Gulch/Woods Creek area burned at low severity, and may not require the intensive treatment prescriptions allocated to other areas. The largest high severity patch in this area occurs on the upper third of the slope between Ottley Gulch and Fryingpan Creek, and has a combination of salvage, site preparation, fuels management zone, and WUI treatments prescribed to address fuels issues in this area. Additionally, the proposed network of roadside fuels and WUI treatments adjacent to private land in the Happy Camp and Seiad areas should be sufficient to facilitate protection of those communities in the event of future fires. In addition, the Joint Chiefs project is currently or has recently treated in this area within the WUI.
136.02 - Fuel Treatment, Reduction	#18879-7	Alternative 2 appears to apply the "10 acre rule" (no salvage harvest in dead patches smaller than 10 acres) to the areas described in A above. This seems overly restrictive given the treatment needs for the WUI areas, particularly when no LSR areas are involved. Without this constraint a significant amount of dead fuel could be removed. Removal through salvage and treatment of the activity fuels would reduce overall fuel buildup and strengthen the road systems as barriers to the spread of future wildfires and as fuel breaks and control features for prescribed fire.	The Klamath National Forest Land and Resource Management Plan standards and guidelines within the Late-Successional Reserves land allocation do not allow salvage harvest treatments in patch sizes less than ten acres. WUI treatments are described within the Fire and Fuels Report and hazardous fuels treatments are identified to protect communities. The treatments identified for the WUI are not limited by patch size and prescriptions described in the Fire and Fuels report are aimed at reducing the threat to communities in both the short and long-term.
136.02 - Fuel Treatment, Reduction	#18918-19	Page 148 of 338 of the DEIS says, "At the stand scale, post-fire logging reduces surface fuels over the long term, particularly in the large diameter size classes (greater than 3" in diameter), which should increase management options for applying prescribed fire treatments or allowing future wildfires to burn without causing excessive damage to the forest vegetation and soils (Peterson, Dodson, & Harrod, 2014)." I believe this should have read "(greater than 3' in diameter)". Another part of the document emphasized that the slash which follows logging operations is the fire danger. Dry vegetation on the ground can catch fire a lot easier than a partially burned tree (especially if the tree is large, a snag, or if it has survived various fires). Thus, any action alternative offered under the FEIS must specifically address how all the logging slash would be addressed in all action units	The original text of the draft EIS is correct; the large diameter fuels referred to in Peterson, Dodson and Harrod (2014) correspond to the 1000 hour fuel moisture class, which has a threshold diameter of 3 inches. All salvage harvest units include prescriptions for site preparation treatments, which will treat residual logging slash as needed.
136.02 - Fuel Treatment, Reduction	#18926-1	During the months of July, August and September 2014, communities around these fires lived through 29 community evacuations notices and advisories. We don't want to repeat this action and set up a cycle or burning large areas with high intensity . We don't want the kids and their kids to have to do it in the future. The documents should point out that over 65% of the fires burned in a low intensity and these low intensity burned areas can be used in future fire events. These lands should be identified as going back to a more natural fire regime. ! !	The Westside Fire Recovery Project is designed to reduce the intensity of future fires, with the hope of reducing the necessity of evacuations in the future. The draft EIS explicitly shows the percentage of the project area burned (vegetative canopy killed) at each severity in Table 1-2; this information is also readily visible in the fire severity maps on pages 321, 356 and 365 and in photos on pages 417, 418 and 422. Many of these areas will receive fuels reduction treatments (including prescribed burning) designed to maintain and augment the conditions created by low severity fire in 2014, and to increase the likelihood of low severity (rather than high severity) fires in the future).
136.02 - Fuel Treatment, Reduction	#18926-3	Fuel Management Zones or Fuel breaks! Installation of a strategic fuels break system (ridges and roads) to expand treatments to protect life first and second priority places to treat would be to expand the treatments to properties and improvements be it public, private or tribal.!	The fuel management zone, roadside fuels, and wildland urban interface treatments included in all action Alternatives provide the desired fuel break system, based on roads, ridges and private property boundaries and designed to protect life, property and infrastructure.
136.02 - Fuel Treatment, Reduction	#18926-30	Helicopter logging and 'salvage' logging in general would extract the largest trees, leave the small trees creating a deep sea of slash and flammable fuels. The Salmon Salvage timber sale, implemented last year on the KNF is a testament to that. Forest managers are scratching their heads trying to figure out how to deal with all the slash. They are even considering dropping fire from a helicopter to engulf the flammable ground fuels left behind from logging on these steep mountain slopes. Logging in this manner does not create fire safe communities. It puts communities at risk with immeasurable ecological costs. ! !	Numerous techniques are available to treat the activity fuels generated by post-fire logging, of which helitorch ignition is just one. The Salmon Salvage project implementation is not yet complete, and much of the activity fuels currently on the ground will be treated as funding and burn windows become available. The same treatment methods and funding mechanisms will be available to facilitate treatment of logging slash generated during the Westside Fire Recovery project, which should ultimately enhance community protection and reduce future fire severity.

Code	Comment Number	Comment Text	Response
136.02 - Fuel Treatment, Reduction	#18926-5	The second priority treatment should be to protect improvements on private, public , or tribal property, including and the lands adjacent (1.25 miles to .25 miles) to private, tribal, or public lands and parcels with structures and other improvements. Treatment on private and tribal lands with structures or improvements should be emphasized on parcels that are doing fuels reduction and taking actions to be better prepared in the event of the next wildfire or human caused fire which threatens life, property and resources.This fire preparedness work on private or tribal property can be performed by residents, landowners, neighbors, or organized crew(s). Public lands receive public management. ! !	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Westside Fire Recovery project proposes treatments to protect private and public land including tribal land. Contracts currently are being implemented in many of these communities and the Westside Fire Recovery project proposes additional treatments to further protect these communities.
136.02 - Fuel Treatment, Reduction	#18931-3	Regarding Management Direction (DEIS pg 7):"The project is designed to be consistent with all applicable laws Policies and plans, and to consider information in guidance documents such a Watershed Analysis, the National Fire Plan and Forest Fire Management Plan." Comment: The DEIS does not appear to be consistent with guidance from, for example, the KNF Fire Management Plan states: (KNF Fire Management Plan, 2012 Pg. 6, 22-13) "Do not allow management activities to result in fuel accumulations that increase the risk of high intensity fires that did not typically occur on the Forest before wildland fire suppression activities in the early 1900s began. Manage fuel loadings and the use of prescribe fire on the Forest to maintain ecological processes."	The fire management plan does state this, and it is drawn from the Forest Land and Resource Management Plan, p 4-54 (2010). Additional guidance on the meaning of fire risk is provided in Appendix B of the Forest Plan Final EIS, pp. 14-16. In Appendix B, fire risk is defined as the “The probability of a fire occurring per thousand acres per decade”. This definition does not work when relating to the likelihood of high intensity fire, which in Appendix B is more closely modeled using a term called fire hazard, which is defined as the ability of initial attack forces to contain a fire at 90th percentile weather conditions. Though this is not s direct measure of severity, the method for determining initial attack success in Appendix B is flame length. In fire management and fire ecology, flame length is an accepted, established indicator for fire intensity and severity, and is the metric used in common fire modeling algorithms for determining scorch height and tree mortality. Examples of such field-wide accepted modeling programs are Behave Plus (used in the Westside Fire Recovery Fire and Fuels analysis) and the Forest Vegetation Simulator-Fire and Fuels Extension.In the Fire and Fuels report (Chapter 3, Westside Fire recovery final EIS) flame length was used as a metric to determine the resulting potential fire severity for treatment units in the project Alternatives. Additionally, fireline intensity was also modeled, a direct measure of predicted fire intensity that can be related to fire severity given the fuel type present at a given location with that modeled fire intensity. For both of these metrics, the modeling in the Fire and Fuels Report clearly shows that all activities within the Westside Fire Recovery project are predicted to reduce fireline intensity and flame length. Given the accepted link between these metrics and fire severity, there is no evidence that this project will contribute to an increased potential for high severity fire when compared to the current condition and what is predicted if the current condition remains unaltered moving into the future.
136.02 - Fuel Treatment, Reduction	#18935-2	The Forest Service contends that post-fire logging will accomplish fire management objectives by reducing the amount large woody material that may fuel wildfire in the future as dead trees fall to the ground over time. See DEIS at 122 ("The direct effect of salvage harvest is reducing density of snags on the landscape […] and subsequently reducing future accumulations of large diameter surface fuels as trees fall to the forest floor"). It recognizes that salvage logging will immediately augment the density and volume of flammable woody fuels smaller than 3-inches diameter, and admits that surface fuel composition and density primarily influence fire behavior in combination with topography and weather. Id. 122-128. According to the DEIS, increased fire hazard attributable to logging operations in the short-term (<10 years) is offset by post-logging fuel treatments and removal of dead trees that could fall to the ground and then fuel wildfire in the long-term. Id. 119-130. Forest Service advocacy of post-fire logging along these lines clearly overlooks relevant factors, ignores scientific information, and misstates the effect of logging to potential wildfire behavior and attainment of fire management objectives. Specifically, it fails to account for: (1) temporal rates of snag fall and wood decomposition affecting projections of fuel density and fire hazard over time, and (2) persistence of slash fuel on steep slopes where post-logging fuel treatments are not likely to occur in any alternative.	See the beginning of Chapter 3 for a discussion of responsible opposing points of view. Salvage logging does create additional activity fuels that, if untreated, can increase long-term fire risk. The commenter cites several papers alluding to increased fire risk in post fire salvage conditions from untreated logging slash. Those conditions are not anticipated in the Westside Fire Recovery project because treatment of activity fuels is a part of all of the action Alternatives (final EIS Chapter 3). Slash removal and maintenance of fuels treatments are important in reducing future fire risk. The Westside Fire Recovery project has fuels reduction and maintenance activities to remove excess fuel loading to reduce fire hazard and increase suppression capability. The effects of treatment of activity fuels by various methods are shown in the model outputs in the Fuels Report. The Fuels Report also clearly shows the long-tem effect of fuel accumulation from fire-killed trees if no salvage harvest occurs. Model results in the Fuels Report are consistent with findings reported in Peterson (2014) that showed heavy fuels from fire-killed trees can persist for as much as 40 years, and that significant reductions in fuel loading can be accomplished by salvage logging. Knapp (2015) states "consumption of both standing snags and Coarse Woody Debris increases fire-line intensity, contributing to extreme fire behavior and more severe fire effects (Page et al., 2013). With Coarse Woody Debris, Brown et al. (2003) speculated that an optimum quantity for warm and dry ponderosa pine and Douglas-fir forest types of the western U.S. that would provide for wildlife, nutrients and other ecological benefits, without contributing to excessive risk of an uncharacteristically severe wildfire, would fall within the range of 11.2–44.8 Mg ha-1 (5–20 tons ac-1), with the higher fuel loading acceptable if the Coarse Woody Debris was comprised of larger pieces. These are the target levels for the Westside Fire Recovery project. Scientific studies relevant to this issue are disclosed within the Fire and Fuels Report. Snag fall and wood decomposition rates are described in the Fire and Fuels reports and are site specific for this project. Each action Alternative has fuels treatments post-salvage logging. Such treatments are analyzed in the fire and fuels report as they are anticipated to occur. The fire and fuels report addresses snag fall into dead fuel loading and associated fire hazard within Chapter 3 of the EIS. Decomposition rates of the dry forests in the Klamath Mountains is very slow. Fire frequency in the Klamath Mountains was historically the main driver in reducing fuel loading. Slash will be removed post-logging even on steeper slopes.

Code	Comment Number	Comment Text	Response
136.02 - Fuel Treatment, Reduction	#18935-8	Multiples lines of research positively correlate post-fire logging activity with increased fire hazard and severity due to accumulations of untreated slash fuel (Donato et al. 2006, Odion et al. 2004, Thompson et al. 2007, Weatherspoon and Skinner 1995). According to Donato and others (2006: 352), Postfire logging alone was notably incongruent with fuel reduction goals. Fuel reduction treatments (prescribed burning or mechanical removal) are frequently intended following postfire logging […] but resources are often not allocated to complete them. Our study underscores that, after logging, mitigation of short-term fire risk is not possible without subsequent fuel reduction treatments. However, implementing these treatments is also problematic. Mechanical removal is generally precluded by its expense, leaving prescribed burning as the most feasible method. This will result in additional seedling mortality and potentially severe soil impacts due to long duration combustion of logging-generated fuel loads. Therefore, the lowest fire risk strategy may be to leave dead trees standing as long as possible (where they are less available to surface flames), allowing for aerial decay and slow, episodic input to surface fuel loads over decades. Logging-created fuels will render direct attack of a wildfire impossible under weather conditions that commonly prevail in fire season. As a common fire suppression practice, direct attack is not to be attempted when flame lengths exceed four-feet (48-inches) in height. Lost opportunity for direct attack of unplanned ignitions will, in turn, increase the size and cost of the next wildfire in the project area. It also will increase the likelihood of severe soil heating with corresponding losses of productivity (Reinhardt and Ryan 1998). More, logging-created fuels threaten fire worker safety by making wildfires more erratic and difficult to control. That risk is enhanced by the fact that the project area contains scores of road miles that may increase where the likelihood of unplanned ignition from human activity is greatest (DellaSala and Frost 2001). The Forest Service is required to study and disclose potentially significant effects of post-fire logging on public health and safety, including foreseeable wildland fire control efforts. It should disclose post-logging fuel load and fire hazard in the project area at a unit-scale. The EIS should disclose how much slash would remain on the ground after logging is completed, based on site-specific analysis of available canopy fuels that would be relocated to the ground, and the likelihood of post-logging fuel treatment on steep slopes.	See response to comment number 5873-95 for post-fire logging activity and fire hazard/severity. See response to comments number 12346-54 and number 12346-50 for response to future suppression activities. Salvage harvest and associated fuel reduction activities are likely to reduce coarse woody debris to less than 35 tons per acre and therefore severe soil heating is unlikely (Brown, 2003). Salvage logging does create additional activity fuels that, if untreated, can increase long-term fire risk. The commenter cites several papers alluding to increased fire risk in post fire salvage conditions from untreated logging slash. Those conditions are not anticipated in the Westside Project because treatment of activity fuels is a part of all of the action Alternatives (final EIS Chapter 3). Slash removal and maintenance of fuels treatments are important in reducing future fire risk. The Westside Fire Recovery Project has fuels reduction and maintenance activities to remove excess fuel loading to reduce fire hazard and increase suppression capability. The effects of treatment of activity fuels by various methods are shown in the model outputs in the Fuels Report. The Fuels Report also clearly shows the long-tem effect of fuel accumulation from fire-killed trees if no salvage harvest occurs. Model results in the Fuels Report are consistent with findings reported in Peterson (2014) that showed heavy fuels from fire-killed trees can persist for as much as 40 years, and that significant reductions in fuel loading can be accomplished by salvage logging. Knapp (2015" states "consumption of both standing snags and Coarse Woody Debris increases fire-line intensity, contributing to extreme fire behavior and more severe fire effects (Page et al., 2013). With Coarse Woody Debris, Brown et al. (2003) speculated that an optimum quantity for warm and dry ponderosa pine and Douglas fir forest types of the western U.S. that would provide for wildlife, nutrients and other ecological benefits, without contributing to excessive risk of an uncharacteristically severe wildfire, would fall within the range of 11.2–44.8 Mg ha-1 (5–20 tons ac-1), with the higher fuel loading acceptable if the Coarse Woody Debris was comprised of larger pieces." These are the target levels for the Westside Fire Recovery Project. See response to comment number 17910-2.
136.02 - Fuel Treatment, Reduction	#19146-1	I couldn't agree more with the stated objectives, including fuels reduction (I'd love to see much more forest land treated than is proposed in this recovery effort, to reduce fuel by brush removal, thinning and limbing), the removal and thinning of trees along roads, and around homes can't be emphasized enough, and by all means quickly recover what wood can be salvaged before it loses its value (why waste it and have it be fuel for future fires).	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
136.02 - Fuel Treatment, Reduction	#19157-3	In intensely burned Late Successional Areas near ridge tops, roads and locations where future fires can be effectively stopped, salvage logging is extremely important. The gigantic fuel loading of dead timber in these areas will burn again. Salvage the Late Successional Areas now to protect what remains.	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
136.03 - Prescribed Burns	#17471-3	From my studies, I have learned that the climate within the USFS is slowly changing to involve and incorporate more collaboration between local community members, NGOs, private property owners and other concerned groups. The USFS should continue this collaborative effort and spend more money supporting and working with tribes such as the Karuk tribe and organizations such as the Mid Klamath Watershed Council to pre-empt large wildfires by actively creating burns that slow the path of wild fires. This type of practice was in place long before the USFS became owners of the forest and prescribed burning has saved many communities and ecosystems. The timber being sold is a product of fire suppression and this sale only encourages more of the same treatment throughout our forests. Fire suppression needs to end and prescribed burns needs to become the new management practice for our forests and our communities.	Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Fire and Fuels Report suggests that fuels treatments would protect communities and decrease fire hazard. The action Alternatives all implement multiple types of activities to reduce snag densities and surface fuel loading, including within the WUI.

Code	Comment Number	Comment Text	Response
136.03 - Prescribed Burns	#18872-2	To address additional safer conditions for fire fighters and community protection, will require fire crews to burn heavily in the fall of the year and follow the moisture with fire to higher elevations in the spring.	Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Fire and Fuels Report suggests that fuels treatments would protect communities and decrease fire hazard. The action Alternatives all implement multiple types of activities to reduce snag densities and surface fuel loading.
136.03 - Prescribed Burns	#18872-4	An aggressive burning program in healthy forests with other restoration efforts that are most likely to see success, and then move to secondary, but no less important areas within the plan	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
136.03 - Prescribed Burns	#18878-44	DEIS: Prescribed fire as a "second-entry" post fire is planned on approximately 11,570 acres. (Pg. 125) Comment: While we wholehearted agree and actively promote prescribed fire, it is unclear where in relation to the proposed salvage units the prescribed fire is to take place. From the maps provided in the DEIS the vast majority is to occur in the Whites Fire Perimeter. Neither the DEIS or the Fire and Fuels Resource Report offers any explanation as to why the Happy Camp Project Area has only 1,888 acres of prescribed fire where we believe it is vital for the protection of life, property, enhancement of cultural resources and protect tribal trust resources. This is especially troublesome as other treatments where fire can be utilized totals approximately 15,448 acres.	We agree that prescribed burning is an important component of the actions proposed in the Westside Fire Recovery project. The relationship of the proposed salvage units to the control burn areas is most easily seen on the map package that accompanies the EIS. One of the reasons that there are not more underburns planned in the Happy Camp Complex is that there are already large areas of underburn projects proposed there from previously approved projects that have not yet been fully implemented. Current and on-going projects, such as Happy Camp Phase II and Thom Sieder Projects propose prescribed fire within the footprint of the Happy Camp Fire area. These provide additional prescribed fire projects in the Happy Camp area not shown in the Westside Fire Recovery Project. The Westside Fire Recovery Project also proposes several actions that would facilitate future prescribed burning in the Happy Camp area including strategic ridgetop fuel breaks, mechanical fuel reduction in WUI areas and roadside hazard tree removal. The prescribed fire projects in the Whites Fire area will not be implemented for several years. Surface fuels will not be sufficient to sustain an effective prescribed fire there for approximately 8 to 12 years.
136.03 - Prescribed Burns	#5919-1	Please do more thining and prescribed burning and stop the huge backburning. We want a more natural forrest not a fir tree plantation. Our economy depends on fishing and travelers, we need diversity on tree plantations. Times have changed!!	With the exception of an incidental tree, no green trees are proposed to be harvested; see response to comment 12346-55. Backburning is a fire suppression activity and is outside the scope of this project. This project proposes prescribed underburning and proposes diverse plantations in terms of species and structure, as suggested by the commenter. See Chapter 2 of the final EIS for a description of proposed action.
141.01 - Introduction, Planting, Seeding	#12349-2	I am concerned that the proposed Westside Fire Recovery Project will negatively impact the ecosystems and species managed by the Klamath National Forest (KNF) and will promote conditions that allow more large, high-severity fires to burn in the future. While reviewing the draft environmental impact statement (DEIS) for the project, I found some aspects of the reasoning behind this project to be flawed. Foremost, KNF argues that salvage logging of fire-killed trees and planting of young conifers in their place will speed the recovery of the burned forest and will reduce the likelihood of future high-intensity burns. This reasoning is flawed because the forest that burned this past summer co-evolved with fire as a natural form of disturbance and is generally well adapted to fire. These forested ecosystems do not need human intervention to recover and persisted in the face of fire prior to the existence of the Forest Service and the KNF. Indeed, these forests need less human intervention to recover. While it is true that the fires of this past summer were exceptional in both extent and severity, these conflagrations were partly a result of the Forest Service's land use practices - specifically logging, planting of high-density, low-diversity confer plantations, and fire suppression. Thus with this project, the KNF is proposing to implement two activities that contributed to these fires in the first place, logging and planting of conifers after logging.	Please see Chapter 1, Purpose of and Need for Action, for a detailed rationale for the Westside Fire Recovery Project. Please also see the Vegetation Report and Fuels Report for detailed analyses of how the project will speed the recovery of the burned areas and will reduce the likelihood of future high severity burns. As the project design features and unit prescriptions show, the proposed salvage logging and reforestation techniques are different from those historically used and have been modified specifically in order to address resource concerns. See response to comment number 6271-1.
141.01 - Introduction, Planting, Seeding	#17111-12	The NSO is a species of special interest and one that almost certainly has been significantly negatively impacted by the 2014 fires. Restoration of suitable habitat for NSO has been used as a justification for intensive salvage and tree planting programs, such as in Alternative #2 of the DEIS. However, there is no scientific evidence to support the hypothesis that either activity will contribute either significantly or positively to a more rapid recovery of NSO habitat or NSO populations than allowing natural recovery processes. In fact, it is certain that salvage will not do so; the potential value of some tree planti ng could be argued.	The restoration aspect of the Westside Fire Recovery Project is not for the sole benefit of spotted owls; rather the purpose and need of the project identifies particular elements that benefit current and future forests which will benefit spotted owls. Our project is designed to target the issue of reducing the risk of large scale high severity fire; this design is directly in line with the Northern Spotted Owl Recovery Plan which identifies one of the primary threats to spotted owls is the loss of habitat to wildfire. Tree planting research has provided information that sometimes appears to be contradicting, but like most research, the substantive enrichment is located in the details. Whether tree planting is helpful towards the regeneration of forested habitat is not a simple answer. Chapter 3 of the EIS provides a detailed response on the topic of tree planting in the sections called “Responsible opposing views and Agency’s to issues raised”.

Code	Comment Number	Comment Text	Response
141.01 - Introduction, Planting, Seeding	#17111-19	Planting may be appropriate within LSRs to establish tree seed sources for specific species and locations. However, planting should not be done following traditional approaches, which are directed to establishing uniformly stocked forest stands over large areas. Extensive, uniform plantings -even at the relatively low density proposed for some areas (200 trees/acre) -will not simulate the spatially heterogeneous pattern of natural seedling establishment.	Please see the response to comment number 17111-4.
141.01 - Introduction, Planting, Seeding	#17111-3	Many of these species require snags, logs, and diverse plant resources; some insect pollinators, for example, require CWD for their larval stages. I would also note that some of the early successional animals, such as wood rats, are important prey species for the Northern Spotted Owl. Naturally disturbed, early successional habitat undergoing slow natural reforestation (without salvage or planting) is currently the rarest of the natural forest developmental stages in the Pacific Northwest - even more so than old-growth forests. Yet, as research at Mount St. Helens has showed, these large, slowly reforesting disturbed areas are major hotspots of regional biodiversity.	Chapter 2 Alternatives, Including the Refined Proposed Action, in the EIS details proposed planting prescriptions. "Planting prescriptions are based on historic unit conditions, projected unit composition, and the likelihood of long-term survivability of project units within a fire ecosystem. Overall, species considered for planting in the project area include Douglas-fir, sugar pine, ponderosa pine, incense cedar, white fir, and red fir. A mosaic distribution will be achieved over time due to the spatial variability achieved by micro-site selection for planting. Conifers will not be planted next to green hardwoods; these hardwoods will be included in average spacing. Seedlings will be widely spaced on poorer sites including southerly aspects and/or rocky soils. Trees will be planted in clusters to achieve groups of conifers throughout the landscape to mimic natural units." See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate. See the beginning of Chapter 3 for a discussion of responsible opposing points of view.
141.01 - Introduction, Planting, Seeding	#17111-31	Extensive reforestation by planting is proposed within the LSRs. Slow natural re-establishment of tree cover is common following natural partial and complete stand replacement disturbances in the Pacific Northwest, however. Two recent studies of Douglas-fir forests in Oregon and Washington document that 40 to 60 years was the average time lapse before closed forest canopies developed following wildfire and sometimes it took as much as 100 years (Freund et al. 2014; Tepley et al. 2014). Therefore, fifty years (a number mentioned in the DEIS) is not a Jong time to wait for establishment of forest cover where timber production is not a consideration (such as LSRs) and, in fact, it is apparently the norm for nature. The "delay" in re-establishment of closed forest provides essential habitat for early successional species, including many vertebrate and invertebrate habitat specialists. Species of interest include many lepidoptera (butterflies and moths) and neo-tropical migrant songbirds. One reason for the biological richness of the early successional habitat is the abundant and diverse food sources, including many varieties of nutrient-rich herbage, fruits, seeds, nuts, and pollen and nectar sources, which form the base of numerous complex food webs. A second reason is the abundant snags and logs, which provided shelter, sources of additional food (e.g.,fungi), and critical habitat for both vertebrate and invertebrate animals; for example, many invertebrate pollinators live their larval stages in wood. This is also the habitat favored by dusky-footed woodrats, that important prey of the NSO. Naturally disturbed habitat undergoing natural reforestation is, in fact, the scarcest type of forest habitat in the Pacific Northwest. I am referring here to naturally disturbed areas that have not undergone salvage logging or artificial reforestation (Franklin et al. 2000). Intensively managed forest lands, which are subject to clearcutting, intensive site preparation, and dense tree planting, provide few of the conditions needed by early-successional organisms. Large, slowly reforesting disturbed areas appear to be very important to maintaining regional biodiversity, as demonstrated by the Mount St. Helens National Volcanic Monument. The monument is the most important hotspot for biological diversity in the Washington Cascade Range, with extraordinary representation of almost all categories of animals, including birds, amphibians, small mammals, and medium-sized predators (Dale, Swanson, and Crisafulli 2005	Chapter 2 Alternatives, Including the Refined Proposed Action, in the EIS details proposed planting prescriptions. "Planting prescriptions are based on historic unit conditions, projected unit composition, and the likelihood of long-term survivability of project units within a fire ecosystem. The Forest Plan identifies several goals to promote biological diversity throughout the Forest (Forest Plan page 4-6). One of those Forest -wide goals is to "Emphasize the maintenance or improvement of Endangered, Threatened and Sensitive Species Habitat". The Westside Recovery Project will create a more biologically diverse ecosystem by promoting regeneration of the forest and reducing fire risk. Reducing fire risk will protect the remaining northern spotted owl habitat and planting conifer will help restore northern spotted owl nesting/roosting habitat in an Late-Successional Reserve. The Forest is also aware of the importance of early seral vegetation in ecosystems. Although managing for early seral habitat is outside the scope of this project. Post-fire a large percentage of the project area is in early seral stage and it won't be planted with conifer. The 2014 fires burned 184,782 acres on the Klamath National Forest. Within the Westside Recovery Project area approximately 3,850-14,490 acres have proposed conifer planting depending on Alternative selected. In addition areas planted with conifer will be in an early seral successional stage for multiple decades. It will take up to five years for planting to be completed. This will create different age classes of developing conifer stands. Areas planted with conifer will use hand methods, variable spacing and hardwoods will be retained. Trees will be planted in clusters to achieve groups of conifers throughout the landscape to mimic natural units. No herbicides will be sprayed within the project area. Estimated survival of conifer seedlings without herbicide application is between 30-50%. The highest density conifer spacing proposed will be 12x12 and this will include spacing off live hardwoods. With a live hardwood present conifers maybe up to 24 feet apart. Three years after planting hand grubbing will occur within a three foot radius of a live conifer seedling. This will leave areas within the treatment unit that contain early seral shrubs, grasses and forbs. Treated and untreated habitats as they develop overtime will provide cover and forage for woodrat which will benefit northern spotted owl.
141.01 - Introduction, Planting, Seeding	#17111-4	Limited planting may be appropriate within the LSRs to establish tree seed sources for specific species and locations but this should not be done using traditional approaches, which are designed to create extensive areas of uniformly stocked forest stands. Uniform tree planting over large areas is inappropriate in LSRs even at low densities. Appropriate plantings in LSRs would be limited in area and spatially heterogeneous. The inappropriateness of creating dense uniform stands is apparent from the fact that since the origin of the NWFP we have undertaken major programs in variable density thinning in existing plantations in LSRs	Chapter 2 Alternatives, Including the Refined Proposed Action, in the EIS details proposed planting prescriptions. "Planting prescriptions are based on historic unit conditions, projected unit composition, and the likelihood of long-term survivability of project units within a fire ecosystem. Overall, species considered for planting in the project area include Douglas-fir, sugar pine, ponderosa pine, incense cedar, white fir, and red fir. A mosaic distribution will be achieved over time due to the spatial variability achieved by micro-site selection for planting. Conifers will not be planted next to green hardwoods; these hardwoods will be included in average spacing. Seedlings will be widely spaced on poorer sites including southerly aspects and/or rocky soils. Trees will be planted in clusters to achieve groups of conifers throughout the landscape to mimic natural units."
141.01 - Introduction, Planting,	#17349-8	Plantations - It appears that quite a number of existing plantations of various ages were lost in the fires. We advocate that replanting of those lost plantations proceed as rapidly as possible starting in early 2015. Since replanting all of them in 2015 is not practical we advocate priqritizing them by site quality and exposure. In this scenario a high site, north or east exposure	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please see the response to comment number 17111-4 for planting techniques.

Code	Comment Number	Comment Text	Response
Seeding		plantation would be high priority.	
141.01 - Introduction, Planting, Seeding	#17387-11	Plant conifers on a very wide spacing in burned LSRs as seed trees only.	Please see the response to comment number 17111-4.
141.01 - Introduction, Planting, Seeding	#17450-5	Finally and specifically, I am unalterably opposed to any activity in Inventoried Roadless Areas and to plantation style planting of non-local species.	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. There will be minimal treatment within Inventoried Roadless Areas, as shown in Table 2-34 of the draft EIS; also see IRA tables in Chapter 2 of the final EIS. Please see the response to comment number 17111-4 for planting techniques. See response to number 17312-2.
141.01 - Introduction, Planting, Seeding	#17481-36	* Reforestation o Wider spacing for planned reentry and maintenance o Leave some areas unplanted o Vary conifers and hardwoods with respect to original species	Please see the response to comment number 17111-4.
141.01 - Introduction, Planting, Seeding	#17481-44	Regarding re-planting, are non-native species that have a higher survival rate considered?	Only native species can be considered for planting as per the National Forest Management Act of 1976
141.01 - Introduction, Planting, Seeding	#18850-7	Also I am in favor of reforestation of any areas possible, including those bordering private property	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
141.01 - Introduction, Planting, Seeding	#18857-15	No tree planting units. Natural regeneration is adequate due to generally small patch size from high severity fire effects. Seed trees are nearly always present and regeneration adequate. Plantation style planting will only increase future fire risk and should be avoided at all costs.	Natural regeneration effects analysis is described in Chapter 3, Vegetation of the EIS: "Successful natural regeneration in one to two decades, though highly variable, has been documented following stand-replacing fires in the Klamath Province within white fir, Douglas-fir, and Douglas-fir/tanoak stand types (Shatford, Hibbs and Puettman 2007; Joint Fire Science Program Final Report, Project 05-2-1-40 2009). Pine and mixed conifer associations were not sampled in the Shatford et al. study. More typically, vegetation is likely to go through an extensive time-period of hardwood- and brush-dominated site occupancy (Zhang, Webster, Powers and Mills 2008). Reforestation will slowly occur naturally but may take many decades to replace brushfields (Zhang et al. 2008). In larger patches where the majority of the trees were killed by the fire, reestablishment of forest cover would rely on natural regeneration and may take decades or longer. For the larger, contiguous areas of high-severity burn, distance from seed sources may further delay natural regeneration. In some cases of high-severity burn, there are no living conifer trees available to provide potential seed for potential natural regeneration for several miles." Please see the Fuels Report for analysis of future fire risk.
141.01 - Introduction, Planting, Seeding	#18872-5	tree planting in favorable north slope areas after fire and logging	Please see the response to comment number 17111-4.
141.01 - Introduction, Planting, Seeding	#18874-1	Our comments on subject project pertain mainly to Forest Service land surrounding the Maplesden Ranch located on Buckhorn Ridge in T.46N, I OW, Section 2 within the boundary of the Beaver Fire. 1. Concerning the area north and east of the Ranch, indicated for site prep, plant and release treatment in all of the alternatives of the DEIS: - Reforestation for this area: We suggest this area be planted in species that were on the land prior to it being burned in the 1977 "Buckhorn" fire. The main species in this area at the time of the Buckhorn fire was fir, cedar and some pine. It was reforested after the 1977 fire with predominantly pine which added to the intensity of the Beaver fire adjacent to the Ranch. This should reduce future risk and severity of fire in the area.	Please see the response to comment number 17111-4.

Code	Comment Number	Comment Text	Response
141.01 - Introduction, Planting, Seeding	#18874-2	Maplesden Ranch located on Buckhorn Ridge in T.46N, I OW, Section 2 A portion of the historic Barton Ditch that we maintain is located in the W1/2 of the NE 1/4 of Section 2 within the area proposed for planting. We suggest that pines not be planted within 20' of the center of this ditch, and that fir and cedar be planted in their stead: not closer than 10' on the uphill side of the ditch, and that no trees are planted on the ditch bank on the downhill side. Pines were planted along the upper side of the ditch and on the ditch bank after the 1977 fire. Trees planted on the ditch bank obstructed access to the ditch and long pine needles versus fir needles caused a great increase in maintenance of the ditch over the last 25 years.	Thank you for bringing this to our attention. We have added a new project design feature (Heritage-8) to address this concern.
141.01 - Introduction, Planting, Seeding	#18878-30	DEIS: Acres salvage-harvested and site-prepared will be planted with a variety of coniferous species to ensure diversity, and will be released from competing vegetation within a year or so of being planted. (Pg. 114) Comment: It should be noted/clarified in the Final Environmental Impact Statement "competing vegetation" such as hardwoods will not be targeted during conifer release.	As described in Chapter 2 of the EIS: "Growth of existing hardwoods will be encouraged; hardwoods will be included in the target stocking for units in areas where they exist." This has been clarified in the final EIS; see Chapter 2.
141.01 - Introduction, Planting, Seeding	#18878-33	DEIS: Research has shown that the quickest way to reestablish a coniferous forest after stand replacement fire is by active reforestation (Rose and Haase 2005). (Pg 114) Comment: In the Introduction of the cited paper it stated "The objective of this paper is to outline some of the post-fire biological reforestation issues and to describe new projects designed to address these issues." We cannot find any conclusive statement within the cited material which would warrant such a statement.	The citation in the draft EIS was incorrect; the reference is to the Zhang et al., 2008 paper. This has been corrected in the final EIS.
141.01 - Introduction, Planting, Seeding	#18883-12	Site Preparation by mastication does not reduce the amount of fuel on the forest floor but does produce more ground cover for fire. Removal of trees up to 16 inches and greater diameter cannot be justified as Site Preparation for planting of new trees.	The Fire and Fuels Resource Report describes the benefits of and reasons for mastication: "Mastication may be utilized in selected stands to reduce high snag densities in lieu of piling stands. Mastication is essentially the mulching or chipping of wood material. The direct effect of mastication is changing the structure and composition of the fuel bed post fire. With no action taken, surface fuels will increase over time as trees fall. As trees fall over in random patterns, fuels will essentially “crisscross” as they fall with some fuels resting on top of others effectively increasing fuel bed height (Figure 19). Higher surface fuel beds will be subject to wind and preheating of fuels lower in the surface fuel profile; thus, increasing fire behavior potential. Rather than having standing dead material that falls overtime, where mastication is identified as a treatment option under Alternative 2, chipped material will create a compact fuel bed (Figure 20). Material will also be expected to decay faster with masticated material due to its proximity to the ground and being saturated for longer period of time during the winter months." As the excerpt shows, mastication is proposed to reduce snags (i.e., dead trees), not live trees, in order to prepare the site for planting.
141.01 - Introduction, Planting, Seeding	#18883-18	Plantations should not be established or reestablished after the salvage logging. Plantations will simply burn in a future fire, and it will take pesticides and other expensive and polluting resources to maintain them. Natural recovery, while slow, is more certain.	Intensely burned forested areas recover slowly. Heavy fuel loading would increase from fallen snags over time. Following a high severity wildfire, heavy fuel loading predisposes an area to higher intensity and higher severity wildfires in the future. Such fires inhibit forest stand regeneration and result in stand type changes to brush or other non-forested vegetation types. Seed tree locations and timing of conifer seed crops is uncertain. These factors can delay lands from reaching the desired conditions defined in the Forest Plan for many years. Assisted recovery, including reforestation along with natural seeding where available has the potential to restore forest cover more rapidly. See Chapter 3 of the EIS for a discussion of effects for vegetation and fuels. Although young trees (planted or naturally regenerated) are less resilient to fire than larger trees, as the Vegetation Resource Report states: "Within the fire-burned area, approximately 70% of all the existing plantations survived the extreme fire conditions of the 2014 Fires." Chemicals have not been used in plantations on the Forest since the early 1980s. Natural regeneration effects analysis is described in Chapter 3, Vegetation, of the EIS: "Successful natural regeneration in one to two decades, though highly variable, has been documented following stand-replacing fires in the Klamath Province within white fir, Douglas-fir, and Douglas-fir/tanoak stand types (Shatford, Hibbs and Puettman 2007; Joint Fire Science Program Final Report, Project 05-2-1-40 2009). Pine and mixed conifer associations were not sampled in the Shatford et al. study. More typically, vegetation is likely to go through an extensive time-period of hardwood- and brush-dominated site occupancy (Zhang, Webster, Powers and Mills 2008). Reforestation will slowly occur naturally but may take many decades to replace brushfields (Zhang et al. 2008). In larger patches where the majority of the trees were killed by the fire, reestablishment of forest cover would rely on natural regeneration and may take decades or longer. For the larger, contiguous areas of high-severity burn, distance from seed sources may further delay natural regeneration. In some cases of high-severity burn, there are no living conifer trees available to provide potential seed for potential natural regeneration for several miles." Planting facilitates regeneration of forested areas; see Chapter 3 under vegetation and fuels for more details.
141.01 - Introduction, Planting,	#18907-14	Site Preparation by mastication does not reduce the amount of fuel on the forest floor but does produce more ground cover for fire. Removal of trees up to 16 inches and greater diameter cannot be justified as Site Preparation for planting of new trees.	See response to 18883-12.

Code	Comment Number	Comment Text	Response
Seeding			
141.01 - Introduction, Planting, Seeding	#18907-15	Reforestation should utilize seedlings grown in a nursery from seeds taken from live trees in adjacent forests. These seedlings will be more adapted to local soil and water conditions and may be more resilient to climate change.	See response to 18883-13.
141.01 - Introduction, Planting, Seeding	#18907-21	Plantations should not be established or reestablished after the salvage logging. Plantations will simply burn in a future fire, and it will take pesticides and other expensive and polluting resources to maintain them. Natural recovery, while slow, is more certain.	See response to comment number 18883-18.
141.01 - Introduction, Planting, Seeding	#18909-25	Another false and unsupported assumption in the DEIS is based on the Rose and Haase study at DEIS page 114: "Research has shown that the quickest way to reestablish a coniferous forest after stand replacement fire is by active reforestation (Rose and Haase 2005)." The Rose and Haase paper makes no such claim. The authors from the Nursery Technology Cooperative at the Department of Forest Science at Oregon State University detailed two projects. The first project was designed to compare field performance among 1-year-old stocktypes; the second project (not yet accomplished at the release of this paper in 2005) was designed to investigate the effects of delayed outplanting and vegetation control on subsequent plantation establishment and growth. On page 115 the DEIS states, "Thus, without site preparation and planting, these areas will likely not regenerate conifers satisfactorily for many decades." In response, please note the Shatford et al. 2007 quoted above on page 3 and 4.	The citation to Rose and Hasse (2005) was in error in the draft and has been corrected in the final. We appreciate that being pointed out. The findings of Shatford et. al. 2007 have been considered in the Vegetation Effects section of the EIS: ""Although natural regeneration of conifer species has occurred elsewhere, following more typical wildfire site conditions, the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007).""Because Late Successional Reserves have been established to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions (Northwest Forest Plan C-14; Late-Successional Reserve Assessment 1-24). Research has shown that the quickest way to reestablish a coniferous forest after stand replacement fire is by active reforestation (Zhang et al. 2008). Research has also shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less severity and intensity or not at all (Thompson, Spies and Ganio, 2007; Weatherspoon and Skinner, 1995; Omi and Kalabokidis 1991). Forest Vegetation Simulation (FVS) modeling (Attachment 1) shows that reforestation will establish forested conditions more rapidly by treating surface fuels and planting trees than by natural succession. It also shows that where surface fuels have been treated by salvage logging and site preparation, the ensuing stand is more resilient to fire than untreated areas. If surface fuels are treated, the risk of future stand replacement fires would be reduced, increasing the probability that planted conifers can persist into the future. In the FVS model, planted stands where fuels had been reduced began to show late-successional stand conditions typical of the Klamath Province with 40% canopy closure and 18 inch diameter at breast height trees in 70 years compared to over 200 years for untreated stands to reach the same stage. We agree that without planting, trees will slowly become reestablished over a period of 10-50 years in severely burned areas, but the probability of a late-successional coniferous forest becoming established in areas where fuels have not been reduced is low because of probable reburns. It is probable that areas where fuels are not treated will go through several cycles of stand replacement fire until surface fuels have been reduced to the point that a low to moderate fire severity regime has been reestablished. This would maintain areas where fuels have not been reduced in semi-permanent brush fields for decades rather than accelerating the development of late-successional stand conditions.
141.01 - Introduction, Planting, Seeding	#19092-3	Fast-track salvage logging is a good idea but it does take time to do a quality job. Restoration of burned areas is important. New trees can be planted as dead burned ones are cut but you all should wait a year and do it in a thinning manner, not a one-size fits all method.	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. As per the EIS in Chapter 2, Alternatives Considered in Detail: "Based on the issues identified through public comment on the proposed action, the Forest Service developed 14 Alternatives to the proposed action, four of which were designed to achieve the purpose and need and were studied in detail. In addition, the Forest Service is required to analyze a no action Alternative." Please see the response to comment number 17111-4 for more details on planting techniques.
141.01 - Introduction, Planting, Seeding	#19146-2	Regarding reforesting the severely burned areas, please plant a variety of native tree species.	Please see the response to comment number 17111-4 for more details on planting techniques.

Code	Comment Number	Comment Text	Response
141.01 - Introduction, Planting, Seeding	#19154-2	When scalping 5 feet around seedlings, dig up species that sprout. Because I know herbicides are controversial.	Herbicides have not been used on the Klamath since the early 1980s, and are not proposed within the Westside Fire Recovery Project.
141.01 - Introduction, Planting, Seeding	#19154-3	Don't forget plantations so many years later.	The EIS provides for reforestation and plantation treatments through plantation establishment.
141.01 - Introduction, Planting, Seeding	#5-1	With all the parts that have to be balanced for any region, this can be very big to deal with. Live vibrant forest need some dead trees and brush. Small animals use this to live in and other live in the dead trees. Dead plant matter creates dirt. Simple. Small plants / grasses, etc are needed as well as trees. The replanting also has to deal with less water, as it looks like there will be more drought. Balance between what grows there now and what will grow better with out so much water, so there would be a better transition	Chapter 1, Purpose of and Need for Action, provides a detailed rationale for the Westside Resource Recovery Project. [Unresponsive to comment. I suggest: Chapter 1, Purpose and Need for Action, describes how various resource concerns are considered for development of the Alternatives described in Chapter 2. Effects on resources of those Alternatives are further analyzed in Chapter 3. Planting prescriptions are based on historic unit conditions, projected unit composition, and the likelihood of long-term survivability of project units within a fire ecosystem. Please see Chapter 2, Site Preparation, Planting, and Release for more information on planting design.]
141.01 - Introduction, Planting, Seeding	#5873-152	If this project involves artificial planting, avoid dense replanting that creates dense homogeneous plantations. Such areas inhibit biodiversity and also represent dangerous fuel conditions. Please replant in patches and/or at a fairly low density and avoid the need for future thinning and other stand management costs. Let's be patient and allow these stands recover slowly as diverse early seral communities. Diverse early seral plant communities are becoming less common and we should encourage slow and easy regeneration of forest communities. This is consistent with the research being done by Nathan Poage which indicates that many stands developed over much longer time periods than we typically allow under the agricultural model of forest management. David Hibbs' research is also showing that natural regeneration is sufficient to reforest most sites after disturbance. And Jerry Franklin points out that the more diverse forests that develop from natural regeneration are more resilient to climate change. In the 2007 Early Seral Forest Workshop, Jerry Franklin pointed out an important reason to rely on natural regeneration, saying — Naturally-regenerated ESFCs are likely to be more resilient under climate change due to - greater species diversity - tree genotypes selected by nature (i.e., environmental stresses) … Reforestation will usually: o Reduce the duration of ESFCs o Reduce heterogeneity of the process by which closed forest canopy is re-established o Alter genotype of planted species (less selection by environment) o Homogenize composition of forest http://www.reo.gov/ecoshare/ccamp/good_forest_opening/powerpoints/FranklinEarlySuccession.ppt Brown and Kertis studied the seedlings that came up naturally after the Warner Creek fire, and found that "seedling density can vary a lot within a plot. You might have a general density of 50 thousand per hectare, but locally those numbers could be anywhere from 0 to 300 per hectare. These seedlings are numerous, but not laid out in a grid!" http://web.archive.org/web/20050428020846/http://www.brownandbrown.tv/warner-presentation-2002-05-14b.pdf.	Artificial reforestation is proposed in all action Alternatives of the Westside Fire Recovery Project. Please see Chapter 2 for proposed planting prescriptions, and the Vegetation section of Chapter 3 for discussion on natural regeneration. The planting prescriptions proposed for the Westside Recovery Project largely incorporate the recommendations in this comment. Only locally adapted nursery stock would be used. See also Response 5873-171.

Code	Comment Number	Comment Text	Response
141.01 - Introduction, Planting, Seeding	#5873-187	Minimize Replanting in Order to Promote Complex Early Seral There is a growing recognition of the ecological importance of complex early seral habitat which typically exists after a disturbance and before young conifers re-establish dominance. Replanting therefore truncates succession to the detriment of complex early seral habitat. The agency should be willing to accept delayed conifer re-establishment. Slow progress toward conifer dominance is not a failure of forestry, but a benefit to biodiversity. We urge the agency to carefully consider how replanting can be adjusted to minimize and mitigate adverse effects on complex early seral habitat, for instance: • consider relying on natural regeneration; • leave unplanted "skips" within planting areas; • plant in a highly variable, clumpy, gappy pattern; • plant at low density, so that future thinning entries are not needed; • plant diverse species and diverse genetic stock (especially important considering climate change); • minimize soil disturbance and avoid weeds; • retaining complex dead wood structure (retain all snags, leave dead/down wood in patches, leave some fuel piles unburned, etc). This project should be adjusted to reflect the growing recognition of the ecological and social value of complex early seral habitats which are promoted by delayed re-establishment and dominance of conifers after disturbance. Complex early seral habitat, with diverse vegetation, as well as retaining some structure remaining after previous entries, often provides important ecological value to a wide variety of wildlife including big game, birds, insects, small animals, plants and wildflowers, butterflies, etc.	Please see response to comment number 5873-171
141.01 - Introduction, Planting, Seeding	#5873-188	Complex early seral habitats are now relatively uncommon as a result of many decades of timber dominant forestry, with regeneration harvest, fire suppression, salvage logging, and conifer replanting. This project could be made more beneficial to the creation of complex early seral habitat by dropping areas from planting entirely when they have a nice existing complement of diverse vegetation. Please minimize efforts to control competing native vegetation. Another option is to replant at very low densities or in a very clumpy-patchy-gappy pattern to allow existing non-conifer vegetation more time in the sun. Try to avoid homogenizing tree densities. The agency should be willing to accept delayed conifer re-establishment. Slow progress toward conifer dominance is not a failure of forestry, but a boon to biodiversity. To help get your creative juices flowing on this interesting and developing topic please review and consider the following resources: Jerry Franklin - Early seral forest: a diminishing resource? http://www.slideshare.net/ecoshare/jerry-franklin-early-seral-forest-a-diminishing-resource. K. Norman Johnson - Policies to Encourage Diverse, Early Seral Forest in Oregon: What Might We Do? http://www.slideshare.net/ecoshare/k-norman-johnson-policies-to-encourage-diverse-early-seral-forest-in-oregon-what-might-we-do. Exploring What is a 'Good' Forest Opening and is the Future a concern? January 30, 2007. http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/workshops/early-seral-forest-2007/. AND http://www.slideshare.net/ecoshare/presentations. Daniel C. Donato, John L. Campbell &amp Jerry F. Franklin 2011. Multiple successional pathways and precocity in forest development: can some forests be born complex? Journal of Vegetation Science & (2011) http://onlinelibrary.wiley.com/doi/10.1111/j.1654-1103.2011.01362.x/pdf. Churchill, D.J., M.C. Dalhgreen, A.J. Larson, and J.F. Franklin. 2013. The ICO approach to restoring spatial pattern in dry forests: Implementation guide. Version 1.0. Stewardship Forestry, Vashon, Washington, USA.http://www.cfc.umt.edu/ForestEcology/files/ICO_Manager_Guide.pdf and Derek J. Churchill, Andrew J. Larson, Matthew C. Dahlgreen, Jerry F. Franklin, Paul F. Hessburg, and James A. Lutz. 2013. Restoring forest resilience: From reference spatial patterns to silvicultural prescriptions and monitoring. Forest Ecology and Management 291 (2013) 442–457. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5428873.pdf Plant at low density to extend the early seral community and avoid future stand management costs. Unsalvaged, naturally regenerated, young stands are one of the rarest forest types in the Pacific northwest, and their biodiversity rivals that of old-growth forests. Indeed, naturally developed early-successional forest habitats, with their rich array of snags and logs and nonarborescent vegetation, are probably the scarcest habitat in the current regional [Pacific Northwest] landscape. Lindenmayer, David B. and Jerry F. Franklin. 2002. Conserving Forest Biodiversity: A Comprehensive Multiscale Approach. Island Press. Washington, DC: 69. See also, DellaSala, D.A., J.E. Williams, C. Deacon-Williams, and J.F. Franklin. Beyond smoke and mirrors: a synthesis of fire policy and science. In review - Conservation Biology	Please see response to comment number 5873-152 for information on planting prescriptions and natural regeneration. Treatment in salvage harvest units is limited to moderate to high severity areas (>50% mortality) outside of Riparian Reserves. See Chapter 2 for a complete description of salvage harvest units. See response to comment number 12346-55.

Code	Comment Number	Comment Text	Response
142.01 - Timber Sales (Green)	#12346-55	We note that the proposed salvage logging is in no way limited to dead trees. While the agency is silent as to the number of live green trees to be removed (as opposed to felled) in roadside logging and to facilitate yarding and landing activities, the DEIS (page 102) does indicate that the Forest Service intends to log trees that are in fact still alive. Please note that dying trees assist in post-fire soil stabilization and restoration via needlecast. Page 48 of the Wildlife Biological Evaluation Report indicates that "[a]lthough the project is using a 70% probability of mortality to identify trees for harvest in the treatment units, many of these trees that meet this definition are mixed with trees with lower probability of mortality thus contributing to canopy cover to the extent that these areas still meet the description of NSO habitat." The proposal to log live trees raises the controversial issue of mortality models and marking guidelines for designating "dying" trees. There is an extensive scientific literature on the delayed mortality of fire-damaged conifers on forests of the western United States. (e.g. Martin 1963utl, Bevins 1980 utl, Ryan 1982 utl, 1983, 1998, Peterson 1985 utl, Peterson and Arbaugh 1986 utl, Wyant et al. 1986 utl, Chambers, et al. 1986 utl, Harrington 1987 utl, 1993, Ryan et al. 1988, Ryan and Reinhardt 1988, Ryan and Frandsen 1991, Regelbrugge and Conard 1993, Mutch and Parsons 1998, Saveland and Neuenschander 1990, Flanagan 2001, Borcher and Schreiner 2002, Stephens and Finney 2002, McHugh and Kolb 2003, Thies et al. 2006, Hood and Bentz 2007, Michaletz and Johnson 2007). While none of these studies are acknowledged or addressed in the Westside DEIS, it is clear that the translation of this science into marking guidelines for salvage logging has been and is still the subject of considerable scientific controversy. The agency's proposal to the harvest "dying" fails to disclose the scientific controversy or respond to the best available science. As discussed by Lindenmayer, Noss, and others, (Lindenmayer et al. 2004, Beschta et al. 2004, Lindenmayer and Noss 2006, Noss and Lindenmayer 2006) ecosystems on sites damaged by the passage of fire are in a stressed condition and are the least able to withstand further disturbance. All trees that have a chance of surviving are needed to play critical roles in natural site regeneration. They should be preserved, even if some will later die. They provide site-adapted seed sources for new trees, shade for seedlings that is critical under the xeric conditions of most western forests, and a host of benefits to wildlife. If a few later succumb, they will provide snag habitat useful to wildlife. (Cf. e.g. Hutto 2006.) Furthermore, even dead trees can play an important role in natural site restoration, as outlined by the above authors. A discussion of these considerations was largely absent from the NEPA documentation related to the harvest selection and marking criteria. Attached to these comments is a 2009 peer-reviewed article (Hanson and North 2009) indicating that the Forest Service Region 5 mortality guidelines may significantly overestimate tree mortality to the detriment of ecosystem functions (including flushing) and post-fire recovery. The abstract for that study concludes: With growing debate over the impacts of post-fire salvage logging in conifer forests of the western USA, managers need accurate assessments of tree survival when significant proportions of the crown have been scorched. The accuracy of fire severity measurements will be affected if trees that initially appear to be fire-killed prove to be viable after longer observation. Our goal was to quantify the extent to which three common Sierra Nevada conifer species may 'flush' (produce new foliage in the year following a fire from scorched portions of the crown) and survive after fire, and to identify tree or burn characteristics associated with survival. We found that, among ponderosa pines and Jeffery pines with 100% initial crown scorch (no green foliage following the fire), the majority of trees flushed, and survived. Red fir with high crown scorch (mean=90%) also flushed, and most large trees survived. Our results indicate that, if flushing is not taken into account, fire severity assessments will tend to overestimate mortality and post-fire salvage could remove many large trees that appear dead but are not. Additionally, following the recent Rim Fire in Region 5, the Forest Service elected to retain all live trees exhibiting green needles in order to contribute to post-fire recovery. Please see: http://www.fs.usda.gov/wps/portal/fsinternet/!ut/p/c5/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gDfxMDT8MwRydLA1cj72BTUwMTAwgAykeaxRtBeY4WBv4eHmFYT4GMHkidBvgAI6EdIeDXIvfdrAJuM3388jPTdUvyA2NMMgyUQQAyrgQmg!!/ dl3/d3/L2dJQSEvUUt3QS9ZQnZ3LzZfS000MjZOMDcxT1RVODBJN0o2MTJQRDMwODQ!/?project=43033 While the Forest Service URL above may be confusing and byzantine, the direction of the Stanislaus National Forest was crystal clear: Do Not "Salvage" Log Living Green	This comment states that scientific controversy exists concerning marking guidelines for mortality, and that the Forest Service is overstating risk of mortality and thus marking trees that would otherwise survive. It is not clear from the comment what scientific controversy exists relative to the application of fire-caused mortality predictions. The existence of diverse thought in scientific literature does not equate to scientific controversy nor does a scientific controversy exist because the commenter has a differing opinion than the Agency about a project. A scientific controversy exists when scientific evidence specifically evaluating the environmental effects of the action calls into question the analysis or findings in the EIS. No such evidence is presented in the comment. As to predicting probability of mortality, the Forest Service is using the R5 Forest Health Protection Marking Guidelines for Fire-Injured Trees in California (Smith and Cluck 2007) which is based on peer - reviewed journal articles (some of which are cited in the comment) and General Technical Reports published by the research branch of the Forest Service. This is the standard practice in Region 5. The comment provides several citations about fire damage suggesting these articles conflict with Smith and Cluck. (Martin 1963, Bevins 1980 , Ryan 1982 , 1983, 1998, Peterson 1985 , Peterson and Arbaugh 1986 , Wyant et al. 1986 , Chambers, et al. 1986, Harrington 1987, 1993, Ryan et al. 1988, Ryan and Reinhardt 1988, Ryan and Frandsen 1991, Regelbrugge and Conard 1993, Mutch and Parsons 1998, Saveland and Neuenschander 1990, Flanagan 2001, Borcher and Schreiner 2002, Stephens and Finney 2002, McHugh and Kolb 2003, Thies et al. 2006, Hood and Bentz 2007, Michaletz and Johnson 2007). Several of the documents listed in this comment are referenced by Smith and Cluck (2007) however the commenter failed to explain the scientific controversy with Smith and Cluck (2007) or with the site-specific on-the-ground application of these guidelines on the Westside Fire Recovery Project. Disagreement by the commenter does not constitute scientific controversy but regardless, the Forest Service has made their assumptions and standards clear from the beginning of the project. Along forest roads, dead and fire - damaged trees with a 60% or greater probability of mortality are proposed for removal. After publication of the draft EIS, these rules were modified so that trees over 45 inches in diameter were required to have a 95% probability of mortality. This was done to ensure that legacy trees along road systems were retained. Project design was modified after publication of the draft, in consultation with the Fish and Wildlife Service to eliminate marking of green hazard trees that are not fire-damaged. This was done to reduce potential impacts to northern spotted owl habitat. Within proposed salvage units, the Forest Service is using a 70% probability of mortality as a threshold. No Alternatives in this project propose the removal of green trees, defined as trees with a less than a 70% probability of mortality. All green trees will be retained. The only exceptions are green trees that pose an immediate hazard to roadways or the occasional live trees that need to be removed for cable harvesting. See Chapter 2 of the final EIS for details of what is being proposed. Green tree is also defined in the glossary.The comment alludes to scientific controversy related to removing green trees and suggests the Forest Service is using a 70% probability of mortality threshold to remove green trees that would otherwise survive as part of an aggressive logging program. There is no controversy related to retaining green trees in severely burned areas; we agree that green trees with a reasonable chance of survival should be retained wherever they occur for the reasons noted in the comment. The question is whether trees with a 70% probability of mortality or higher should be marked. It has been the recent experience of the Forest on the Salmon Salvage and the professional judgement of Forest staff with decades of experience on the Forest that most trees with a 70% probability of mortality in the marking guidelines will in fact die, particularly in the drought conditions that have existed in northern California for the past four years. In the Marking Guidelines for Fire-Injured Trees in California (Smith and Cluck 2011), 70% probability of mortality and above is the threshold to use when it is important to prevent taking trees that may live. Proposed risk-reduction salvage units were located in the most severely burned areas where any surviving trees had been exposed to higher intensity fire than those in less severely burned areas. The winter of 2014-2015 was drier and warmer than normal so fire-damaged trees likely experienced more stress than would have normally occurred. Between publication of the draft, and publication of the final EIS, field crews report that extensive additional secondary mortality from drought and insect attack has occurred in all RAVG classes. About 8,500 green trees with a 30% chance of survival or greater (or less than a 70% chance of mortality) in units have been marked for retention. We note the reference to ""flushing"" which is the emergence of new growth in scorched trees. The reference to Hanson and North and the effects of flushing relative to the mortality guidelines would depend on the timing of marking. Retention trees were marked in the late spring 2015, mostly after new growth had started to form. If flushing had occurred, it would have been visible and would have been considered as part of the live crown in the damage assessment. No flushing has been reported by field crews, most likely because the proposed Westside Fire Recovery units are in areas where there was high fire severity and extensive foliage consumption in the crowns of the trees. The cited Hanson/North study did not include Douglas-fir, which is by far the Westside Project's predominate species affected. Also, as cited directly from Hanso and North (2009) from their own study; "Although we found higher survival than Hood et al. (2007), there are several limitations to our design that may influence our results. We had a relatively small sample size from only two locations and sampling was restricted to a narrow subset of trees (e.g. ponderosa and Jeffrey pine with 100% scorch and red fir with 85% or greater scorch). We also did not sample in high-severity crown-fire areas where foliage consumption is high. Future investigations with larger samples in other locations will facilitate more precise estimates of flushing and

Code	Comment Number	Comment Text	Response
		Trees. The Klamath National Forest has failed to justify their more aggressive logging desires.	survival."" The Westside Proposed Action salvage units were in moderate to high fire severity areas where foliage consumption was generally high, so the findings of Hanson and North may not be applicable. Regardless, as noted above, “flushing” would have been evident at the time the trees were marked. If trees did “flush” after field layout was completed, and in fact appeared to have a reasonable chance of survival, they can be removed from the sale by the Forest Service during implementation. The project does include specific project design features to retain legacy trees and snags (EIS, Chapter 2, Project Design Features Wildlife 11 and 12) and no salvage is proposed within wilderness, backcountry, research natural areas or designated or recommended wild rivers. Within inventoried Roadless Areas and hydrologic Riparian Reserves, only dead and dying roadside hazard trees along roads would cut (EIS, Chapter 2, Alternative 2 description). Within hydrologic Riparian Reserves, only material between 14 and 26 inches in diameter would be removed for the purpose of reducing fuels adjacent to the road. Trees over 26 inches in diameter would be retained on-site. See also comment 12346-1, 12346-48, 5873-64 and 17111-1
142.01 - Timber Sales (Green)	#15601-1	The proposed plan reverts to the bad old days of the 50's and 60's when the overriding goal of the USFS appeared to be "get the cut out" at any and all costs to the forest enviroinment! Most likely many of the USFS planners were not around during those days - but I was and remember clearly the stain on the USFS's environmental record, a stain which I as as USFS employee lived with for over the 15 years of my own career with the USFS.	There is a need to harvest dead or dying trees in order to provide funding for the restoration of future wildlife habitat and improvement of watershed conditions (EIS, Chapter 1, Purpose and Need). Much of the restoration would not happen without this funding source. In addition, the project has included specific project design features and best management practices which will minimize resource impacts to the forest (EIS, Chapter 2, Project Design Features; EIS, Appendix D).
142.01 - Timber Sales (Green)	#18909-100	Tree mortality is a natural process in a forest ecosystem. Diseased, damaged and dead trees are key structural components of late-successional forests. Accordingly, management planning for LSRs must acknowledge the considerable value of retaining dead and dying trees. There are guidelines within the Northwest Forest Plan specifically for post-fire logging within LSRs. All standing live trees should be retained and management should focus on retaining snags that are likely to persist until late successional conditions have developed and the new stand is again producing large snags. The project as proposed is contrary to the protection of the LSR and threatened species. The proposal to log live trees raises the controversial issue of mortality models and marking guidelines for designating "dying" trees and it is illegal in LSRs. There is an extensive scientific literature on the delayed mortality of fire-damaged conifers on western forests. Ecosystems affected by the passage of fire are in a stressed condition and are the least able to withstand further disturbance. All trees that have a chance of surviving are needed to play critical roles in natural site regeneration. They should be preserved, even if some will later die. They provide site-adapted seed sources for new trees, shade for seedlings that is critical under the xeric conditions of most western forests, and a host of benefits to wildlife. If a few later succumb, they will provide snag habitat useful to wildlife.	The Forest Plan provides direction for salvage in Late Successional Reserves (Forest Plan, pp. 4-87 - 4-88) which will be followed in this project (EIS, Chapter 2, Alternative 2 description). The Forest Plan specifically states that "all standing live trees should be retained, including those injured (for example, scorched) but likely to survive." The responsible official has chosen to salvage trees with a 70 percent or greater probability of dying within the next three to five years, as these trees are not "likely to survive" (EIS, Chapter 2, Alternative 2 description). However, the project does include specific project design features to retain legacy trees and snags (EIS, Chapter 2, Project Design Features Wildlife 11 and 12) and no salvage is proposed within wilderness, backcountry, research natural areas, designated or recommended wild rivers, inventoried Roadless Areas, Riparian Reserves associated with stream channels or high ranked northern spotted owl cores, or within designated snag retention areas (EIS, Chapter 2, Alternative 2 description) which also overlap with Late-Successional Reserve areas. See response to 12346-55.See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
142.01 - Timber Sales (Green)	#18934-12	Marking Guidelines Klamath National Forest staff has provided conflicting statements on the marking guidelines and methods for this project. During the first open house meeting in Sawyers Bar, forest staff indicated that there would not be individual tree marking and instead the project, due to its scale, would allow for "designation by description." During the second open house in Sawyers Bar, forest staff indicated that there would be individual tree marking for all cut and all leave trees throughout the project. This needs to be clarified and clearly stipulated in the EIS. Individual tree marking is the only appropriate method to use as descriptive designations allow for leeway and judgment calls to be made on-site by those with a profit motive to cut more rather than less as well as discrepancies as to what what was intended. The self-selected massive scale of the Westside project is no excuse for the Forest Service not adequately marking trees. Additionally, we have found that the marking guidelines that were used in the Salmon Salvage Project of 2014 on the Salmon River, which are the same as those proposed in all of the Westside Fire Recovery Project alternatives (other than the Karuk Alternative), are flawed and should not be used for the Westside Fire Recovery Project. We personally visited Salmon Salvage salvage units and roadside hazard units before, during and after the treatment. In a pre-salvage fieldtrip USFS personnel explained the marking guidelines and although they seemed like they may be overly lenient on the side of cutting still green trees, it wasn't until the units were actually treated that we became aware of the profound affect these guidelines would have on the landscape for the foreseeable future. Throughout the Salmon Salvage project we witnessed a shocking number of large, green, legacy trees being cut and hauled out of the units, particularly along roadside hazard treatment areas. Many of these trees, that appeared to have little fire damage, filled two, three and four log loads as they made their way out of Late-Succesional Reserves and some of the last remaining patches of old growth in these fire affected landscapes, to out of state mills where they still have equipment large enough to handle this size of tree. It is a travesty to lose these large, legacy trees from our forests, and especially LSR's, forever, they are irreplaceable and play an extremely important role in fire recovery and ecosystem resiliency. After doing some research, we found that the current guidelines being used greatly over predict the mortality of fire damaged live trees, especially large trees, and are not scientifically supported as they are being implemented. This goes directly against the Westside projects purpose and need. The salvage harvest of large green legacy trees that have a high likelihood of survival will have a dramatic and long lasting impact on the forests being treated. These trees, if left standing will greatly contribute to the recovery of this landscape in many ways, providing natural regeneration from uniquely adapted genetics for the landscape; contributing to a healthy distribution of age and size class variation on the landscape; providing invaluable wildlife habitat; shade and moisture retention for newly regenerating forests; and improved visual and physical qualities for future generations of people to enjoy, to name a few. We strongly urge the adoption of the alternative marking guideline of "no green at the time of harvest," which will more readily achieve the DEIS objective of meeting the, "need for restored and fire-resilient forest ecosystems." These alternative marking guidelines have been used successfully in multiple fire salvage projects, most recently being used on the Rim Fire Restoration Project on the Stanislaus National Forest. The inaccuracies of the proposed marking guidelines were well laid out in Dr. Kennedy Meadows comment letter, included here by reference. If a significant number of these large trees along main roadways do die in 5 years they are large enough that the wood will still be in great condition and they are both accessible and merchantable for a future roadside hazard project through a CE - so nothing would be lost. However, under the current guidelines those critical and irreplaceable, legacy trees and their genetics are guaranteed to be lost forever. These trees are important for habitat, heterogeneity and stand structure and play a very important role in the landscape recovery and resiliency.	Project guidelines originally allowed the removal of green trees along roads as was done in Salmon Salvage whether they were fire damaged or not, so long as the tree Forest Service definition of a “hazard tree”. Project design for the Westside Fire Recovery Project was modified in consultation with the Fish and Wildlife Service after publication of the draft, to eliminate marking of green hazard trees that are not fire-damaged. This was done to reduce potential impacts to northern spotted owl habitat. Along forest roads, dead and fire - damaged trees with a 60% or greater probability of mortality are proposed for removal. After publication of the DEIS and in response to public comment, these rules were modified so that trees over 45 inches in diameter were required to have a 95% probability of mortality before they could be marked. This was done to ensure that legacy trees along road systems were retained. Within proposed salvage units, the Forest Service is using a 70% probability of mortality as a threshold (EIS, Chapter 2, Alternative 2 description). The guidelines in Report #RO-11-01 ""Marking Guidelines for Fire-Injured Trees in California"" (Smith & Cluck, 2011) are stated in Chapter 2 of the EIS under Alternative 2, Salvage Harvest description describe which trees are considered for harvest. The fire-injured tree marking guidelines for the Westside Fire are based on published models from the Hood et al. 2010 study (Hood, Sharon M.; Smith, Sheri L.; Cluck, Daniel R. 2010. Predicting mortality for five California conifers following a wildfire. Forest Ecology and Management. 206: 750-762). These well established guidelines are based on the best available science documenting post-fire conifer mortality in California and their use has contributed to the success of many post-fire salvage and restoration projects. See also comment response #12346-55 about green trees.

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142.01 - Timber Sales (Green)	#19076-6	We question the ability of qualified USFS oversight and monitoring while so much proposed contract work would be done at the same time. And it is not in the interest of the public to add to sediment loads during a time of minimal precipitation, when there is so much Pending work already required to meet 303(d) requirements that should have already been done. Certainly that work should not be dependent on timber sales for funding.	This comment is an opinion of the commenter. Monitoring and oversight of Forest Service contracts is outside the scope of this project. Legacy sediment sites will be scheduled for treatment as a condition of the North Coast Regional Water Quality Control Board waiver of waste discharge requirements (EIS, Chapter 2, Alternative 2 description) and appropriate project design features and best management practices have been developed to minimize impacts to water quality (EIS, Chapter 2, Project Design Features; EIS, Appendix D). In the analysis for water quality, it was found that there was no change to the risk categories for sediment regime alteration due to project activities (EIS, Chapter 3, Water Quality, Alternative 2 Direct and Indirect Effects). Without revenue from salvage funding may not be available to treat these legacy sites. See Chapter 2 of the final EIS under the monitoring section for details about the monitoring to take place.
142.01 - Timber Sales (Green)	#5873-7	The FS should retain all green trees and all large snags because live trees and large snags persist the longest and will contribute the most toward minimizing the “snag gap.” The proposal will remove thousands of live trees with a 30% chance of survival. These survivors are critically valuable in a post-fire landscape. They not only provide rare green tree habitat, but they offer a source of future snags to mitigate the snag gap.	See the salvage in Late-Successional Reserve discussion in Chapter 1 of the final EIS and in the Appendix of the final EIS. Green trees are being retained; see Chapter 2 of the final EIS for a detailed description of what is being proposed. Also see response to comment number 12346-55. Project design features are incorporated into the project for the retention of legacy components; see wildlife project design features in Chapter 2 of the final EIS.
142.02 - Timber Sales (Salvage)	#12346-70	Please note that there is near universal scientific consensus that salvage logging does not leave watersheds and forests in a healthier, more resilient state, and that the timber volume gained via salvage is neither predictable nor sustainable. We urge the Forest Service to take a hard look at the growing body of literature indicating that the post-fire ecosystems have many benefits including providing habitat for listed species that are diminished or eliminated by salvage logging and plantation forestry. The agency's decision to fast-track this planning process and to circumvent a meaningful objection process indicate to us the public's participation and scientific input are unwanted. This proposal to harm recovering post-fire forests serving as spotted owl critical habitat which are designated Late-Succesional Reserves is extremely troubling to our organizations and we urge that the project be abandoned as currently conceived.	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.02 - Timber Sales (Salvage)	#12346-71	While ignoring or discounting the vast body of peer-reviewed studies regarding the significant environmental impacts of salvage logging, the Westside DEIS repeatedly references "Zhang et al. 2008" to support the controversial contention that "reforestation would restore the desired forested environment faster than natural regeneration." Please note that the "desired forested environment" referenced by Zhang et al. consists of industrial forestlands in the Southern Cascade Mountain Range managed by Roseburg Forest Products (with herbicide application and clearcutting) to "provide harvestable yields in about 30 years." (Zhang, page 429). In contrast, the Westside Salvage planning area is located in the Klamath Mountains, like the forest stands studied by Donato et al. Our organizations provided a copy of the Donato study to the agency during project scoping. Yet, curiously, the DEIS largely ignores Donato's findings regarding natural post-fire reforestation in the Klamath Mountains on federal lands. Is the Forest Service proposing to clearcut the existing LSR snag forest, utilize herbicides and manage these stands on 30 year rotations? If not, why is the agency basing its analysis on a reforestation study conducted on private industrial forestlands in the Cascade Mountain Range, rather than one conducted on Forest Service lands regarding the effects of salvage logging on reforestation in the Klamath Mountains? Please respond to the following regarding the Zhang paper: 1) Zhang et al. (2008) did not compare post-fire logging/planting to no-logging/naturalregeneration. They compared post-fire logging and replanting to post-fire logging with no replanting--i.e., after the tractor logging had compacted the soil, removed any natural seed sources, and destroyed any natural regeneration that might have been coming in. Therefore, Zhang et al. (2008) has no relevance to the Westside project. Nor does it have any relevance to carbon stocks after fire, including high-intensity fire, in areas that have not been logged or replanted. 2) Zhang et al. (2008) do not present any quantitative data on plant species, and instead cite to DiTomasso et al. (1997). The DiTomasso et al. (1997) study compared salvagelogged/ replanted/herbicide-treated areas to salvage-logged/replanted/No-herbicide areas. Therefore, once again, the study is inapplicable to the Westside project (wherein the comparison is between salvage logging/replanting/herbicides and nologging/ no-planting/no-herbicides). It is not clear whether the journal (California Agriculture) in which DiTomasso et al. (1997) was published is peer-reviewed, but the study concludes that salvage logging followed by herbicides initially reduces plant species richness relative to salvage logging followed by no herbicides, but that there is	As described in Chapter 3 of the EIS: "Although there is some controversy about whether older trees are more successful in storing carbon than younger trees (Coulson et al. 2015), there is general agreement that forests are an important factor in carbon storage (Fitzsimmons, et al. 2004, US EPA 2013, Pan et al. 2011). Likewise, there is general agreement that less carbon is stored in decaying wood than in wood content in lumber and manufactured wood products (Skog 2008, Finkral and Evans 2008) and that stand-replacing wildfire releases carbon into the atmosphere (Vose et al. 2012). Therefore, activities that accelerate the regeneration of forests (conifer and hardwood) after moderate- to high-severity vegetation burns, that promote the use of dead and dying wood rather than allowing it to decay, and lessen the likelihood of stand-replacing wildfire and insect disturbance would have a beneficial effect on carbon storage." Response to: "Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk" The review of Donato et al 2006 by Newton et al 2006 (M. Newton, S. Fitzgerald, R. R. Rose, P. W. Adams, S. D. Tesch, J. Sessions, T. Atzet, R. F. Powers, C. Skinner) is applicable to Westside Resource Recovery Project EIS reforestation circumstances. As per the findings of Newton et al in the review of Donato et al, they noted the following: “Donato et al. (1) recently concluded that logging 2 to 3 years after wildfire kills natural regeneration and increases fire risk. The research may make a valuable contribution, but the study lacks adequate context and supporting information to be clearly interpreted. Here, we discuss the papers methods and conclusions in the context of relevant management objectives and the forestry knowledge base concerning natural regeneration processes, mortality from logging, and fuel accumulations in southwestern Oregon and northwestern California. Donato et al. (1) made inferences about natural regeneration processes, mortality from logging, and fuel accumulations without presenting key information regarding (i) agency postfire management directives for reforestation or downed wood levels (2), (ii) implications of delays in postfire plan implementation, or (iii) important environmental and disturbance descriptors such as plant associations, fire intensity, seed tree proximity, and weather patterns. Results from their study cannot be readily extrapolated because it was a short-term observational study of site-specific forest operations governed by agency management objectives. Other management plans, operations, or conditions could yield different results (3). In the case of the 2002 Biscuit Fire, logging was postponed for 2 years, allowing more seeds to germinate and increasing seedling exposure to injury during logging (4). Donato et al. cite a lack of scientific data regarding the management of public forests after large fires. However, it should be noted that conifer reforestation (planted and natural) and vegetation ecology have been widely studied in the region. Studies show variable responses with plant association, competing vegetation, local climate, soils, and other factors (5, 6). Hobbs et al. (5) provide a synthesis of 13 years of research in southern Oregon and northern California. Fewer studies have examined reforestation after wildfire, especially over longer periods (4, 7–9), but damage to natural regeneration after delayed salvage logging was reported more than 50 years ago (4, 8)…”See

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		similar plant species richness over time, and possibly somewhat higher plant species 18 diversity in some of the logged/planted/herbicide areas relative to logged/planted/noherbicide. Total vegetative cover was highest in the areas with no herbicides. Again, though, the results of DiTomasso et al. (1997) are irrelevant to the proposed salvage logging project because they do not compare no-logging/no-replanting/no-herbicides to logging/replanting/herbicides. 3) As for carbon, recent data shows that the highest biomass (and carbon) levels are maintained by periodic high-intensity fire, due to the combined biomass of the snags and logs from the previous fire and the vigorous natural tree regeneration spurred by the fire and the nutrient cycling resulting from the fire (See: Keith, H., B.G. Mackey, and D.B. Lindenmayer. 2009. Re-evaluation of forest biomass carbon stocks and lessons from the world's most carbon-dense forests. Proceedings of the National Academy of Sciences 106: 11635-11640). The Keith et al. (2009) study was conducted in fire-adapted forests in Australia, but the authors made clear that their results are applicable to other fire-adapted temperate forests, including western U.S. conifer forests. Vigorous natural conifer regeneration is the rule, not the exception, in high-intensity fire areas of the Klamath- Siskiyou (with no salvage logging, replanting, or herbicide application). See: a) Donato, D.C., J.B. Fontaine, J.L. Campbell, W.D. Robinson, J.B. Kauffman, and B.E. Law. 2006. Post-wildfire logging hinders regeneration and increases fire risk. Science 311: 352; and b) Shatford, J.P.A., D.E. Hibbs, and K.J. Puettmann. 2007. Conifer regeneration after forest fire in the Klamath-Siskiyous: how much, how soon? Journal of Forestry April/May 2007, pp. 139-146.	response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
142.02 - Timber Sales (Salvage)	#12349-8	I'm not opposed to all logging, but the weight of scientific evidence indicates that logging after a wildfire is one of the worst times to log in terms of the effects on both terrestrial and aquatic biota of forested ecosystems. To summarize my thoughts, I think there are some positive aspects to the proposed project, but the large-scale salvage logging that is proposed, particularly within LSR lands, needs to be removed from the project. If the logging proposed in the preferred alternative ends up happening, the KNF will be going back to the ways of putting timber production above all else, including threatened species such as the northern spotted owl and coho salmon. The preferred alternative, as it stands, will not be good for the forest. It will most likely result in conditions that are conducive to additional large, high-intensity fires and will negatively impact imperiled species.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Salvage harvest is proposed on a small percentage of the project area (less than 4 percent overall and even less in Late-Successional Reserve). See Chapter 3 of the EIS for effects to fire and fuels by Alternative. See response to responsible opposing points of view at the beginning of Chapter 3; we acknowledge other scientific opinions but feel there salvage logging in post-fire conditions has important benefits and helps to meet the purpose and need of the project.
142.02 - Timber Sales (Salvage)	#14300-1	The idea of clear cutting burn areas disgusts me because fire is good for the land and new life comes to the forest after the fires destructive wake. Clear cutting and taking everything away just adds to the destruction and takes away the chance for new seed spawn and growth. This is a terrible idea and i don't understand why the forest service would even propose this.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Through project design only dead trees and trees with a 70 percent or greater chance of dying will be removed. In addition, there are project specific design features which prescribe levels of snags and downed wood to leave within harvest units. Therefore, the salvage harvest proposed will not remove all of the trees from the landscape.
142.02 - Timber Sales (Salvage)	#14974-1	Extreme logging shouldn't be done around and in the Klamath National Forest. Clearcutting old-growth reserves in key salmon strongholds will damage fisheries, and destroy the ecosystem. Bears, deer, bird species and many other animals will lose their territories.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter to of the final EIS for a description of proposed actions; no clear-cutting is proposed. Effects to wildlife and aquatic species from the project and Alternatives are disclosed in Chapter 3 of the EIS.
142.02 - Timber Sales (Salvage)	#15138-1	If logs already down have value and do not require new access roads or the use of skid loaders to remove them, then perhaps it is good to do so. But downed trees also provide habitat services, protect soil, enable new growth and protect waterways. Removing masses of biomass hastens degradation in vulnerable areas. Clear cut logging is never justified, and the logging proposed here is an environmental disaster waiting to happen.	Pre-existing down logs and snags will be left in the salvage units unless they need to be removed for safety reasons (EIS, Chapter 2, Project Design Features, Wildlife - 13).

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142.02 - Timber Sales (Salvage)	#15226-1	I am opposed to clear cutting forests of any size and any place. Only sustainable logging should be allowed and only if it can be done without damaging the forest as a whole. Wood is no longer necessary for modern buildings and implements, so society can afford to be picky on how we extract wood from OUR forests.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter to of the final EIS for a description of proposed actions; no clear-cutting is proposed.
142.02 - Timber Sales (Salvage)	#16137-1	It is imperative that you, as guardians of our nation's forests, leave this area alone to regenerate naturally from a fire, like it has done for many millennia without your 'help'. As such, please do not allow any salvage logging to proceed!! No exceptions!!! Stop catering to the whims of the rapacious, unconscionable, and greedy timber companies, who would take the last of our country's forest heritage if they could! Enough is enough!!!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.02 - Timber Sales (Salvage)	#16872-1	Timber planners on the Klamath National Forest are exploiting last summer's wildfires to push an extreme logging proposal that calls for clearcutting old-growth reserves in key salmon strongholds. Please stand with conservation groups, native tribes, watershed councils and fire ecologists to oppose the Forest Service rush to log at any cost. The backbone of the Northwest Forest Plan is the idea that some special places would be set aside from logging while timber would be produced where logging would do the least harm. The Klamath National Forest is hoping to throw out the rulebook by logging protected reserves to protect old-growth forests and geological reserves that prohibit logging on landslides and unstable slopes. Ask the Forest Service to follow their own rules that protect important wildlands, wildlife and watersheds.	See response to comment number 6271-1.Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.02 - Timber Sales (Salvage)	#17111-22	Salvage will make no positive contribution to the reestablishment of late successional forest habitat or to the early successional ecosystems that provide habitat for NSO prey species, among many others.	See response to comment number 17111-22. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.02 - Timber Sales (Salvage)	#17111-23	Retention of large snags and logs are critical parts of the natural recovery processes and none of this wood legacy can be demonstrated as being in excess to ecological needs on moist forest sites; indeed, all of the scientific evidence is to the contrary. Removal of medium and fine fuels, but not large snags and Jogs, may be ecologically justifiable on sites characterized by PAGs with Fire Regimes I and II.	We recognize the importance of large snags and logs on natural recovery processes. The project is required to meet standards in the Forest Plan for snag retention and coarse woody debris. We agree that retention of large structures is beneficial for northern spotted owls and many other species, and that any material over time would serve an ecological function for the simple reason that there is no “excess” in nature. We also agree that we should strive to maintain large structures that could persist until the next stand is capable of producing large material. That is a requirement of the Forest Plan (4-87; MA 5-30). Retention however, of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current Late-Successional Reserve land allocation (EIS Chapter 3 – Fuels). See also response to 17111-1, 5873-64 and EIS Chapter 3, Responsible Opposing Views and Agency’s Responses to Issues Raised. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate. See also EIS Chapter 3, Responsible Opposing Views and Agency’s Responses to Issues Raised.
142.02 - Timber Sales (Salvage)	#17273-1	Clear-cutting is a terrible way to treat our National forest lands. It hurts. It hurts the plants and the animals and the human soul. Trees help conserve water and thwart drought. Clear-cutting is a horrible way to service our forests. Please don't commit such crimes against nature!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 6271-1 and 8435-1; no clear-cutting is proposed (see Chapter 2).

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142.02 - Timber Sales (Salvage)	#17282-2	The level of logging and road building proposed is simply too much. While some removal of hazard trees along public roads and strategic fuels treatments are needed to protect local communities, I am concerned that the current Forest Service plan will continue to perpetuate the agency's century-old exclusion of fire and inclusion of plantation forestry.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.02 - Timber Sales (Salvage)	#17287-1	I am a resident of Siskiyou County and I reside on the Klamath River. I was in the midst of the Wildfires of 2014. I am writing to give my support for the Westside Fire Recovery Project. I would like to see as much harvesting of the burned trees as possible. I do support the emergency efforts that need to be done immediately. Please do not wait until the wood is unusable and the fire risk in our area increases.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.02 - Timber Sales (Salvage)	#17289-1	This letter is in support of the Westside Fire Recovery Project. The 2014 wildfires were devastating for us all. Now, we need to recover and prepare for the future. The burned trees should be harvested as soon as possible, the roads, and firebreaks cleared and new trees planted. I'm sure that these and other related items are on your future plans for our beautiful Klamath National Forest. You are doing a good job!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.02 - Timber Sales (Salvage)	#17349-2	We support and advocate an aggressive approach to treatment of dead fuels created by the fires. We - · envision that this step in the Recovery process involves physical removal of commercial material through the timber sale process. We advocate that where fire intensity resulted in mortality of most or all of the trees, treatment should remove all merchantable material through salvage and be followed by burning of the residual slash and dead material and planting of conifer seedling. We also advocate that where fire intensity resulted in a mix of live and dead trees (a "salt and pepper" condition}, salvage be designed to remove the dead trees so that the area remains stocked with live trees. In these salt and pepper situations follow-up fuel treatment is more complex but is critical to the future management of the residual stand. Some planting of conifer seedlings may be appropriate. It is true that we are biased toward making full use of salvage during the fire recovery effort. However, we do not advocate "salvage-at-any-cost". The objective here is to utilize the salvage step to improve the long term management of the forest. If salvage is somehow detrimental to the long term health and well-being of the forest then it is not an appropriate treatment. It is important when addressing the question of "should we or shouldn't we?" that we keep in mind that the dominate environmental effect on the land comes from the fire and that effect unfortunately is a given. The effects of salvage are commonly a small additional effect to the existing fire effects. The positive effects of salvage commonly involve creating a more fire resistant and fire resilient forest stand due to fuel removal and treatment, creating a forest stand with a significant conifer component {without waiting decades or centuries}, capturing the commercial value of the dead trees, gaining the ability to reinvest the proceeds from the dead timber in the recovery effort,	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Alternative 2 includes salvage harvest, fuels treatment and reforestation. Live trees will be left in all salvage units according to the marking guidelines. See response to 12346-55.
142.02 - Timber Sales (Salvage)	#17349-4	Given our "pro-salvage" bias we advocate that as the Interdisciplinary Team evaluates the multitude of situations in the fires, their mind set is: salvage is an integral step in the recovery process unless there are compelling reasons that make it inappropriate to a particular situation. Achieving an optimal balance is no easy task but we are optimistic the Team will give the effort their very best because this is a hugely important project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.02 - Timber Sales (Salvage)	#17375-1	Why are you proposing logging of public old growth forests? Ancient forests are not renewable. The concept of sustainable logging does not include permanently annihilating a public trust resource	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We are not logging ancient forests; see Chapter 2 of the EIS for what is being proposed. See response to comment number 6271-1.
142.02 - Timber Sales (Salvage)	#17396-2	Salvage logging is not supported by scientific data, although it is customary. An excellent study published in Science showed it to cause more harm than good. There are articles that advocate for it, but there are no scientific studies that show that it is beneficial.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter failed to provide evidence that supports that salvage logging is not supported by scientific data. The Forest Service used best available science in the development and analysis of this project, as referenced throughout the final EIS and supporting documents. See response to comment number 6271-1.

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142.02 - Timber Sales (Salvage)	#17481-35	* Salvage o Longer term contracts - to salvage timber that dies after sale is marked o Adjust DBH and top size of timber as wood quality deteriorates - industry indicates that sales would be more attractive o Y.U.M. and treat units for fuel reduction	Comment is about implementation contracts and beyond the scope of National Environmental Policy Act analysis.
142.02 - Timber Sales (Salvage)	#17503-1	Please allow only very light salvage logging. After a fire most trees will survive if allowed to come back. Forests are important to fish, wildlife and water. Big trees are not replaceable.	Salvage harvest is only proposed in a small percentage of the burn area (around 4 percent). In addition, live trees will be left in all salvage units according to the marking guidelines. See response to 12346-55.
142.02 - Timber Sales (Salvage)	#17507-1	I support the project objective of meeting the need for "restored and fire-resilient forested ecosystems," as stated in the DEIS. Unfortunately, the use of the S&C guidelines for marking trees for salvage harvest will delay the meeting of this objective by permitting the harvest of green trees that would otherwise have a reasonable probability to live. I urge the adoption of the alternative marking guideline of "no green at the time of harvest," which will more rapidly lead to achieving the Project restoration objective. The marking policy I recommend, "no green at the time of harvest," was used on the McNally restoration project on the Sequoia National Forest and the Warm Fire restoration project on the Kaibab National Forest, and I understand is being proposed for use on the Rim Fire Restoration Project on the Stanislaus National Forest, as well as on many smaller projects.3 (3.Private communication from Dr. Chad Hanson) It was ultimately also used on the Piute Fire restoration project on the Sequoia National Forest. The salvage harvest of green trees that would otherwise live will have a significant adverse environmental impact. If left in place, these trees will contribute appreciably to and accelerate the restoration of healthy natural ecosystems, one objective of the Project. Their contribution will include: providing a more balanced distribution of tree sizes, such as is found in a natural ecosystem, contributing seed for natural regeneration -- seed uniquely adapted genetically to each microsite -- and providing shade and shelter to protect seedlings from lethal desiccation by solar radiation or wind. Mature green trees left on site will also provide shelter, nesting, and foraging habitat for many forms of wildlife, and their seeds will provide essential food for wildlife. The S&C guidelines overpredict the mortality of damaged live trees, and their use as proposed on the Westside Project4 (4.The Westside Project proposed use of the S&C guidelines is without testing for cambial damage. I do not recommend that testing for cambial damage be done, since the methods the Forest Service has used may further stress fire-damaged trees and create pitch that may attract bark beetles, and are subject to error if not done with great care by experienced personnel. However, the S&C data set will not support guidelines that ignore cambial damage, such as the S&C guidelines.) will result in the cutting of substantial numbers of green but damaged trees that would otherwise live. The problem is, in large part, that the procedure used to develop the S&C guidelines from the S&C data set is statistically incorrect. I summarize the arguments leading to this conclusion below and provide additional details in an appendix. For simplicity I limit this discussion to yellow pine (ponderosa and Jeffrey pine) and white fir, and generally to trees of diameter at breast height (dbh) over 20 inches. These are the trees that can make the largest positive contribution to achieving the Project restoration objective if left standing.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Live (or green) trees will be retained; see response to comment number 12346-55.

Code	Comment Number	Comment Text	Response
142.02 - Timber Sales (Salvage)	#17507-2	In conclusion, my contention that the marking guidelines are based on a model that over-predicts mortality for trees over 20" dbh is consistently supported by multiple pieces of evidence: -- Differences between predictions of mortality from the scientific literature and (for yellow pine) the underlying data base itself, as compared to predictions from the guidelines. -- The the over-representation of trees with high levels of cambial damage in the data base, together with the omission of a cambial damage term in the guidelines that would properly take this into account. The guidelines are simply wrong. As a result, the use of these guidelines will result in the harvest of a number of large damaged but green trees that would otherwise live. This will, in turn, substantially set back natural regeneration of the forest, with adverse environmental consequences on both flora and fauna. I recommend the adoption of a guideline of "no green foliage at the time of harvest," as has been used successfully on other similar projects. Other alternatives are suggested in the appendix.	See Response to Comment numbers 17507-1 and 12346-55.
142.02 - Timber Sales (Salvage)	#18147-1	I am against clear cutting. I am for select logging. in this case, with so much fire kill, I would cut the dead and dying, leave as many live trees as possible. this includes other tree species such as oaks, madrones etc. (perhaps shading conifers when first growing up till they out grow the shade.) in short, keep forests as close to they were originally, no clear cuts, no plantation replants.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Live trees will be left in all salvage harvest units. See response to 12346-55.No clear-cutting is proposed. See Chapter 2 of the final EIS for proposed actions.
142.02 - Timber Sales (Salvage)	#18850-1	It's too bad that the USFS can't do more salvage logging, but with the environmental extremist getting their way it makes it difficult for you to do your job.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.02 - Timber Sales (Salvage)	#18852-11	This DEIS does not truly reflect ecosystem management, and instead over-simplifies and negates the likely impacts that post fire salvage logging will have on our forests, watersheds and fisheries. (Please see the aerial photo of current salvage logging activities on private land within the Beaver fire area, consider this an indication of likely logging activity effects on landscapes and soils within the Westside Recovery project area, this is not an acceptable land management outcome).	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The EIS discloses the impacts from salvage harvest on vegetation, soils, watersheds and aquatic resources. Salvage harvest on private lands are not a good indicator of the outcomes of this project because the objectives of private land salvage are primarily commodity driven while salvage harvest on the National Forest are driven by multiple objectives including restoration of a fire-resilient forest.
142.02 - Timber Sales (Salvage)	#18852-13	I do support judicious salvage harvesting in order to produce some commodity value,	Salvage harvest is proposed in Alternatives 2, 3, 4 and 5. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.02 - Timber Sales (Salvage)	#18852-17	Retention of old-growth and large diameter trees, particularly those with living canopies should be retained for ecological performance values. Contemplating what some are calling the largest timber sale in Klamath National Forest history and one of the largest proposed by the US Forest Service is daunting. It is arguable that this should never have been proposed singly, that the Beaver fire landscape is distinct from the Happy Camp Complex environment which is distinct from the White's fire landscape. It is also unfortunate that a primary stated goal is to capture commodity value "as soon as possible" and that this obviously and inarguably compromises our ability to truly implement best management practices.	Legacy trees and snags will be retained in all salvage harvest units as described in the project design features. While the Purpose and Need does include capturing commodity value in the fire killed trees it does not exempt the project from proper Best Management Practices as required by the Clean Water Act. Appendix D lists the project specific Best Management Practices which will be implemented on this project.
142.02 - Timber Sales (Salvage)	#18852-45	29) Forest landscapes following catastrophic wildfire events, which are subjected to intensive timber harvesting are particularly vulnerable to long term ecological degradation, once impacted these lands will pose serious challenges to greater ecosystem restoration and resiliency for long time frames.	The activities planned in this project are designed to restore a fire-resilient forested ecosystem in the shortest amount of time. Impacts from salvage harvesting have been considered in the EIS.

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142.02 - Timber Sales (Salvage)	#18852-50	-"Noss, R.F., J.F. Franklin, T. Schoennagel, W.L. Baker and P.B. Moyle 2006. Ecology and Management of Fire-prone Forests of the Western United States. Policy Paper, Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests." "Post-fire logging is almost always inappropriate from an ecological standpoint (Lindenmayer et al. 2004, Lindenmayer and Noss 2006), perhaps especially after high- severity fire. Trees that survive the fire for even a short period of time are critical as seed sources and as habitat that will sustain many elements of biodiversity both above- and below-ground. Removal of structural legacies-living and dead-is inconsistent with scientific understanding of natural disturbance regimes and short- and long-term recovery processes on sites characterized by high-severity fire regimes. Removal of any material is a potential detriment, but removal of mature living trees and the largest and most decay- resistant snags and logs produces the greatest negative impact on recovery processes, slowing the recovery of ecosystem function and characteristic biodiversity. This is without reference to negative effects of the logging process itself, such as impacts of roads on soils and streams."	Citation only. See the beginning of Chapter 3 of the final EIS for a discussion of responsible opposing points of view.
142.02 - Timber Sales (Salvage)	#18852-53	Dr. Jerry Franklin, 1/20/04. "Salvage logging of large snags and down boles does not contribute to recovery of latesuccessional forest habitat; in fact, the only activity more antithetical to the recovery process would be removal of surviving green trees from burned sites. Large snags and logs of decay resistant species, such as Douglas-fir and cedars, are critical as early and late successional wildlife habitat as well as for sustaining key ecological processes associated with nutrient, hydrologic, and energy cycles."	Citation only. See the beginning of Chapter 3 of the final EIS for a discussion of responsible opposing points of view.
142.02 - Timber Sales (Salvage)	#18852-8	The plan however does go to great lengths to articulate the dangers of large woody debris, and standing snags which is used as a key driver in overall planning, I believe this to be either ill-informed or utilized as a disingenuous justification for the projects design focused on salvage logging and commodity production.	The purpose and need for the Westside Fire Recovery Project includes fuel reduction, restoration of wildlife habitat and watershed condition, and public safety as major components of ecosystem recovery, in addition to recovering value from deteriorating timber. The EIS discusses the impacts to fuel loading and fire behavior in the fire and fuels section.
142.02 - Timber Sales (Salvage)	#18857-17	No salvage logging should take place in partially burned stands that sustained minimal (less than 70%) mortality. Undamaged or partially fire damaged stands provide disproportionately important roles in ecological recovery and refugia for the survival of particular biota. (Lindenmeyer & Franklin 2008 p.140)	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See the beginning of Chapter 3 of the final EIS for a discussion of responsible opposing points of view. See also response to comment number 12346-55. See Chapter 2 of the final EIS for a description of what is proposed. Trees that burned at a moderate to high severity are almost all dead; see Chapter 3 of the final EIS for more details about what is proposed, why, and its effects.
142.02 - Timber Sales (Salvage)	#18857-22	Included below is a scientific brief written by Timothy Ingalsbee, Ph.D. of the Western Fire Ecology Center that you and your staff may find instructive. Entire text of article included in original attachment.	Citation only.
142.02 - Timber Sales (Salvage)	#18858-1	But there is an enormous body of science that suggests the trade off of the type of logging you propose is by no means beneficial to wildlife or fisheries. Unfortunately, you don't seem to address any of that science in your DEIS. I have included with these comments copies of just a few papers that call into question the theory that, because a fire might "reburn," post-fire logging is actually environmentally beneficial.	See the beginning of Chapter 3 for a discussion of responsible opposing points of view. The final EIS and supporting documents incorporate best available science.

Code	Comment Number	Comment Text	Response
142.02 - Timber Sales (Salvage)	#18878-77	In a recent review, (Lindenmayer, D. B. & R.F. Noss. 2006. Salvage Logging, Ecosystem Processes, and Biodiversity Conservation. Conservation Biology 20(4):949-958) it was indicated that medium- and large-scale salvage logging operations can: * * * * * * * * reduce or eliminate biological legacies such as large trees with cavities and large logs and coarse woody debris; modify or destroy rare post-disturbance wildlife habitats; influence populations of some species and alter community composition; impair natural vegetation recovery; facilitate the colonization of alien and/or invasive species; alter soil properties and nutrient levels and increase erosion; modify hydrological regimes and aquatic ecosystems, and alter patterns of landscape heterogeneity . Broad overarching statements such as, "salvage logging will promote ecosystem sustainability by increasing the likelihood and speed by which burned forested areas are regenerated .... " needs further explanation and justification. Given time, the ecosystem function and sustainability will recover through natural succession and the timely reintroduction of fire as traditionally practiced by the Karuk People. By promoting the "need" for salvage harvest in terms of ecosystem function and sustainability implies wildfires and the subsequent mosaic pattern of disturbance is an unnatural process and detrimental to forest health. Finally, the USPS Region 5--Ecological Restoration Leadership Intent (2011) p.3 states: "Ensure that vegetation and fire management efforts are grounded in concern for biodiversity and ecological processes both before and after disturbances like fire." This statement clearly suggests any post-fire actions should highlight the biodiversity in the early seral landscape and support ecological process (like returning fire) to build resilience in this evolving landscape. The early seral conditions on the landscape are not conditions to rapidly escape, but conditions to support and foster.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. As described in Chapter 1 of the EIS: "There is a need for restored and fire-resilient forested ecosystems. Wildfires provide some benefits to forest ecosystems such as snag and downed wood creation and short-term fuels reduction in areas of low intensity burns. However, intensely burned forested areas may be slow to recover and heavy fuel loading will result from fallen snags. Following a high severity wildfire, heavy fuel loading predisposes an area to higher intensity and higher severity wildfires in the future. Such fires inhibit forest stand regeneration and result in stand type changes to brush or other non-forested vegetation types, delaying these lands from reaching the desired conditions of the Forest Plan or providing for future forested wildlife habitat per Forest Plan goals and direction. High intensity fires also put remaining wildlife habitat at risk of future loss. By reducing fuels created by the 2014 fires and replanting selected areas, the likelihood and speed by which burned, forested areas are restored is increased. This results in a more fire-resilient forested ecosystem for the benefit of wildlife habitat and watershed conditions. Activities to address this need include: •Salvage harvest of fire-killed trees in selected areas to prevent high fuel loads from fire-killed trees in the future.•Fuels reduction by piling and burning fuels, mastication of fuels, and underburning within the wildland urban interface and other strategic areas.•Replanting of burned areas with an appropriate species mix and spacing for the site.•Retention of clumps of snags within treatment areas to ensure that habitat for snag-dependent species is retained.See wildlife project design project design features in Chapter 2 regarding legacy trees.
142.02 - Timber Sales (Salvage)	#18879-11	Alternative 4 reduces road miles and salvage harvest acres in numerous places. It appears some road miles are dropped not because they are high disturbance or high risk but because they happen to fall within a Key watershed or other sensitive classification. Better management would be to only drop those road segments or salvage areas because of factors present on that particular site rather than because of some conceptual reason or land classification definition.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Alternative 4 was developed to respond to concerns regarding watershed impacts and aquatic resources. A number of criteria including site specific knowledge and field visits of the sites was used to identify the most sensitive watersheds.
142.02 - Timber Sales (Salvage)	#18883-20	The Salvage Harvest definition on pages 30 and 31 of the DEIS states: “In determining what individual trees will be harvested, standing dead trees 14 inches in diameter at breast height or greater will be considered…”. Does this mean that all trees dead or alive less than 14 inches in diameter will be left in all treatment areas?	The statement by the comment is incorrect; not all trees less than 14 inches in diameter will be left in treatment areas. Some will be left, others will be cut to facilitate operability in the unit and still others will be masticated, chipped, piled and burned or other means of disposal. Position statement. See response to Comment number 16695-4.
142.02 - Timber Sales (Salvage)	#18883-25	No new roads should be constructed to harvest dead trees. The economic value of the trees will be far less than the cost of the erosion, sedimentation, and long term maintenance or retirement cost of these roads.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No new permanent roads will be constructed for this project. Old temporary roads will be reopened, but they will put to bed and decommissioned after use so that potential erosion is minimized. See Project Design Features for watersheds. There will be no net increase in road density as a result of the project. Alternative 4 has the least amount of temporary road of all Alternatives. Also see response to comment number 12364-1.
142.02 - Timber Sales (Salvage)	#18907-19	No activity of any kind should be allowed in late-seral or old-growth stands and no harvesting of individual trees over 30" diameter at breast height (DBH) should be allowed.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 6271-1.

Code	Comment Number	Comment Text	Response
142.02 - Timber Sales (Salvage)	#18909-10	The Peterson study examined eastern dry forest types, much different than those in the project area as noted in the Taylor et al 1998 study, referenced in the DEIS. The Peterson study looked at areas that burned at 95-100% mortality, while the Westside DEIS considers logging areas at 50% mortality. The DEIS does not detail how these important differences affect the assumptions in the DEIS. Peterson et al.: "Our study examined fuel succession patterns by surveying downed woody fuels across a chrono sequence of dry coniferous forest stands that burned with high fire severity (95- 100% overstory tree mortality) within mixed- and high-severity wildfires in eastern Washington and Oregon, USA, between 1970 and 2007. We sampled forests in which ponderosa pine (Pinus ponderosa) and Douglas-fir (Pseudotsuga menziesii) are the dominant early-seral tree species, though such forests may also contain significant components of lodgepole pine (Pinus contorta), western larch (Larix occidentalis), or true firs (Abies grandis, A. concolor, or A. magnifica). These forests historically supported low- and mixed-severity fire regimes with mean fire return intervals often less than 35 years." Taylor et al. 19982 at page 286: "In drier southern Douglas-fir-dominated forests of the Klamath Mountains in northwest California and southwest Oregon, fire regimes appear to be different from those farther north. Fires occur much more frequently, every 13-22 years, and finer scale canopy openings caused by frequent, less severe fires appear to control stand development patterns." 2 Taylor, Allen H., Skinner, Carl N., Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111 (1998) 285-301	We proposed a 70% probability of mortality threshold for salvage harvest; however most of the stands proposed for salvage harvest are 90-100 percent dead because of ongoing secondary mortality and efforts to flag out any areas that had significant numbers of live trees. We agree with the descriptions of the fire regimes in the comment from Taylor and Skinner (1998).. That does not mean that the findings of Peterson et al (2015) are not applicable. Although we are in a fire regime that is historically low to moderate severity, the Westside Fires were by all accounts, a high severity event because of accumulated fuels from fire suppression and untreated fuels created by the 1987 fires. Those are the conditions described in Peterson et al. 2015. See response to comment number 12346-55. See response to comment number 5873-72 about the Klamath province fire regime and snag retention. See also response 5873-170. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate. See EIS Chapter 3, responsible opposing views and agency response. See Also: Knapp, E. J. 2015. Long-term dead wood changes in a Sierra Nevada mixed conifer forest: Habitat and fire hazard implications. Forest Ecology and Management 339 (2015) 87–95 Ritchie M.W. , E. E. Knapp, C. N. Skinner.2012. Snag longevity and surface fuel accumulation following post-fire logging in a ponderosa pine dominated forest. Forest Ecology and Management 287 (2013) 113–122 Peterson , D. W., E. K. Dodson and R. J. Harrod. 2003. Post-fire logging reduces surface woody fuels up to four decades following wildfire Erich K. Forest Ecology and Management 338 (2015) 84–91 Skinner, C. N. 2002. Influence of fire on the dynamics of dead woody material in forests of California and Southwestern Oregon. Pages 445-454 in Symposium on the ecology and management of dead wood in western forests, November 2-4, 1999, Reno, Nevada. Skinner, C. N., A. H. Taylor, and J. K. Agee. 2006. Klamath Mountains bioregion. Pages 170-194 in N. G. Sugihara, J. W. van Wagtendonk, K. E. Shaffer, J. Fites-Kaufman, and A. E. Thode, editors. Fire in California's Ecosystems. University of California Press, Berkeley and Los Angeles, CA. Taylor, A. H., and C. N. Skinner. 1997. Fire regimes and management of old-growth Douglas fir forests in the Klamath Mountains of Northwestern California. Pages 203-208 in Fire Effects on Threatened and Endangered Species and Habitats. International Association of Wildland Fire, Fairfield, WA, Coeur d'Alene, ID. Taylor, A. H., and C. N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111:285-301.
142.02 - Timber Sales (Salvage)	#18909-22	The DEIS fails to adequately consider the positive aspects of moderately burned fire areas. There is a consensus of scientific opinion that post-fire logging and artificial conifer plantation establishment is one of the most ecologically damaging activities that could occur after mixed-severity fire4. Moderate severity, as defined in the USDA glossary of terms is fire that causes moderate soil heating, occurs where litter is consumed and duff is charred or consumed, but the underlying mineral soil is not visibly altered. As needles fall in burned areas the soil temperature is decreased, which is favorable to germinating seeds. The DEIS fails to mention the importance of mosses and lichens and their contribution to regeneration and the importance of scorched trees which the project proposes for removal. 4 Letter from Scientists on Proposed Postfire Salvage on the Stanislaus National Forest, central Sierra Nevada region, California. January 3, 2014. Letter from Scientists on Proposed Postfire Salvage on the Stanislaus National Forest, central Sierra Nevada region, California. January 3, 2014	The Burned Area Emergency Response report for the 2014 Westside Fires focused on severe soil effects while the EIS also considers severe vegetation effects of the Fires. As described in Chapter 1 of the EIS: "Of the approximately 185,000 acres that burned on the western Klamath National Forest, approximately 27 percent exhibit very high vegetation burn severity effects. Within high severity areas, fuel consumption of duff, conifer and hardwood litter, saplings, and small and large dead material occurred within the ground and surface profile. Full consumption of canopy foliage and small branches within the crown stratum has left standing dead trees that are storing a tremendous amount of biomass available for future surface fuel accumulation. Areas of high severity burns experienced 75 percent or greater vegetation mortality, loss of canopy and understory cover, and loss of duff layers and large woody debris. The stands that burned at high severity ranged in species composition and structure, including shrub/oak stands, single layered conifer plantations, multi-layered mixed conifer stands, and higher elevation stands dominated by true fir. Most trees within high severity burn areas are expected to die in the short term." Survey and Manage vascular plants, bryophytes, lichens and fungi are considered in the Botany and Non-Native Invasive Species section of Chapter 3 of the EIS.

Code	Comment Number	Comment Text	Response
142.02 - Timber Sales (Salvage)	#18909-26	On page 115 of the DEIS, "Hazard tree removal where it does not overlap with proposed salvage harvest units will decrease fuel loading and, therefore, potential fuels hazard; this will indirectly promote conifer regeneration." This is not supported by the best available science. For instance it is well known that opening forest canopies can increase solar radiation leading to increased brush growth, which increase ground and ladder fuels, in turn increasing fire risk. Also stated on page 115 of the DEIS: "When combined with the direct and indirect effects of the proposed salvage, site preparation, and planting treatments, the end result would be an increase in acres treated for hazardous fuels reduction, an increase in acres of roadside treatments and an increase in acres of planted conifer stands set on a trajectory towards establishing resilience to fire, insects, and disease and towards achieving northern spotted owl dispersal, foraging and nesting/roosting habitat characteristics. The objectives of the proposed project are in concert with those proposed by these overlapping projects which may no longer be implemented within the project area due to changes in conditions." The assumption that conifer plantations would set a trajectory towards establishing resilience to fire, insects, and disease and towards achieving northern spotted owl dispersal, foraging and nesting/roosting habitat characteristics is a broad assumption not based on the best available science, given that the project is contrary to the recovery of the species and would likely negatively affect Northern spotted owls. The proposed project would also remove, downgrade and degrade thousands of acres of Critical Habitat, suitable habitat and negatively affect Activity Centers. Further, it is not clear which NEPA projects will no longer be implemented as this information is not readily available in the DEIS or supporting files. The DEIS fails to consider all of the past, present and reasonably foreseeable national forest timber sales as well as private lands timber harvest plans.	Opening forest canopies can increase solar radiation and increase the growth of brush. However, the fire return intervals also play a role in the ability of a site to establish conifer species. Sites with heavy fuels will have a higher chance of burning and setting back conifer regeneration. Appendix C of the draft EIS lists the projects considered for cumulative effects (including national forest timber sales and private timber harvest plans) and each resource section of Chapter 3 includes a cumulative effects section.
142.02 - Timber Sales (Salvage)	#18909-5	Fire-created snags and logs serve many vital ecological functions and services for forest soils, streams, vegetation, and wildlife.1 Large-diameter snags and logs can also help mitigate conditions that lead to high-intensity fires, and aid post-fire natural recovery processes. Conversely, commercially extracting fire-killed trees via salvage logging causes significant short- and long-term adverse effects on forest ecosystem structures, functions and processes. Considering the wide array of vital ecological services that snags and logs provide, the term "salvage" is appropriate only for logging operations in which the primary management objective is extraction of commodity timber values at the expense of other economic and ecological values, which is not applicable to Late-Succesional Reserves. 1 Lindenmayor, D. B., Foster, D. R., Franklin, J. F., Hunter, M. L, Noss, R. F., Schiegelow, F. A., Perry, D. Salvage	See response to comment number 6271-1.
142.02 - Timber Sales (Salvage)	#18937-14	I also traveled to the Whites Fire area, just over Etna Summit and very near Sawyers Bar, California. I took this trip after an extended discussion at the KNF Headquarters in Yreka with Mike Hupp, Westside Fire Recovery IDT leader. After Mike and I's and inspirational discussion, I was very disappointed with what I saw. The roadside mark and units poised for clearcut were astounding, even to the untrained eye. I felt I had been misled about the Project's objectives. The large salvage units I observed were on steep slopes and contained many live trees above the North Fork of the Salmon and the South Fork of the Russian Rivers. If these units are cut and roads are opened for hauling, I am very concerned that increased temperatures, additional sediment and road use will have a significant effect on these rivers' salmon habitat and other aquatic habitat.	Salvage harvest units do contain live trees which will be left according to the marking guidelines. There have not been any identified significant effects on salmon or aquatic habitat as a result of this project because specific project design features have been developed to minimize impacts to soils and riparian/aquatic resources.

Code	Comment Number	Comment Text	Response
142.02 - Timber Sales (Salvage)	#19073-2	The proposed action in the Draft EIS is proposing to treat only approximately 4% of the total Forest Service burned area with salvage harvesting (a slightly higher percentage when other activities are included). All of the other Alternatives propose to treat even fewer acres. The selected alternative should treat as many acres as possible on all of the fire areas considered, including the Beaver Fire. It is apparent that treating only 4% of the burned area does not come close to a complete fire recovery effort given the amount of acreage burned and the large acreage of high mortality. I also understand the regulatory restrictions you are dealing with and time frame issues with NEPA, undertaking an EIS, and required consultation and coordination with other government agencies and groups. Also, the time frame needed in order to adequately implement in a timely manner is a key consideration. The timber that will be salvaged and offered for sale will have already started to decay and have active worms working in the sap-wood. It has a limited time, possibly 2 years before the merchantable qualities of this timber will be lost and none recoverable. I would like to have seen more of the high severity burned areas treated but understand the above restrictions. I and my company will support the selection of Alternative 2. It is better than nothing and will help to achieve some measure of rehabilitation and salvage of the values on these burned forests.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The purpose and need for the Westside Fire Recovery Project includes fuel reduction, restoration of wildlife habitat and watershed condition, and public safety as major components of ecosystem recovery, in addition to recovering value from deteriorating timber.
142.02 - Timber Sales (Salvage)	#19073-4	The timeframe for getting a return on your investment and allowing for rapid re-establishment of conifer stands is very short. There is a need to make a rapid decision and begin implementation in early June.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest Service is focused on getting a decision for implementation as soon as possible.
142.02 - Timber Sales (Salvage)	#19073-5	It is imperative the EIS visibly display and discuss the small amount of burned acres that are actually being proposed for treatment. Approximately 4% of the burned acres are planned for salvage harvesting in Alternative 2. That means 96% will be not treated with salvage operations. This needs to be highlighted in order to show the miniscule effects any salvage operation will have on resource values within the burned areas.	See the treatment maps in Appendix A of the final EIS and see tables and pie charts is Chapter 2 of the final EIS for a description of what is being proposed. Chapter 1 of the EIS quantifies the project area and Table 2-31 compares the project activities by Alternative.
142.02 - Timber Sales (Salvage)	#19092-1	Please allow post-fire logging in areas affected by summer 2015 wildfires. Salvage logging is important because the dead trees attract insects which infect healthy trees.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Salvage harvest is proposed in all action Alternatives; see Chapter 2 of the final EIS for what is being proposed.
142.02 - Timber Sales (Salvage)	#19157-5	Salvage logging should be implemented in low to moderate fire severity areas.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Salvage harvest is only proposed in areas of moderate to high severity vegetation mortality; see Chapter 2 of the final EIS for what is being proposed.

Code	Comment Number	Comment Text	Response
142.02 - Timber Sales (Salvage)	#3678-16	The IDT members know Supervisor Grantham's Purpose & Need statement at page 10 indicating the need to "restore fire-resilient forested ecosystems" is a legitimate need but logging the area will definitely not help achieve the need. A few IDT members know logging is not a "catch-all" activity as is currently used by the USFS to solve all forest problems (real or perceived). Indeed, logging creates many problems and real restoration opportunities. Here's how supervisor Grantham words her Purpose & Need statement at page 11 in the DEIS. The first sentence below is true. The rest was added to justify logging. "Wildfires provide some benefits to forest ecosystems such as snag and downed wood creation and short-term fuels reduction in areas of low intensity burns. However, intensely burned forested areas may be slow to recover and heavy fuel loading will result from fallen snags. Following a high severity wildfire, heavy fuel loading predisposes an area to higher intensity and higher severity wildfires in the future. Such fires inhibit forest stand regeneration and result in stand type changes to brush or other non-forested vegetation types, delaying these lands from reaching the desired conditions of the Forest Plan or providing for future forested wildlife habitat per Forest Plan goals and direction. High intensity fires also put remaining wildlife habitat at risk of future loss. By reducing fuels created by the 2014 fires and replanting selected areas, the likelihood and speed by which burned, forested areas are restored is increased. This results in a more fire-resilient forested ecosystem for the benefit of wildlife habitat and watershed conditions. Activities to address this need include: • Salvage harvest of fire-killed trees in selected areas to prevent high fuel loads from fire-killed trees in the future. • Fuels reduction by piling and burning fuels, mastication of fuels, and underburning within the wildland urban interface and other strategic areas. • Replanting of burned areas with an appropriate species mix and spacing for the site. • Retention of clumps of snags within treatment areas to ensure that habitat for snag-dependent species is retained. " Comment: Once again, best science tells us that the statement "Following a high severity wildfire, heavy fuel loading predisposes an area to higher intensity and higher severity wildfires in the future" is untrue. Excerpts from Final Report, Joint Fire Science Program Project 03-1-4-11 "Initial effects of salvage on fuel loads two and three years after the 2002 fire and the potential for reburns (Donato et al. 2006 Science) showed that: • Salvage logging can produce large quantities of fine and coarse slash fuel from unmerchantable materials—equal to [fine] or 3.5 times [coarse] that present in mature forests on comparable sites. Inherent felling/handling/grading practices result in levels that may decouple with prescribed levels. • Relative to unsalvaged burn areas, this slash may result in higher fire potentials in the event of reburn over short time scales (e.g. several years); effects over longer time scales due to removal of larger material warrant further study. • These results are consistent with those of other ongoing studies on these and other fires (Thompson et al. 2007; McIver and Ottmar 2007); together these studies are substantially broadening and deepening our understanding of postfire fuels management." Final Report, Joint Fire Science Program Project 03-1-4-11 (pages 1 & 2) Project Title: Effects of grass seeding and salvage logging on fuel loads, potential fire behavior, and biological diversity of severely burned low elevation southern Oregon forests Project Location: Siskiyou National Forest, southwestern Oregon Principal Investigators: W. Douglas Robinson, J. Boone Kauffman, Beverly E. Law http://www.firescience.gov/projects/03-1-4-11/project/03-1-4-11_final_report.pdf Excerpts from "Reburn severity in managed and unmanaged vegetation in a large wildfire": "Biscuit Fire severity in the logged and planted areas was 16–61% higher than comparable unmanaged areas depending on the values of the covariates. The particular ecological effects of this difference are unknown; nonetheless, the hypothesis that salvage-logging followed by planting reduces reburn severity is not supported by these data." "Our findings are inconsistent with the hypothesis that this particular postfire management system reduces the risk of high-severity fire in a reburn occurring 15 years after the original fire. The logging component of this system is often considered a fuel-reduction treatment (2, 5–7). However, the large-diameter fuels removed during harvest do not readily carry wildland fire (12, 27). Thus, logging may not reduce available fuels. In fact, harvesting fire-killed trees may increase available surface fuels by transferring unmerchantable material, such as tops, branches, and broken boles to the ground immediately after harvest (3, 8)." 2007, "Reburn severity in managed and unmanaged vegetation in a large wildfire" By Jonathan Thompson & Lisa Ganio, Department of Forest Science, Oregon State University and Thomas Spies, Pacific Northwest Research Station, U.S. Department of Agriculture Forest Service	Direct, indirect, and cumulative effects to wildlife, watershed, soils, and fuels, among other resources, as well as management requirements to minimize adverse effects, are addressed in the EIS, with appropriate references to the scientific literature. The Forest Service acknowledges that there is uncertainty and conflicting science for some of the management actions. However, impacts to forest resources have been analyzed based on the rationale presented. Numerous scientific publications are cited and utilized in the assessment of effects, showing both positive and negative effects.It is acknowledged that salvage harvesting would elevate the amount of surface fuels in the short term before fuels reduction activities (machine and hand piling, broadcast burning, mastication) are accomplished. However, after treatment activities are completed, there would be a significant reduction in large surface fuels which relates to fireline production rates. Fireline production rates are significantly slowed where firelines intersect large down logs. Snags contribute to long range spotting and increased fire size. Numerous snags preclude nighttime firefighting operations, normally the time when fire behavior is at its minimum and significant suppression activities may be conducted. Strategic placement of the treated units would reduce woody fuels which would reduce threats of future wildfire behavior (Peterson, Dodson and Harrod 2014). Suppression forces could enter these areas and take appropriate actions as needed to manage fires to achieve the desired condition. Suppression forces would not be hindered by the high density of snags or high levels of Coarse Woody Debris in the units which would allow immediate and appropriate action to be taken. Suppression actions would not be restricted by fire behavior; thus, direct suppression actions would be possible within treated stands. Without treatment, control of future fires will be difficult and time consuming in areas that have high densities of snags and surface fuels. Within 10 years, treatments are expected to result in future fire behavior that would enable ground crews to use direct attack within those treatment units. See response to comment number 17910-2.See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
		http://www.pnas.org/content/104/25/10743.full	
142.02 - Timber Sales (Salvage)	#3678-33	Issue #40---Best Science Clearly Indicates Post-Fire Logging causes Significant, Long-Term Harm to the Natural Resources in the Forest. Providing Short-Term Financial Benefits to the Resource Extraction Corporations is not a Reason to Cause such Environmental Plunder. No human development action in the forest inflicts more long-term ecosystem damage than a post-fire timber sale. Opposing Views Attachment #2 includes statements of more than 400 Ph.D. scientists who are experts in their fields. Their statements describe how scores of natural resources in the forest are damaged and/or destroyed by post-fire logging. As the scientists point out, some of this damage is long-term and so severe the resources will cease to function properly and the landscape will only restore itself after many decades if humans leave it alone. Human actions following any post-fire timber sale will only slow down the natural restoration process.	Direct, indirect, and cumulative effects to wildlife, watershed, soils, and fuels, among other resources, as well as management requirements to minimize adverse effects, are addressed in the EIS, with appropriate references to the scientific literature. The Forest Service acknowledges that there is uncertainty and conflicting science for some of the management actions. However, impacts to forest resources have been analyzed based on the rationale presented. Numerous scientific publications are cited and utilized in the assessment of effects, showing both positive and negative effects.

Code	Comment Number	Comment Text	Response
142.02 - Timber Sales (Salvage)	#3678-35	Comment: No legitimate science even infers that there might be ecological benefits from removing dead and dying trees from a post-fire landscape. Scores of available science literature describe the ecological destruction that accompanies a post-fire timber sale. Comment: I ask the IDT members to please honestly examine the tradeoffs between providing opportunities for resource extraction corporations to profit financially vs. the long-term ecological damage that post-fire logging will inflict. Spending your yearly timber funding and pleasing your supervisor by meeting their volume expectations must never justify post-fire logging. Indeed, the Federal Courts agree that the Responsible Official must disclose and consider "adverse impacts" when making the final decision that the IDT has failed to do here.	This comment is an opinion of the commenter. Direct, indirect, and cumulative effects to wildlife, watershed, soils, and fuels, among other resources, as well as management requirements to minimize adverse effects, are addressed in the EIS, with appropriate references to the scientific literature.
142.02 - Timber Sales (Salvage)	#5873-154	Although many existing silvicultural systems have been designed to mimic stand-scale natural disturbances, McRae et al. (2001) and Palik et al. (2002) remind us that natural disturbances are inherently different from those of silviculture. One difference, of course, relates to the amount of carbon removed form the site when harvesting a forest. Removals tend to be much greater with harvesting than for fire, for example. Fire tends to create a complex mosaic of forest types and ages on the landscape. Forest harvesting, as commonly practiced, tends to simplify forest composition and structure. Crow, T.R. and A.J. Perera. 2004. Emulating natural landscape disturbance in forest management – an introduction. Landscape Ecology 19: 231-233. http://www.firescience.gov/projects/01-1-3-43/project/01-1-3-43_01_1_3_43_Deliverable_02.pdf	As described in Chapter 3 of the EIS: "Although there is some controversy about whether older trees are more successful in storing carbon than younger trees (Coulson et al. 2015), there is general agreement that forests are an important factor in carbon storage (Fitzsimmons, et al. 2004, US EPA 2013, Pan et al. 2011). Likewise, there is general agreement that less carbon is stored in decaying wood than in wood content in lumber and manufactured wood products (Skog 2008, Finkral and Evans 2008) and that stand-replacing wildfire releases carbon into the atmosphere (Vose et al. 2012). Therefore, activities that accelerate the regeneration of forests (conifer and hardwood) after moderate- to high-severity vegetation burns, that promote the use of dead and dying wood rather than allowing it to decay, and lessen the likelihood of stand-replacing wildfire and insect disturbance would have a beneficial effect on carbon storage."
142.02 - Timber Sales (Salvage)	#5873-156	From a wildlife perspective, stand-replacing fires and timber harvesting both represent major disturbances which significantly alter habitats … Despite their similarities, fire and logging differ in several of the habitat conditions they procure for wildlife. Wildfires, especially when severe, generate large amounts of standing (eventually downed) dead trees including large ones which represent an important habitat and food source for many wildlife species (Drapeau et al. 2002; Pedlar et al. 2002). … [T]he spatial variability of fire severity creates various amounts of green or mixed-severity stands over the burned landscape (e.g., Kafka, Gauthier, and Bergeron 2001; Smyth et al. 2005), which represent important refuge sites for some wildlife species (Norton and Hannon 1997; Tittler and Hannon 2000; Lance and Phinney 2001; Tittler, Hannon, and Norton 2001). Contrarily, clearcut harvesting removes most of the large live trees, leaves few standing deadwood, and retains variable amounts of non-commercial trees and understory vegetation. … All studies directly comparing bird assemblages in burned and harvested stands reported an important divergence in bird assemblages, especially for the first years following disturbance (Hutto 1995; Schulte and Niemi 1998; Hobson and Schieck 1999; Imbeau, Savard, and Gagnon 1999; Schieck and Hobson 2000; Morissette et al. 2002; Simon, Schwab, and Otto 2002). One of the most striking differences lies in the abundance of the snag-associated guild in post-fire stands. … [H]igh snag densities are clearly missing in harvested stands (Schulte and Niemi 1998; Pedlar et al. 2002; Simon, Schwab, and Otto 2002). Concordantly, Imbeau, Savard, and Gagnon (1999) found no resident and cavity-nesting species in recent clearcuts, where little retention (green or dead trees) has been left on site. Similarly, Hobson and Schieck (1999) found very distinct assemblages between burned and harvested forests, a difference that was partly explained by the dominance of several snag-associated species. These major differences in the abundance of snag-associated species are of particular importance considering that several of these have been identified as the most sensitive to the long-term effects of forestry (Imbeau, Mönkkönen, and Desrochers 2001). … The magnitude of the initial divergence and eventual convergence in bird communities between fire and harvesting may greatly depend on the level of residual vegetation (Schieck and Hobson 2000). Schieck and Hobson (2000) found that bird assemblages from larger patches within disturbed stands supported more species from older forests than smaller ones. In contrast, bird communities from smaller patches (within cut blocks vs. burned stands) mainly reflected the surrounding post-disturbance communities, therefore showing the same initial divergence in bird assemblages between post-fire and post-harvest stands reported by Hobson and Schieck (1999). Nonetheless, over time these small patch communities also became more similar to those inhabiting mature fire origin forests and hence converged as succession proceeded (although some differences still persisted up to 60 years after disturbance). … Early after disturbance, most stand-level attributes differ between	The comment provides a number of citations concerning fires and forest ecology but does not show how those are specific to the conditions of the Westside Recovery Project. There are about 52,000 acres of moderate to high severity fire where over half the trees were killed.. The most aggressive harvest proposal (Alternative 2) would harvest about 15 percent of that area. Within harvest units, snag retention standards and coarse woody debris standards must be met. Many hundreds of acres have been deleted from the Proposed Actio to maintain snag habitats. Since over 80% of the high severity burn areas would be retained, we don't believe there will be a shortage of snags. Late Successional Reserve land allocation areas comprise a majority of acres identified for treatment in the Proposed Action. Late-Successional Reserve is not regulated for timber harvest in the Klamath Forest Plan. The purpose and need for the Westside Fire Recovery Project includes fuel reduction, restoration of wildlife habitat and watershed condition, and public safety as major components of ecosystem recovery, in addition to recovering value from deteriorating timber. See Chapter 1 of the EIS for the rationale on why salvage harvest is proposed in Late Successional Reserves. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. Clear-cutting is not proposed; see Chapter 2 of the final EIS. Also see Chapter 2 for a description of project design features for resource mitigation. Green trees will be retained; see response to 12346-55. See Chapter 3 for a discussion of wildlife effects. See also EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised

Code	Comment Number	Comment Text	Response
		harvesting and wildfire. Structurally, young post-fire stands are characterized by more snags and less downed woody debris than young post-harvest stands. … Biodiversity elements significantly differ between burned and logged sites. Early after disturbance, significant differences in understory vascular and non-vascular community composition are commonly reported. Faunal assemblages, be they mammals, invertebrates, or birds, all seem to respond differently initially to harvesting- and wildfire-induced disturbances. … At the stand scale, while most forest attributes are different early after disturbance between burned and logged stands, the majority of these converge a few decades after fire. A few exceptions are to be noted, though. … [W]hile faunal communities do become less different as time passes, late in succession some species present in burned stands are either significantly less abundant or absent in similarly aged logged stands. … Post-fire salvage logging affects ecological processes, biological legacies, and the abundance of species commonly encountered only after fire. Removal of fire-killed trees can affect tree regeneration, understory composition, the abundance and distribution of dead wood, wildlife habitat, and soil properties. … At the landscape scale, the most important difference between fire and harvesting regimes is the distribution of stand age classes. The proportion of stands older than the rotation period (usually 100 yrs) tends toward zero under a fully regulated harvesting regime, while it is around 37% under a fire regime of similar rotation period. This results in a significant loss of over-mature forests in managed landscapes, potentially affecting organisms that are often associated with such stands. NCASI. 2006. Similarities and differences between harvesting- and wildfire-induced disturbances in fire-mediated Canadian landscapes. Technical Bulletin No. 924. Research Triangle Park, N.C.: National Council for Air and Stream Improvement, Inc. http://landscape.zoology.wisc.edu/People/Simard/NCASI924.pdf	
142.02 - Timber Sales (Salvage)	#5873-45	The ICBEMP analysis showed that traditional salvage logging that removes large trees is not compatible with ecosystem management. Can salvage timber sales be compatible with ecosystem-based management? … Our findings suggest that this type of harvesting is not compatible with contemporary ecosystem-based management. Ecosystem-based management would emphasize removing smaller green trees with greater attention to prevention of mortality rather than removal of large dead trees. Quigley, Thomas M., tech. ed. 1996; The Interior Columbia Basin Ecosystem Management Project: Scientific Assessment.) Gen. Tech. Rep. PNW-GTR-382; Page 178.	The Inner Columbia Basin Ecosystem Management Project is a large-scale regional ecosystem assessment project in the upper Columbia River Basin on the east side of the Cascades. As such it is not directly applicable to the Klamath National Forest. Management direction for the Klamath National Forest is found its Land and Resource Management Plan or Forest Plan. As a general principle of forest management, we agree that managing smaller green trees to prevent mortality from fire and insects is preferable to dealing with large dead trees after a stand replacement fire, however we are trying to address the circumstances created by the fires on the Klamath National Forest in 2014. About 52,000 acres of the Forest burned with moderate to high intensity killing most of the trees. Retention of all of the trees killed in the fires would create an unacceptable fuels risk. The Westside Fire Recovery project would salvage a little over 10% of the moderate to high severity burn areas where most of the trees were killed (5,760 acres out of an estimated 52,000 acres). Within Late Successional Reserves, which are managed for large trees, 77% of the stands with mostly dead trees greater than 24 inches would be retained. Lumping green and dead trees together (all burn severities) 90% of the stands greater with trees greater than 24 inches in diameter would be retained (Appendix E, Table 12). In addition, legacy trees (very large old trees) have been marked for retention wherever they occurred. See response to comment12346-55.The Inner Columbia Basin Ecosystem Management Project analysis states: "Salvage—We found that salvage activities could contribute to the achievement of long-term ecological integrity by emphasizing prevention of insect and disease outbreaks rather than focusing on the removal of large recently dead trees. Such an approach would include removing smaller living trees as part of the overall management regime and emphasizing stand structure and composition at the watershed level, rather than managing at the stand level. Low risks to ecological integrity would exist from treating currently roaded areas, where companion efforts might include reducing adverse effects associated with roads. Such approaches can be consistent with attainment of economic objectives for salvage activities."

Code	Comment Number	Comment Text	Response
142.02 - Timber Sales (Salvage)	#6271-1	I appreciate your work in developing the Northwest Forest Plan since it balances the need to protect "late-successional" old-growth reserves and geological riparian reserves, and focusses logging along major access roads. I was dismayed to learn that these well developed policies are to be ignored so that recently burned areas in the KNF can be logged. Such logging on steep unstable slopes will damage the ecological values of the area and go against settled policy in the Northwest Forest Plan. Please follow your plan and stop this irresponsible logging project.	There is salvage harvest proposed within Late-Successional Reserve and Riparian Reserve areas. See Chapter 1 of the EIS for a discussion of why salvage harvest is proposed in these areas and how it is consistent with the Northwest Forest Plan. Effects from salvage harvest on water quality, wildlife, aquatics, vegetation and other resources are disclosed in Chapter 3 of the EIS.
142.02 - Timber Sales (Salvage)	#6924-1	So "late-successional" Old-Growth reserves and geological riparian reserves survived the Wild Fires as nature intended and you use it as an excuse to clear cut!?	See response to comment number 6271-1.
142.02 - Timber Sales (Salvage)	#7136-1	I am writing in response to the proposed logging in the Westside Salvage Progect. Having been around clearcut logging, I am convinced there is no other reason for it than greed. It is my understanding that it is illegal in these protected forests. I have spent time in other countries where the wildlife and wild landscapes have been categorically destroyed by human hands. Wildfires are destructive, yes, but the biological diversity is still constructive after a fire, whereas landscapes and wildlife become desolate after a clearcut. Please consider what we have to lose, and conversely, what we have to gain by these decisions.	See response to comment number 6271-1.
142.02 - Timber Sales (Salvage)	#7563-1	I am shaking my head, by the extreme clearcut logging of late successional and old growth reserves as well as geological riparian reserves proposed by the Klamath National Forest in the Westside Salvage Project. I'm hoping it doesn't happen however, Fire is a possible and natural occurrence down the road in this planning area. A great reason why I am including my letter. It is unacceptable allowing this illegal logging of protected forests that belong in the hands of earth loving Americans. The Northwest Forest Plan becomes meaningless if reserves are only protected until timber planners deciding on logging them. This needs immediate change. Also, a program start up of take a tree / plant a tree, must be in place immediately. From the damage already occured on previous deforestations. It takes much time waiting on a tree growing upwards in the direction of adulthood, giving us all their benefits of oxygen, medicines, music and protecting wildlife's home base. Kindly join us now, with fire ecologists, forestry specialists, impacted communities and local tribes focusing on restoration and fire safety instead of what seems like pushing divisive and controversial clearcut logging proposals on steep slopes in key watersheds and critical wildlife habitats. Klamath National Forest timber planners should not be allowed acting above the law. The Forest Service needs meeting of the minds, in betterment with its obligation, practicing being a good steward of the land. Follow the Northwest Forest Plan. Focus logging along major access roads and protect the most important and vulnerable recovering areas: the late successional and geological reserves.	See response to comment number 6271-1.
142.02 - Timber Sales (Salvage)	#7776-1	Please reconsider the "Westside Fire Recovery Project" in the Klamath National Forest, which is actually a plan to clear cut old-growth trees. A naturally occurring forest fire is part of nature and the forest ecosystem that maintains the balance so necessary for endemic life to thrive. A clear cut may be profitable, but it is not good science and it is definitely not good for our environment or us. Please let nature take its course unhindered.	See response to comment number 6271-1.
142.02 - Timber Sales (Salvage)	#7794-1	As a frequent visitor to KNF, especially its relatively intact areas, and studying ecological and biological issues I have come to understand that the "Westside Fire Recovery Project" in the Klamath National Forest is merely an institutionalized and rather corrupt practice that has done severe damage to indigenous species, and results in improper clearcutting of old-growth trees.	See response to comment number 6271-1.

Code	Comment Number	Comment Text	Response
142.04 - Harvest Methods	#12346-28	In the Grider Creek Key Watershed Forest Service "specialists reviewed heavily impacted areas relative to the proposed units and found that, particularly in Upper Grider Creek 7th field watershed, there is potential for adverse effects related to sediment from salvage harvest due to heavily impacted riparian areas within and downstream of project units 520, 524, 525 and 528." ACSOR at 49. Emphasis added. Please note this information was not carried forward into the aquatic analysis contained in the Westside Salvage Logging DEIS. Page 231 of the DEIS does reveal that "[p]ost fire accelerated erosion due to ground based salvage logging could result in a 6 to 1,000 fold increase in sediment production." The ACS and the CWA do not permit Forest Service logging actions that will result in a 6 fold increase in sediment production let alone those that will result in a 1,000 fold increase. In contrast to the proposed accelerated erosion from proposed salvage logging activities, were the agency to allow burned stands to recover as nature intended "natural falling of dead needles, branches and eventually tree boles would continue to assist in recovery of soil stability." DEIS at 230. Please note that much of the analysis in the DEIS and ACSOR rely upon the existence of Riparian Reserves to mitigate and reduce sediment production from upland salvage logging activities. Yet the DEIS calls for logging in steep, unstable Geological Riparian Reserves and in moderately and high severity logging units above burned Hydrological Riparian Reserves in which "key riparian functions, including sediment retention capacity and streams shade, are assumed to be lost…"ACSOR page 49. As acknowledged on page 231 of the Westside DEIS, "[n]ewly constructed roads are the largest source of erosion and this is exacerbated in a burned environment because the capacity of the landscape to moderate flow and trap sediment is greatly reduced." Emphasis added.	Fisheries, earth, and water scientists analyzed the effects of project activities and developed Project Design Features to protect riparian and aquatic resources. See Aquatic Conservation Strategy Report, Biological Assessment for Fish, EIS Chapter 3 - Aquatic Resources section, and the Aquatic Resource Report and addendum for the final EIS. If no action is taken, the watersheds with a high risk of temperature regime alterations, without artificial regeneration that is proposed in the action Alternatives, will have an extended duration of elevated risk. Natural regeneration will occur, but in general it will be more than 80 years to get trees with 10 inch diameters at breast height in areas burned with high and moderate severity (draft EIS page 202-203). For landslide risk, the Geology Report states: There is a reduction in the duration of elevated risk due to planting for nine watersheds compared to Alternative 1 [No Action]. The reduction in duration of elevated risk will benefit natural resources and infrastructure in the long-term.
142.04 - Harvest Methods	#12346-68	Comment 4: We asked that BLM provide some flexibility in how fuels would be treated by focusing on the desired goals. The BLM has restricted fuels treatments to handpiling and burning. Contractors could use light weight equipment to treat fuels without detrimentally compacting soils.Response: The commenter has not provided details on methodology or supporting science that would support the claim that machine piling could be done without detrimentallycompacting soils in excess of RMP standards for percent area compacted by current activities. Resource management plans call for limiting compaction in harvested areas in order to minimize soil productivity losses. Therefore, no additional use of mechanical equipment for fuels reduction was proposed, as ground-based logging would compact up to 12 percent of the harvest units. This is particularly important in the Cottonwood planning area as the majority of soils contain high rock content. It was identified that ripping the soils in this areawould bring rocks and cobbles to the surface. The priority was given to minimizing the soil area compacted instead of trying to mitigate the effects. Additionally, the harvest prescription resulting in relatively few trees per acre being cut minimizes the slash, and consequently, also reduces the need for mechanical fuel treatment. Medford BLM Cottonwood Project EA Appendix A, Response to Comments Page 3-2: http://www.blm.gov/or/districts/medford/plans/files/Revised_EA_Final.pdf	The Bureau of Land Management Cottonwood Project is outside the scope of this project's analysis. The Bureau of Land Management Cottonwood Project infers that "relatively few trees per acre are being cut minimizes the slash…". This statement isn't applicable for this project. It is anticipated that areas with salvage harvest and post-activity fuels (slash) will require mechanical site preparation for fuels reduction, as proposed. See Chapter 2 of the final EIS for a description of proposed actions.

Code	Comment Number	Comment Text	Response
142.04 - Harvest Methods	#12354-5	DeMaynadier, Phillip G., and Malcolm L. Hunter J r. "The relationship between forest management and amphibian ecology: a review of the North American literature." Environmental Reviews 3, no. 3-4 (1995): 230-261. Abstract Questions about the compatibility of forest harvesting practices and conservation of biological diversity are largely driven by concerns that habitat quality for many species may be degraded in intensively managed forest landscapes. We review the literature on relationships between common forest harvesting practices and the distribution and abundance of amphibians, a group that has attracted considerable attention in recent years because of their potential ecological importance in forest ecosystems and because of reports of widespread population declines. Clear-cut harvesting generally has negative short-term impacts on local amphibian populations, especially salamanders.. . . However, research on the influence of forest age suggests that the long-term effects of forest harvesting on amphibians are variable, and for many species these effects can be mitigated if regeneration practices leave adequate microhabitat structure intact. In contrast, long-term effects can be significant in forest plantations, which are often associated with intensive site preparations and stand management practices that modify levels of coarse woody debris and other microhabitats. Other forest practices reviewed for their effect on amphibians include prescribed fire, logging roads, and streamside harvesting. We discuss problems commonly encountered in the experimental design and measu rement of forest amphibian populations, including a notable lack of pretreatment data, and outline several aspects of amphibian-forestry relationships in need of further research. Management recommendations relevant to conserving upland and riparian zone amphibian habitat during forest harvesting are offered.	This article referenced by the commenter discusses the impacts of clear-cutting harvest methods on amphibians that are not relevant to this project's analysis. The article also mentions the impacts of site preparation and planting on soils and amphibians if coarse woody debris levels are modified. See Chapter 2 for a discussion of proposed actions. For the salvage harvest proposed by this project, watershed and wildlife project design features have been incorporated for resource protection, including the retention of coarse woody debris; see Chapter 2 of the final EIS for project design features. The project is required to meet the coarse woody debris standard and guideline 6-16, "A renewable supply of large down logs is critical for maintaining populations of fungi, arthropods, bryophytes, and various other organisms that use this habitat structure. Provision of Coarse Woody Debris is also a key standard and guideline for American marten, fisher, 2 amphibians, and 2 species of vascular plants. The objective is to provide Coarse Woody Debris well-distributed across the landscape in a manner which meets the needs of species and provides for ecological functions. Standards and guidelines would provide for appropriate Coarse Woody Debris quantity, quality (such as species, decay stage, and size) and groups of plant associations and stand types, which can be used as a baseline for managers to develop prescriptions for landscape management. An important factor is to provide the Coarse Woody Debris within a forest patch so that the appropriate microclimate for various organisms that use this substrate is available." (See the soils discussion under Chapter 3 of the final EIS for a discussion of effects.)
142.04 - Harvest Methods	#17313-5	For example, the decommissioned portion of 46N62 in lower Walker Creek may have too great of an environmental cost to reopen (allows salvage on units 058, 058-1, 058-3,058-6, 058-7). In comparing the area accessible in Alt. 2 compared to Alt. 4, the treatment area on the west side (Unit 058-3) was reduced in Alt. 4 without that road access. Could more of that area be included as a helicopter unit so that the area adjacent to the private property could still have treatment of the larger fuels if the road is not opened? Could the possibility of heli yarding from the west side of the private be explored? Maybe it is not critical that the entire Unit 058-3 be treated? The Thom-Seider project put a 500-foot fuels reduction buffer around the private properties downslope of Unit 058-3 that if implemented may provide reasonable protection from wildfire. We urge your staff to make a careful assessment of the fire hazard to those properties and alternatives to re-opening the decommissioned portion of 46N62.	The interdisciplinary team did a close review of what treatments units required treatment and what access roads were and were not needed for the proposed treatments. Some components of Alternative 4 have been incorporated into the preferred Alternative for the final EIS, modified Alternative 3; see Chapter 2 for a discussion. For modified Alternative 3, about three miles of new temporary roads will be constructed. This Alternative reduces the mileage of temporary roads on existing roadbeds that will be used for project access to less than five miles. All temporary roads associated with salvage in the Beaver project area were dropped due to dropping the associated salvage units. In the Beaver project area, there are no new temporary roads and no temporary road actions that involve stream crossings. About five miles of temporary roads on re-opened decommissioned roads are proposed for use. The decommissioned section of Forest Road 46N62 (also referred to as the “Caroline Creek Road”) will remain closed. Sections of decommissioned road associated with dropped salvage units were also dropped; these include decommissioned sections of 45N56YA, 46N42Y, and 46N78 which will remain closed. All temporary roads, including those on previously decommissioned roads, will be closed and hydrologically stabilized according the project design features. Also see response to comment number 12364-1.
142.04 - Harvest Methods	#17478-1	as necessary as timber harvest is, remembering viable and proven practices benefits both forest health and business interests. after decades of repeating fire syndrom, the measured impact requires recognition of logging practices and effects	The design of salvage harvest proposed in this project has built upon past practices that have worked when developing the current practices.
142.04 - Harvest Methods	#17481-26	Prescriptions should follow Dr. Malcom North's recommendations to increase mechanical treatment in stands up to 45 % slope. This will pave the way for well-planned prescribed fire. This also should increase pace and scale of recovery.	Watershed Project Design Features for ground-based equipment are described in detail in Chapter 2 of the EIS: "Ground-based harvest equipment will be limited to 35% slopes, except when moving from one bench to another on dormant landslide terrain. In addition, ground-based equipment can travel up to 100 feet on slopes 35 to 45 percent."
142.04 - Harvest Methods	#17502-1	Please do not clear-cut and log Whites Gulch.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.04 - Harvest Methods	#18852-36	19) Generally considered, the use of helicopter and skyline logging systems is more appropriate than ground based methods. The use of mechanical equipment on slopes over 20% is not fully disclosed for the resultant soil and landscape disturbance likely to occur., slopes up to 30%+ are allowed for mechanical disturbance based on general prescriptive determinations. Affects from helicopter and skyline yarding systems are not fully disclosed for resource concerns, but are "anticipated" to have no significant effect. Yarding and logging systems are one of the key drivers of watershed impairment, sediment delivery, mass wasting and soil disturbance, anticipated affects are not fully recognized in this DEIS.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Effects to soils and hydrology are disclosed in the final EIS and supporting documents. Analysis has been improved in response to comments and further interdisciplinary review and discussion.

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142.04 - Harvest Methods	#18857-16	No helicopter units. Activity slash left from helicopter units is very difficult to cleanup and will increase fire activity in future fires. Likewise the economics of helicopter logging necessitates the removal of large, old trees and snags.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.04 - Harvest Methods	#18909-107	The Leverkus et al. 201218 study was done in a Mediterranean mountain ecosystem and could have significant insights for consideration. It examines post-fire burned areas and studied the costs of restoration and three different treatment types; Non-intervention (NI), partial cut plus lopping (PCL) and salvage logging (SL). 18 Leverkus, Alexandro B., Puerta-Pinero, Carolina, Ramon Guzman´lvarez, Jose, Navarro, Javier, Castro, Jorge. Post-fire salvage logging increases restoration costs in a Mediterranean mountain ecosystem Springer Science+Business Media B.V. New Forests (2012) 43:601-613 From the Abstract: Initial cost of wood management was greatest in SL and zero in NI. Reforestation cost was highest in NI and lowest in SL, and seedling-mortality rates proved lowest in PCL (43 % vs. 51 % and 52 % in SL and NI, respectively). Considering all the post-fire management operations, salvage logging did not provide particular economic advantages for forest restoration, and had an overall cost of 3,436 ± 340 €/ha. By contrast, NI and PCL reduced total restoration costs by 50 and 35 %, respectively, and PCL indeed promoted restoration success. We suggest that the full cost of management operations needs to be considered when evaluating the economic implications of post-fire salvage logging. Page 610: The results show that, from an economic point of view, post-fire salvage logging was not the best option, and that less intensive post-fire management may lead to cost reductions and increased reforestation success. We request that planners look at and disclose the high costs of mechanized logging on post-fire landscapes and the costs of all different treatment types.	The cited study is not applicable to the Westside project area because the study area is located where harvesting trees does not provide commercial benefits; the economics of salvage logging versus other treatments cited in the study do not apply to the Westside project area. The costs of treatments in the Westside project area are disclosed in the socio-economic section of Chapter 3 of the final EIS and in more detail in the referenced socio-economic resource report.
142.04 - Harvest Methods	#18926-8	Helicopter Salvage Logging - The United States Forest Service (USFS, US Forest Service, or Forest Service) alternatives do not meet the purpose and need, it does not promote forest and watershed "recovery". Instead the proposed alternatives 2,3,4,and 5 would all substantially increase the risks from future fires, because the preferred alternative in the DEIS, alternative # 2 includes 2,640 acres of helicopter salvage logging (DEIS page 31).! ! Studies and experience on the ground both clearly indicate that helicopter logging leaves behind "jackpots" of highly flammable logging slash due to the high cost of using a helicopter combined with the high cost of treating these fuels on the ground. If fuels are not adequately treated in the ground based methods of salvage logging, this would occur also in many cases.! ! Taking Of Live Old Growth Trees Increases Fire Risks ! Many stands identified for "salvage" logging are older stands where the natural wildfire underburned thus improving these stands. If these live green trees are removed as salvage log it would destroy the work the fire did to create healthy older forests. Many of these trees have been through fires before. ! !	Salvage harvest treatment will identify trees for harvest using the "Marking Guidelines for Fire-Injured Trees in California" (Smith & Cluck, 2011).Treatment in salvage harvest units is limited to moderate to high severity areas (>50% mortality) outside of Riparian Reserves. Fire-damaged green trees with a 70 percent or higher probability of mortality in the next three to five years were included in the salvage harvest proposal. See response to comment12346-55.Harvest systems selection, including helicopter, was considered in the Vegetation Environmental Consequences section, Chapter 3, of the EIS in site preparation evaluations.
142.04 - Harvest Methods	#19075-4	In the USFS own statement "ground based salvage logging could result in a 6 to 1000 fold increase in sediment production". This would not be good for salmon habitat	A project design feature has been developed to require applying soil cover to areas where ground based logging could result in additional sediment production in order to limit the amount of erosion.
142.04 - Harvest Methods	#19077-1	I have worked with the Karuk and the other Tribes in the area for over 20 years. I cannot see how the Forest Service can just go in and clear cut. Thinning is the good way not clear cutting. It damages all the areas including the wildlife areas and the dirt coming off the hills will compromise the fish.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Thinning is proposed for the fuels reduction portion of the project. No clear-cutting is proposed. See Chapter 2 of the final EIS for a description of proposed actions. The EIS discloses effects to wildlife from the project in Chapter 3.

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142.04 - Harvest Methods	#19092-2	Selective logging is a good idea. Clear-cutting on a wide scale leads to plantation- like areas. Please allow the time and money for foresters to do a quality job of aiding old-growth type forests recover without making them blindly clear-cut.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 6271-1. Thinning or selective logging is proposed for the fuels reduction portions of the project. No clear-cutting is proposed. See Chapter 2 of the final EIS for a description of proposed action.
142.04 - Harvest Methods	#19157-2	To achieve the most amount of treatment possible prior to insects and disease destroying the standing dead trees, I encourage the use of Ground -based logging systems where ever possible. Cable systems is a second choice.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Ground based and cable harvest systems are proposed in Alternatives 2-5.
142.04 - Harvest Methods	#5873-30	Hutto, R.L., 2006. Toward Meaningful Snag-Management Guidelines for Postfire Salvage Logging in North American Conifer Forests. Conservation Biology Volume 20, No. 4, 984–993. http://web.archive.org/web/20090310114517/http://avianscience.dbs.umt.edu/documents/hutto_conbio_2006.pdf ("Species such as the Black-backed Woodpecker (Picoides arcticus) are nearly restricted in their habitat distribution to severely burned forests. Moreover, existing postfire salvage-logging studies reveal that most postfire specialist species are completely absent from burned forests that have been (even partially) salvage logged. I call for the long-overdue development and use of more meaningful snag-retention guidelines for postfire specialists, and I note that the biology of the most fire-dependent bird species suggests that even a cursory attempt to meet their snag needs would preclude postfire salvage logging in those severely burned conifer forests wherein the maintenance of biological diversity is deemed important.")	The Alternatives will only affect between 8-13 percent of the estimated snag associated species habitat in the project area and cumulative effects area (EIS, Chapter 3, Terrestrial Wildlife, Effects to snag associated species). The remaining areas are not proposed for treatment and would provide ample post-fire habitat for snag dependent species.
142.09 - Roadside Hazard Treatments	#17387-13	Retain all trees (live and dead) that are over 30 inches DBH unless they are hazard trees. These large trees provide forest structure and wildlife habitat even if dead."	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We acknowledge that large dead snags provide for forest structure and wildlife habitat. For this reason, the team developed project design features to retain legacy components; see the project design features table in Chapter 2 of the final EIS under wildlife for details. There is no diameter limit set for this project. See Chapter 2 of the final EIS for a description of what is being proposed. See response to comment number 18852-15.
142.09 - Roadside Hazard Treatments	#17481-9	Remove all roadside hazard trees. Repair any damage to roads from tree removal.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Road repair and maintenance has been ongoing since the fire, including Burned Area Emergency Reclamation work, as discussed in Chapter 1 of the final EIS. Road maintenance will also be done as needed for this project and beyond what is needed by this project as necessary as part of the regular road maintenance program for the Forest. The project proposes the removal of all fire-damaged hazard trees; no green roadside hazard trees are proposed for removal unless they pose an immediate risk to the road. See Chapter 2 of the final EIS under roadside hazard treatments for a detailed description of what is being proposed.
142.09 - Roadside Hazard Treatments	#18850-4	I appreciate that you are paying close attention to following ridge lines and historical fire lines along with road hazard clean up.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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142.09 - Roadside Hazard Treatments	#18852-15	I support specific hazard tree removal (100% crown mortality) along primary system roads, but do not believe more remote road systems with little usage or planned closures require the same treatments for "safety" rationalizations. The use of the .7% likelihood of mortality prescription I believe is not supported by all the science nor does it assist with long term ecosystem recovery.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Chapter 2 Alternatives, Including the Refined proposed action under Alt 2 Roadside Hazard Treatments. Maps in the EIS shows the roads that were marked for roadside hazard treatments. Roads that are currently closed, brushed in, over grown were not marked for roadside hazard tree removal unless they accessed a planned fuels, vegetation, timber unit for the project. The following Guides were used to determine if a tree is a roadside hazard - Regional Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (Angwin et al. 2012) to capture current hazard trees and Report #RO-11-01 "Marking Guidelines for Fire-Injured Trees in California" (Smith & Cluck, 2011) in order to capture future hazard trees. Not all trees along a road system are being removed, only ones that meet these two guides.
142.09 - Roadside Hazard Treatments	#18852-39	22) The total lineal distance of the proposed roadside treatments (approximately 650 miles) cannot fully anticipate the resource concerns affected by this proposal. Though roadside thinning is generally desired for fuels reduction and strategic fuel breaks, the expansive nature of this prescription within the scope of this planning effort precludes adequate review. Road thinning which focuses on commodity log production and not fuels risks reduction is counter-productive and not in accord with best management practices.	Chapter 2 Alternatives, Including the Refined proposed action under Alt 2 Roadside Hazard Treatments. Maps in the EIS shows the roads that were marked for roadside hazard treatments. Roads that are currently closed, brushed in, over grown were not marked for roadside hazard tree removal unless they accessed a planned fuels, vegetation, timber unit for the project. The following Guides were used to determine if a tree is a roadside hazard - Regional Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (Angwin et al. 2012) to capture current hazard trees and Report #RO-11-01 "Marking Guidelines for Fire-Injured Trees in California" (Smith & Cluck, 2011) in order to capture future hazard trees. Not all trees along a road system are being removed, only ones that meet these two guides.
142.09 - Roadside Hazard Treatments	#18858-2	The proposal to log 250 feet on either side of 650 miles of roads in the project area is particularly disappointing, first because it is so unnecessary, and second because it appears to be no more than a fabricated excuse to commercially log thousands of acres of northern spotted owl habitat (and important aquatic habitat) under the guise of a concern for human safety-a uniquely ugly feint. According to the DEIS, 162,300 acres of Forest Service land, or 253 square miles, burned, from which you will remove hazard trees on 650 miles. A little math shows that you intend to remove hazard trees on about 2.56 linear miles of roads per square mile of burned area, on average. But road density is unevenly distributed of course; the maps in the DEIS show many sections where the road density is significantly higher than 2.53 miles. In some of those areas your 500-foot logging swath will encompass nearly 100 percent of the section, because the roads themselves are little more than 500 feet from each other. In such cases, the 1 hazard-tree logging you propose is nowhere near as benign as you suggest. There is no way that all of these 650 miles of roads in this 162,300 acres are needed- are you intending to remove hazard trees on roads that are currently closed? Why have you not considered closing some of these 650 miles roads, rather than logging them? This would be a particularly good option in areas where there is spotted owl habitat, and your failure to consider it is dispiriting and saddening. Sometimes I wonder if the Forest Service has some kind of weird collective road-hoarding complex. You do not need all these roads, and the forest would be better off without them.	Chapter 2 Alternatives, Including the Refined proposed action under Alt 2 Roadside Hazard Treatments. Maps in the EIS shows the roads that were marked for roadside hazard treatments. Roads that are currently closed, brushed in, over grown were not marked for roadside hazard tree removal unless they accessed a planned fuels, vegetation, timber unit for the project.
142.09 - Roadside Hazard Treatments	#18859-6	Specific to the project and to the Pacific fisher, I would suggest that every potential hazard tree within 250 feet of any publicly accessible road be removed. Mortality due to roadkill is an identified threat to fishers and one that I have personally dealt with while conducting research on fishers. While conducting radio telemetry work on fishers in the coast range of California roadkill was a significant source of mortality, second only to predation. Removing snags from roadside areas would cause no significant reduction in the total number of snags available to species like fisher that depend on snags for some phase of their life history. By removing snags close to roads we would be removing the attraction of these areas to fishers thus lowering the likelihood that individual fishers would be killed by passing vehicles.	General comment in favor of roadside hazard tree removal. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
142.09 - Roadside Hazard Treatments	#18870-2	Please focus logging only along major access roads.	Chapter 2 Alternatives, Including the Refined proposed action under Alt 2 Roadside Hazard Treatments. Maps in the EIS shows the roads that were marked for roadside hazard treatments. Roads that are currently closed, brushed in, over grown were not marked for roadside hazard tree removal unless they accessed a planned fuels, vegetation, timber unit for the project.

Code	Comment Number	Comment Text	Response
142.09 - Roadside Hazard Treatments	#18883-17	It makes no sense to remove "hazard trees" along roads that are closed to the public ("Maintenance Level 1" roads). Removal of hazard trees should be confined to legitimate roadside hazard trees that are along roads and capable of falling onto roadways that are open to the public.	See response to comments number 18907-20.
142.09 - Roadside Hazard Treatments	#18883-4	Existing and reopened roads are a major source of sediment to local streams. Combined with movement of any equipment in the forest, the proposed project will increased sediment to nearby streams and the Klamath River. Roadside Hazard Treatment should not be performed because it will contribute significantly to sediment movement and stream damage. No amount of culverts and grading or seeding can be done that will mitigate the adverse erosion effects.	See response to comments number 18907-5. The impacts of existing and reopened roads to soil erosion have been described using the soils stability indicator in the soils report for the project and summarized in Chapter 3 of the EIS.
142.09 - Roadside Hazard Treatments	#18883-5	Removing all dead trees next to roads and those that have a 60 percent or higher probability of dying in the next 3 to 5 years is excessive. Removal of trees within 250 feet on each side of road is not needed for any safety concern and will result in tremendously increased erosion and instability of the roadbed. Removal of trees further from the roadway than 250 feet has no safety justification and will be used by field personnel and fallers to take large green trees and trees that may live for many decades to come. The eroded topsoil will leave higher cut banks. These roads scars will be more visible and decrease scenic values.	The comment reflects the opinion of the author but provides no evidence why hazard tree standards are excessive, or that the consequences described would actually occur, nor does it accurately reflect how green trees are addressed. The removal of all trees within 250' of the road is not proposed; this is just the area being evaluated for roadside hazards. The decision to use a 250 foot boundary is within the discretion of the Forest Supervisor. Only trees that meet roadside hazard criteria, as described in Chapter 2 of the final EIS, will be marked to be cut. Fire damaged trees that have less than a 60% chance of mortality (95% for trees greater than 45") and dead trees may be marked as hazard trees. Only trees that are fire injured, dead and dying that can impact the road will be removed. Green trees will be retained; see response to comment12346-55. Clarifications to this treatment have been made since the draft EIS; please see Chapter 2 of the final EIS for a detailed description of this proposed activity. The soil report for this project describes impacts to soil indicators. Chapter 3 of the EIS summarizes the soils effects analysis. Hazard tree removal will not remove all trees within 250 feet on each side of the road. Effects to scenery are disclosed in Chapter 3 of the EIS and in the Scenery Report and its amendment.
142.09 - Roadside Hazard Treatments	#18883-6	If any dead roadside trees are removed they should be less than 18 inches dbh as trees greater than 18 inches dbh will decay very slowly and will remain as habitat for animals for many decades to come. They pose minimal danger to anything.	See response to comments number 18907-8.
142.09 - Roadside Hazard Treatments	#18907-2	The potential for dead trees to fall on people driving vehicles on public paved or unpaved roads is infinitesimal. The Forest Service and Caltrans will remove any trees that fall on these roadways. Wind, rain and snow will cause dead trees to fall down gradually over a period of many years. Providing "safety" for people who work or visit in forested lands cannot justify the need for the project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Chapter 1 and 2 talk about purpose and need and the proposed action for hazard tree removal.
142.09 - Roadside Hazard Treatments	#18907-20	It makes no sense to remove "hazard trees" along roads that are closed to the public ("Maintenance Level 1" roads). Removal of hazard trees should be confined to legitimate roadside hazard trees that are along roads and capable of falling onto roadways that are open to the public.	Trees along roads that are currently drivable are being marked for hazard tree removal. This may include some level 1 roads that are open and were not closed.
142.09 - Roadside Hazard Treatments	#18907-5	Roadside Hazard Treatment should not be performed because it will contribute significantly to sediment movement and stream damage. No amount of culverts and grading or seeding can be done that will mitigate the adverse erosion effects.	Chapter 3 discusses the effects of the hazard tree removal for hydrology and soils. The impacts of roadside hazard treatments to soil erosion have been described using the soils stability indicator in the soils report for the project and summarized in Chapter 3 of the EIS.

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142.09 - Roadside Hazard Treatments	#18907-7	5. Removing all dead trees next to roads and those that have a 60 percent or higher probability of dying in the next 3 to 5 years is excessive. Removal of trees within 250 feet on each side of road is not needed for any safety concern and will result in tremendously increased erosion and instability of the roadbed. Removal of trees further from the roadway than 250 feet has no safety justification and will be used by field personnel and fallers to take large green trees and trees that may live for many decades to come. The eroded topsoil will leave higher cut banks. These roads scars will be more visible and decrease scenic values.	See response to comment numbers 18883-5 and 12346-55.
142.09 - Roadside Hazard Treatments	#18907-8	6. If any dead roadside trees are removed they should be less than 18 inches dbh as trees greater than 18 inches dbh will decay very slowly and will remain as habitat for animals for many decades to come. They pose minimal danger to anything.	Chapter 2 Alternatives, Including the Refined proposed action under Alt 2 Roadside Hazard Treatments. Maps in the EIS shows the roads that were marked for roadside hazard treatments. Roads that are currently closed, brushed in, over grown were not marked for roadside hazard tree removal unless they accessed a planned fuels, vegetation, timber unit for the project. The following Guides were used to determine if a tree is a roadside hazard - Regional Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (Angwin et al. 2012) to capture current hazard trees and Report #RO-11-01 "Marking Guidelines for Fire-Injured Trees in California" (Smith & Cluck, 2011) in order to capture future hazard trees. Not all trees along a road system are being removed, only ones that meet these two guides. No diameter was set for these treatments.
142.09 - Roadside Hazard Treatments	#18926-4	The primary or first priority treatment should take place on higher travelled roads and trails to provide private property owners with structures and residents, fire managers, and the forest users as the public egress and ingress on emergency access routes and designated safety zones on public, private and/or tribal lands. ! !	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Roads that are currently drivable by the public are being marked for hazard tree removal. Hazard trees along private property and trails are not being marked. Evacuation routes are a priority; see Chapter 2 of the final EIS for a full description of how roadside hazard treatment is being proposed.
142.09 - Roadside Hazard Treatments	#18926-9	Emergency Access Routes Recognition and Prioritized in Treatments The DEIS states on page 15 "For roadside hazard removal, fire-damaged green trees with a 60 percent or higher probability of mortality within the next three to five years were included in the salvage harvest proposal. Actual distance of roadside hazard treatments may vary based on the Regional Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (Angwin et al. 2012)." Roadside hazard trees that are alive with green branches on emergency access routes (safe ingress and egress) that will make shade that add to the shade fuel break should be left in place. If these trees dye, they can be picked up in a future project. A shaded fuel break is or should be the desired condition on all of these emergency ingress and egress routes. This should be reflected in the project documents.! !	Chapter 2 Alternatives, Including the Refined proposed action under Alternative 2 Roadside Hazard Treatments. Maps in the EIS shows the roads that were marked for roadside hazard treatments. Roads that are currently closed, brushed in, over grown were not marked for roadside hazard tree removal unless they accessed a planned fuels, vegetation, timber unit for the project. The following Guides were used to determine if a tree is a roadside hazard - Regional Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (Angwin et al. 2012) to capture current hazard trees and "Marking Guidelines for Fire-Injured Trees in California" (Smith & Cluck, 2011) in order to capture future hazard trees. Not all trees along a road system are being removed, only ones that meet these two guides. No diameter was set for these treatments. Green trees will be retained; see response to comment12346-55.
142.09 - Roadside Hazard Treatments	#19072-10	2. Roadside Hazard Treatment Alternative 2 proposes to identify and remove hazard trees along about 650 miles of National Forest Transportation System roads, county roads, and state highways. This includes Maintenance Level 1roads used by Forest Service employees and contractors for administrative purposes. Maintenance Level 1 roads are not routinely maintained. Reopening 69 miles of Level 1roads for salvage logging and hazard tree removal may result in significant impacts to water quality, especially in cumulatively impacted watersheds that have burned with a moderate or high intensity.	Chapter 2 of the EIS discusses the different Alternatives, which roads are being selected for roadside hazard tree removal and how. An Alternative has been included that reduces the miles of level 1 roads proposed for salvage logging and hazard tree removal. Green trees are only being marked if they were affected by the fire and meet the Region 5 hazard tree guidelines and fire damage mortality guides. Roadside hazard treatments have been clarified since the draft EIS; see Chapter 2 of the final EIS for a detailed description of treatments. See response to comment number 12346-55 about green trees.
142.09 - Roadside Hazard Treatments	#19157-4	Immediately harvest road side salvage 250 feet and more on both side of the roads in all areas.	General comment in favor of roadside hazard tree removal.

Code	Comment Number	Comment Text	Response
142.11 - Fuel/Fire wood Permits	#10-1	I am on Seiad Oaks Road in Seiad Valley and am especially concerned about the steep burned mountain where the fire came down to my neighbors backyard. It is full of dead trees and seems to be too steep to get the dead trees out which leaves us all living in peril. I would like to see wood being made available to those of us who have wood heating but, like me, do not have a 4WD truck and the equipment for hauling trunks out of the woods... I could go to the side of a road with a chainsaw & cut up logs & carry them in my sedan... I feel the wood sales should benefit the local people.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. In Seiad we do understand there is limited areas of cutting firewood due to the restricted areas. We have in approved National Environmental Policy Act document Thom-Seider EIS areas signed and setup around Seiad - Grider Creek Road, Walker Creek Road, etc. to allow for cutting of under 10 inch diameter at breast height green conifer or hardwoods. A map of these are located at the front desk of our district office. The area you speak of up Seiad Creek Road Seiad Oaks, no access from Forest Service Roads only through private property is a valid general firewood cutting area. You can cut trees meeting the current Klamath National Forest Firewood cutting permit there.
142.11 - Fuel/Fire wood Permits	#3679-1	Which brings up the issue of the current Happy Camp/Oak Knoll woodcutting policy that allows green hardwoods to be cut. This policy needs to be changed, especially since, as I interpret this Draft EIS, hardwoods are finally being valued.	Green hardwoods can be cut using a valid Klamath National Forest firewood permit. Changing this policy is outside the scope of this project.
144.01 - Grazing Permits, Allotments	#18883-7	No grazing from cows should be allowed within the perimeter of any of the three fire areas for many years to come. Grazing is known to be detrimental to springs, creeks, grasslands, and the entire environment. Cows should be kept out of the fire areas and no new grazing areas should be opened to compensate for the loss.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Permitted grazing is outside the scope of this project; however, the management of already permitted grazing operations is being addressed through monitoring and annual operating instructions. Efforts will be taken to schedule grazing in areas that are not actively being treated so as to minimize stress to livestock and protect young seedlings. Permittees will be notified through Annual Operating Instructions of areas where harvesting, burning activity, and/or grazing restrictions will occur that could affect their permit. Additionally, Range project design features have been created to protect rangeland improvements such as cattle guards and corrals. See Chapter 3 of the final EIS under the grazing section or the grazing resource report for more details.
144.01 - Grazing Permits, Allotments	#4-4	Wilderness o Trails maintenance and hazards (possibly chainsaw exemption in burned area) o Erosion control – burned trails o Trailhead and campsite hazards o Livestock grazing as a fuel reduction and meadow retention tool	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Hazard Trees associated with trails within the project area will be addressed separately from this project as part of routine trail maintenance. Trail-side hazard trees will be prioritized and treated based on risk level including probability of tree failure and probability of a target. Selective treatment of hazard trees along trails allows for protection of scenery and the recreation setting. Erosion control is part of project design for proposed actions; see chapter 2 watershed project design features. Livestock grazing is outside the scope of this project, although where it exists already, it is recognized to serve the purpose of fuels reduction of fine fuels at times. Meadow retention is not an objective of this project.
151.01 - Road Construction, Maint.	#12346-45	On page 36 the Forest Service indicates that it intends to re-open 69 miles of closed level 1 roads in order to log along them. This action increases rather than decreases the potential for negative impacts to human health and safety. Closed roads are not subject to motorized travel. Reopening them in order to log along them presents the possibility of injury associated with the logging and involves unnecessary impacts to wildlife habitat and hydrological resources associated with the re-opening of closed (and in some cases decommissioned) roads. The Forest Service's contention that roads are only closed (or decommissioned) until the foreseeable and inevitable fire event occurs would mean that no road on the KNF is ever truly closed or decommissioned. This position would prevent attainment of the NW Forest Plan standard requiring net road reduction in Key Watersheds. Since no roads are ever permanently closed or decommissioned on the Forest, the agency cannot construct (even temporary) logging roads in Key Watersheds and the agency must disclose and analyze the increase in the mileage of logging roads that has occurred in Key Watersheds since the inception of the Forest Plan. The Scoping Notice for the Westside Salvage Logging timber sale indicates that the Forest Service intends to conduct up to 1,300 acres of roadside logging in Inventoried Roadless Areas. Such logging will greatly increase the cumulative edge effects, hydrological effects, barriers to wildlife, and soils impacts of the existing roads and routes in IRAs. Yet the DEIS and its supporting documents contain no analysis or disclosure of the impacts associated with	The amount of temporary road needed to facilitate implementation varies from about 5 miles in Alternative 4 to about 24 miles in Alternative 2. Only fuels treatments and site preparation and planting would occur within those portions of the project in the IRAs. Also see response to comment number 12364-1.

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		dramatically increasing the roadside clearing and fragmentation within IRAs. Indeed, the 1,300 acre figure found in the scoping notice is absent from the DEIS.	
151.01 - Road Construction, Maint.	#12354-6	Because California has declared the Gray Wolf, Canis lupus, an Endangered Species, and populations of the wolf are moving into Southwest Oregon, we can expect wolves to explore KNF in the next very few years. Roading prevents C. lupus from successfully reproducing, at levels of over .75 kilometers of road per square kilometer. I will not here supply the references, as my letter is getting too long, but suffice to say that this figure is extremely well-supported by decades of study. KNF proposes far too many roads for this private profit logging, and must consider that this may be illegal in itself. I will be contacting agencies and organizations on the subjects of Endangered, Threatened, and Species of Special Concern.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. This project does not propose any new system roads. See response to number 12346-32 for description of temporary roads needed.
151.01 - Road Construction, Maint.	#17313-4	An example of temporary roads that appear not to be a sediment concern (ridge top road) and facilitate important fuels treatment for WUI protection are the roads that access units 243-1 and 208. A wildfire in these untreated fuels would threaten a fuelbreak on Frying Pan Ridge and consequently the WUI on the east side of the ridge. Decommissioned roads. There needs to be a compelling reason to reopen a road that has previously been decommissioned. We do not support the opening of roads where culverts have been pulled and drainages reshaped. In some cases, we encourage salvage by helicopter where there is a clear fuels reduction benefit.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter's suggestions either were already or have been incorporated into project design. It appears that the commenter is in favor of proposed fuels treatments proposed in units 243-1 and 208 that are already incorporated into project design. Some salvage harvest by helicopter is also already incorporated into project design. Modified Alternative 3 was developed in response to comments and consultation and is the preferred Alternative for the final EIS. For modified Alternative 3, about three miles of new temporary roads will be constructed. This Alternative reduces the mileage of temporary roads on existing roadbeds that will be used for project access to less than five miles. About five miles of temporary roads on re-opened decommissioned roads are proposed for use. The decommissioned section of Forest Road 46N62 (also referred to as the “Caroline Creek Road”) will remain closed. Sections of decommissioned road associated with dropped salvage units were also dropped; these include decommissioned sections of 45N56YA, 46N42Y, and 46N78 which will remain closed. All temporary roads, including those on previously decommissioned roads, will be closed and hydrologically stabilized according the project design features. See Chapter 2 of the final EIS for a description of proposed actions. Also see response to comment number 12364-1.
151.01 - Road Construction, Maint.	#17349-5	Roads - We advocate that the Forest take full advantage of the existing road system including those road beds that may have been unused for long periods. The existing road beds provide low to zero impact opportunities for access for recovery activities. Also, we advocate serious consideration be given to construction of new roads to facilitate salvage and follow-up treatments where the cash and environmental costs of construction are low compared to the benefits gained from the access.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest has taken advantage of both previously decommissioned roads and existing roadbeds for temporary use. Construction of new roads was not necessary to facilitate salvage or follow up treatments. Also see response to comment number 12364-1.
151.01 - Road Construction, Maint.	#17458-2	For the health of the forest, please do not remove all remaining timber from the burned areas, and do not build roads over the entire area.	All live trees will be retained in salvage harvest units according to the marking guidelines. See response to 12346-55.No new roads are being proposed.

Code	Comment Number	Comment Text	Response
151.01 - Road Construction, Maint.	#17481-10	These roads could and should be brushed in advance of any fires.	Roadside hazard treatments are included as a part of the action Alternatives. See Chapter 2 of the final EIS for a detailed description of what is being proposed regarding roads.
151.01 - Road Construction, Maint.	#17481-13	To reduce future culverts clogging. Increase the undersized culverts.	See response to number 17349-5.
151.01 - Road Construction, Maint.	#17481-14	Consideration should be made for repairs that will be needed on county roads. Increased use of county roads by commercial trucks performing fire recovery activities.	Forest Service contracts require that roads are brought back to their pre-existing conditions following implementation.
151.01 - Road Construction, Maint.	#17501-8	Please drop all commercial units from the Westside Project that would require the building of temporary roads, or the reopening of old roads, even if they would be closed after the timber sale. When the KNF already has an existing backlog of road maintenance way beyond its ability to keep up with, there is no reasoning to justify opening up old roads again or building new roads in the first place.	Road maintenance activities on the forest are beyond the scope of this project. Alternative 4 addresses the concerns raised by the commenter by reducing or eliminating temporary roads.
151.01 - Road Construction, Maint.	#18857-14	No new roads, either permanent or temporary.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
151.01 - Road Construction, Maint.	#18869-3	in doing so we would also reduce the likelihood of future catastrophic fires would be reduce by using the additional roads needed for the salvage logging	See response to number 17349-5.
151.01 - Road Construction, Maint.	#18872-6	road maintenance with other restoration efforts that are most likely to see success, and then move to secondary, but no less important, areas of restoration within the plan.	See Response to number 17349-5
151.01 - Road Construction, Maint.	#18878-15	DEIS: There is a need for worker and public safety and access. (Pg. 10) Comment: In general, we are fully supportive of roadside hazard treatments along access and egress routes for community safety and to support our management objective of putting fire back on a fire-adapted and fire-dependent landscape. This concept is supported by the Karuk Alternative. However, we are concerned with the total amount of road miles to be treated in the Refined Proposed Action. We are opposed to the anticipated treatment along Maintenance Level (ML) land 2 roads and the re-opening of decommissioned roads. This is especially acute in the Grider and Thompson drainages in the Happy Camp Project Area and the West Fork drainage in the Whites Fire Project Area. There is also ongoing concern as to conditions of all ML roads pre and post project implementation and the impact to fisheries resources in both the short and long term.	All Forest Service System roads within the project area will be evaluated for roadside hazard tree identification and removal including maintenance level 2 roads. Roads will also be maintained as needed for project implementation and any legacy sediment sites will be treated. In addition, any previously decommissioned roads that are opened for this project will be closed and hydrologically stabilized following project implementation. While there may be short term negative impacts at the site scale to fisheries during project implementation from roads, the long term impacts would be beneficial because of road maintenance, legacy site treatment and hydrological stabilization of temporary roads. Short term negative impacts would be avoided in Alternative 4 as temporary roads are reduced or eliminated from sensitive watersheds (EIS, Chapter 3, Aquatic Resources). Also see response to comment number 12364-1.

Code	Comment Number	Comment Text	Response
151.01 - Road Construction, Maint.	#18907-29	No new roads should be constructed to harvest dead trees. The economic value of the trees will be far less than the cost of the erosion, sedimentation, and long term maintenance or retirement cost of these roads.	See response to 18883-25.
151.01 - Road Construction, Maint.	#18907-6	Existing and reopened roads are a major source of sediment to local streams. Combined with movement of any equipment in the forest, the proposed project will increased sediment to nearby streams and the Klamath River.	Chapter 1 of the final EIS describes the purpose and need, including the improvement of watershed conditions. Regarding construction and reconstruction of temporary roads, the project includes watershed mitigations, as described in the project design features in Chapter 2 of the final EIS. The majority of the effects on sediment are from the fires themselves, as disclosed in Chapter 3 of the EIS. See the EIS, Chapter 3, Water Quality section for a discussion of effects to sediment regimes from the project. As part of this project, the Forest is also treating within Riparian Reserves and treating legacy sites for the purpose of watershed improvements (see Chapter 2).
151.01 - Road Construction, Maint.	#18909-77	Construction, reconstruction, and maintenance of a water crossing usually requires heavy equipment to be in and near streams, lakes, and other aquatic habitats to install or remove culverts, fords and bridges and their associated fills, abutments, piles, and cribbing. Such disturbance near the waterbody can increase the potential for accelerated erosion and sedimentation from destabilization of streambanks or shorelines, vegetation and ground cover removal, and soil exposure or compaction. In addition, heavy equipment has potential for contamination of the surface water from vehicle fluids. Permits may be required for in-stream work associated with stream crossing construction and maintenance projects. There are specific requirements for such projects under the Clean Water Act and implementing regulations. State and local entities may also provide guidance and regulations. Stream reaches that are likely to be negatively affected by temporary road actions and landings include portions of Doggett Creek, Beaver Creek, Grider Creek, O'Neil Creek, Kuntz Creek, Whites Gulch, China Creek, and Klamath River (due to actions in Gard Creek and Caroline Creek drainages). Temporary roads used by the project include 14 stream crossings. Direct effects to aquatic habitat may occur while crossings on temporary roads are being constructed, or reconstructed, used, and hydrologically restored after use. Due to these actions river/stream habitat for management indicator species may be affected at 14 sites; four perennial stream crossings and ten intermittent stream crossings, none of which are fish-bearing. Reaches of Doggett Creek, Beaver Creek, Grider Creek, O'Neil Creek, Kuntz Creek, Whites Gulch, China Creek, Gard Creek, and Caroline Creek would be affected. Any increase in sediment is contrary to the Clean Water Act.	The Forest will obtain the necessary approvals from the North Coast Regional Water Quality Control Board prior to project implementation. Any guidance or requirements that are associated with those approvals will be followed.
151.01 - Road Construction, Maint.	#18913-3	We are vehemently opposed to the following elements of the Klamath National Forest proposal to: * Build 22 miles of new permanent and temporary roads, especially given the conflict with this has with the Klamath National Forest mandate to create a "minimum system" road network under Subpart A of Travel Management Rule in 2015. Roads across the Forest are a major source of erosion and sediment, which degrades water quality and cements spawning gravels for native fishes. This new road network has the potential to affect more than 3,000 acres in the Klamath, Scott, and North Fork Salmon Wild & Scenic Rivers, as well as proposed Wild and Scenic sections of the Elk, Grider, and South Russian Creek. 6,300 acres of roadless lands are also affected by construction of these new roads, which we find unacceptable if we are to meet state and federal objectives that better enhance headwater habitat for trout, salmon and steelhead.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No new roads are proposed in this project. Temporary roads would be closed and hydrologically stabilized following project implementation. Effects to resources from road construction are discussed in Chapter 3 of the EIS.
151.01 - Road Construction, Maint.	#19075-2	I oppose the creation of new roads for this project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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151.01 - Road Construction, Maint.	#5873-155	In terms of sedimentation, it is the forest roads that may have the most signi?cant impact because of the constant source of sediment they can provide over the life time of the road network.When all attributes are considered it appears that [clearcutting] does not emulate wild?re and may have a more detrimental impact on headwater systems in both the short and long-term. … Overall, the results suggest that harvesting does not emulate wild?re, particularly [clearcutting]. … It is important for forest managers to consider the complex affects that harvest treatments can have on headwater systems if they are going to successfully practice ecosystem management and achieve sustainable forest management. It is also important for managers to understand that there are many other attributes to be considered. In particular, the ability of harvest treatments to emulate wild?re in regards to peak ?ows, organic matter inputs, large woody debris recruitment, channel morphology, and stream biota response. Due to the inability to statistically analyse these attributes they were not incorporated into the scope of this paper. Nitschke C.R. 2005. Does forest harvesting emulate ?re disturbance? A comparison of effects on selected attributes in coniferous-dominated headwater systems. Forest Ecology and Management 214 (2005) 305–319. http://www.sierraforestlegacy.org/Resources/Conservation/FireForestEcology/FireScienceResearch/FuelsManagement/FM-Nitschke05.pdf	Salvage harvest, not clear-cutting is proposed in the Westside Fire Recovery Project. Salvage harvest would not occur within hydrologic Riparian Reserves. Project Design Features from Chapter 2 of the EIS and Best Management Practices in Appendix D are in place to minimize effects to resources from proposed actions, including impacts to sedimentation from the road network.
151.02 - Road Closure, Decomm.	#17460-6	In the DEIS, table 2-42, the 3rd recommendation is "No opening of selfdecommissioned MI and M2 level roads." Part of the response given in the DEIS to this recommendation is: "In response to relevant issue #1, alternative 4 limits the number and location of self decommissioned roads that are proposed for use to further reduce impacts. "Unfortunately the Alternative 4 Map Book provided on the web page hosting the public Westside documents do not indicate exactly which self-decommissioned roads were eliminated under Alternative 4, and no list of such roads was provided in the other DEIS documents: that information should have been provided publicly during the comment period for the public to evaluate, compare, and comment on. I was able to get a list of roads excluded from the project under Alternative 4 from Westside Fire Recovery IDT Leader Mike Hupp. Comparing the list of roads he provided with my own field visits and photographs within the project area, the following roads meet the criteria for Maintenance Level 1 roads, as described in USDA's Forest Service publication "Guidelines for Road Maintenance Levels," due to being blocked by natural vegetative overgrowth, often by trees 3" dbh or larger growing directly in the roadway, and some blocked by additional rockslides, large snags, and brush. Here is a list of roads in the Happy Camp Complex, many of them in worse condition than officially 2 decommissioned roads: 15N09, 16N41, 45N03Y (MI blocked by an earth mound), 46N77A, 46N77D, 46N77F, 46N80X, 46N67A, and the southern portion of 46N78Y. This is not a comprehensive list: there may be more roads within the project area that currently exist in a Maintenance Level 1 state, but are not accurately identified as such by the project. Additionally, parts of 44N40 have also not been maintained, and currently meet the Maintenance Level 1 category: the entrance to 44N40 where it intersects with 46N64 is blocked by rockslides and large downed snags that do not appear to be any part of the BAER project, and the beginning of 44N40 where it intersects with 44N98 is currently being eroded by water runoff running down the road from what appears to be a blocked culvert, and partially blocked by a rockslide beyond that. Road 45N86X almost meets Maintenance Level 1 conditions due to overgrowth and rockfall in the roadway, and is impassable beyond 0.3 miles due to a large snag across the road. At a minimum, road 45N86X would require regrading before use for any salvage or plant-and-release operations, and may require more maintenance due to settling and areas of erosion on the downhill edge of the road prism. None of the roads in this list, that exist at Maintenance Level 1 conditions, were in the list provided to me by Mike Huff; thus none of them are eliminated under Alternative 4. None of them are currently usable along their entire length by motor vehicles, and all of them appear to require regrading along their lengths using bulldozers, increasing ground disturbance impacting watersheds throughout the project. The total length of these roads (excluding 45N03Y, as I have not been able to determine the access level at its eastern terminus) is at least 13 miles; most run across very steep terrain, some cross perennial or intermittent streams. There are several issues that should be addressed directly by the EIS in regards to these roads: 1. Eliminating these roads from hazard and salvage tree removal, as similar MI roads have been in Alternative 4, would lessen the overall impact on the	See response number 12346-32. Also see response to comment number 12364-1.

Code	Comment Number	Comment Text	Response
		watershed by reducing ground disturbance and retaining post-fire habitat. 2. Because these roads currently exist in a Maintenance Level 1 condition, the ground disturbance associated with their restoration needs to be accounted for under all project alternatives, due to impact on watersheds, fisheries, and potential for spread of non-native invasive species. It is not clear in the published DEIS documents that the deteriorated conditions of these roads has been properly accounted for. 3. Two of these roads exist within the LSRs on Blue Mountain, which has been identified as having a high risk for landslide activity. What is the impact of restoring these roads for salvage operations in this area due to any increased landslide risk? That is not addressed in the Geology Report. 3 4. What other roads are within the Westside Project, for all alternatives, that currently exist under Maintenance Level 1 conditions, and need to be properly evaluated for the effects of restoring them to a usable condition for this project? According to the USDA's "Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl," Attachment A, page B19 (http://www.reo.gov/library/reports/newsandga. pd!): The amount of existing system and nonsystem roads within Key Watersheds should be reduced through decommissioning of roads. Road closures with gates or barriers do not qualifY as decommissioning or a reduction in road mileage. If funding is insufficient to implement reductions, there will be no net increase in the amount of roads in Key Watersheds. That is, for each mile of new road constructed, at least one mile of road should be decommissioned, and priority given to roads that pose the greatest risks to riparian and aquatic ecosystems. This guideline applies within the LSRs to all the alternatives. There is no special provision for "temporary roads" or "new roads" within that set of guidelines without decommissioning an equal length of roads within the project. The alternatives in the DEIS have failed to meet that guideline.	
151.02 - Road Closure, Decomm.	#17481-17	During this process, re-open as many roads as possible. For public health and safety in classes 1 through 4.	Existing National Forest System roads will receive maintenance as needed for project implementation.
151.02 - Road Closure, Decomm.	#18850-5	I am hopeful that if the need to open up old roads, it is only temporary and that they will be closed up again when work is finished.	That is correct, any roads opened for project implementation will be closed and hydrologically stabilized following project implementation.
151.02 - Road Closure, Decomm.	#18858-10	An alternative to close at least some of the roads rather than log them must be formulated, and how this can be done to benefit wildlife should be discussed and considered, and then adopted.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
151.02 - Road Closure, Decomm.	#18926-23	Road Decommissioning ! There needs to be a compelling reason to reopen a road that has previously been decommissioned. No roads should be re-opened in LSR'. Do not re-open roads where culverts have been pulled and drainages reshaped,! ! This is a large project. Road decommissioning would be deferred from the access and travel management plans to be included in large project. Decommissioning of roads should be included in this project in the Salmon River, on the North Fork, and elsewhere. The maintenance costs of keeping a road can be expensive. The US Forest Service says it does not have enough money to maintain the road system annually. Lack of funds for the US Forest Service to maintain all of the roads in the road system is a justification for eliminating some roads. The DEIS does not eliminate or decommission roads. The updated version of the DEIS or the Final Environmental Impact Statement should include decommissioning of roads.! ! Trails - Please add hazard tree removal to the KNF system of trails that are in the affected areas, included in the proposed action. These trails receive hundreds of Visitors each year and burned trees deemed "hazard trees" adjacent to these trails. Many of these trees should be removed and included in this project. The public using these trails should have the same safety precautions in effect as persons traveling the State Highways and County Roads. Waiting for many of these trees to fall at their own volition may take years and will jeopardize trail user safety.! !	See response to number 18858-10. Roads that are re-opened would be closed and hydrologically stabilized following project implementation. Also see response to comment number 12364-1.
152.01 - Trails Construction, Maint.	#18907-17	No work on or near the PCT or other trails should be allowed either in a planning document or on the ground during adjacent activity. Hikers and others using trails like to have snags and woody debris within at least 100 feet of each side of trails for shade and rest areas. No harvesting or equipment access should be allowed to occur within at least 100 feet of each side of these trails or campsites.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project incorporates project design features, as described in Chapter 2 of the EIS for the mitigation of scenery and recreation resources. No salvage harvest (or logging) of green trees that would provide shade for hikers is proposed. See response to comment12346-55. However, roadside hazard treatments of fire-damaged trees are proposed within the boundary of some campsites. Most trails will have immediate hazard trees hand fallen along the trail ways, consistent with existing policy and implemented outside of this project. Effects to recreation and scenery are disclosed by Alternative in Chapter 3 of the final EIS and supporting documents.
181.04 - Make project cost efficient	#17329-2	The draft EIS is proposing to only treat approximately 5% of the total burned area. The selected alternative should treat as many acres as possible on all of the fire areas considered. I want to express the importance of selecting an economical alternative. The selected alternative needs to be implementable if true recovery of these acres is expected. As you know, that can only occur if the project is economically viable. I believe the majority of the taxpayers and county residents would rather see a quick response to the restoration efforts on these fires by producing an economically feasible project that will produce some revenue.	The preferred Alternative 2 aims to maximize the balance of desired outcomes identified in the project's Purpose and Need, which are addressing worker and public safety and access; safe conditions for firefighters performing fire suppression for community protection; a project that is economically viable, meeting project objectives and benefitting our local communities; and restored and fire-resilient forested ecosystems. (EIS Chapter 1) Components of preferred action Alternative 2 will include salvage (6,800 treatment acres within 11,700 acres of units); roadside hazard treatments (650 miles); hazardous fuel treatments (22,900 acres); and site preparation (12,656 acres) for replanting (14,184 acres) to support the desired outcomes identified in the Purpose and Need. An objective of the preferred action Alternative will incorporate timber salvage treatments that will be limited to areas of moderate to high severity vegetation mortality with more than 10 contiguous acres of medium to high severity vegetation mortality and less than 40 percent crown closure. Considerations for salvage logging were also given in relation to accessibility, economics and units that are outside of northern spotted owl core areas that have more than 50% effective nesting, roosting or foraging habitat remaining within the core area. (EIS Chapter 2) Salvage logging will promote ecosystem sustainability by increasing the likelihood and speed by which burned forested areas are reforested following the fires by opening areas up for safe planting and by reducing large-log fuel loads.
181.04 - Make project cost efficient	#18747-3	Salvage harvest is a urgent must. This will reduce the severity of any future burns but must be accomplished soon or the logs will have no value.	An Emergency Situation Determination has been approved by the Chief of the Forest Service. Pursuant to the emergency situation determination the Final EIS and Record of Decision will be released at the same time, eliminating the requirement of an objection period, pursuant to 36 CFR 218.21. The emergency situation determination promotes relief from hazards threatening human health and safety; mitigation of threats to natural resources on National Forest System or adjacent lands; avoiding a loss of commodity value sufficient to jeopardize the agency's ability to accomplish project objectives directly related to resource protection or restoration in the most expeditious manner possible within the law.
181.04 - Make project cost efficient	#18859-12	With each passing day, economic value is lost from hazard and salvage timber, meaning the private sector will lose interest in participation and necessary work will be solely dependent upon the difficult and unlikely allocation of taxpayer funds.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please refer to comment number 18747-3 regarding Emergency Situation Determination.

Code	Comment Number	Comment Text	Response
181.04 - Make project cost efficient	#18859-3	Implementation of the Westside Recovery Project is needed as soon as possible as any delay will cause continued degradation of wood within the project area, making the economic feasibility of the project more difficult.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please refer to comment number 18747-3 regarding Emergency Situation Determination.
181.05 - General Efficient/ Effective Project	#14-10	The timeframe for getting a return on your investment and allowing for rapid re-establishment of conifer stands is very short. There is a need to make a rapid decision and begin implementation in early June.	Please refer to comment number 18747-3 regarding Emergency Situation Determination.
181.05 - General Efficient/ Effective Project	#16957-2	Another substantive issue that must be addressed is the investment of forest service time and effort, and that of the taxpayers, to implement plantation planting management on these areas. The investment in this type of plantation management comes with need to protect the investment from further fire events. As a taxpayer and one who is concerned with the health and safety of firefighters, rural communities and the health of the forest, I want the forest service to address how their commitment to fire suppression will be able to end the vicious cycle of high intensity fire? Suppressing fire out of these areas in order to secure the investment in timber is a waste of money and effort, these areas have a frequent fire return interval which cannot be controlled. These plantations may put create economically viable timber but only at the expense of continuing to fight fire with large scale efforts that cost a tremendous amount in terms of manpower and funding. These areas will burn again, and it its the job of the forest service to work with communities and native american tribes to return a healthy fire management regime to this landscape.	The project is designed to meet the Purpose and Need, including worker and public safety and access; safe conditions for firefighters performing fire suppression for community protection; a project that is economically viable, meeting project objectives and benefitting our local communities; and restored and fire-resilient forested ecosystems. Implementation funding and fire suppression operations is outside the scope of analysis in this EIS. Planting does not preclude fuels treatments, as discussed in Chapter 2 of the EIS and in Chapter 3 under fuels and vegetation sections. See the fuels section of Chapter 3 for a discussion about the project's effects on fuels conditions.
181.05 - General Efficient/ Effective Project	#17349-1	You and your staff are to be complimented on moving forward promptly with a constructive, action oriented project. We fully support your efforts to utilize all available emergency authorities to expedite the planning and implementation processes.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please refer to comment number 18747-3 regarding Emergency Situation Determination.
181.05 - General Efficient/ Effective Project	#19-8	Timber Products Company (TPC) is please with the expeditious completion of project scoping and the DEIS. TPC is fully aware that the Klamath National Forest has likely never undertaken a project of this unprecedented magnitude. As mentioned earlier, I must reiterate how extremely important the timing is to the success od this project. If lengthy delays occur, the outcome will undoubtedly be serious limitations to the commercial viability of this project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please refer to comment number 18747-3 regarding Emergency Situation Determination.
181.05 - General Efficient/ Effective Project	#23-1	I urge you to consider the most cost effective and ecologically efficient alternative possible for the Westside project. The sooner the forest heals from the damaging effects of fire, including the removal of dead trees, the healthier the forest will become in providing valuable habitat for wildlife and fisheries.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Please refer to comment number 18747-3 regarding Emergency Situation Determination.
181.05 - General Efficient/ Effective Project	#28-3	We have to act now to get this work done by selling the burned trees - there's no way that the federal government (tax payers!) can afford to PAY to have them removes after they are rotten and worthless. After their value is gone, the Forest Service will just be leaving a time bomb for future generations in our communities. Why is that a good idea when we can get work done now and make conditions better? Please get this project done as quickly as possible.	Thank you for your comment on the Westside Fire Recovery Project. To facilitate implementation of this project as soon as possible, the Forest has received an Emergency Situation Determination. Please refer to comment number 18747-3.An economically viable project is part of the purpose and need of this project as stated in Chapter 1 of the EIS. (There is a need for a project that is economically viable, meeting the project objectives and benefiting our local communities).

Code	Comment Number	Comment Text	Response
203 - Multiple Resources/Reasons	#12232-1	Natural forest ecosystems are at their most vulnerable just after a major disturbance like a wildfire. Chainsaws and industrial logging equipment are not a form of restoration; they contribute to erosion, compacted soil, polluted streams and degraded landscapes. Please join with fire ecologists, impacted communities, watershed councils, native tribes and conservation groups to focus on restoration and fire safety instead of pushing divisive and controversial clear-cut logging proposals on steep slopes in key watersheds and in critical wildlife habitat.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The comment is mistaken; no clear-cutting is proposed. See Chapter 2 of the final EIS for a description of proposed actions. Effects are disclosed throughout Chapter 3 of the final EIS.
203 - Multiple Resources/Reasons	#12414-1	Forest fire is a natural ecological occurrence and fosters healthy diversity and generates habitat for many plants and animals. It is completely unacceptable to exploit recent wildfires in order to fast-track illegal logging of protected old-growth forests. According to the The Northwest Forest Plan, some forest areas--like this one--are to be protected from logging. If reserves are only protected until timber planners decide to log them, the plan is useless.	We acknowledge the fire is a natural ecological occurrence; however, the fires of 2014 of the Klamath were outside the range of typical variability with moderate and high severity areas in need of salvage harvest treatments The proposed salvage logging is not illegal but is consistent with Forest Plan and applicable law, regulation and policy. The commenter does not accurately reflect the direction or intent of the Northwest Forest Plan. Salvage logging in Late Successional Reserves in permitted and expected per the Northwest Forest Plan, as incorporated into the Klamath's direction in the Forest Plan. See Chapter 1 of the EIS for a discussion of salvage in Late Successional Reserves.
203 - Multiple Resources/Reasons	#12424-1	So follow the Northwest Forest Plan -- focus logging along major access roads and PROTECT the most important and vulnerable recovering areas: the late-successional and geological reserves. Natural forest ecosystems are at their most vulnerable just after a major disturbance like a wildfire. Chainsaws and industrial logging equipment are not a form of restoration; they contribute to erosion, compacted soil, polluted streams and degraded landscapes. These forests are public lands owned collectively by all Americans. Public lands are meant to be managed for the common good, but instead the Forest Service is declaring the need to send chainsaws into the forest is so urgent that it is an emergency requiring exemptions to environmental laws and short cuts to public participation. I want my public forests to be managed in a way that protects endangered species, preserves clean water and allows the natural ecosystem to heal itself from fire as it has done for millennia.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project is consistent with the Forest Plan, which incorporates directions from the Northwest Forest Plan regarding treatment, especially salvage logging in Late-Successional Reserves. See the beginning of Chapter 3 for a discussion of responsible opposing views. The project is consistent with law and regulations, including the endangered species act and the clean water act. The Forest has been consulting throughout the planning process with regulatory agencies. And, the new preferred Alternative (modified Alternative 3) in the final EIS has been developed in response to consultation efforts.
203 - Multiple Resources/Reasons	#12549-3	The Northwest Forest Plan states that in LSRs living trees in a fire area should be uncut and Klamath Forest Plan requires that snags be retained on a per acre level. The DEIS assumption that moderate fire severity areas no longer support habitat for native plant and animal species is wildly inaccurate. Further, high-severity patches are of greatest importance to ecological integrity as they provide biological legacies that sustain the diversity of plants and wildlife. Post-fire landscapes are not in need of "restoration" because fire itself is a restorative agent.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We are unaware of the assumption that moderate and high severity fire provide no ecological benefit. The Northwest Forest Plan is incorporated into the Forest Plan and is followed for the Westside Fire Recovery project. See Chapter 1 for a discussion of salvage in Late Successional Reserves. The commenter does not provide direct quotes or a correct interpretation of the Northwest Forest Plan. The statements in the draft EIS regarding assumptions of plant habitat suitability in moderate-high intensity burns is directed towards Botanical Species of Concern, not native plants in general. The Botany and Non-native invasive species section of Chapter 3 acknowledges the benefits of moderate to high intensity burns in the regeneration of unique fire-follower plant species.
203 - Multiple Resources/Reasons	#12945-1	Say no to a logging tragedy! The heart of Klamath-Siskiyou bioregion could lose 30,000 acres of prime snag forest habitat on the steepest of unstable slopes above vital wild salmon rivers. Late-Succesional Reserves, Wild and Scenic Rivers, seventy-five watersheds and Caroline Creek eagles, bumblebees, meadows, endemic salamanders, Coho and Chinook salmon, Pacific fisher and seventy threatened Northern spotted owls and a suite of native plants need your help. The Westside situation is perilous. In a time when we need every tree we can grow as a carbon sink, it is NOT time to log! Let alone what you are going to do to increase rock and mudslides and degrade the watershed!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter fails to provide any evidence to support these opinion statements. See Chapter 2 of the EIS for a description of the proposed actions; this project is not proposing to remove 30,000 acres of snags. Effects of the proposed actions is disclosed in Chapter 3 of the final EIS.
203 - Multiple Resources/Reasons	#14038-1	Clearcutting is just wrong in so many ways. The potential for landslides in this area is huge. The impact on wildlife and the environment would be extreme. Please protect these important wildlands, wildlife and watersheds.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a description of proposed actions; no clear-cutting is proposed. The project has been designed to improve wildlife habitat and watersheds, as described in the purpose and needs statements in Chapter 1 of the EIS. Chapter 3 discloses effects by resource area and Alternative.

Code	Comment Number	Comment Text	Response
203 - Multiple Resources/Reasons	#16129-1	We know how how long it takes to grow these forests and how quickly they are chopped down. Isn't deforestation one of the main causes of global warming , while contributing to loss of habitat for many animals and their subsequent extinction? And then there's the problem of erosion, and a degraded quality of soil from the selfish destruction of our forests.I have read that only 2% of the old growth forests in California remain and would think California authorities would do their best to preserve that which remains or the original majestic forests of California.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter fails to provide any evidence to support these opinion statements. See Chapter 2 of the EIS for a description of the proposed actions and Chapter 3 for a discussion of effects, including climate change.
203 - Multiple Resources/Reasons	#17274-1	This project fails to act in the interests of the affected public and lacks reasonable justification. Soil fertility, water quality, critical habitat for species along with best available science practices all seem to be ignored. In a time when water is scarce around the west US our agencies shouldn't be drafting our rivers down further.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter fails to describe how the interests of the public are not being served by this project. See Chapter 1 for the purpose and need of the project. Direct, indirect, and cumulative effects to wildlife, watershed, soils, fuels, sensitive plants, and aquatic species, among other resources are addressed in the Chapter 3 of the EIS, with appropriate references to the scientific literature.
203 - Multiple Resources/Reasons	#17282-1	I am very concerned about the Project's potential impact on water quality and threatened salmon, old growth forests and the Northern spotted owl, existing and proposed Wild & Scenic Rivers, and roadless areas (some of which have been proposed in legislation as additions to the Marble Mountain Wilderness).	Direct, indirect, and cumulative effects to Roadless Areas, wildlife, watershed, soils, fuels, sensitive plants, and aquatic species, among other resources, are disclosed in the Chapter 3 of the EIS, with appropriate references to the scientific literature. Project Design Features from Chapter 2 of the EIS are in place to minimize effects to resources. No salvage harvest is proposed within wilderness, backcountry, research natural area, designated or recommended wild rivers, inventoried Roadless Areas, Riparian Reserves associated with stream channels or high ranked northern spotted owl cores in the project area.
203 - Multiple Resources/Reasons	#17282-4	Also, please avoid activities that could harm existing and proposed Wild & Scenic Rivers, water quality and threatened salmon, and roadless areas that provide refuge for wildlife.	See response number 17282-1
203 - Multiple Resources/Reasons	#17434-1	The potential impact on water quality and threatened salmon, old growth forests and the Northern spotted owl, existing and proposed Wild & Scenic Rivers, and roadless areas (some of which have been proposed in legislation as additions to the Marble Mountain Wilderness) are poorly analyzed and would likely lead to severe, long term problems for the forest.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response number 17282-1. The commenter fails to provide evidence in support of the claims.
203 - Multiple Resources/Reasons	#17450-1	I endured and observed up close the massive "salvage" logging operation in the Little North Fork area last fall. This operation destroyed wildlife habitat, increased erosion and runoff into the Salmon River and generally made a mess of our mountains. In addition it was very disruptive to community life (logging trucks blasting through Sawyers Bar starting at 3:00 AM for months on end) and provided no economic benefit to the local communities - the vast majority of the loggers, truckers and support personnel were from out of state.	It appears that the commenter is referencing the Salmon Salvage project, which is an action considered for cumulative effects for this project, as denoted in the Appendix of the EIS. The cumulative effects of this action when combined with the proposed actions of the Westside Fire Recovery project are disclosed throughout Chapter 3 of the EIS. Effects to Roadless Areas, wildlife and soil erosion are disclosed in the Chapter 3 of the EIS, with appropriate references to the scientific literature. The Westside Fire Recovery project, although similar in nature, does not have the same proposed actions as the Salmon Salvage Project. Project Design Features from Chapter 2 of the EIS are in place to minimize effects to resources.

Code	Comment Number	Comment Text	Response
203 - Multiple Resources/Reasons	#17465-1	As lovers of the out-or-doors, campers, hikers, and birders, my husband and I are VERY upset over your proposed Westside Fire Recovery Project of logging for the Klamath National Forest! We feel that your plans would be extremely disruptive for the plants and animals that call this forest home! Your methods of logging, including building extra roads and working on steep hillsides, are completely unnecessary, damaging to the ecosystem involved, and ruinous for the scenic value of this beautiful area! The work that you are suggesting would not be protective of the local watersheds and would seriously threaten the local fish, especially the salmon! We strongly support, instead, the Kanuk Indian Tribe's proposed alternative plan that we feel focuses on restoration after the previous fires and protection of the watersheds, the local plants and animals, and the native cultural resources that have been there for thousands of years. Their alternative plan does NOT threaten the Wild and Scenic Rivers in the area, nor does it ruin other local rivers that should have this designation in the future! It is far more important to save the ecosystem than it is to log a few thousand board feet of timber. The jobs that your plan creates will be soon gone, but the damage to the Klamath National Forest will remain for decades afterwards! We believe that the Kanuk Indian Tribe's proposed alternative plan for the Klamath National Forest is the correct and proper plan for sustainable reforestation, restoring the forest after last year's fires, and protecting the land and rivers for the myriads of creatures and plants that live there. Their plan does NOT add additional, unnecessary roads to the forest and keeps logging to a manageable minimum, while it will encourage the natural regeneration of the forest. Additionally, their plan gives important long-term protection to the watersheds, salmon and other fish, and keeps the roadless areas as they are now! Please reconsider your plan and adopt the more ecologically sound plan put forth by the Kanuk Indian Tribe!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 12414-1. See Chapter 1 of the EIS for a discussion of the purpose and need of the project. See Chapter 2 of the EIS for a description of the proposed actions. Direct, indirect, and cumulative effects for all Alternatives to wildlife, watershed, soils, fuels, sensitive plants, and aquatic species, among other resources, as well as management requirements to minimize adverse effects, are addressed in the Chapter 3 of the EIS, with appropriate references to the scientific literature. Project design features found in Chapter 2 of the EIS associated with proposed activities are intended to protect resources and species. See Chapter 2 of the EIS under Alternatives considered through consultation, for a description of how the Karuk Alternative has been considered and incorporated into the preferred Alternative for the final EIS.
203 - Multiple Resources/Reasons	#17472-1	The Klamath is a unique and beautiful place and should not be viewed as a commodity! Since the Klamath watershed and forests are still recovering from all the intensive logging in the past, please consider letting the forest heal on its own! I visit the Klamath and the Smith Rivers every year. These are exceptional recreation areas and should be treated with respect and care instead of clear cutting and degrading the streams and surroundings for logs that probably won't even be milled in America! Why aren't we preserving these beautiful habitats for future generations instead of raping and pillaging the land for a few dollars? The precious salmon and watersheds will not benefit from this project! Please value the natural resources of this place! Let mother nature heal herself.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 12414-1. See Chapter 1 of the EIS for a discussion of the purpose and need of the project. See Chapter 2 of the EIS for a description of the proposed actions. Direct, indirect, and cumulative effects for all Alternatives to recreation, wildlife, watershed, soils, fuels, sensitive plants, and aquatic species, among other resources, as well as management requirements to minimize adverse effects, are addressed in the Chapter 3 of the EIS, with appropriate references to the scientific literature. Project design features found in Chapter 2 of the EIS associated with proposed activities are intended to protect resources and species. The affected environment (or existing condition, including past actions) of the project area is disclosed by resource area throughout Chapter 3 of the EIS.
203 - Multiple Resources/Reasons	#17481-27	Alternative 1: There are many opportunities to assist the forest in recovery with nominal short term negative environmental effects and very significant long term favorable environmental effects. Such opportunities include removal of fuel loading through salvage logging, site preparation for reforestation, and fuel treatment to protect infrastructure, private property and improve future fire fighter safety. All of these measures better position the forest to withstand future fires because intensity and damaging effects will be reduced. Reforestation along with the associated site preparation will speed the establishment of a desirable level of conifer stocking where that component was lost to high intensity fire. All of the above measures serve to accelerate habitat recovery for spotted owls and related species. Properly designed, all the above activities can be implemented with nominal additional negative environmental effects above those imposed on the land from the fire. I do not like any part of this alterative because it does nothing to assist or accelerate the recovery of the burned forest. Plus the No Action will for-go the socio-economic benefits such as employment associated with recovery activities and the potential to generate revenue from the sale of dead timber which can be reinvested in the damaged lands. Also foregone will be the benefits of fuel treatment to reduce the hazard in and adjacent to communities such as Happy Camp, Seiad Valley, Hamburg, etc.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The agency acknowledges the statements made by the commenter, many of which reflect the disclosure of effects throughout Chapter 3 of the EIS. The analysis of the no action Alternative serves as a baseline comparison on which other action Alternatives can be analyzed and compared.

Code	Comment Number	Comment Text	Response
203 - Multiple Resources/Reasons	#18853-5	With this as background, our membership has reviewed the proposed action for the Klamath National Forest and we strongly believe that Alternative Two should be supported. Forest health is paramount to the environmental soundness of California. The proposed action will allow our skilled Licensed Timber Operators to move in and get the job done with regard to fuels reduction and the safeguarding of the forest against future fire risk; and will also allow our workers to salvage burned trees before they create a hazard that can lead to future fires and to the infestation of pests. The plan would also allow our operators to "partner" with the federal government on restoration of forest habitat, via reforestation and other techniques. We again urge the United States Forest Service and you to adopt Alternative 2, the action as proposed by the Forest Service.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Alternative 2 was the preferred Alternative in the draft EIS; however, in response to consultation and other public comments, the preferred Alternative is now a modified Alternative 3.
203 - Multiple Resources/Reasons	#18857-12	No salvage units in the Grider Creek drainage to protect roadless values, watershed values, scenic values - such as the Pacific Crest Trail (PCT) and connectivity between the Marble Mountains Wilderness, the Siskiyou Crest and the adjacent LSRs. * No salvage units should be proposed in the following watersheds or areas to protect ecological values, scenic values, and recreational qualities within and adjacent to large Inventoried Roadless Areas or Wilderness Areas. This would include the following areas: Happy Camp Fire: Grider Creek, N. Fork Kelsey Creek, McGuffy Creek, Kuntz Creek, Tom Martin Creek Whites Fire: E. Fork Whites Gulch, Sixmile Creek, South Russian Creek, Tanners Peak area, 3	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. In response to consultation and other public comments, the preferred Alternative is now a modified Alternative 3.
203 - Multiple Resources/Reasons	#18864-1	Please please please choose the most ecologically and environmentally sound actions instead of clear cutting, building,, and logging over 600 miles of roads that will erode. Protect the wildlife and future generations! We all need to breathe clean air and drink clean water. If you do not stop this. We will.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. No clear-cutting is proposed in the Westside Fire Recovery Project. See response number 8435-1 for description of clearcutting verses salvage logging. See Chapter 2 of the final EIS for what is being proposed.
203 - Multiple Resources/Reasons	#18866-1	Please find an ecologically sound alternative solution that will benefit and help our fish, wildlife, trees, climate, and human population. Please stop the West Side Fire project. Thank you.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
203 - Multiple Resources/Reasons	#18867-2	I value post-fire habitates for salmon, birds (including spotted owls), many wild mammals, and all living beings on the Klamath National Forest. This timber volumn is not needed! Opening up roads- erosion plus disconnecting wild terrain equals bad news!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Project effects are disclosed in Chapter 3 of the EIS.
203 - Multiple Resources/Reasons	#18868-1	Human life is part of forest life- the Eco system includes all humans, animals, plants and earthly life. We need clean air and water to sustain life! Trees, soil, and water (etc.) Depend on all species growing and surviving.	The agency acknowledges the humans are part of the ecology. See effects to air, water, soil, and climate change in Chapter 3 of the EIS.
203 - Multiple Resources/Reasons	#18878-69	Draft Karuk Tribe Department of Natural Resources Eco-Cultural Resources Management Plan (06-05-10) (http://karuk.us/images/docs/dnr/ECRMP 6-15-10 doc.pdf)	Citation only. Citation has been reviewed. Any identified culturally significant resources will be protected from project activities using project design features and/or Standard Resource Protection Measures. The Forest Service is actively consulting with the Karuk Tribe; see Chapter 1 of the EIS.

Code	Comment Number	Comment Text	Response
203 - Multiple Resources/Reasons	#18878-70	Holmlund, Croy Robert 2006. Fish, Forests, Fire, and Freedom: Infringements of Karuk Religious Freedom Through Federal Natural Resource Management. Humboldt State Master Thesis	We agree that culturally significant resources are more than simply artifacts and anthropological histories. Any identified culturally significant resources will be protected from project activities using project design features and/or Standard Resource Protection Measures. The Forest Service is actively consulting with the Karuk Tribe; see Chapter 1 of the EIS. Citation only. Citation has been reviewed and incorporated into the project record.
203 - Multiple Resources/Reasons	#18878-71	Taylor, A.H., Skinner, C.N., and Agee, J.A. 2006. Klamath Mountains bioregion. In N. G. Sugihara, J. W. Van Wagtendonk, K. E. Shaffer, J. Fites-Kaufman, and A. E. Thode, Fire in California's ecosystem. Berkeley and Los Angeles: University of California Press	Citation only. This citation paper has been reviewed. We agree with the commenter in citing this paper that "more area is burning at high intensity, and this is related, in part, to higher quantities and more homogeneous fuels caused by accumulation during the fire-suppression period." The Fire and Fuels report in the EIS describes proposed treatments and concludes that the treatment design would assist in planned and unplanned fire into the future. This would allow fire to play a role on the landscape into the future and would reduce the likelihood of the treated area burning at higher intensity and severity into the future.
203 - Multiple Resources/Reasons	#18926-6	The third priority should include the protection of resources in a prioritized manner. The priority being sensitive resources down to matrix lands. ! ! Reduction of the Fire Risk in Future Fires !	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
203 - Multiple Resources/Reasons	#19078-1	I wish to express my disapproval of the Westside Timber Sale due to impacts to the Klamath River's key salmon refugia, cumulative impacts to forest and watershed, and violations of the Clean Water Act, the Endangered Species Act, NEPA and California's Porter Cologne law. I incorporate by reference the comments of the Klamath Siskiyou Wildlands Center, the Center for Biological Diversity, the Karuk Tribe and the Environmental Protection Information Center and the Klamath Forest Alliance.	See response to number 12549-5

Code	Comment Number	Comment Text	Response
203 - Multiple Resources/Reasons	#5873-49	The agency often cites Franklin and Agee. 2003 "Forging a Science-Based National Forest Fire Policy," Issues in Science and Technology Online. Fall 2003. http://web.archive.org/web/20071215154828/http://www.issues.org/issues/20.1/franklin.html to support "active management" after fire. This paper simply does not support aggressive salvage logging. In fact, it has very short discussion of post fire logging that includes the following: Management of postburn areas, including timber salvage, needs to incorporate the concept of biological legacies. Salvaging dead and damaged trees from burns involves the ecology of a place, not simply economics and fuels. In addition to effects on postfire wildlife habitat, there are also effects of salvage logging on soils, sediments, water quality, and aquatic organisms. Significant scientific information exists on this topic as well as on biological legacies. Biological legacies differ by orders of magnitude in natural forests, a fact that should guide restoration programs. Where stand-replacement fires are characteristic, such as with lodgepole pine and Pacific Coast Douglas fir forests, massive areas of standing dead and down trees are usual; salvage operations generally are not needed and do not contribute to ecological recovery, even though they do provide economic return. On the other hand, uncharacteristic stand-replacement fires in dry forests can produce uncharacteristic levels of postfire fuels, including standing dead and down trees. Removing portions of that particular biological legacy may be appropriate as part of an intelligent ecological restoration program, and not simply as salvage. (emphasis added) At most this paper supports removal of a portion of the uncharacteristic fuels. The only fuels that would be "uncharacteristic" and the small trees that grew up as a result of fire suppression. If the tree was there before fire suppression, than it should remain after a stand replacing fire. Only small fuels should be removed. This intent is clear from Jerry Franklin's work on The Klamath Tribes' Forest Management Plan. Specific principles to guide removal of trees, snags, and logs from burned sites are as follows: … 2) Trees (live and dead) and down wood will be retained in sufficient quantities to provide for wildlife and ecological needs, including long-term structural enrichment of the site. However, this goal does have to be evaluated in the context of whether the post-fire levels of snags and down wood are within the characteristic range for the plant association; i.e., where pre-burn stands had uncharacteristic stand densities for that plant association. General guidelines for retention of trees (live and dead) and down wood within the wildfire area are as follows: Retain amounts and distributions of trees as would be characteristic of the pre-burn (historical) landscape … … Large snags persist for the longest period, and are most difficult to replace. Consequently, snag and log retention will focus on the largest (21"+ DBH) pieces in the post-burn landscape. … The retention standards should be checked to make sure that they will provide amounts and distributions of snags and down wood that will meet requirements for species at risk, sensitive species, and other species of special interest to the Tribes (such as mule deer). If they will not meet the species requirements, adjust the retention standards accordingly. There is an important caveat: this may not be done if providing for a particular species requires maintaining uncharacteristic levels of post-fire fuels over a significant portion of the burned landscape. As noted above, proposed levels of snag and down wood retention will be evaluated to determine that they will not result in fuel loadings that are above characteristic levels for the plant association. Where they do, the goal will be to adjust retention to characteristic levels. In such a case retention of the large snags and down wood will be the standard since these structures contribute less to fuels on a cubic foot basis, persist longer, and provide habitat for more species. (emphasis added) K. Norm Johnson, Jerry Franklin, Debora Johnson. The Klamath Tribes' Forest Management Plan. Dec 2003. http://web.archive.org/web/20040103034821/http://www.klamathtribes.org/forestplan.htm pp 108-109. The Franklin and Agee piece also makes clear that salvage logging must be considered in an ecological restoration framework and all adverse impacts of the logging must be considered. A truly ecological post-fire plan would involve: • rehabilitating fire fighting impacts (e.g. minimize erosion and block OHV use, re-establish native plant communities), • significant road closures to protect watershed values and avoid the knee-jerk removal of hazard trees, • culvert removal or replacement to provide for passage of fish sediment and woody debris, • a long-term plan for managing fuels in the future, • plans to avoid as much as possible impacts from seeding (e.g. weeds and competition with native plant communities), planting (dense plantations), logging (e.g. loss of snag habitat, loss of cover, etc.)	See the beginning of Chapter 3 for a discussion of responsible opposing points of view. The final EIS and supporting documents incorporate best available science.

Code	Comment Number	Comment Text	Response
203 - Multiple Resources/Reasons	#5873-97	The NEPA document also fails to disclose that NOT salvage logging (e.g., natural recovery) may have some countervailing benefits in terms of fire risk and reburn potential, including: (a) large logs store water, (b) standing snags provide some shade, (c) regrowth tends to be more patchy and less dense and continuous, (d) fuels in the form of branches and dead trees fall to the ground slowly over time and have a chance to decay as they added, (e) falling snags over time ten to break up the continuity of fuels in the form of brush and reprod.	The effects of not salvage harvesting are discussed under Alternative 1, no action. Throughout the document we acknowledge the importance of retaining large woody debris and snags. See the Chapter 1, salvage in Late-Successional Reserve and the beginning of Chapter 3 for responsible opposing points of view. Because we recognize the importance of these components on the landscape, coarse/large woody debris and snag retention were incorporated into project design; see watershed and wildlife project design features in Chapter 2 of the final EIS. Treatments are not affecting stream shade because no salvage harvest is proposed in hydrologic Riparian Reserves and project design features apply for roadside hazard treatments watershed-5 and -23, Chapter 2 of the final EIS). Outside of hydrologic Riparian Reserves, shade was also considered as follows: "Units identified for salvage harvest and site preparation and planting activities had high to moderate vegetation mortality due to the 2014 fires. These areas burned at such intensities that they no longer offer adequate canopy cover to provide the shade, moisture, humidity, and temperature characteristics required by most Sensitive species (assumption being field verified)." In the hydrology section of Chapter 3, Riparian Function is analyzed at the project scale. The analysis includes shade reduction not related to debris flows along stream channels. The trend also considers effects to large wood recruitment in the short and long term. We also analyze the difference between salvage logging and not in terms of fire hazard/risk and reburn potential. Fuel loading, decay rates, and brush regeneration are also considered in the fuels analysis; see Chapter 3 of the final EIS.
203 - Multiple Resources/Reasons	#7904-1	I'm writing to request that you withdraw the proposal for the "Westside Fire Recovery Project" in the Klamath National Forest. Fire is not only natural in this area, it is essential to maintain the area's natural diversity. And while recent fire suppression and other interventions have significantly changed the area's historical fire regime, and some fires today may therefore arguably cause harm to the ecosystem, the evidence now seems clear that post-fire logging generally increases any such negative impacts rather than mitigating them. This is especially true for the steep slopes and sensitive aquatic habitats which are the hallmarks of the entire Klamath bioregion and for the old-growth forests targeted for a substantial part of the Westside project. Please allow natural post-fire succession to take its course, and keep any interventions modest and science-driven, rather than industrial-scale and economically motivated as the Westside project appears to be.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised.
203 - Multiple Resources/Reasons	#9222-1	Please do your job and protect the Klamath National Forest. This is some of the most beautiful area I have backpacked and I feel a special need top speak in it's defense. Clear cutting this area will lead to a great deal of erosion, impairing the clean running of the streams, and hurting the salmon. Trees stabilize slopes and provide habitat for many species. Your own rules are in place to protect the forest and it's inhabitants. Follow these rules, don't circumvent them.	See response to comment number 6271-1.
204 - Wildlife	#14120-2	The animals are running out of places to live and be safe. Our wildlife are under threat from so many angles. They desperately need to be protected, mainly from humans. Life is hard enough for people, let alone the animals. Can't we please offer them some much needed help?!	The benefits and negative effects of the Westside Fire Recovery project on wildlife species in the project area are described in the Wildlife reports (Management Indicator Species, Survey and Manage, Biological Evaluation and Migratory Bird reports).
204 - Wildlife	#17349-9	Wildlife - For big game species the fires will be a positive thing in terms of forage quantity and quality over the next 10 years or more. Keep in mind that salvage and reforestation activities will also benefit these same species by creating a different age class of forage in the treated areas thereby extending the time period of favorable forage conditions. For old-growth species the fire obviously altered the habitat. Recovery treatments will have relatively small effects on the short term post fire habitat but will have substantial long term benefits from fuel treatments and tree species composition. Noise effects will be a factor but for the most part need to be tolerated in order to reap the long term benefits.	The big game species identified in the Forest Plan are a Management Indicator Species used for Forest Plan analysis and these species were not intended to be analyzed at the project scale. However, we have added a brief analysis to the in the Wildlife Report Amendment to respond to this comment.
204 - Wildlife	#17375-4	Any area that provides connectivity to previously impacted areas is of greater value to wildlife and water quality than the sum of the parts	Connectivity is addressed in the Wildlife Biological Evaluation (as amended). There is no salvage logging in the stream related Riparian Reserves which offer connectivity within and between watersheds. Alternatives 3 focuses on reducing the effects to connectivity in the Beaver Fire area and Alternative 5 does not have any salvage in the Late Successional Reserve. The project design and range of Alternatives illustrates the varied effects to connectivity that might occur while meeting the purpose and need.

Code	Comment Number	Comment Text	Response
204 - Wildlife	#17501-4	All units within the Westside Project that would require the removal of green trees for yarding or operational needs should be dropped from the project. All green trees should remain this burned ecosystem to help speed the recovery of the land on its own. Drop the units in the Caroline Creek Bald Eagle Management Area. There is no excuse for logging near bald eagle nesting sites. Bald eagles have evolved with fire and they will be more harmed from the logging of its snag habitat than it will be from the naturally occurring fire.	Forest Plan Standard and Guideline Management Area 5-43 which provides for a protection areas around nest and roosting sites was incorporated into the analysis and project design features. However, Forest Plan Standard and Guideline Management Area 5-57 provides an exemption for hazard tree removal and salvage activities that benefit eagle habitat. The salvage harvest reduces fuels around bald eagle nests and roost sites which is beneficial for reducing future wildfire behavior/severity in the future.
204 - Wildlife	#17501-6	How can the KNF possibly suggest that it is okay to log within northern spotted owl (NSO) home ranges? There are 94 nest sites, core areas and home ranges, also know as Activity Centers in the project area, 92 of these sites will be treated in the Westside Project. The project may adversely affect 70 NSO Activity Centers! How can this be acceptable when this species is listed as threatened under the ESA, and may be up-listed because its population continues to decline. At a continued loss of 3% a year according to U.S. Fish and Wildlife, the NSO will most likely be listed as endangered, but only because projects like the Westside still keep getting proposed. There is no reason to log within NSO activity centers when there is so much timber that can still be logged from second growth or areas that don't have NSO activity centers. Drop all units in the Westside Project that will adversely impact the NSO. Contradicting the findings of the DEIS, that NSO use of burned areas is scientifically unclear, the Wildlife BA makes it clear that "owl use of burned areas is well documented," and that "snags and live trees" in burn areas are used for perch sites when foraging in fire-effected areas (Wildlife BA P. 38). The Wildlife BA also identifies a study by Clark (2007), stating that NSO often respond to severe fires by expanding home range size. This study and its findings were not adequately utilized in the DEIS analysis and all home ranges effected by high severity fire should be expanded by at least one-third to address direct and indirect NSO impacts In some areas salvage logging has excluded most of the inventoried roadless area from potential wilderness designation. Thousands of acres have been salvage logged with extreme impacts to roadless values. Many of the areas identified in the Forest Plan as not currently meeting the criteria for retention of roadless area values are listed as showing signs of "alteration" or "excessive alteration" due to degradation by salvage logging. In areas where "natural integrity in no longer maintained," salvage logging is nearly always to blame. I believe the KNF must fully disclose these forest-wide impacts to an important forest resource -roadless areas - by identifying the number of acres salvage logged in roadless areas since 1987, the percentage of roadless areas impacted by salvage logging, the percentage of roadless acreage impacted and the cumulative impact of this logging in roadless habitats. In their paper, "Restoration of Federal Forests in the Pacific Northwest," professors Norm Johnson and Jerry Franklin state, "Conflicts often exist between economic and ecological objectives as timber salvage is generally about recovering economic values rather than enhancing ecological recovery." They also list three recommendations under "General Post Disturbance Guidance," these recommendations include: 1) Do no significant additional ecological damage to the biota and functional capabilities of the post disturbance ecosystem, with particular consideration of soil and aquatic resources. 2) Consider the merit of potential activities in the context of the primary management objectives for the site. For example, salvage would appear to be inappropriate in areas that have been allocated primarily to maintenance of native biodiversity and functions and natural forest ecosystems (including old growth) and 3)	Northern Spotted owl use of fire affected areas is described in the Biological Assessment in the section called “northern spotted owl use of the post-fire landscape”. In this section of the Biological Assessment, the summary of literature on this topic includes Dr. Clark among may other researchers that have contributed to the current body of literature on northern spotted owl use of fire affected landscapes. The past actions on the Forest including salvage harvest were incorporated in the wildlife analysis by evaluating the existing condition of habitat. Estimating the amount of salvage harvest in 1987 will not change the existing habitat in the project area. The existing habitat is the result of many factors including human and natural disturbances. Thank you for pointing out these management recommendations. After reviewing “Restoration of federal forests in the Pacific Northwest: strategies and management implications” authored by Johnson and Franklin (2009), we didn’t find the same recommendations in the document as those presented in the comment. However, the commenter seems to be pointing out a concern about salvage harvest. The final EIS provides information concerning salvage harvest in Chapter 3 of the final EIS in the sections called “Responsible opposing views and agency’s response to issues raised”.
204 - Wildlife	#17764-2	You should take a lot more time considering all of the wildlife habitats you are going to disrupt by trying to allow anyone to begin cutting this summer, 2015.	Several reports were generated to describe the effects to a wide array of habitat and species as a result of all of the action Alternatives of the Westside Fire Recovery project. These include the Management Indicator Species report, the Biological Evaluation, the Survey and Manage report and the Migratory Bird Report. These reports have been further amended as a result of additional information and public comment. The results of the analysis contained in the reports is summarized in the draft EIS and in the final EIS.
204 - Wildlife	#18726-2	All trees that might possibly survive are needed for site regeneration. They provide site adapted seed sources, shade for seedlings, and many benefits for wildlife. It is natural for trees to die. Diseased, damaged and dead trees provide key structural components in late successional forests. They provide important habitat for wildlife	Trees that have less than a 70% probability of mortality (as defined by Report #RO-11-01) in the next three to five years are not being considered for salvage harvest (See Chapter 2 of the final EIS). Fire killed trees will be retained in hydrologic Riparian Reserves, inner gorges and other retention areas to ensure legacy components remain on the landscape until the ecosystem is capable of replacing them (See Response 2 in the "Responsible Opposing Views and Agency's Response to Issues Raised" in Chapter 3 of the final EIS).

Code	Comment Number	Comment Text	Response
204 - Wildlife	#18859-5	As a professional wildlife biologist with nearly 25 years of experience working in northern California forest ecosystems, it is imperative to the future of our forests to implement recovery and restoration efforts as soon as possible. It is my professional opinion that the Westside Recovery Project will have no significant negative impact on species such as northern spotted owls, Pacific fisher, and coho salmon. The greater long term threat to these species is not implementing this project and dealing with the inevitable re-burn that will take place on these acres.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
204 - Wildlife	#18899-1	The Center for Biological Diversity, KS Wild, Environmental Protection Information Center, and Klamath Forest Alliance submit the attached comments from spotted owl biologist Monica Bond regarding the impacts of the proposed Westside Project on the ESA listed northern spotted owl. We respectfully urge you to protect northern spotted owl habitat within the Project area from salvage logging, including (and especially) the severely burned forest that these owls rely on in post-fire landscapes for finding the food they need to survive. For example, Clark et al. 2013 determined that no salvage logging should occur within a 2.2. km radius of owl centers in order to protect owl habitat (nesting, roosting, and foraging) in post-fire landscapes. Moreover, because northern spotted owls are listed under the ESA, protection of their habitat, as a matter of law, must err on the side of conservation.	The commenter overstates the results of a researcher. Clark's 2007 thesis and subsequent papers are clear that he was unable to separate the effects of high-severity fire, salvage logging and past timber harvest. Darren Clark's 2013 paper coauthored by Dr. Robert Anthony and Dr. Lawrence Andrews provides strong evidence that site occupancy of spotted owl nesting territories declined in the short-term following wildfire, and that habitat modification and loss due to past timber harvest, high severity fire and salvage logging jointly contributed to declines in site occupancy, his research cannot tell us definitively how salvage logging itself contributed to the effect. His 2011 paper, again co-authored by Drs. Anthony and Andrews, notes that survival rates in post-fire landscapes may be influenced by habitat degradation in stands of low to moderate severity fire due to delayed tree mortality, changes in microclimate and prey abundance or increased predator pressure, all of which are co-variates that have not been adequately studied in the scant literature on owls and wildfire. In his 2013 paper, Clark suggests "a cautionary approach when applying our findings to future land management decisions." Although he recommends restricting salvage logging on public lands within 2.2 kilometers of spotted owl territories, his recommendation does not have the certainty of the commenter's statement that he "determined that no salvage logging should occur within a 2.2 km radius of owl centers…" Indeed the Endangered Species Act requires that consulting biologists 'err on the side of the species' in providing guidance in an uncertain field. Note that the low-level of treatment across the very large fire-affected areas (6.3 % of the fire affected area is actually being considered for salvage) could indeed be interpreted as a conservative approach. Moreover, the Endangered Species Act doesn't generally require a full ' hands off' approach unless an action truly jeopardizes the continuing existence of the species. The Endangered Species Act certainly allows for moderate levels of treatment including and up to treatments that may result in actual 'take' of a species. Given the low level of take requested in this project and the large amounts of fire-affected lands that will be left untreated or very lightly treated, this decision certainly 'errs on the side of the species.'

Code	Comment Number	Comment Text	Response
204 - Wildlife	#18916-2	The DEIS makes the following representation regarding my 2013 study pertaining to Pacific fishers and wildland fire: "Fisher use of fire affected habitat is not well understood (Hanson 2013). In southern Sierra Nevada, fisher scat was found in pre-fire dense, mature mixed conifer that was both fire effected and not fire effected (Hanson 2013). However, the study didn't provide an estimate of post-fire canopy cover which can be an important habitat component in linking fisher use with habitat conditions. In addition, forest stand complexity and physical structure can provide cover that is likely important for fisher in fire affected forests, but these attributes were not measured. Basically, the article (Hanson 2013) provided some evidence that fisher will use fire affected habitat, but the stand characteristics that may aid in explaining these observations were not explored." With regard to DEIS's characterization of Hanson (2013), it dodges the central findings, and is misleading and internally contradictory. For example, the Wildlife Biological Evaluation (on p. 20), which was incorporated by reference into the DEIS, claims that I did not include forest structure in my analysis, but in the first quoted sentence above the DEIS admits the opposite. In fact, I explicitly analyzed fisher use by fire severity and pre-fire structure/composition--both dominant size class and canopy cover--and forest type (see Abstract, and Results at p. 26, of Hanson 2013). Further, the DEIS claims that I didn't quantify post-fire effects, but this is inaccurate. In my Methods (see p. 25 of my study), I explicitly describe the fire severity categories analyzed, and the level and range of tree basal area mortality associated with each (canopy cover mortality levels track very closely with percent basal area mortality--see, e.g., Miller et al. 2009), where higher-severity was defined as 50-100% basal area mortality (which is the equivalent of 50-100% canopy cover mortality-see Miller et al. 2009, Vol. 113, pp. 645-656 in Remote Sensing of Environment). Below is a brief summary of my findings in Hanson (2013): Hanson, C.T. 2013. Pacific fisher habitat use of a heterogeneous post-fire and unburned landscape in the southern Sierra Nevada, California, USA. The Open Forest Science Journal 6: 24-30. (Pacific fishers are using pre-fire mature/old forest that experienced moderate/higher-severity fire more than expected based upon availability, just as fishers are selecting dense, mature/old forest in its unburned state as well. The proportion of higher-severity fire was significantly higher within 0.5 kilometers of fisher detection locations than at random locations, indicating that fishers are selecting areas with relatively higher levels of higher-intensity fire. When fishers are near fire perimeters, they strongly select the burned side of the fire edge. Both males and female fishers are using large mixed-intensity fire areas, such as the McNally fire, including several kilometers into the fire area.) In addition, I gathered additional data in the McNally fire, using the same methods described in Hanson (2013), but focused mainly in large higher-severity fire patches, and found very strong use of large, intense fire areas patches in dense, mature/old conifer forest, especially by female fishers. My findings are in-press in a new study, Hanson (2015), the results of which I summarize below: Hanson, C.T. 2015. Use of higher-severity fire areas by female Pacific fishers on the Kern Plateau, Sierra Nevada, California, USA. The Wildlife Society Bulletin (in press). (Using a Pacific fisher scat-detection approach, the current hypothesis among land managers that fishers will avoid higher-intensity fire areas was rejected, and fishers used unlogged higher-intensity fire areas at levels comparable to use of unburned dense, mature/old forest. Female fishers demonstrated a significant selection in favor of the large, intense McNally fire over adjacent unburned mature/old forest, and the highest frequency of female fisher scat detection was over 250 meters into the interior of the largest higher-intensity fire patch (over 12,000 acres).	See response to comment 18916-3.

Code	Comment Number	Comment Text	Response
204 - Wildlife	#18916-3	The Wildlife BE (p. 20) also claims the following, in response to Hanson (2013): "Even areas with shrub and other ground cover, fisher are subject to higher rates of predation (Wengert 2013)." However, this is inaccurate and highly misleading, as the areas Wengert (2013) found to represent the overlap between predators of fishers, and fishers, were barren/rocky areas and open/shrub areas that were not consistent with dense, old forest that burned at higher-severity. Higher-severity fire occurring in dense, old conifer forest creates a unique forest habitat type called "complex early seral forest", which cannot be equated with general "open" or "shrub" conditions. Many types of ground cover are open, or are comprised of some level of some type of shrubs, but this does not make them complex early seral forest, which contains an abundance not only of tall, mature shrubs (which provide high levels of cover for hunting fishers), but also a very high abundance of medium and large snags, and downed logs (which fishers can travel next to for cover from predation). Because of these factors, the open/shrub areas in Wengert (2013), as described in the Wildlife BE, cannot be honestly compared to the complex early seral forest areas that fishers are actively using, and selecting, in Hanson (2013) and Hanson (2015) and, by the same token, cannot be compared to the areas of dense, mature/old forest that experienced higher-severity fire in the Westside fire area. Suggestions to the contrary are not scientifically legitimate or valid, and appear to be nothing more than an attempt to dismiss and minimize adverse effects of the proposed post-fire logging on a species that is proposed for listing under the ESA. As I concluded on p. 28 of Hanson (2013): "My results indicate that fishers benefit not from moderate/higher-severity fire in general but, rather, moderate/higher-severity fire in mature/old forest with moderate to high pre-fire canopy cover. Such areas have high structural complexity [21, 30], and can have higher overall biomass (live and dead sources combined) than unburned old forest [31]. Both of these are reduced by postfire logging [32]…While moderate- and higher-severity fire certainly reduce overstory canopy cover, they greatly accentuate structural complexity, and density, with regard to snags, downed logs, montane chaparral patches, and natural conifer regeneration patches [21, 30, 34] (Fig. 3). The "complex early seral forest" habitat resulting from higher-severity fire is, as a result of this complexity and high biomass, rich in native biodiversity and wildlife abundance [21, 34-38]. This may help explain why fishers are not declining on the Kern Plateau [27], despite the fact that a high proportion of the forested landscape has recently experienced large, mixed-severity fires." I encourage you to withdraw the Westside post-fire logging project, or at least scale it back dramatically to avoid logging in LSRs and roadless areas, and generally areas of dense, mature/old forest that experienced moderate/high-severity fire in order to avoid adverse impacts to Pacific fishers, based upon the best available science. In such a revised project, as I recommend, management would be limited to felling genuine hazard trees that are dead and are within falling distance of roads maintained for public use (maintenance level 3, 4, and 5 only).	The approach to analyzing fisher included concepts from Hanson (2013). As of the date of this response Hanson (2015) was not available for review. Fisher habitat classifications are described in Table 7 of the Biological Evaluation(as amended). The fisher analysis was updated for the final EIS and does not assume that all areas burned with high or moderate severity were non-habitat. Denning/Resting and foraging habitat that was burned with high/moderate severity fire was assumed to become movement habitat. Movement habitat was considered habitat in both the connectivity and home range analysis. So areas that met denning/resting and foraging habitat that burned with moderate and high severity where treatment is proposed is assumed to be a modification or removal of fisher habitat.
204 - Wildlife	#18926-17	The salvage activities proposed within LSRs as part of the Westside Fire Recovery Plan are inconsistent with NWFP intent and direction for management of LSRs, including their treatment following a major disturbance. Salvage will make no positive contribution to the reestablishment of late-successional forest habitat or to the early successional ecosystems that provide habitat for NSO prey species, among many others. Retention of large snags and logs are critical parts of the natural recovery processes and none of this wood legacy can be demonstrated as being in excess to ecological needs on moist forest sites; indeed, all of the scientific evidence is to the contrary. Removal of medium and fine fuels, but not large snags and logs, may be ecologically justifiable on sites characterized by PAGs with Fire Regimes I and II. Issues associated with fire suppression could be addressed by creating snag-free corridors or narrow FMZs. Some limited tree planting may be justified to provide seed sources for tree species otherwise likely to be absent or under-represented but the plantings should be carried out in low numbers and at variable density. Establishment of large areas of plantations, even at low density, is inappropriate within the LSRs or on sites characterized by Fire Regimes I and II. Current knowledge regarding the ecology and recovery of the NSO is inadequate in the DEIS should be considered during revision of the DEIS or a Final Environmental Impact Statement.! ! To support this position on what to do in an LSR after a forest fire (salvage logging, tree planting, etc) and consistency with the Northwest Forest Plan, I hereby incorporate by reference the comments	See EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised for a discussion of the many issues raised in this comment.

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		with scientific studies dated April 6, 2015 and submitted on April 21, 2015 by Dr. Jerry Franklin for the Westside Fire Recovery Project.! !	
204.01 - NSO	#12346-72	Conservation of listed species is literally an afterthought in the KNF's rush to salvage log as many acres as possible as quickly as possible. The Biological Evaluation (BE) and Biological Assessment (BA) for impacts to the NSO cannot inform agency planning or alternative development because the logging alternatives were developed prior to the completion of a BE or BA. Indeed, as of March 31, 2015, neither document is available to the public during the DEIS commenting period and neither document informed development of the DEIS. Please note that page 10 of the Wildlife Biological Report contends that "[a] detailed discussion and review of the literature concerning NSO use of fire affected forest is available in the Biological Assessment." But it was not. Throughout much of the truncated NEPA commenting period the KNF has withheld the BA from the public. Similarly, page 12 of the WBR incorrectly states that "[m]ore information on NSO critical habitat is available in the project Biological Assessment. As of March 31, 2015, this statement is simply false. The alleged information is unavailable to the public. Page 38 of the WBR contends that "[a] detailed description of [the] affected environment for the northern spotted owl is described in the project Biological Assessment." This may be so, but such a description is useless if the public is precluded from being able to review it in a timely manner.Page 149 of the DEIS indicates that the KNF intends to log 1,205 acres of habitat deemed critical for the survival and recovery of the NSO. Page 3-4 of the DEIS discloses (but does not analyze) that the 2014 fires negatively impact 31,000 acres of suitable NSO habitat. The KNF proposes to further remove 456 acres of Nesting and Roosting habitat, 432 acres of Foraging habitat and 317 acres of Dispersal habitat (DEIS page 149) through the logging of large snags, future coarse woody debris, and roadside logging of live green trees in stands that currently provide critical NSO habitat in Late-Succesional Reserves. This LSR and CHU logging will have the effect of "reducing canopy cover and other habitat characteristics" necessary for the survival and recovery of the species. Rather than protect, restore and conserve the remaining NSO habitat, KNF timber planners prefer to rely upon the contention that they are not increasing the risk to NSO reproduction "not because the actions [logging] do not have an effect but because most of the activity centers with other actions are already at the highest level of risk for this analysis." This is an unacceptable approach to the recovery of a threatened subspecies whose population is in decline and cuts against Recovery Action 12 of the 2011 final NSO Recovery Plan.	It was the Forest's intention to post the Wildlife Biological Evaluation and Wildlife Biological Assessment at the same time for public comment. We recognize there was a delay in posting the Biological Assessment, but this document was available to the public during about half of the comment period and subsequently, the Forest extended the comment period. The northern spotted recovery plan consistency is discussed in the Wildlife Biological Assessment in Table 2 and Appendix B. However, it is important to acknowledge that the analysis presented in the Wildlife Biological Evaluation or the Wildlife Biological Assessment for Critical Habitat was not intended to be a measure of the Recovery Plan. The Recovery Plan is a guidance document that provides recommendations to aid in the recovery of the northern spotted owl. The Recovery Plan is also intended to be used as a whole and not necessarily as individual Recovery Actions.

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204.01 - NSO	#12346-73	As stated on page 49 of the WBER: Overall, the amount of NSO critical habitat has been on a decline because of large fire events that resulted in removing many acres of habitat. The 2014 fires added to this negative trend in the amount and quality of NSO critical habitat. The additional removal of NSO critical habitat from alternative 2 will continue this negative trend. Even though 3 On March 27, 2015, two weeks after commencement of the shortened DEIS commenting period (due to "Alternative NEPA Arrangements) KS Wild received an email from Wendy Coats of the KNF indicating that an Updated Wildlife Biological Report had been placed on the project web site and that the updated document scrubbed all mention of the still unavailable Biological Evaluation and Biological Assessment which continue to be incomplete and hence incapable of influencing the design of the proposed logging alternatives which the public is tasked with commenting upon. 26 there is no defined minimum threshold for NSO critical habitat that would aid in determining the magnitude of effects, KLE7 is likely the most affected critical habitat subunit from fires in the last few decades in the project area and the proposed [logging] treatments will further affect some of the remaining habitat. On April 2, 2015, several weeks into the public comment period for the Westside salvage logging project, the KNF belated released a Draft Biological Assessment for the spotted owl. Pages 55-56 of that document indicate that the agency intends to take action which may jeopardize the continued existence of the species in the Klamath National Forest. KNF timber planners intend to conduct logging activities "Likely to Adversely Affect" 70 owl activity centers. Page 56 of the Draft BA concludes "a total of 75% of the ACs [activity centers] in the analysis area will be adversely affected by the proposed treatments. In addition, 23% of all activity centers on the west side of the KNF will be adversely affected by the proposed activities." It appears that the KNF also intends to remove designated NSO critical habitat located in known activity centers that have been designated critical to providing demographic population support for the species. The DEIS and the Draft BA fail to disclose or analyze the location and impacts of critical habitat removal that occurs outside of known NSO activity centers. The Northern Spotted Owl Recovery Plan (2011; NSO RP) provides direction to the Forest Service regarding the management of spotted owls generally, as well as after wildfire specifically. According to the United States Fish and Wildlife Service, "Recovery Actions' are near-term recommendations to guide the activities needed to accomplish the recovery objectives and achieve the recovery criteria," such that a species may be delisted from ESA protection. Recovery Action 10 directs federal agencies to: "Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population. The intent of this recovery action is to protect, enhance and develop habitat in the quantity and distribution necessary to provide for the long-term recovery of spotted owls." NSO RP, III-43. The NSO RP also states "this recommendation includes currently occupied as well as historically occupied sites (collectively "spotted owl sites," see Appendix G: Glossary of Terms)." Id. at III- 42. Furthermore, the NSO RP states that "As a general rule, forest management activities that are likely to diminish a home range's capability to support spotted owl occupancy, survival and reproduction in the long-term should be discouraged." Id. at III-43. It appears that the Westside project is likely to adversely affect 70 spotted owls, and yet the Forest Service nonetheless is proposing to move forward with post-fire logging activities that will not "conserve" spotted owl sites. In addition, post-fire logging will "diminish a home range's capability to support spotted owl occupancy, survival and reproduction in the long-term," the very activity the NSO RP states should not occur. NSO Recovery Plan Recovery Action 12 directs: "In lands where management is focused on development of spotted owl habitat, post-fire silvicultural activities should concentrate on conserving and restoring habitat elements that take a long time to develop (e.g., large 27 trees, medium and large snags, downed wood)." NSO RP, III-49. Post-fire logging particularly targets medium and large fire-killed trees (snags) for removal. The NEPA analysis does not explain how the proposed action is consistent with these (and other) provisions of the NSO RP, as required by law. 40 C.F.R. § 1508.27(b)(10) (consideration of a project's significance requires an analysis of "Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment").	The Endangered Species Act does not allow a Federal agency to “Jeopardize” any threatened, endangered, or proposed species. To ensure that “Jeopardy” does not happen, the action agency must consult with the U.S. Fish and Wildlife Service or National Marine Fisheries Service. The Forest has been in consultation with both of these Federal agencies for the past several months. However, the action agency can consult on a project that may result in effects that are likely to adversely affect a spotted owl activity center as long as the action doesn’t reach the point of “Jeopardy”. The Wildlife Biological Evaluation and the Wildlife Biological Assessment both analyze the effects of the proposed activities on spotted owl critical habitat and spotted owl activity centers. The critical habitat and activity center analyses are not the same. Activity centers may or may not contain critical habitat but the effects to an activity center are the same regardless whether this activity center contains critical habitat. Critical habitat is a geographically defined area that varying amounts and quality of habitat; however, the effects to critical are assessed based on the “primary constituent elements” that represent the important biological elements for spotted owl habitat. The effects analysis for critical habitat estimates the effects to the primary constituent elements within each Critical Habitat subunit. The Northern Spotted Owl Recovery Plan is not a regulatory document. The Recovery Plan provides many recommendations to minimize effects to spotted owls. Recovery Action 12 speaks directly to the need for post-fire silvicultural treatments should focus on conserving and restoring habitat elements that take a long time to develop (e.g. large trees, medium, and large snags, down wood). The Recovery Plan also discusses the one of the primary threats to spotted owls is the loss of habitat to wildfire. The Westside Fire Recovery Project is trying to balance the current and future needs of northern spotted owls and their habitat. More information is available in the final EIS under the heading titled “Responsible opposing views and agencies’ responses to issues raised” the second topic called “Whether there is “excess material” that can be removed” provides a detailed description of the various guiding documents used to inform land management and snag retention. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

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204.01 - NSO	#12346-74	Similarly, the NEPA analysis does not explain how the Westside project will contribute to the recovery of the northern spotted owl. 40 C.F.R. § 1508.27(b); 16 U.S.C. 1536. The DEIS also misrepresents the best available science on spotted owl use of burned forests. The DEIS erroneously states that "The use of post-fire burned areas for foraging is a point of disagreement in the literature because there is little evidence to support idea that these areas are actually being used for foraging; although owls have been found in these areas, there is no evidence that they are foraging. For the purpose of this analysis, due to the lack of information on how these burned areas are being used, use of post-fire burned areas for foraging will not be discussed further." DEIS, 132. This is in error. As the FWS has stated, the "best available information suggests that even with loss of forest canopy cover and other key habitat components typically found in NRF habitat, burned areas can provide some habitat function for spotted owls depending on fire severity. For example, areas that burned at low severity in some cases still provided spotted owl nesting, roosting, and foraging function. Areas that were burned at moderate and high severity may provide some limited nesting and foraging depending on burn patch size, edge type, and proximity to known sites (Bond et al. 2002, Bond et al. 2009, Clark 2007, Clark et al. 2011, and Clark et al. 2013 plus other authors per Appendix C)." United States Fish and Wildlife Service, Biological Opinion for the Douglas Complex Post-Fire Salvage project, TAILS #01EOFW00-2014-F-0161 (2014) (Douglas Complex BiOp). FWS also explains that "studies of spotted owls in post-fire landscapes indicate that spotted owls use forest stands that have been burned, but generally do not use stands that have been burned and logged." Id. While spotted owls prefer late-successional habitat when it is available, they have been observed foraging in areas burned by fires of all intensity categories. The research indicates that "low- to moderate-severity fires that retain adequate canopy can function for nesting or roosting and thus allow the continued use of spotted owl activity centers, while territories that burned at high-severity no longer supported nesting spotted owls. It is expected that within mixed severity burns, spotted owls will select the best available post-fire suitable habitat and Activity Centers at these locations may persist into the future." Id. "However, results of these and other studies are confounded because of post-fire logging that occurred within the study areas." Id. "While the role of this burned habitat is unclear in overall spotted owl population maintenance, available information suggests that in the short-term this habitat, in particular when it is salvage logged, likely contributes to reductions in spotted owl survival and occupancy." Id. Indeed, "spotted owl use of these burned areas is well documented (Bond et al 2002, Bond et al. 2009, Clark 2007, Clark et al. 2011, Clark et al. 2013, Gaines et al. 1995, Jenness et al. 2004, King et al. 1998, Lee et al. 2012, Roberts et al. 2011)." See also, NSO RP, III-47 - III-49. Similarly, the DEIS fails to discuss how spotted owls change their use of habitat post-fire. According to the FWS, "Where spotted owl activity centers are affected by fire (any range of severities) but sufficient habitat remains in the home range and immediately adjacent area, site fidelity may cause spotted owls to increase the size of their home ranges or shift locations to encompass the best available habitats rather than vacate the burned site (King et al. 1998, Clark 2007, Clark et al. 2011, 2013). Thus, a shift by spotted owls may occur under conditions where the burned area is presumably still functional in terms of extant spotted owl habitat and the affected area is considered to be occupied. This shift is likely to occur within the pre-fire home range of the affected spotted owl(s)." Douglas Complex BiOp. Indeed, "Clark (2007) found that in high severity burned landscapes, and landscapes with salvage harvest, spotted owls are likely to increase their home ranges to compensate for the loss of suitable habitat and this will likely impact spotted owl habitat-fitness." Id. Clark and others concluded that "spotted owls may shift their habitat use patterns and/or increase their home range size to encompass the best available suitable habitat post-fire rather than vacate the affected site, unless very poor habitat conditions exist over much of their home range (King et al. 1998, Clark 2007)." Id. Spotted owls that shift and/or expand their home ranges in response to wildfire take advantage of unoccupied habitat that may be necessary for the species to persist in a postfire environment. The NSO Recovery Plan states that "it is not uncommon for an occupied spotted owl site to be unoccupied in subsequent years, only to be re-occupied by the same or different spotted owls two, three or even more years later (Dugger et al. 2009). While temporarily unoccupied, these sites provide conservation value to the species by providing habitat that can	As stated in the draft Wildlife Biological Assessment submitted to U.S. Fish and Wildlife Service on April 16, 2015 and posted to the project website on the same day, "the U.S. Fish and Wildlife Service compilation and review of the most recent and pertinent research on northern spotted owl use of the post fire landscape... had considerable influence on the effectsanalysis for the proposed Westside Fire Recovery project. Information within Appendix C of theDouglas Biological Opinion has been incorporated into the analysis of northern spotted owl use of a post-fire landscapeand the assessment effects from the proposed project." Please see the Wildlife Biological Assessment for more information on the results of these studies and how their analyses were incorporated into the Westside Fire Recovery project.

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		be used by spotted owls on nearby sites while also providing viable locations on which future pairs or territorial singles can establish territories." NSO RP, III-45. Unoccupied owl habitat is important post-fire because it represents vacant territory that may be recolonized by shifting or dispersing owls. In a heavily fragmented landscape like the planning area, these "vacant" sites may represent the best remaining suitable habitat. Id. The DEIS does not address this issue at all. At the very least, there is scientific controversy around the use of burned forests by northern spotted owls. The Forest Service is required by NEPA to disclose and respond to this controversy in the FEIS. 40 C.F.R. §§ 1502.24; 1508.27(b)(4); 1502.9.	
204.01 - NSO	#12707-1	The below seems accurate after considerable time researching. However, understand also that the Northern Spotted owl is now a serious candidate for Endangered status with USFWS. What this means, is that ANY habitat fragmentation occurring through post-fire logging is now being scientifically understood as having severe repercussions for their local survival or extinction. Please review the repeated information below. thank you.	The Northern Spotted Owl Recovery Plan identified current and past habitat loss and competition with barred owls are the primary threats to spotted owl. Habitat loss can result from natural disturbances and land management, but wildfire, at least in the Klamath Province, is the leading cause of habitat loss. However, recent research has provided information that spotted owls, under certain circumstances, may not be as affected by fire as previously thought. Despite this information, the research community hasn't agreed to the level of effects fire may have on spotted owls. In the Biological Assessment under the subsection called "northern spotted owl use of the post-fire landscape" provides a summary of the research related to spotted owl use of fire affected habitat and potential effects to activity center occupancy, survival, and reproduction.

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204.01 - NSO	#17111-12	The NSO is a species of special interest and one that almost certainly has been significantly negatively impacted by the 2014 fires. Restoration of suitable habitat for NSO has been used as a justification for intensive salvage and tree planting programs, such as in Alternative #2 of the DEIS. However, there is no scientific evidence to support the hypothesis that either activity will contribute either significantly or positively to a more rapid recovery of NSO habitat or NSO populations than allowing natural recovery processes. In fact, it is certain that salvage will not do so; the potential value of some tree planti ng could be argued.	The restoration aspect of the Westside Fire Recovery Project is not for the sole benefit of spotted owls; rather the purpose and need of the project identifies particular elements that benefit current and future forests which happens to benefit spotted owls. Our project has no intent to manage spotted owl populations; the Forest focuses our efforts to manage areas for multiple uses including habitat for spotted owls. Our project is designed to target the issue of reducing the risk of large scale high severity fire; this design is directly in line with the Northern Spotted Owl Recovery Plan which identifies one of the primary threats to spotted owls is the loss of habitat to wildfire. Tree planting research has provided information that sometimes appears to be contradicting, but like most research, the substantive enrichment is located in the details. Whether tree planting is helpful towards the regeneration of forested habitat is not a simple answer. Chapter 3 of the EIS provides a detailed response on the topic of tree planting in the sections called “Responsible opposing views and Agency’s to issues raised”.
204.01 - NSO	#17111-17	This significant information regardi ng NSO, as well as impacts of the Barred Owl, needs to be acknowledged and considered in the final EIS. Specific consideration needs to be given to the impacts of: (I) salvage on development of the debris-rich Jate-successional conditions characteristic of forested NSO (and prey) habitat; and (2) establishment of conifer plantations on the amount and distribution of shrub-dominated early successional habitat in which the woodrat resides.	See response to 18899-8
204.01 - NSO	#17111-22	Salvage will make no positive contribution to the reestablishment of late successional forest habitat or to the early successional ecosystems that provide habitat for NSO prey species, among many others.	Thank you for sharing your opinion. The final EIS provides information concerning tree planting in Chapter 3 of the final EIS in the sections called “Responsible opposing views and Agency’s to issues raised”. The Wildlife Biological Assessment provides an effects analysis for the proposed treatments on prey species located in the section called “effects on prey, competitors or predators”.
204.01 - NSO	#17111-23	Retention of large snags and logs are critical parts of the natural recovery processes and none of this wood legacy can be demonstrated as being in excess to ecological needs on moist forest sites; indeed, all of the scientific evidence is to the contrary. Removal of medium and fine fuels, but not large snags and Jogs, may be ecologically justifiable on sites characterized by PAGs with Fire Regimes I and II.	Response 2 in the "Responsible Opposing Views and Agency's Response to Issues Raised" in Chapter 3 of the final EIS describes the balance the Westside Fire Recovery is striking between retaining legacy components on the landscape until the ecosystem can replace them and reducing the risk of future wildfire. The analysis, along with the Fire and Fuels analysis in Chapter 3 of the final EIS, argues that retention of all dead wood currently on the landscape creates an undesirable risk of future high-severity fire. See also EIS Chapter 3, Responsible Opposing Views and Agency’s Responses to Issues Raised
204.01 - NSO	#17111-28	The DEIS does not appear to include some current and relevant information regard ing habitat preferences of the NSO. Alan B. Frankli n et al. (2000) report that in northwestern California, the highest habitat fitness for NSO is found in landscapes that are a mixture of mature and old forest with open vegetation types, such as brush fields and young forest, and not i n landscapes dominated by old forests. The fact that an early successional species -the dusky-footed woodrat -is the primary prey for NSO in this region may be part of the reason that owls prefer a mixed landscape. In any case, the fact that habitat fitness for the owl is favored by a heterogeneous landscape mosaic should be factored into decisions regarding establishment of conifer plantations, both withi n and outside of LSRs	Like Dr. Franklin and co-authors (2000) point out in their article, the general area where our project area occurs displays a heterogeneous environment of habitats; this complex environment is largely shaped by wildfire that may be best described as low to moderate severity fire environment (Taylor and Skinner, 1997). Spotted owl prey species can occupy the same habitat commonly associated with spotted owls, but some prey species like the woodrat or mouse can be found in early successional habitat. However, the fires occurring in 2014 burned very large areas (100s of contiguous acres) at high fire severity in portion of the fire perimeters while other portions burned in at severities and scale that more closely resemble those that would create the complex habitat that Dr. Franklin described. The Westside Fire Recovery Project is focusing salvage harvest in the large patches of high severity fire and reduces treatment in areas that more closely resemble the complex habitat that is associated with the project. Planting of trees in the project is not intended to interfere with the complex habitats. This is evident by the tree planting prescription and design which avoids rows of evenly spaced planted trees. Instead, the planting prescription attempts to provide a balance between giving young trees some help to grow with less competition but the space between these planted trees will still provide the herbaceous and brush components that are common in early successional habitat in the project area. The final EIS provides information concerning tree planting in Chapter 3 of the final EIS in the sections called “Responsible opposing views and Agency’s to issues raised”.

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204.01 - NSO	#17111-29	Unfortunately, the DEIS also fai ls to acknowledge some important information with regards to the ecology of the NSO in the Klamath-Siskiyou region, either in the literature review or in analyzing effects of various alternatives. In a study of NSO habitat fitness in relation to landscape conditions, A. Franklin et al. (2000) show that a mosaic of older forest interspersed with early successional vegetation types had the highest fitness for NSO. Landscapes dominated either primarily or exclusively by older forest or primarily by early successional vegetation provided lower levels of fitness than the mosaic based on estimates of survival and fecundity. Hence, landscape mosaics of mature and old forest and early successional habitats, the latter including brush fields, would be appropriate recovery targets for restoration programs focused on NSO habitat	Dr. Franklin and co-authors article titled “Climate, habitat quality, and fitness potential in Northern Spotted Owl populations in Northwestern California” (2000) provide an abundant amount of information linking Northern Spotted Owl and ecological theory. The Westside Fire Recovery used Dr. Franklin’s work in the analysis for Northern Spotted Owls in the Wildlife Biological Assessment located in the section called “methods for assessing habitat fitness of fire-affected activity centers”. The Wildlife Biological Assessment explicitly uses Dr. Franklin’s work in combination with more recent research to identify the spotted owl activity centers that are more likely to contribute to higher levels of survival and reproduction as identified in the Wildlife Biological Assessment as “fitness potential”. In other words, activity centers with “high fitness potential” are more likely to provide resources to support survival and reproduction than an activity center identified with “low fitness potential”. This information was used in the development of the project Alternatives, especially Alternative 3 and modified Alternative 3.
204.01 - NSO	#17111-30	I also noted that the DEIS does not appear to have fully considered recommendations of the 2011 Final Revised NSO Recovery Plan. Specifically, Recovery Plan Action 10 advises, "Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population", which includes protecting both historically and currently occupied NSO sites (NSO Recovery Plan 111-42 - III-47. It appears that numerous sites will be eliminated by the proposed salvage logging (DEIS 148-149). Recovery Action 12 advises, "In lands where management is focused on development of spotted owl habitat, post-fire silvicultural activities should concentrate on conserving and restoring habitat elements that take a long time to develop (e.g., large trees, medium and large snags, downed wood)" (NSO Recovery Plan III-49). LSRs are certainly lands where "management is focused on development of NSO habitat"! As noted in the DEIS, the Westside proposal will remove many of the medium and large snags: "salvage activities will reduce snag densities of trees equal to or greater than 14 inches in diameter at breast height (dbh)" (DEIS 122)	The Northern Spotted Owl Recovery Plan is not a regulatory document; rather this plan provides recommendations that will aid in the conservation of the Northern Spotted owl. However, the Westside Fire Recovery Project did consider this plan through design of the project. Recovery Action 12 does describe the need to retain particular features, but the Recovery Plan also describes the need to reduce the loss of spotted owl habitat to wildfire. The intent of the Recovery Plan is likely more related to finding a balance between retaining some important features like large dead trees while reducing fuels that may contribute to high severity fire. The Project Design Features identify the retention of legacy features that include disproportionally large dead trees in salvage harvest unit plus retention of dead trees in riparian reserves which commonly contain the largest size class trees. In addition, trees with a 30% or greater chance of surviving the effects of the fire in the near future will not be harvested. The Wildlife Biological Assessment discusses the Recovery Actions in the sections called “Consistency with recovery plans and other guidance” and in appendix B. The Wildlife Biological Evaluation and Wildlife Biological Assessment evaluated all potential activity centers that may be affected by the actions proposed in the Westside Fire Recovery Project. As a result of this evaluation, we identified 94 activity centers which represent the culmination of past and current activity centers. In fact, we analyzed activity centers from the 1990’s that haven’t had a spotted owl detection in the last decade; further, we identified activity centers that are highly likely to represent different nest sites used by the same owl pair. In addition, activity centers that have lost considerable amounts of habitat to natural disturbance and no owls have been detected in these activity centers in recent years have been included in this analysis. From a qualitative and quantitative perspective of existing quality, quantity, and distribution of habitat, the project area is highly unlikely to support 94 activity centers simultaneously. Therefore, the spotted owl analysis takes into consideration the effects to the currently occupied activity centers plus the unoccupied activity centers that may become occupied in the future despite the existing habitat conditions of the activity center.
204.01 - NSO	#17375-3	The Northern spotted owl needs mixed forest, including old growth.	Northern Spotted Owl habitat has been described to included different ages classes and species compositions which can include old-growth conifer forests and mixed conifer forest types. The Biological Assessment describes the habitat types and fire affected habitat in the sections called “methods for assessing pre-fire habitat suitability” and “methods for assessing effects to northern spotted owl habitat from wildfire”.
204.01 - NSO	#17460-2	I have several concerns with Alternative 2 (the alternative being promoted by the forest service). In addition to those highlighted by Professor Franklin, the first is the effect on Northern Spotted Owls, which are likely to be adversely affected, according to the USFS Wildlife Biological Assessment, dated April 16, 2015.	The effects to wildlife are described for all action Alternatives and this information will be used to develop a decision that balances resource concerns with the purpose and need of the project.
204.01 - NSO	#17481-29	Alternative 3: Likes/Dislikes - I like the aspects of this Alternative that involve recovery activities identical to Alternative 2. I dislike the aspects of this Alternative that reduce recovery activities for the perceived benefits to Spotted Owls ,etc. I believe the reduction in salvage logging activity will reduce the long term habitat while gaining a very limited short term benefit of lower disturbance levels.	Thank you for sharing your opinion. The combination of rules the Forest must follow in conjunction with balancing the needs of several wildlife species that extend well beyond spotted owl while still meeting the purpose and need of the project presents a challenge. However, a balance approach for any one resource has inherent trade-offs which may result in a benefit for one species while negatively affecting another. For Northern Spotted Owls, Alternative 3 is one approach to balancing the purpose and need of the project while reducing the effects to the spotted owl by reducing treatment in areas that are likely to be more important to spotted owls.
204.01 - NSO	#18849-3	while this lingering debris will only provide greater fuel in future fires at the expense of remaining habitat for the Northern spotted owl.	We agree that the retention of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province. The intended purpose of salvage of fire-killed trees is to reduce the amount and continuity of fuels that would be created when those trees break or fall to the ground and become surface fuel. These actions compliment proposed fuel reduction and strategic fuel management zones as part of a landscape scale strategy to reduce the size and severity of future fires (Thompson et al, 2007). Our goal is to reestablish the high frequency - low severity fire regime that characterized the Klamath Province so that fire could play its natural role on the landscape. Salvage logging is proposed in conjunction with fuels treatments. Salvage harvest would remove the heavy fuels that would contribute to future high severity fires, decreasing the amount and continuity of fuels on the landscape and reducing fire risk for the Northern Spotted Owl. See the beginning of Chapter

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			3 for a discussion of responsible opposing points of view.
204.01 - NSO	#18852-51	-"Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl, 1994." Late-Successional Reserves are identified with an objective to protect and enhance conditions of late- successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth forest related species including the northern spotted owl. Limited stand management is permitted, subject to review by the Regional Ecosystem Office. While priority should be given to salvage in areas where it will have a positive effect on latesuccessional forest habitat, salvage operations should not diminish habitat suitability now or in the future. Tree mortality is a natural process in a forest ecosystem. Diseased and damaged trees are key structural components of late-successional forests. Accordingly, management planning for Late-Successional Reserves must acknowledge the considerable value of retaining dead and dying trees in the forest as well as the benefits from salvage activities. In all cases, planning for salvage should focus on long-range objectives, which are based on desired future condition of the forest. Because Late-Successional Reserves have been established to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions. The rate of development of this habitat will vary among provinces and forest types and will be influenced by a complex interaction of stand-level factors that include site productivity, population dynamics of live trees and snags, and decay rates of coarse woody debris. Because there is much to learn about the development of species associated with these forests and their habitat, it seems prudent to only allow removal of conservative quantities of salvage material from Late-Successional Reserves and retain management opportunities until the process is better understood. (Standards and Guidelines C-13) Surviving trees will provide a significant residual of larger trees in the developing stand. In addition, defects caused by fire in residual trees may accelerate development of structural characteristics suitable for associated species. Also, those damaged trees that eventually die will provide additional snags. Consequently, all standing live trees should be retained, including those injured (e.g., scorched) but likely to survive. Snags provide a variety of habitat benefits for a variety of wildlife species associated with late-successional forests. Accordingly, following stand-replacing disturbance, management should focus on retaining snags that are likely to persist until late- successional conditions have developed and the new stand is again producing large snags. (Standards and Guidelines C-14) Late-successional forest communities are the result of a unique interaction of disturbance, regeneration, succession, and climate that can never be recreated in their entirety through management. The structure, species composition, and function of these forests are, in their entirety, not fully understood. (Standards and Guidelines B-5) Late-successional forests are those forest seral stages that include mature and old-growth age classes. One goal of these standards and guidelines is to maintain late-successional and oldgrowth species habitat and ecosystems on federal lands. Another goal of forest management on federal lands is to maintain biological diversity associated with native species and ecosystems in accordance with laws and regulations. Forest ecosystems are quite variable throughout the range of the northern spotted owl. Therefore, site-specific knowledge of ecosystems will be incorporated into watershed-level analysis and integrated into Forest and District plans and province-level planing. (Basis for Standards and Guidelines B-1) The structure and composition of late-successional and old-growth forest ecosystems have been detailed in numerous publications. Four major structural	The final EIS provides information concerning tree planting in Chapter 3 of the final EIS in the sections called “Responsible opposing views and agency’s response to issues raised”.

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		attributes of old-growth Douglas- fir forests are: live old-growth trees, standing dead trees (snags), fallen trees or logs on the forest floor, and logs in streams. (Basis for Standards and Guidelines B-2)	
204.01 - NSO	#18852-52	-"RECORD OF DECISION for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl; Mike Espy, Secretary, U.S. Department of Agriculture; Bruce Babbitt, Secretary, U.S. Department of the Interior" In addition, timber sales must undergo appropriate site-specific analysis, and must comply with applicable regulatory requirements for public participation and administrative appeal.	The final EIS is a site-specific analysis that involves the public through the National Environmental Policy Act process.
204.01 - NSO	#18857-10	No salvage in Critical Habitat for NSO.	The decision must balance the effects to resources with meeting the purpose and need of the project. Alternative 1 (no action) is included in this decision process.
204.01 - NSO	#18858-11	I have attached to these comments copies of Monica Bond, et. al., Habitat Use and Selection by California Spotted Owls in a Postfire Landscape , Journal of Wildlife Management 73(7); Derek E. Lee, et. al., Dynamics of Breeding-Season Site Occupancy of the California Spotted Owl in Burned Forests, The Condor 114(4); Saab et.al., Nest-site selection by cavitynesting birds in relation to postfire salvage logging , Forest Ecology and Management 257 (2009) 151-159 ;	Citation only; no comment for agency response. See responsible opposing points of view at the beginning of Chapter 3 regarding a discussion of input presented by Monica Bond.

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204.01 - NSO	#18858-4	The spotted owl sections of this DEIS are sparse and partisan. You state there is a "disagreement" about whether spotted owls use burned areas for foraging, but do not cite your evidence of this. Instead you say only that "use of post-fire burned areas for foraging will not be discussed further." DEIS at 132. You have clearly picked a side in this disagreement-the one that favors your logging plans-but how do you address the recent radio telemetry studies (by Lee and Bond, attached to these comments) that show spotted owls not only use burned areas for foraging, but prefer burned areas for foraging? Do you accuse these researchers of falsifying their data? As an example, Bond states: The California spotted owls we studied used all severities of burned forest for nesting, roosting, and foraging during the breeding season 4 years after a large forest fire. We detected a negative effect of distance from the center of an owl's foraging range on utilization of habitat for foraging, regardless of burn severity, as expected for central-place foragers. However, we documented one owl traveling 3.4 km from the center of a foraging range, indicating that an owl will travel at least this distance while foraging during the breeding season. After accounting for distance, spotted owls selected burned areas for foraging over unburned forest, with the greatest selection for high-severity burned areas. Monica Bond, et. al., Habitat Use and Selection by California Spotted Owls in a Postfire Landscape , Journal of Wildlife Management 73(7) at 1121. (Emphasis added). And Lee: Forest fire, particularly high-severity fire, is generally presumed to reduce occupancy by California Spotted Owls, 2 on the basis of modifications to the forest canopy, basal area of live trees, and other vegetation and habitat elements. Our results do not support this presumption and instead corroborate and elaborate on previous studies of the Spotted Owl that found occupancy not diminished by forest fires of varying severities (Bond et al. 2002, Jenness et al. 2004, Roberts et al. 2011). We found no significant effect of fire on occupancy dynamics for up to 7 years post-fire and for the vegetation conditions of the sites in our study. (…) At our burned sites, an average of 32% of suitable vegetation burned at high severity, yet rates of colonization of and local extinction from these sites were not significantly different from those at unburned sites. Thus owls continued to occupy sites where nearly one third of their suitable habitat burned severely. Derek E. Lee, et. al., Dynamics of Breeding-Season Site Occupancy of the California Spotted Owl in Burned Forests, The Condor 114(4) at 799, 800. Similarly, I find no mention in your DEIS of the findings in the Revised Northern Spotted Owl Recovery Plan, which states, "Results from the three radio-telemetry studies of spotted owls in post-fire landscapes indicate that spotted owls use forest stands that have been burned, but generally do not use stands that have been burned and logged." Revised Recovery Plan at III-48. (Emphasis added). (The Recovery Plan cites, later in that paragraph, the Bond studies). You have plainly failed to use the best available science on spotted owls in your DEIS, and this failure has colored-tainted, actually-the entire analysis. For example, your decision "not to discuss" that spotted owls forage in burned areas permits you to claim only a loss of 432 acres of foraging habitat from your logging plan under Alternative 2. DEIS at 149. It seems to me that you are pretending "not to discuss" the foraging aspect, but in actuality what you are not discussing is your reason for believing that burned forest is not foraging habitat-that is what you are not discussing: that and, of course, the science that does not go your way. You are only too happy to discuss foraging habitat on your own terms, and announce that there isn't any foraging habitat left. And what is your justification for departing in such a startling and brazen manner from the findings in the Recovery Plan? I feel you should discuss that, too.	The DEIS provided a summary of the documents that are incorporated by reference. Given the inherent nature of a summary being brief and provide the reader a snapshot of information while still providing a full explanation of the topic in the supporting documents. However, the FEIS provides a much more detailed description of the relevant research used in the Northern Spotted owl analysis in the Terrestrial Wildlife section. The DEIS does state the fact that among the available research, there isn't complete agreement on the effects of wildfire on NSO. The commenter provides several pieces of literature but lacks the complete breath of available research. Darren Clark and co-authors in "Relationship between wildfire, salvage, and occupancy of nesting territories by northern spotted owls" (2013) states "The few studies that have been conducted on spotted owls in burned landscapes have provided equivocal results regarding the effects of wildfire on the species." The Forest isn't attempting to contest the validity of any researcher or particular study, we are simply pointing out the fact that NSO use of fire affected areas isn't completely clear and further research is needed to better understand this relationship. Meanwhile, the FEIS provides a more detailed summary of the information we gleaned from the research community, the methods used to develop the analysis, and the results of the analysis.
204.01 - NSO	#18858-7	The FEIS must squarely address the impacts your logging, particularly the roadside hazard removal, will have to the northern spotted owl, using actual spotted owl science as it is represented in the Revised Recovery Plan and in the current literature.	The final EIS incorporates the Wildlife Biological Assessment by reference. The Wildlife Biological Assessment clearly identifies each treatment and corresponding effect in the section called " Effects to northern spotted owl and northern spotted owl habitat from the proposed activities".
204.01 - NSO	#18859-10	while this lingering debris will only provide greater fuel in future fires at the expense of remaining habitat for the Northern spotted owl.	See response to 18849-3.

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204.01 - NSO	#18899-12	The DEIS further concludes (on page 147), that Alternative 1 (no action) is "unlikely to provide the needs for reproducing northern spotted owl [sic]." But, as described above, there is no sound scientific basis 11 for this statement. And, just one paragraph later, the DEIS states "[t]he lack of treatment will retain all the remaining habitat and important legacy structures to aid in the development of owl habitat by providing physical structure as the stand regenerates. Since northern spotted owls and their prey rely on these structures to fulfill their needs for survival and reproduction, the maintenance of large trees and large woody debris will increase the quality of future owl habitat." These are obviously conflicting statements. Other conflicts include different numbers in Table 3-8 (page 145) compared with Table 3-6. Both tables are describing exactly the same thing but the numbers are different. Given continued occupancy and reproduction in Spotted Owl sites that experienced significant amounts of severe fire, the conclusions in the DEIS are not supported and will instead lead to loss of important habitat for a species that is already ESA listed. The DEIS (on page 148) concludes with regards to the Preferred Alternative 2: Direct and Indirect Effects Risk to Reproduction: All the known activity centers within the analysis area will have some type of treatment in the home range but the level of effects will vary. For analysis indicator 1, three activity centers met the 'very low' criteria before treatment and alternative 2 will not affect this activity center's [sic] risk level. However, one activity center moved to a higher risk level from moderate level. The remaining activity centers did not move in risk level.	The commenter takes the “unlikely to provide the needs for reproducing northern spotted owl” out of context. The full sentence refers only to the 12 or more activity centers that were heavily affected by the fire and within the context of regeneration of these areas. Indeed, these sites are severely affected with high-severity fire and have lost most of the elements that can sustain owls. Although planting can accelerate the establishment of forest cover and can accelerate the growth of suitable habitat, it does not immediately restore suitable habitat. The second reference, i.e. “[t]he lack of treatment …” refers to critical habitat within the area and includes all fire affected habitat, low through moderate to severe. Both low-severity fire and to a lesser extent moderate severity fire does in fact retain significant elements of northern spotted owl habitat and can provide suitable habitat immediately. It’s disingenuous to suggest that these statements conflict when they refer to very different components of the project. *** Most of these low – to moderately affected areas will be only very lightly treated to reduce the likelihood of stand replacing fire in the near future and provide better conditions for the surviving trees. Remember that the criteria for salvage is very generous and will retain all trees that have at least a 30% chance of surviving. Thank you for pointing out the discrepancy between tables 3-6 and 3-8. Table 3-6 appears to be the correct data. We will correct the error. The ‘final’ paragraph referred to by the commenter is actually the beginning of the section analyzing the effects of Alternative 2 on the northern spotted owl. Because of the effects of the wildfire, most of the activity centers found within the project area are already strongly affected and placed in a high to moderate risk category for spotted owl reproduction. Although treatments are likely to adversely affect spotted owl habitat within most of the activity centers treated, these treatments will not affect the current risk assessment for reproduction as was caused by the wildfire.
204.01 - NSO	#18899-13	The DEIS (on page 148) also concludes with regards to the Preferred Alternative 2: Cumulative Effects Risk to Reproduction: The direct and indirect effects of alternative 2 plus the effects resulting from other actions within the analysis area do not change the risk level for any of the activity center. The risk level does not change due to the other actions, not because the actions do not have an effect but because most of the activity centers with other actions are already at the highest level of risk for this analysis. These activity centers will continue to have a high risk to reproduction and reproduction is not likely to occur in these activity centers so the cumulative effects of adding the effects of alternative 2 to the effects of other actions will not have a substantial effect on reproduction. Emphasis added. These conclusions that activity centers will not change risk level is not supported, as post-fire logging can adversely impact occupancy and thus reproduction (Lee et al. 2012, Clark et al. 2013) and the underlying methodology is fundamentally flawed. Another issue is that the BE states (on page 11) that "[h]owever, moderate level ACs may shift to high risk regardless of this project because of delayed tree mortality." This statement ignores the importance of trees to the post-fire environment and ability of Spotted Owls to use a site after fire. They require trees for perching and pouncing. A study cited in the BA-Irwin et al. 2012-specifically states that as long as some trees are standing (including 8-10 years after the fire, in the case of Irwin's study), they can be used by owls. Salvage logging removes those trees and reduces the usefulness of the site to owls, which is one of the reasons that the NSO RP recommends the retention of these habitat features. NSO RP, page III-49.	The commenter challenges the draft EIS’s conclusions that proposed project activities would not affect the risk level to northern spotted owl reproduction in the Aquatic Conservation Strategy. The AC’s referred to in the draft EIS were severely affected by the wildfire to the point where our best science determined that the likelihood of successful northern spotted owl reproduction was very low or low. This is a threshold determination that once affected to such a severe degree, moderate project treatments will not affect the already very low likelihood of reproduction. Fire effects have already removed the thermal and predator cover, the dead and downed logs, the mid-story structures for perching, the overstory structures for nesting, etc.

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204.01 - NSO	#18899-14	An additional major flaw in the DEIS is the statement on page 132: The use of post-fire burned areas for foraging is a point of disagreement in the literature because there is little evidence to support idea [sic] that these areas are actually being used for foraging; although owls have been found in these areas, there is no evidence that they are 12 foraging. For the purpose of this analysis, due to the lack of information on how these burned areas are being used, use of post-fire burned areas for foraging will not be discussed further. No serious Spotted Owl biologist would agree with this premise; indeed all of the major studies of foraging habitat over the past > 30 years have conducted some kind of telemetry and assumed nighttime locations are foraging. This assumption was established first by world expert on Spotted Owls, Dr. Eric Forsman, in his publication (Forsman 1984) on page 13: At night when adults were not calling or moving from 1 place to another, they were considered to be foraging even if they did not move for long periods of time (except, of course, for incubating or brooding females). This approach was adopted because it was extremely difficult to distinguish between foraging and resting behavior at night. For example, an owl might be immobile (i.e., "resting") for some time and yet still be actively watching for prey. If we accept this premise that nighttime locations may not be foraging, then all definitions of suitable foraging habitat must be rendered invalid because they all rely on the assumption identified above. This would entail re-writing the entire Northern Spotted Owl Recovery Plan of 2012, NSO Critical Habitat designations, and all Forest Service regulations with respect to management of foraging habitat. Moreover, many of the studies that used nighttime radio-tracking to estimate foraging actually observed foraging on numerous occasions (see e.g., Forsman 1984), thus providing support for nighttime observations as foraging behavior. In sum, the habitat fitness potential methodology adopted in the BA and DEIS was based only on studies in forests that had not recently burned. There are more relevant studies in recently burned forests demonstrating that owls continue to occupy and reproduce even in sites with large amounts of highseverity fire. Lee et al. (2013) specifically cautioned that not all sites with high amounts of severe fire were unoccupied. The attached Appendix A (soon to be published in a peer-reviewed scientific journal as Lee and Bond in press B) shows that even sites with the vast majority of a 300-acre Protected Activity Center severely burned, California Spotted Owl pairs were present in the Rim Fire. Further, Lee et al. (2012) documented a 38% probability of re-colonization of unoccupied sites during any given year after fire, so even unoccupied burned sites stand a good chance of being re-colonized. In light of the best available science and the imperiled status of the NSO, all the Northern Spotted Owl sites in the Westside Project should receive protection from post-fire logging.	Although using telemetry to identify preferred foraging areas is accepted methodology when working in intact northern spotted owl habitat, the use of the same methodology to presume foraging behavior in burned over habitat is more questionable. Site fidelity behavior patterns can tie northern spotted owl to areas once productive for foraging that no longer provide an adequate prey base. A better way to express the thought behind the quote offered from the draft EIS may be to say that although telemetry in a limited number of studies have found owls within high-severity burn areas, we cannot presume that they were foraging there successfully. In Darren Clark's 2007 thesis four radio-collared birds were returned dead in an emaciated condition. We should presume that these birds had been foraging, but were for unknown reasons unsuccessful in that foraging and could not sustain themselves in whatever habitat they were left with post-fire. Also, as Dr. Forsman points out in his quote offered by the commenter "it was extremely difficult to distinguish between foraging and resting behavior at night." The convenient and accepted research presumption of foraging in previous studies does not in any scientific sense, help distinguish between these behaviors. And again the argument that to question the validity of the assumption "then all definitions of suitable foraging habitat must be rendered invalid" is scientifically specious. Science advances through challenges its own assumptions when technique or data provides the substance to critique well-accepted paradigms. The statement in the draft EIS was not a challenge to the accepted paradigm of accepting all telemetry locations as foraging sites but merely a recognition of the untested presumption and a question of whether or not that presumption should be unquestionably applied to a 'new' habitat type – recently burned forest.

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204.01 - NSO	#18899-16	IV. The Preferred Alternative Fails to Use the Best Available Science or Scientist Recommendations The BA offers quite a bit of discussion about Spotted Owl fire studies, but ultimately the proposed logging in the Preferred Alternative 2 does not appropriately analyze, incorporate, or use results from the published studies to inform management. Recommended Protective Areas-First, the BA designates a 500-acre core area in the ACs within which logging is restricted in low-risk sites (and only 11 sites were designated as low risk: 83 sites are moderate-high risk and there is no restriction on logging in the ACs). Bond et al. (2009) recommended not logging within 1.5 km of core nest/roost areas-this translates into a 1,750-acre area. More applicable to the Westside Project is a study about Northern Spotted Owls in burned and salvagedlogged landscapes (Clark et al. 2013). Clark et al. (2013) found that occupancy of Northern Spotted Owl territories in a recently burned landscape that was subjected to salvage logging declined at a greater rate than in a landscape that had not burned recently. Initial occupancy was best predicted by older forests that burned with a moderate severity at the core scale. This study combined early seral, severely burned, and salvaged logged forest into one category and thus could not separate the effects of salvage logging from fire. Nonetheless the authors stated (on page 11): Our results contrast with those of previous studies that compared occupancy rates of spotted owls in burned and unburned landscapes. Jenness et al. (2004) found that territory occupancy of Mexican spotted owls in burned areas was similar to unburned areas. Roberts et al. (2011) found that site occupancy of California spotted owls in randomly selected burned and unburned areas were similar. Neither of these studies was affected by the high degree of salvage logging 16 we observed following the Timbered Rock burn, which may explain the difference between our results and those of previous studies. Emphasis added. The authors went on to state (on page 13) …the large areas of clear-cuts created by salvage logging and past timber harvest (approx. 45% of the area within 2,230 m of spotted owl territories…) potentially exacerbated declines in site occupancy following the Timbered Rock burn or confounded the effects of wildfire. Declines in site occupancy may not be as large in burned areas that were not subjected to previous timber harvest or substantial amounts of post-fire salvage logging. Importantly, Clark et al. (2013) recommended restricting salvage logging after fires on public lands within 2.2 km of Spotted Owl territories (the median home range size in this portion of the Spotted Owl's range) to limit the negative impacts of salvage logging. This restriction on logging within 2.2 km of core nest/roost areas should be placed at all known ACs, not just the ACs the BA identified as "low risk," as it is not possible to determine post-fire occupancy based solely on habitat metrics, and because unoccupied burned sites have a good probability of being re-colonized in the future (see discussion above). Buffer Distance from Edge-Second, the BA states (on page 22) that "A large proportion of PFF is habitat that burned at the highest severity and therefore contains minimal amounts of structure or cover. Because of this, it was assumed that NSO would not use this habitat when it occurred too far from exiting cover - estimated to be approximately 500 feet." Bond et al. (2009) documented preferential use of severely burned complex early seral forest stands, and Comfort (2013) and Eyes (2014) found preferential use of hard edges between high-severity fire areas and other types. However, none of these studies examined the extent to which owls will venture into the interior forest to forage, thus the 500-foot buffer is purely arbitrary. I could find no reference to a 500-foot edge threshold in Comfort (2013) or Eyes (2014). Bond et al. 2009 recorded multiple foraging locations in the interior of large high-severity patches. There is no actual scientific basis for the statement that owls would not travel more than 500 feet from the edge of a fire.	The comment claims that spotted owl analysis fails to consider “best available science”. The “best available science” is addressed in the Code of Federal Regulations (40CFR1502.24) “Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement. An agency may place discussion of methodology in an appendix.” The FEIS terrestrial wildlife section for Northern Spotted Owl analysis provides the professional and scientific integrity throughout the document and it provides ample discussion of the relevant research that discusses both sides of the contradicting science related to the spotted owl use of fire-affected habitat in the section called “Use of Fire-Affected Habitat” and "Site Occupancy". In addition, the FEIS presents the effects of salvage on NSO and it is described in the section called “Land Management” subsection “salvage harvest”. This commenter also presents two “management recommendations” from Clark et al. 2013 and Bond et al. 2009. Please see comment #18899-1This comment also disagrees with the use of a 500ft buffer to define post-fire foraging areas. Please see response to comment #18899-4.

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204.01 - NSO	#18899-17	Finally, as described above, protective measures should be in place for areas beyond 500 acres because Spotted Owls require foraging habitat farther from their breeding season nesting stands. Surveys-In the Preferred Alternative 2, surveys will only be done prior to project implementation, but are largely meaningless for owl conservation because this alternative only protects forests within 0.24 mile of nesting areas during Feb 1 to July 9 (Table 2-35 on page 88). Lee et al. (2012) recommends surveys be conducted for 2 years to be confident about occupancy, and USFWS requires the use of a standard protocol of multiple-year surveys. However, even unoccupied sites had a 38% probability being re-colonized in any given year after fire (Lee et al. 2012). I recommend not placing any ACs into risk categories until at least 2 years of protocol surveys in all sites have been conducted, but all ACs should receive protection from logging.2 The NSO Recovery Plan states that 2 The Forest Service should also address the issue of reduced detectability of Northern Spotted Owls when Barred Owls are present (Kelly et al. 2003, pp. 51-52; Courtney et al. 2004, p. 7-16; Olson et al. 2005, p. 929; Crozier et al. 2006, p.766-767), particularly because NSO occupancy is a key component of the Forest Service's effects analysis. 17 it is not uncommon for an occupied spotted owl site to be unoccupied in subsequent years, only to be re-occupied by the same or different spotted owls two, three or even more years later (Dugger et al. 2009). While temporarily unoccupied, these sites provide conservation value to the species by providing habitat that can be used by spotted owls on nearby sites while also providing viable locations on which future pairs or territorial singles can establish territories. NSO RP, III-45. Unoccupied owl habitat is important post-fire because it represents vacant territory that may be recolonized by shifting or dispersing owls. In a heavily fragmented landscape like the planning area, "vacant" sites may represent the best remaining suitable habitat. Id. The DEIS does not address this issue at all.	For the most part, these comments focus on owl conservation protocols on an undisturbed landscape and fail to address the reality of a burned landscape. The 500 acres represents the core use area of a spotted owl in undisturbed conditions and covers 80% of their usual use. Although generally owls are central place foragers and an owl circle reasonably represents their estimated territory, in reality, spotted owls resting and foraging use is highly dependent on the specifics of habitat availability and typically rest and forage where opportunities present themselves. Radio telemetry work generally shows complex polygons of use where their time is differentially spent where presumably conditions are functionally best. Stand altering treatments are focused on severely burned areas that are already compromised for full functionality. As we have stated previously, the research literature is uncertain about the value of severely burned areas. Existing telemetry data and logic argues that spotted owls will use these areas if they provide good foraging and that their use of these more open areas is challenged by the lack of cover and the predation pressure the may feel in such areas. Site fidelity may encourage owls to use these areas immediately after the fire, and they may indeed be useful at that time when any prey that may survive the high severity conditions are displaced from their usual cover and may be more vulnerable to predation. These conditions would change rapidly as surviving predators take advantage of the disturbance. Once the immediate flush of available prey is exhausted, it is not likely that the area would be valuable for foraging until post fire sprouting of vegetation provides a foraging base for prey. Relative to the specific sites we consider in this proposed project, the current research cannot fully explain the likely sequence of prey availability and owl use, especially relative to rapidly decaying conditions of much of the remaining snags in a severely burned area. Although snags with available perch branches are useful for foraging owls, once they decay to a point that perch branches have fallen, they become unavailable for foraging owls. Some of this logic may explain the emaciated owls found in the post-fire landscape by Darrin Clark in his thesis work. Site fidelity has kept owls within a burned landscape that inadequately provides foraging opportunities or that require an unreasonable expenditure of energy to provision themselves. Although two-year protocol surveys do provide a greater reliability in the presence of barred owls, the nature of commercial salvage prevents us from delaying treatments for that long. However, following protocol is a probability issue – the single year surveys we've committed to may not provide the full surety of a two-year survey, they do provide useful information, just at a lower level of certainty. As the northern spotted owl Revised Recovery Plan recognizes (page III-21) that "given the need for action in the face of uncertainty" managers should implement a program that will reconcile the goals of conserving and encouraging spotted owl habitat while better enabling forests to recover from past management measures (fire suppression that fosters conditions that present higher probabilities of high-severity, stand replacing wildfires) and respond positively to climate change with resilience. University of Montana wildlife professor L. Scott Mills emphasizes the need for management action and states "…embrace uncertainty. Do not be intimidated by the fact that ecological processes are complex. Do not feel that wide variance in estimates of parameters come from weak science. Do not freeze up from a lack of knowledge…The lack of full scientific certainty should never be used as a reason of inaction in the face of a wildlife population problem. Embrace uncertainty." (page xiv, Mills 2007). At the same time, Recovery Action 16 requires the consideration of "long-term maintenance of local forest management infrastructure as a priority in planning and land management decisions" (page III-53, Revised northern spotted owl Recovery Plan). Again, this focuses us on the relatively small percentage of the burned landscape that will be treated with salvage logging. Although treatments affect a relatively small portion of the landscape, they provide needed revenue to local communities and are a vital aid in maintaining that local infrastructure.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-18	I have one final critique from the Forest Service's analyses. The DEIS (on page 3) notes "[s]ome fires, or portions of fires, burned within wilderness area, where natural processes drive restoration." The Late- Successional Reserve network of the Northwest Forest Plan is also a land allocation where natural processes must take precedence over economic recovery: "The objective of Late-Successional Reserves is to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl," NFP S&G page C-9, and LSRs "are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems." NFP S&G page C-11. Moreover, natural restorative processes cannot be restricted just to wilderness when, as here, the well-being of an ESA listed species is at stake. Conclusion Protection of all 94 ACs affected by the 2014 fires is necessary for the survival and recovery of the Northern Spotted Owl. This should be achieved by conducting no post-fire logging within at least a 2.2 km (Clark et al. 2013) to 3.4 km (Carey et al. 1992) radius area surrounding the nests/roost sites. If the Forest Service were to fully consider all the year-round requirements of the Northern Spotted Owl and ensure that its actions would not threaten the continued existence of this declining, federally listed subspecies, it would refrain from conducting post-fire logging anywhere in the fire complex that might be used by the owls, including during the non-breeding season, with the exception of removal of hazard trees as necessary along well-traveled roadways and adjacent to infrastructure. Otherwise, there will certainly be adverse impacts of the Westside Project on the Northern Spotted Owl's ability to use burned stands for hunting, as well as serious negative impacts on the suite of burned-forest dependent species including woodpeckers, bluebirds, house wrens, deer mice, and a host of other organisms that survive and reproduce better in severely burned forests than anywhere else. Please do not hesitate to contact me with any questions. I am always happy to assist.	The consideration of Northern Spotted Owls and the post-fire environment is summarized in the Terrestrial Wildlife Section "Northern Spotted Owl: Relevant Scientific Literature" subsection in Chapter 3. Since the literature doesn't provide a clear linkage between suitable habitat, fire affected habitat, and spotted owl reproduction, we used recommended home range and core size for activity centers and the habitat minimums of suitable habitat (USDI U.S. Fish and Wildlife Service 2009) and professional judgment to estimate the possible spotted owl use of moderate- and high-severity fire-affected habitat. Snag and legacy component retention design incorporated into all Alternatives of the Westside Fire Recovery project (See Chapter 2 of the final EIS) provide for continued movement and use even after fire salvage. Limited operating periods will reduce the disturbance to Northern Spotted Owls that do remain in the vicinity of salvage units as well. These mitigations are not clearly considered in the findings of Clark et al (2013) or other Northern Spotted Owl post-fire effects literature. The Westside Fire Recovery project is designed to balance the need for legacy components on the landscape in the long-term and the need to protect the area from future high-severity wildfires via fuels reduction. (See response 2 in the "Responsible Opposing Views and Agency's Response to Issues Raised" in Chapter 3 of the final EIS)

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-19	Post-Fire Foraging-In all available studies of Spotted Owl post-fire habitat selection using radio-tagged owls (Clark 2007, Bond et al. 2009, Eyes 2014), unburned or low-severity burned NR habitat is consistently extremely important for this species for nesting, roosting, and foraging. However, all of these studies also show that Spotted Owls use high-severity patches for foraging, including relatively large patches (e.g., 36 ha in Yosemite National Park; Eyes 2014 on page 28; and in Bond et al. 2009, in the McNally Fire, California Spotted Owls were detected foraging well in the interior of a > 100-ha severely burned patch). High-severity patches near the nest had the highest probability of use by owls in burned foraging ranges in the Sequoia National Forest (Bond et al. 2009; selection probability for severely burned forest high closest to nest). The BA provides extensive discussion of work conducted by Clark (2007) on Northern Spotted Owls. Unfortunately, the BA fails to divulge that much of the high-severity burned forest on private lands in the Timbered Rock study area was post-fire logged, which likely contributed to lower daily survival rates in the post-fire landscape (Clark et al. 2011) as well as lower occupancy (Clark et al. 2013). Lee et al. (2012) reported that for most of their sample of California Spotted Owl sites in the Sierra Nevada where 7 salvage logging was known to occur, owls were present after fire but not detected after post-fire logging (Lee et al. 2012 on page 800 state: "post-fire logging…occurred within 2 years after the fire near at least eight of our 41 burned sites. Severn of the eight sites that were later logged were occupied by California Spotted Owls after the fire but none of the eight sites was occupied after logging…"). Lee et al. (2013) reported lower probability of occupancy of burned sites by owls after salvage logging in southern California, although the effect was not statistically significant (logging in this study was restricted to relatively small-scale removal of hazard trees on private lands rather than commercial harvest such as that proposed in the Westside Project). With regards to foraging habitat selection, Clark (2007) states on page 100 of his M.S. thesis: "[all owls were] 2.33 times more likely (95% CI = 1.75-3.09, p < 0.0001) to use NRF habitat with high severity burn than early-seral forests. NRF habitats with moderate and high severity burn and RF with moderate severity burns were selected and used more frequently than available, but overall use of these habitats was relatively low." Salvage logged sites were used less frequently than available, and in the same fashion as early seral forest stands. For just owls within the perimeter of the burn, "NRF habitats of any fire severity were selected, with low/unburned stands being 3.23 times…, moderate severity stands being 4.48 times…, and high severity stands being 3.58 times more likely used than early seral habitat." (Clark 2007, page 103). The owls also used salvage logged areas, but only where associated with riparian buffers and patches of leave trees, and some locations were from the logged areas prior to or during timber harvest (although number of these locations was unknown). "Areas that received clearcut salvage were rarely used." (Clark 2007, page 103, emphasis added).	The commenter implies more certainty than the literature suggests. The commenter overstates and simplifies the findings in the literature and understates the complexity of the relationship between owls, fire and salvage logging. Spotted owl use of high-severity burned areas is still very much uncertain and is likely to be highly site-specific and variable. Relevant to the discourse and little mentioned in the comment is the July 2014 Master's Thesis of Ms. Stephanie Eyes. Using radio-telemetry in the Yosemite National Park, Ms. Eyes tracked spotted owl use of burned areas post fire. Ms. Eyes's research was more robust than previous efforts to document spotted owl use of burned areas and extends the body of literature on the topic extensively. Ms. Eye's thesis contradicts some of the most important conclusions of previous studies such as Ms. Monica Bond's 2009 study. The commenter criticizes the Biological Assessment (BA) for not comprehensively analyzing fully the body of literature that addresses owl use of burned areas, particularly Clark's 2007 Thesis . However, the BA extensively addresses the relevant literature and notes, as does Dr. Patricia's Manley's 2014 declaration regarding the use of this literature to argue against salvage logging in the Rim Fire. The BA comes to the appropriate conclusion that "owl use of burned areas is well documented but links between owl use, fire severity and intensity of salvage are not clear." (page 38, BA) Also that "[F}actors involved in northern spotted owl's periodic selection of burned areas for foraging are not known at this time, and further research is needed to account for the many other aspects of a burned landscape that would factor into the northern spotted owl selection process.' (page 38, BA). Given the uncertainty of the literature regarding not only the northern spotted owl's response to the burned landscape, but their response to salvage logging, the Forest has proposed the reasonable and prudent course of using extensive on-the-ground review of site specific conditions to limit salvage logging to a very small percentage of the larger landscape and to avoid primary owl cores entirely. Of the 187,100 acres of Federal land that was burned within the project area, only 10,250 acres (5.4%) are being considered for salvage and of those acres only 7,940 acres will be salvaged which will further reduce the proportion of treatment (4.2%) in the project area that removes most of the burned snags. Remember that leaves 179,160 acres (95.7%) of the burned area on federal lands within the project un-salvaged. Project design features will leave all burned trees that have at least a 31% probability of surviving as determined by professional guidelines in salvage harvest units. Given the uncertainty of spotted owl biologists in determining the likely use of any given area by spotted owls post fire, there is certainly a risk in going forward with any salvage. However, given the economic support salvage operations can afford hard hit rural communities, the infrastructure support salvage operations provide struggling rural mills and the ecological advantage of salvage in providing for adequate regeneration, a balanced risk of providing for salvage on such a small percentage of the larger burned landscape is a reasonable risk. One must keep in mind that even in the northern spotted owl Revised Recovery Plan, Recovery Action 16 calls The devil is in the details. And in this case, the contradictions in the literature regarding the details of how exactly spotted owl were using burned over areas cannot be resolved without additional research to separate out the factors that are affecting owl's use. In the meantime, the site-specific analysis provided by the BA using the best available knowledge of spotted owl biology and behavior in the area in question combined with the reasonable guidelines to avoid disturbing areas that may have remnant owls, certainly outweigh the narrow results of the available research.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-2	The following comments address the Draft Environmental Impact Statement (DEIS), the Biological Assessment (BA), and the Biological Evaluation (BE) for the Westside 'Fire Recovery' Project, a logging project that harvests trees from forests recently burned by fire. Ninety-four Northern Spotted Owl (Strix occidentalis caurina) Activity Centers ("AC") were impacted by fire, and the project's Preferred Alternative 2 will conduct logging in more than 90 of these ACs. In summary: ? The BA and DEIS fail to include Post Fire Foraging ("PFF") habitat as suitable habitat in the assessment of habitat risk potential of an Activity Center, despite admission that Spotted Owls forage in severely burned forest. ? The BA's assessment of reproductive potential does not consider evidence that offspring are often produced at Activity Centers with high amounts of high-severity fire. ? The BA's reproductive risk assessment methodology incorrectly places Activity Centers into the moderate and high risk category, thus opening them up to harmful post-fire logging, despite the fact that these areas, if not used for nesting, will likely be used as foraging habitat if left unlogged. ? The Preferred Alternative 2 does not base its protective standards on the published literature about Spotted Owls and fire, and even the most protective design feature-no logging in the 500-acre core area of 11 Activity Centers-will not prevent loss of those 11 sites' associated foraging habitats, and leaves no protection at all for the other 83 sites. ? All of the Westside Project's Action Alternatives fail to give Spotted Owls the benefit of the doubt, as is required by the ESA (see TVA v. Hill, 437 U.S. 153, 194 (1978)), and all the alternatives will very likely result in harmful effects to more than 90 Northern Spotted Owl breeding sites and associated foraging habitats.	The Endangered Species Act Handbook authored by the U.S. Fish and Wildlife Service and National Marine Fisheries Service indeed cautions consulting biologists to 'err on the side of the species.' However, that caution refers to the effects analysis itself and fosters determinations that, when faced with the uncertainty in likely effects that is common in wildlife sciences, favors the more adverse possibilities. Essentially by assuming the worst, consulting biologists focus on all the range of minimizing actions that may reduce the eventual impact of the project. The Biological Assessment does just that and assumes adverse effects on the owls that may or may not be occupying the majority of its affected activity centers. The Project appropriately provides Project Design Features that, in cooperation with the U.S. Fish and Wildlife Service, were designed to minimize those adverse effects while ensuring that the purpose and need of the project would be fulfilled. The Endangered Species Act allows for a balance between the conservation of individuals of the species and the need for project implementation that would have adverse effects. When action agency biologists determine that adverse effect may occur on individuals, it is the responsibility of the U.S. Fish and Wildlife Service to complete a jeopardy analysis that will determine if the proposed actions are likely to jeopardize the survival and recovery of a listed species. Although likely to adversely affect individual northern spotted owl, the U.S. Fish and Wildlife Service has determined that the proposed actions are not likely to jeopardize the species. In that case, under streamlining, we jointly look for project design features that are likely to reduce the effect of adverse actions while avoiding changes to the project that would compromise its ability to meet the purpose and need. The Endangered Species Act does not require a cessation of all actions that may adversely affect individuals.Keep in mind that adverse effects may be as mild as a distant disturbance that may interfere briefly with a foraging or resting behavior or of course as severe as breeding failure, out-migration or even death. The Endangered Species Act limits the regulatory agency to developing reasonable and prudent measures and their implementing terms and conditions that do not alter the basic design, location, scope, duration or timing of the action. They are limited to requiring only minor changes. Generally under streamlining, the Forest Service and U.S. Fish and Wildlife Service work together during project planning to devise designs that would minimize adverse effects even more than might be possible using the regulatory framework of the Endangered Species Act. Under streamlining, these minimizations are included as explicit or implicit project design features rather than as reasonable and prudent measures. In order to avoid major changes to the project design, much of the efforts to provide design features may only be able to reduce the likelihood of the more severe adverse effects rather than eliminate adverse effects entirely. Reducing the likelihood of more severe adverse effects may simply maintain them as less severe disturbances or habitat alterations. They are still adverse effects, but less likely to cause an impairment in basic life-sustaining behaviors. Due to the need for rapid project development, collaborative efforts may be more limited than would generally be the case in a more typical vegetation management project. Nevertheless, the U.S. Fish and Wildlife Service have been involved to some degree from the beginning of our efforts and have been valuable and necessary partners in the project development. Pages 15 and 16 of the Biological Assessment detail some of the changes in project design as a result of the Level 1 consultation process, although keep in mind that many of the project design features were included in the original proposal in anticipation of the level 1 streamlining process.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-20	It is true that Clark's radio-tagged Northern Spotted Owls preferred old, structurally diverse forest as foraging habitat, but they also preferred severely burned forest (i.e., used it more than it was available)-a point that cannot be discounted by the Forest Service during analysis of effects of removing this foraging habitat. These severely burned patches were rare within owl home ranges in the study, yet were used more frequently than available. Clark (2007) specifically stated: "[w]hile, these areas of stand replacement may not provide high quality habitat, they likely provided some benefit to owls following wildfire because owls did make use of these stands. I hypothesize that high severity burns in NRF habitat which created early seral stands may be used by owls because they may provide increased prey abundance…but I was unable to test this hypothesis. Furthermore, large dead trees created by wildfire are likely to serve as "legacy structures", and provide coarse woody debris and snags for future late-successional forests…, potentially making these stands important to creation of spotted owl habitat in the future. In addition, early seral forests created by disturbance events that are not altered by timber harvest are extremely rare…and support some of the highest levels of biodiversity…Therefore, the potential ecological benefits of large standing dead trees should be weighed against social and economic objectives when considering land management activities." (Clark 2007, page 115). At base, Clark (2007) found that use of high-severity burned forests for foraging was more than expected based on their availability to the owls. And in Bond et al. (2009), Spotted Owls selected severely burned forest for foraging significantly more often than expected based on availability within foraging ranges (see Figure 1, Bond et al. 2009 on page 1120). 8 Overall, actual telemetry locations from Clark and Bond et al. show that Spotted Owls largely avoided foraging in clearcut salvage-logged stands (very few points in those stands), and any use in these areas was associated with riparian buffers and retention stands. This is the best available science. The BA provides extensive discussion on use of burned stands, but only very vaguely discusses salvage logging and provides no analyses whatsoever. The only discussion provided in the BA regarding effects of salvage logging states (on page 34): "…links between owl use, fire severity and intensity of salvage are not clear. Researchers were typically unable to separate effects of pre-fire timber harvest, wildfire, and post-fire salvage harvest. Research results are highly variable, depending on methods, burn severities, proximity of NSO's to fire and spatial arrangement. Research of NSO use of burned areas has also been confounded by small sample sizes. In addition, general terms used in the literature including 'moderate severity' and 'salvage logging' make comparison to specific conditions found within the project area difficult. Most references to 'salvage logging' in the literature refer to clear-cut logging, and do not factor in design features such as leave tree groups, legacy tree retention, core area avoidance or even limited operating periods." This discussion provides no information whatsoever about any of the results from published literature about effects of salvage logging (e.g., Clark 2007, Clark et al. 2011; 2013, Lee et al. 2012; 2013). These studies all provided at least some informative data about effects, as I have described above, despite the differences in study areas and logging types. Research has not been "confounded" by small sample sizes, because effect sizes were large enough to obtain significant parameter estimates for most of the studies. Even with variability of selection among owls, we know that not only can this raptor use the severe fire areas, but also that it can prefer them. Given that the ESA requires erring on the side of species' conservation in light of the precarious state of ESA-listed species such as the Northern Spotted Owl, instead of assuming salvage logging might not harm owls, the DEIS must assume, given the best available science, that logging potential foraging habitat will indeed cause significant adverse impacts to the subspecies. Unfortunately, there is not a single Northern Spotted Owl study available investigating occupancy, survival, reproduction, and foraging in a study area with no salvage logging. Darren Clark and Emily Comfort both found important results about effects of post-fire logging on Spotted Owls, but this fire complex on the Klamath National Forest is a truly fantastic opportunity to gather data on responses in an post-fire landscape that has not undergone salvage logging, particularly with such a large sample size (94 ACs affected by fire). The BA's analyses only vaguely discuss salvage logging and do not provide any useful details from the literature. A valid hypothesis based on the best available scientific data is that a mosaic of forest types, ranging from older forest with high canopy cover (for nesting and roosting) to complex early seral burned forests with abundant snags (for	We agree with the commenter that these high severity burn sites may provide some valuable foraging for northern spotted owl post-fire. But we may disagree on their long-term value. Again, it's reasonable to assume that post fire conditions may provide a flush of easily available prey that may have survived the fire, but find themselves in a significantly changed landscape where their familiar cover sites are now unavailable. Limited green forage is likely to also drive these prey species further from cover and again provide for 'easy pickings' immediately after the fire. We currently do not know how long this condition might last, but it is reasonable to assume that it is likely to be short-term and that surviving individuals will not prosper or breed significantly until there is green-up and their own foraging conditions improve. So there may be two pulses of prey availability relative to changing conditions post fire – an immediate flush of prey availability post fire, and a longer term flush after green-up and post-fire conditions improve breeding in the prey species. These two pulses may be separated by a time where these high severity areas offer relatively little available prey.I also agree with the commenter relative to the importance of legacy structures. Keep in mind that the proposed salvage logging is unlikely to fully clearcut large areas. The project considerations for salvage harvesting offered on page 12 of the BA limit salvage harvesting significantly related to the northern spotted owl. Project design features listed in table 6 on page 16 of the BA describes retention that more closely resembles a mosaic of harvested clumps and clumps of green, legacy and pre-existing and post-fire snags. Because of the nature of the descriptive prescription we cannot model out on such a large landscape acre by acre what the landscape will retain post treatment. Treatment actions will be responsive to the actual on site conditions and be limited by the project design features and the commitment to retention found in the draft EIS and the BA. However we can say that considerable care has been taken to maintain legacy structures within the treatment areas and these structures will be available immediately post fire through treatments and will serve to provide habitat elements into the future. Treatments should maintain a mosaic of conditions where post-fire conditions allow that mosaic. The purpose of the BA is not to discuss the effects of salvage logging in general. The purpose of the BA is to determine what effects that salvage logging may have on listed species that may occur in the project area. That is a much narrower focus than the more general evaluation implied by the commenter. The BA does cite Clark 2007 and 2011 as well as the Lee 2012 paper cited by the commenter. The two Clark papers are cited on page 22 in the context of post-fire foraging habitat and in a number of other places as well. The Lee paper is first cited on page 36 in the context of northern spotted owl use of post-fire landscapes. The assumption is NOT that salvage logging will not harm owls, in fact the adverse effect determinations on most activity centers demonstrates that is not the base assumption. Again the Endangered Species Act does not require action agencies to avoid all adverse effects. We have an obligation to minimize those effects and the U.S. Fish and Wildlife Service has the responsibility to determine the larger population level jeopardy determination, but adverse effects in themselves do not necessarily preclude taking management action. Indeed, the large scale of the treatments are entirely derivative of the large scale of the wildfire events. The level of severity and impact on intact owl sites should be in itself a message for the need for treatments to lower the probability of such losses. Although the commenter ably makes an argument for the value post-fire to northern spotted owl of high severity burn areas, they cannot reasonably compare those sites to intact forest with that mosaic of forest types. Our treatments are intended to not only better restore these areas to intact forest, but to protect neighboring, low severity or unaffected forest lands from similar events.

Code	Comment Number	Comment Text	Response
		foraging) within a home range can provide the elements necessary to maintain productivity of Northern Spotted Owls.	

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-21	Finally, Recovery Action 10 in the Northern Spotted Owl Recovery Plan (NSO RP) (2012: III-43) states "Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population." Since at least two studies recommend not salvage logging in Spotted Owl ranges, Clark et al. 2013 and Bond et al. (2009), and even the BA acknowledges (on page 35) that "NSO foraging activity in these burned areas is supported in the literature…", then logging this 9 habitat within core areas in the Westside Project would be a violation of not only the best available science, but this recovery action as well. Similarly, Recovery Action 12 in the NSO RP (2012: III-49) states that "In lands where management is focused on development of spotted owl habitat, post-fire silvicultural activities should concentrate on conserving and restoring habitat elements that take a long time to develop (e.g., large trees, medium and large snags, downed wood)." However, the Westside Project - which is located in Northern Spotted Owl Critical Habitat and Late-Successional Reserves, and are "lands where management is focused on development of spotted owl habitat" - would remove the remaining habitat features (snags and downed wood, as well as some live trees) that are essential to recovery of the species, and is inconsistent with the best available science and the NSO RP. In short, there is no evidence to support salvage logging in owl ranges while there is substantial evidence showing that salvage logging will likely harm Northern Spotted Owls. II. The BA/BE's "Habitat Fitness Potential" Methodology for Ranking Spotted Owl Activity Centers and Allowing Salvage Logging in High and Moderate Risk ACs is Fundamentally	The BA addresses Recovery Actions 10, 12 and 32 in some detail on pages 8 and 9. Page 9 presents a table addressing the primary recommendations of each of these Recovery Actions and states the project design features that intend to implement these recommendations. Although Clark 2013 did recommend that salvage logging be restricted within 2.2 km of an northern spotted owl site (a home range) he also states that his study was “opportunistic and observational.” His study could not reasonably separate out the effects of high-severity fire, past timber activities and salvage logging and he recommends “a cautionary approach when applying our findings to future land management decisions.” Without diminishing the importance of either Darrin Clark’s work or that of Monica Bond, its important to point out the remaining uncertainty and that other research such as that of Stephanie Eyes (2014) or Emily Comfort (2013) has found an avoidance of high-severity burn areas by spotted owls. Stephanie Eyes thesis work evaluated twice as many owls as did Monica Bond and monitored them over three seasons of habitat use rather than just one. Salvage logging is not undertaken specifically to support northern spotted owl individuals. In fact, it is avoided in the most sensitive sites and in the areas most likely to support continuing northern spotted owl presence in the burn areas. There are likely to be some indirect beneficial effects to northern spotted owl in promoting future habitat and reducing the risk of future stand replacing fires in other areas, but these are not presented as primary reasons for treatment. For the most part, the commenter overstates the effects of the proposed activities and does not balance these out with the project design features such as the maintenance of remnant legacy components. See response to comment12346-55. See the beginning of Chapter 3 for responsible opposing points of view.
204.01 - NSO	#18899-22	The DEIS (page 43) describes the assessment and management of Northern Spotted Owl Activity Centers (ACs) as follows: 1. In 0.5 mile core areas (500 acres): if the site contains > 50% suitable NRF habitat, and if an additional 1,086 acres NRF habitat is in the outer home range (0.5 to 1.3 miles), then the site is "high potential." In the Preferred Alternative 2, only these core areas are protected from logging, but logging can still occur in home ranges of these sites. 2. In 0.5 mile core areas (500 acres): if the sites contains < 50% suitable NRF habitat, and if > 20% NRF habitat is in 1.3 mile (1,375-ac) home range, then the site is "moderate potential." 3. If < 20% NRF remains in 1.3 mile home range, it is "low potential." Logging will be conducted in all moderate and low potential core areas and home ranges. The BA (page 25) cites studies by Dugger and Franklin to justify the 50% suitable habitat threshold, but these studies were not conducted in recently burned study areas, and therefore are not the best available science for determining the "potential" of a recently burned site. Because we now know that Spotted Owls not only use severely burned forest for foraging, but actually prefer it (use it more than available), there is no scientific basis to conclude that such areas are not suitable habitat. They are suitable, and any credible analysis of site "potential" must therefore account for that fact. The risk-potential methodology does not derive from the best available science and instead derives solely from an assessment of Northern Spotted Owl demography based on habitat in sites in longunburned landscapes. But post-fire forests are not at all the same as logged forests. Rather, radiotelemetry studies document, and the BA agrees (on page 35), that "NSO foraging activity in these burned areas is supported in the literature." Even though the agency specifically recognizes the fact that PFF is important foraging habitat, the analysis categorizes risk to owl reproduction using only traditionally defined suitable NRF habitat from long-unburned forests, and assumes that the risk assessment in this post-fire landscape need not account for the benefits of PFF. This is arbitrary and results in an incorrect assessment of risk.	The commenter criticizes the BA for the use of guidelines developed in research conducted in unburned sites in determining habitat suitability and reproduction potential, while at the same time using research conducted in unburned sites to provide argument that the assumption that telemetry data of a stationary bird indicates foraging activity. As action agency wildlife biologists, we act as consumers of research and must accept the need to apply research conducted in another location, under different circumstances, with limited or narrow focus to our very site-specific, purpose and need specific projects. Inevitably it takes a certain amount of speculation based on the known research, the known life history, essential behaviors and known demographics of the species. This is then tempered with our own field history of surveys, observations and area-specific knowledge. We must assess the work of Dugger and Franklin, as well as the works of Bond and Lee, relative to the site-specific differences. None of these apply absolutely or without error to the current conditions and must be evaluated relative to the known differences. One of the reasons the courts have provided broad discretion to agency biologists is derivative of this need for interpretation of data relative to project scale conditions. Relative to the comment, it is not certain that spotted owls will always preferentially use high-severity burn areas for foraging, not do we know why there may be differences between the various researchers. Our response to that uncertainty is to balance our treatments with this knowledge and the need for meeting our purpose and need, while at the same time meeting the requirements of the Endangered Species Act for minimization of adverse effects and the need under National Environmental Policy Act to fully disclose the potential effects of the project in the draft EIS. In that effort to balance the probabilities of adversely affecting the owl with the need for treatments, the BA does evaluate post-fire habitat extensively and within the context of the best available research. Pages 36 through 40 of the BA evaluate the post-fire use of habitat by owls and appropriately note the differences between the available research and the current site conditions. Post fire foraging habitat is noted in Table 8 of the BA and it is evident that it was used in the development of site specific determinations.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-23	Further, even sites with a large amount of high-severity fire can still be occupied and reproductive, which is well-documented in the literature (Bond et al. 2002, Jenness et al. 2004, Lee et al. 2013). For 10 example, Jenness et al. (2004: page 769) found in Mexican Spotted Owl sites, "[f]ires burned > 50% of each of the three burned survey areas [1-km circles around nests/roosts] with successful nests in 1997 (including stand-replacement-level percentages of 8, 31, and 32%)…" In a burned landscape in southern California, Lee et al. (2013) found that only when 50% of forested habitat in a 500-acre core area burned severely did there begin to be negative effects on occupancy-but many sites that burned greater than this threshold were still occupied, and increasing amounts of high-severity fire did not adversely impact reproduction in the best, most reproductive sites. Instead, the most productive Spotted Owl sites (i.e. consistently occupied and reproductive) in this southern California study area showed negligible impacts of severe fire on reproduction no matter how much of this fire occurred in a 500-acre core area (Lee and Bond in press A). In addition, a study of Spotted Owl site occupancy in the Rim Fire showed no reduction in occupancy by pairs, no matter how much of 300-acre PAC burned at high severity (Lee and Bond in press B; see attached Appendix A for letter to the Stanislaus National Forest describing these data). Therefore, it is essential not to assume that NRF habitat which, because it burned severely and now falls below the Forest Service's risk-potential thresholds, is therefore non-reproductive. Again, burned forests are structurally and biologically different from logged landscapes, and severely burned forest is known to provide important suitable habitat for owls. Nonetheless the DEIS (on page 141) says: "80 percent of the activity centers analyzed in the project area is at moderate or high risk to reproduction. The 'high' risk activity centers in the project area are not likely to produce any offspring because the core and home range aren't expected to provide enough of the resources needed to support the adults and offspring." As described above, this is an unjustified assumption that is not supported by scientific data from burned landscapes, and is instead contradicted by the best available science. The best available science shows that occupancy by pairs of owls was largely unaffected by amount of severe fire in the absence of salvage logging (Appendix A, attached), suggesting that most sites remain occupied and productive after fire regardless of fire severity (but before salvage logging). This demonstrates the remarkable ability of owls to coexist with severe fire, and also shows that habitat use will be influenced by site-specific factors (as noted in the BA on page 34: "Factors involved in the NSO's periodic selection of burned areas for foraging are not known at this time, and further research is needed to account for the many other aspects of a burned landscape that would factor into the NSO selection process.") However, the BA ultimately acknowledges (on page 35): "NSO foraging activity in these burned areas is supported in the literature…" Therefore it is not biologically valid for the BA to fail to consider PFF as potentially suitable habitat when categorizing habitat in ACs. There is a disconnect here where the agency acknowledges the use of burned forests on one hand, but then fails to consider it suitable on the other hand, thus improperly placing far too many ACs into the high risk category and, worse, exposing them to post-fire logging. This lack of consideration of the suitability of PFF directly results in the logging of what is actually suitable habitat and wrongly results in an artificially high number of ACs (83) being placed into the moderate and high-risk category (assuming little or no chance of reproduction), and therefore open to logging. This flawed process will cause significant harm to sites that actually could support reproductive owls, if they were left unlogged. If burned PFF habitat were properly called "suitable," then far more ACs would be in the low-risk category where core areas would not be logged	The Biological Assessment (BA) and Biological Evaluation (BE) both have an analysis to estimate the effects on northern spotted owl as a result of the proposed activities in this project, but these analyses are not the same and are not intended to be identical. The BE provides a relative change in the level of “risk to reproduction” based on effects to northern spotted owl habitat within the core and home range as described in the BE under the section called “analysis indicator”. The BE presents four levels of “risk to reproduction”: very low, low, moderate, and high risk to reproduction. For each of these levels of risk, a description of reproduction potential is provided given the amount of habitat occurring in the core and home range. For example, an activity center with “very low” risk to reproduction will likely provide sufficient resources to support reproduction, but if the project resulted in this same core and home range in a loss of habitat that resulted in this activity center moving in level of risk from “very low” to “moderate”, then this activity center would have a much lower potential for reproduction. An activity center with a “high risk to reproduction” that had a reduction in habitat as a result of this project is still affecting this activity center. Activity centers identified with a “high risk to reproduction” is described in the BE as reproduction is not likely to occur in the activity center because of the low number of habitat acres occurring in the core and home range. This doesn’t mean that reproduction couldn’t occur in activity centers identified with a “high risk to reproduction” rather successful reproduction is associated with relatively large number of suitable habitat acres and a low level of suitable habitat would provide challenges for reproducing northern spotted owl that would likely result in a lack of reproduction. A Biological Assessment is a document used to communicate information and analysis between the Forest and the U.S. Fish and Wildlife Service under the Endangered Species Act for consultation on the Westside Fire Recovery Project. The BA only analyzes one Alternative or combination of Alternatives as decided by the responsible official. Unlike the BE which must meet the requirements of the National Environmental Policy Act, the BA must meet the requirements of the Endangered Species Act thus the analysis provided in the BA may be similar but it is not necessarily the same as the BE. The northern spotted owl analysis in the BA does include fire-affected habitat into the effects analysis. The BA provides a review of the literature and it incorporates pertinent research into the analysis include northern spotted owl fire-affected habitat. The BA provides a detailed description and review of the literature associated with northern spotted owl use of fire-affected habitat under the section called “northern spotted owl use of the post-fire landscape”. In addition, the BA presents the process used to incorporate northern spotted owl research into the analysis in the section called “methods for assessing effects to northern spotted owl habitat from wildfire” and this section also defines fire-affected northern spotted owl habitat. The BA also outlines the methods used to include fire-affected habitat into the effects analysis in the section called “methods for assess impacts to individual activity centers”. The methods used to assess each of the northern spotted owl activity centers in the analysis area are displayed in the BA under the section called “methods for assessing habitat fitness potential of fire-affected activity centers”. Based on suitable northern spotted owl habitat, each activity center was placed into one of the three possible “habitat fitness potential” categories: high, moderate, or low fitness potential. This analysis is based on the northern spotted owl Recovery Plan recommended Interim Guidance (2012); northern spotted owl analysis is recommended to identify the activity centers that are most likely to contribute towards northern spotted owl recovery through reproduction (Recovery Action 10, pages III-43 to III-47). The interim guidance recommends focusing vegetation management in activity centers with ≤50% (250 acres) nesting/roosting and foraging habitat in the core and ≤40% (1,336 acres) nesting/roosting and foraging habitat in the core and home range combined (page III-45). Using this guidance, the northern spotted owl analysis resulted in 11 of the 94 activity centers evaluated in the analysis area being identified as meeting this recommendation and those activity centers were assigned a “low habitat fitness potential” as a result of the current habitat conditions; these activity centers are estimated to contain less than 700 acres of nesting/roosting and foraging habitat within the core and home range combined. In this project, the “high habitat fitness potential” activity centers are identified with >50% (250 acres) nesting/roosting and foraging habitat in the core and >20% (665 acres) nesting/roosting and foraging habitat in the core and home range combined which is a lower level of habitat than recommended in the interim guidance. Therefore, based on the amount of habitat, there are activity centers identified as moderate and high habitat fitness potential that could be identified in a low habitat fitness potential level. The BE provides a different approach for estimating effects on northern spotted owl using an analysis indicator called “risk to reproduction”. This comment may be combining these analyses that resulted in an interpretation that appears to be a far greater level of effects than actually presented in the analysis.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-24	The Preferred Alternative 2 restricts salvage logging only within 500-acre core areas in 'low-risk' ACs.1 However, protecting just the 500-ac core is insufficient, as Northern Spotted Owl home ranges are typically larger than 500 acres, owls expand their use of habitat as the breeding season progresses, and more distant locations may be critically important for survival. 1 Biologically, the Forest Service's approach is to "write off" those ACs where the unburned or low-burned potential nesting and roosting habitat is most limited post-fire. In fact, these sites require even greater levels of protection, and the ESA does not permit the FWS to write them off. TVA v. Hill, 437 U.S. 153, 194 (1978) ("Congress has spoken in the plainest of words, making it abundantly clear that the balance has been struck in favor of affording endangered species the highest of priorities"). 13 The concept of a 'core area' is to encompass and protect the best nesting, roosting, and foraging habitat in a contiguous manner close to the territory center. It has been demonstrated that the Protected Activity Center and the actual core area of the nest and daytime roost sites of California Spotted Owls showed considerable overlap, thus verifying the efficacy of the PACs for owl conservation (Berigan et al. 2012). Several studies, however, have noted the importance of habitats beyond the core area for overall year-round survival. Wiens et al. (2014: page 11) stated "Core-use areas only provide a fraction of the resources required for reproduction and survival, but these areas typically contain unique structure and resources required for nesting, roosting, and provisioning young." Emphasis added. Core areas are the most likely to be defended from conspecifics, but are not the total area required for survival and reproduction. Similarly, in their study of foraging habitat of Northern Spotted Owls in the Olympic Peninsula and North Cascades, North and Reynolds (1996: page 642) noted "[c]aution…should be used when inferring habitat quality from site use-intensity. The amount of time an animal spends in 1 area does not necessarily correspond to the site's habitat value. For example, an animal may spend only 5 minutes a day drinking, yet if water is scarce, the site is essential to the animal's survival." Emphasis added. The fact that most locations of Spotted Owls are within the core use area (because they are central-place foragers) does not negate the importance of foraging sites beyond the core areas. Adult survival is an important parameter in population growth rates for this species, where adult survival is high with low temporal variation, and reproduction/recruitment is low with high temporal variation (Franklin et al. 2000). Numerous radio-telemetry studies have documented expansion of habitat use by Spotted Owls during the overwinter nonbreeding season, which is also the most energetically stressful time when most mortality of adults and dispersing juveniles occurs (Franklin et al. 2000). Wiens et al. (2014) reported nonbreeding season home ranges of Northern Spotted Owls in the Coast Range of Oregon were twice as large as those used during the breeding season. In another study (Glenn et al. 2004), nonbreeding season home-range sizes of Northern Spotted Owls in the Oregon Coast Range were on average 1,239 ha (SE = 134), and 898 ha (SE = 147.3) in the breeding season-this amounts to use of an average of 3,062 acres during the nonbreeding season.	The activity center “core” is a one-half mile radius typically centered on the nest site. The core is specifically identified because the core typically contains the majority, of the northern spotted owl activity during the nesting period. As discussed in the BA in section called “methods for assessing habitat fitness of fire-affected activity centers”, the amount and quality of habitat in the core is strongly associated with successful reproduction. In addition, the northern spotted owl Recovery Plan recommends to “emphasize vegetation management treatments outside spotted owl core areas…” (page III-34). Therefore, minimizing effects to habitat in the core is likely one of the most important components in northern spotted owl recovery. The effects of the proposed activities for each of the Alternatives are available in the Biological Evaluation.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-25	Why do many Spotted Owls expand their winter movements and occasionally even migrate? This is likely because Spotted Owls are capable of depleting the prey supply in the breeding season core area during nesting. Carey et al. (1992: page 233) found "moderate-to-high foraging activity (> 0.3 owl-years within 1 km of the center of the trap grid) appeared to depress flying squirrel populations…Populations on two trap grids that contained owl nest sites (in 1986) showed marked depression…" In a recent study, 4 radio-tagged Mexican Spotted Owls moved to wintering areas that burned 4-6 years earlier and that had 2-6 times greater abundance and biomass of small mammal prey than nest core areas associated with those owls (Ganey et al. 2014). Similarly, Block et al. (2005) found 2 radio-marked Mexican Spotted Owls moved to a wintering area where prey biomass during the winter was 7 times greater than during winter in the nesting area of these owls. These studies indicate that wintering areas-and in the case of Ganey et al. (2014), burned wintering areas-provided important foraging habitats during an energetically stressful time of year. The literature on movements and habitat use of Spotted Owls can help us to estimate a more robust amount of habitat to protect from logging. The table below is from Carey et al. (1992) page 231. The study was conducted partly in the Klamath Mountains. Over 24 months, "areas traversed ranged from an average of 533 + 58 hectares in the MCC to 2,908 + 595 hectares in the DFF," (Carey et al. 1992: page 231). In the table below, the most applicable habitat type to the Westside Project would be MCF2, the 14 mixed-conifer fragmented old forest in the Klamath. These owls traversed over 4,438 acres, and up to 5,083 acres (including +1 SE and converted from hectares), based on a Minimum Convex Polygon. In the study, the length of the major axes traversed by owls ranged from an average of 2.9 km in MCC clumped old forest, to 5.5 km in MCF2 fragmented old forest. If we assume the center of the axis was the nest, and used the most applicable habitat type to the Westside Project (MCF2), then the average farthest distance owls ranged from their nest was approximately 2.75 km (= 5.5 km / 2), and the maximum farthest distance was 3.45 km (= 5.5 + 1.4 / 2). Indeed, Bond et al. (2009) found a female California Spotted Owl ranged > 3.4 km from the nest during the breeding season, a distance similar to that found by Carey et al. (1992). That female remained for several days in the distant stand, and then returned to areas closer to the nest. Therefore, an adequately protective buffer around nests/roost sites would likely be at least a 3.5 km radius. This radius, however, does not even consider winter migratory movements in which owls travel even farther distances seeking out foraging habitats. Wiens et al. (2014: page 185) documented Northern Spotted Owls often were located 3-4 km from their breeding sites in fall and winter, but 5 of 23 owls migrated to a winter home range that was 7-25 km distant from their breeding range. Bond et al. (2010) also documented expanded winter movements by California Spotted Owls, including a pair that migrated 13 km from their breeding season territory center-they then moved back to the same breeding site the following spring. In a major study of > 70 radio-tagged Northern Spotted Owls from 3 areas in the Klamath and South Cascade mountains, Irwin et al. (2012) observed 4-6 individuals moved to lower elevations each winter, and roosted in conifer forests but foraged < 600 m from the nearest conifer forests, perching from scattered trees and snags in oak savannahs and manzanita shrubfields . Although these distances are the farthest traveled and not the average, the depletion of prey within high-use breeding-season foraging areas forces owls to travel to new locations to hunt, and using the farthest location would be the most conservative protective standard. Overall, we must assume that, given the energy needed to travel to distant foraging habitats, these hunting grounds are important to the individuals and necessary for their survival. Therefore, it stands to reason that for the high reproductive potential, low-risk Activity Centers, a 500 acre area-while comprising the nest and most breeding-season roost sites-falls far short of the area actually required by Spotted Owls to maintain 15 survival and reproduction. Even the 1,086 home range is far too small an area given their actual use patterns. Thus, it is not scientifically valid or cautious management to conclude that no adverse effects will occur from merely protecting 500 acre core areas of a handful of the so-called low-risk sites, especially since many additional sites likely will support reproduction and should be included in this lowrisk category.	The defined “core” and “home range” area has been described differently depending on the spot within the northern spotted owl range, but the Klamath Province has a defined core and home range size. The U.S. Fish and Wildlife Service has defined the core (one-half mile radius) and home range (1.3 mile radius) which is typically centered on a nest site (northern spotted owl Recovery Plan 2012 and the Regulatory and Scientific Basis for the U.S. Fish and Wildlife Service Guidance for the Evaluation of Take for Northern Spotted Owl on Private Timberlands in California’s Northern Interior Region 2009). Using the defined core and home range, the “submitted” Biological Assessment estimated the effects of the proposed activities (using Alternative 2 with modification) and determined that 70 of the 94 activity centers analyzed were “likely to be adversely affected” by the project. However, this determination has a wide spectrum of effects which range from effects that barely exceed “insignificant” or “discountable” to the level of affecting many acres of suitable habitat. Although the determination is accurate based on the described process of consultation, the consequences of the estimated effects on the 70 activity centers are not equal.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-26	Moreover, the available research suggests that Northern Spotted Owls expand and shift their core and home ranges post-fire. FWS (2014, page 32 of Douglas Complex Post-Fire Salvage Project Biological Opinion, TAILS #01EOFW00-2014-F-0161) explains that "Clark (2007) found that in high severity burned landscapes, and landscapes with salvage harvest, spotted owls are likely to increase their home ranges to compensate for the loss of suitable habitat and this will likely impact spotted owl habitat-fitness." Id. on page 43. Clark and others concluded that "spotted owls may shift their habitat use patterns and/or increase their home range size to encompass the best available suitable habitat post-fire rather than vacate the affected site, unless very poor habitat conditions exist over much of their home range (King et al. 1998, Clark 2007)." Id. on page 33. Spotted Owls that shift and/or expand their home ranges in response to wildfire and subsequent postfire logging take advantage of unoccupied habitat that may be necessary for the species to persist in a post-fire environment. Protection of all habitat needed year-round is likely to be especially important for this seriously declining subspecies, and past and continued logging may explain population declines range-wide despite protection of core areas	Spotted owls can move from one nest site to another for various reasons including natural disturbance. This possible movement of a nest location is one of the primary reasons for conducting northern spotted owl surveys throughout the life a project. The Westside Fire Recovery Project is currently being surveyed , but surveys are not complete for this year at this time. If a new nest site is discovered (a nest not previously considered during consultation with the U.S. Fish and Wildlife Service) before the completion of a project, then the Forest is require to re-initiate consultation to account for the possible effects resulting from completing the project. The analysis presented in the BA and BE includes the best available data on northern spotted owl locations.
204.01 - NSO	#18899-4	This project would conduct post-fire logging in up to 94 Northern Spotted Owl Activity Centers (AC = ~1,086 acres surrounding nests/roost locations). In the Forest Service's Preferred Alternative 2, only 11 of these ACs were categorized as "low risk" and thus their 500-acre core areas will be protected from logging (but the home ranges of all ACs are open for logging). The other ACs will experience logging even within the 500-acre core areas because the Forest Service erroneously deemed these as low-quality sites with low potential for reproduction. The analysis of impacts in the Westside BA and BE with respect to Northern Spotted Owls is fundamentally flawed, thus leading to conclusions about impacts that are not supported by scientific data. One key reason the analysis is flawed is because the Forest Service acknowledges (BA page 22) that "even with the loss of canopy cover and key habitat components typically found in the NRF habitat, studies indicated that burned areas can still function as foraging habitat after the fire, depending on many factors including patch size, edge type, burn severity, and proximity to known owl sites." The BA 4 defines this foraging habitat as "PFF," or "Post Fire Foraging." Then, however, in the methodology used to determine 4 categories of risk as described in the BA/BE and DEIS, the agency does not consider the burned forest (PFF) as suitable - it instead ignores the PFF when calculating suitable habitat as part of the process of defining low, moderate, and high risk ACs. Moderate and high risk ACs are assumed to have low potential for reproduction. This lack of consideration of the suitability of PFF resulted in an artificially high number of ACs (83) placed into the moderate and high-risk category (assuming little or no chance of reproduction), thus subjecting the 500-ac core areas of these ACs to post-fire logging. This is counter-productive because the very areas that need protection from post-fire logging-severely burned areas-are instead opened to logging under the false pretense that such areas are not important to owls. In fact, these areas are critically important because they provide the habitat owls need to find food to survive in the post-fire environment. The Forest Service's wrongful assumptions thus will cause significant harm to 83 sites, and will likely preclude the sites' ability to support owls. Indeed, post-fire logging has been demonstrated to reduce occupancy of Spotted Owl territories (see discussion, below), and post-fire logged sites are very rarely used by foraging owls; unlogged burned sites, on the other hand, are frequently used for foraging by Northern Spotted Owls. Further, to assume likelihood of reproduction at a site based solely on amount of unburned/low-burned NRF habitat is incorrect because it does not reflect scientific data showing owl occupancy and reproduction even at sites where a substantial amount of habitat burned at high severity.	The research associated with spotted owl use of fire-affected forest lacks clarity and agreement between researchers. The BA provides a brief review of the relevant research in the section called “northern spotted owl use of the post-fire landscape” and we found that the research has opposing views. For example, Clark et al. (2013) states “the few studies that have been conducted on spotted owls in burned landscapes have provided equivocal results regarding the effects of wildfire on the species [spotted owl]”. Eyes (2014) states “ Overall, California spotted owl avoided high severity forest patches and used lower severity patches, consistent with my predictions and previous research on northern spotted owls (Clark 200, Comfort 2013).” While Lee and Bond (2015) stated “Our findings add to the growing body of research that fire, even high-severity fire, is not a major threat to the persistence of California Spotted Owls in the Sierra Nevada (Bond et al. 2002, 2009, Roberts 2008, Roberts et al. 2011, Lee et al. 2012).” As presented in Dr. Manley’s review of the available research concerning spotted owl use of fire-affected forests in her declaration for the US District Court, the available research displays disagreement and until research provides more fully developed, it is premature to make clear conclusions about spotted owl use of high fire severity affected forests and the level of effects resulting from salvage harvest (Center for Bio. Div. vs. Forest Service Oct 1, 2014).We weighed the information in these articles displayed above plus many other articles not presented here (see the BA) and used our own experience and professional judgement to develop the methods presented in the BA. We focused our analysis on the quality, distribution, and amount of habitat and recognized that pre-fire suitable habitat that burned at moderate and high severity fire could provide foraging opportunity. However, given the large expanses of contiguous moderate and high severity fire affected forest in the project area, it isn’t reasonable to assume that an owl would tradeoff the cover of high quality habitat to venture far into a burned forest that provides much less cover to escape predation for the potential reward of a possible meal. Therefore, we limited the value of fire-affected habitat to 500 feet from existing suitable habitat. This scenario provides likely use pattern based on our professional judgement and review of the literature, but we are not saying that a spotted owl would not venture further than 500 feet into moderate and high severity fire affected habitat from suitable habitat; rather we think that most spotted owls would use high quality habitat first and given the biotic (e.g. pre-fire habitat quality and adjacent existing habitat quality) and abiotic (e.g. slope position and patch size) of the fire affected habitat, spotted owls are most likely to use fire affected habitat within 500 feet of existing suitable habitat.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-5	Another fundamental flaw in the Westside BA/BE is the failure to develop management standards based on the best scientific data available, including protecting owl home ranges from post-fire logging (see e.g. Clark et al. 2013; Bond et al. 2009). The BA/BE arbitrarily assume owls will not forage more than 500 feet from the edge of high-severity patches, which is not based on any published scientific studies of which I am aware. Even if the 500-acre cores of all ACs received protection from post-fire logging, there is no scientific evidence that this minimal protection will have no adverse impact on the owls at the larger home range scale, as owls utilize areas far outside the 500-ac core area for foraging, particularly during energetically stressful overwintering months after the prey supply has been depleted within the birds' nesting areas. This is why the published literature speaks to protecting not just core areas, but home ranges as well (Clark et al. 2013). These major flaws in the impacts analysis result in unacceptable levels of habitat loss from post-fire logging in the Westside Project, which is especially problematic and worrisome given that the Northern Spotted Owl continues to experience population declines, and scientific studies show adverse effects of post-fire logging on occupancy, survival, and habitat use. Below, I provide additional details and information regarding these failures in the BA and BE analyses of impacts which I hope will be useful in a new, updated analysis of the impacts of post-fire logging.	We are not aware of any rule that prohibits effects on spotted owl. The Endangered Species Act likely presents the greatest amount of requirements for the actions that may affect northern spotted owl. The Forest has entered into consultation with the U.S. Fish and Wildlife Service per Section 7 of the Endangered Species Act. After we completed the analysis of effects of the project on spotted owl, the level of effects rose to the level of a formal consultation. A formal consultation is basically started when the estimated level of effects on spotted owl or its critical habitat resulting from the proposed activities exceed the level of “insignificant” or “discountable”. However, a Federal agency proposed actions can’t “jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat” (Section 7(a)(2) Endangered Species Act). Therefore, formal consultation has a wide range of effects that may occur within a given project and still be within the formal consultation process. The Westside Fire Recovery Project has identified several spotted owl activity centers with the determination that the proposed activities are “likely to adversely affect” spotted owl activity centers or its critical habitat. Given the wide range of effects that could occur within the formal consultation framework, the Westside Fire Recovery Project BA provides stepwise process of displaying effects for each activity center. This is accomplished by presenting the existing amount of habitat occurring in the core and home range with the acres of habitat degraded, downgraded, or removed for each activity center. Plus, we developed “intensity factors” that incorporate the best available research into triggers that represent when the proposed activities have exceeded the level of “insignificant” or “discountable” effects. Therefore, each activity center that was assigned an “intensity factor” was also assigned a determination of “likely to adversely affect”. The remaining activity centers without a determination had a site specific evaluation where a combination of effects were identified that resulted in a portion of these activities centers with effects that exceeded “insignificant” or “discountable”. The BA provide a detailed process described under the section called “methods for assessing impacts to individual activity centers”.
204.01 - NSO	#18899-6	I strongly recommend protection of all 94 ACs affected by the 2014 fires by conducting no post-fire logging within at least a 2.2 km (3,756 acre) area surrounding the nests/roost sites. Even better, if the Forest Service were to fully consider all the year-round requirements of the Northern Spotted Owl and ensure that the agency's actions would not threaten the continued existence of this declining, federally listed subspecies, it would refrain from conducting post-fire logging anywhere in the fire complex that owls might use, with the exception of removal of hazard trees as necessary along well-traveled roadways. Otherwise, there will certainly be adverse impacts of the Westside Project on the Northern 5 Spotted Owl's ability to use burned stands for hunting, as well as serious negative impacts on the suite of burned-forest dependent species including woodpeckers, bluebirds, house wrens, deer mice, and a host of other organisms that survive and reproduce better in severely burned forests than anywhere	The Westside Fire Recovery Project will undoubtedly have effects on several wildlife species as a result of all Alternatives including the “no action” Alternative. This is one of the primary reasons for completing the extensive resource documents. For wildlife alone, we have provided a Biological Assessment, Biological Evaluation, Management Indicator Species, Survey and Manage, and Migratory Bird Reports to describe the effects of the project may have on several individual species or groups of species. Even though we didn’t analyze all wildlife species that could occur within the project, the species within the documents identified above provide a description of effects across all the terrestrial habitats in the project area. Therefore, though possibly indirectly, even deer mice are considered in the effects analysis of this project.
204.01 - NSO	#18899-7	The BA/BE and DEIS Fail to Adequately Describe the Scientific Literature that Shows Salvage Logging is Harmful to Spotted Owl Occupancy, Survival, and Habitat Use The DEIS (page vi) states that there is disagreement about the effects of salvage logging on Northern Spotted Owls. This is incorrect, at least within the expert scientific community that conducts research on Spotted Owls. The only published scientific data available demonstrate nothing but adverse effects of post-fire logging on this species. There is not a single published study showing post-fire logging is beneficial to owls - only the Forest Service's incorrect assumption that trees must be replanted after fire to regrow a forest. The reality is that Spotted Owls are not only remarkably tolerant of high-severity fire in their home ranges and even core areas, but also they use severely burned forest to find the food they need to survive. Habitat Attributes for Prey-The BA section entitled "NSO use of post-fire habitat" provides a literature review of some of the available studies on Spotted Owl occupancy, reproduction, survival, and space use after forest fire. However, there are numerous statements that should be revised to provide a more accurate and balanced representation of the literature. For example, on page 32, the BA states "Replacement woody debris may replenish from falling snags and trees or may remain in areas where fire intensity was less severe." This statement should also be extended to areas of high fire severity, where snags and coarse woody debris, herbaceous plants, and shrubs can be plentiful (Bond et al. 2009, Donato et al. 2012, DellaSalla et al. 2014). These habitat attributes-which are eliminated after post-fire logging-can support a variety of small mammal species that are consumed by Spotted Owls (Forsman et al. 1984, Williams et al. 1992), possibly explaining why these owls can use complex early seral burned forests for foraging. There is no scientific justification to say woody debris and falling snags will remain only in areas burned less severely.	This sentence was intended to reflect that snags in areas affected by high severity fire provide future coarse woody debris and when compared to forests that burned at lower severity fire, high severity fire affected areas may lack coarse woody debris immediately after a fire.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-8	The BA also provides no information about project effects to small mammal potential prey for Northern Spotted Owls. There is no mention of proposed management of shrubs in the Westside Project, but salvage operations often remove shrubs because they are perceived to compete with tree seedling regrowth (although this is not actually true, and nitrogen-fixing shrubs like Ceanothus can improve soil conditions). Deer mice (Peromyscus maniculatus) increased significantly over time in moderate and severely burned mixed-conifer forests in the San Bernardino Mountains of southern California over a 5- year post-fire period (Borchert et al. 2014). During two years subsequent to intense fire in forests in Montana, deer mice were invariably the most numerous species in burned study sites (Zwolak and Forsman 2007). Dramatic increases in deer mice in severely burned conifer forests were not due simply to colonization of the burn from surrounding unburned forests. When population densities were low, the vast majority of individually ear-tagged deer mice were found in post-severe-fire forest areas, and mice appeared regularly in unburned forests only when population densities were high (Zwolak and Forsman 2008). This finding indicated that severely burned forest was preferred deer mouse habitat and that the post-fire population increase was intrinsic to the burn, thus the burn itself was a source habitat. 6 Pocket gophers (Thomomys bottae) were the second most important prey item for California Spotted Owls by percent biomass in the Sierra National Forest (Munton et al. 2002) and the most important prey item in burned landscapes of the Sequoia National Forest (Bond et al. 2013) based on analyses of regurgitated pellets. Pocket gophers are uncommon in mature and older forests with little or no herbaceous ground cover (Williams et al. 1992), and thus will probably benefit from the complex early seral habitat created by fire. For example, high-intensity burned patches documented by Bond et al. (2009) contained high levels of herbaceous vegetation.	The Biological Assessment does describe the effects of the proposed activities on northern spotted owl prey species. Prey species are described in several portions of the BA. For example, in the BA under section called “Species life history and status” subsection “northern spotted owl Prey”, prey species that are likely to occur in the analysis area are discussed. In section “northern spotted owl use of the post-fire landscape”, prey species are discussed in reference to the change in habitat conditions due to fire and the possible effects to prey species abundance. In section “Effects to northern spotted owl and northern spotted owl habitat from the proposed activities”, the BA describes the effects of each proposed activities such as salvage harvest, fuels management zones, and underburning on likely changes to prey abundance. Prey are discussed again in section called “effects on prey, competitors, or predators” which describes the overall effects of the project on prey species habitat.We agree that fire can influence small mammal distribution and populations. Zwolak and Foresman (2007) found small mammal communities differed between burned and unburned forest habitat. Generally, burned areas had a higher proportion of deer mice when compared to other species captured in the study area, but species diversity increased the year following the fire. Generally, deer mice numbers increased in fire affected areas (Zwolak and Foresman 2008). However, red-backed voles, bushy-tailed wood-rats, and flying squirrels avoided burned areas for at least two years after the fire. This avoidance of burned areas was attributed to the possible reduction in food resources, predation, and distance from colonists. The primary prey species associated with northern spotted owl in California is the dusky-footed woodrat, northern flying squirrel, red tree vole, and deer mice presented in order of importance (Franklin 1997). The Westside Fire Recovery Project contains all these species except red tree vole and the northern flying squirrel is likely not as common as described in Franklin (1997) study area. When comparing frequency and biomass, the woodrat and flying squirrel are the most important prey species (Franklin 1997). Woodrats are associated with brush habitat and are in low abundance in old-growth forests (Sakai and Noon 1993). Northern flying squirrels are associated with mid- and late-seral forests (Carey et al. 1992). High severity fire affected areas in the project area, deer mice are likely present and will likely increase in density. Shrubs are likely to establish within most areas that lack tree canopy cover. After shrubs establish, woodrats should become more abundant and these woodrats may enter the adjacent closed canopy forest where northern spotted owl could capture these prey. Prey capture in the brushy areas is difficult for northern spotted owl (Franklin 1997). However, until brush covers these fire affected areas, deer mice are likely accessible to northern spotted owl as a food source. Northern flying squirrels are not likely present in high severity fire affected areas since these areas lack tree canopy cover. As the forest develops into mid-seral conditions, flying squirrels may return to these areas.The proposed planting of trees in the Westside Fire Recovery Project is prescribed at a minimum spacing of 12 feet between seedlings. These trees have an estimated probability of mortality of about 40-50% thus increasing the spacing between seedlings when mortality occurs. The seedlings will be planted after the fuels are reduced to meet desired fuels conditions in the salvage harvest and site preparation and plant treatment units. No herbicide will be used to control shrubs in the project, but proposed treatments may post-pone shrub growth (i.e. fuels treatment) or interrupt shrub growth in small pockets (i.e. possible hand treatment around seedlings). For northern spotted owl, treatment units will likely have a variety of stages of early seral vegetation to possible food sources for foraging and outside the treatment units, there are a wide-range of vegetation conditions ranging from herbaceous habitat to late-seral conifer forest. Overall, spotted owls will have diverse habitat types to forage within and the species and density of those species are anticipated to reflect the habitat type.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18899-9	The BA also contains an incorrect assertion-that severe fire causes a limitation of coarse woody debris. The BA (page 32) states "habitat attributes such as coarse woody debris (CWD) for prey habitat…can be altered drastically and be limiting after severe wildfire." (Emphasis added.) It is completely erroneous to state that CWD in severely burned complex early seral forests would be limiting. In fact, it is welldescribed in the scientific literature that complex early seral forests contain abundant dead wood which is not present after regeneration harvest or post-fire logging (Donato et al. 2012, DellaSalla et al. 2014). This dead wood is strongly associated with small mammal habitat (and hence Northern Spotted Owl prey) in all kinds of forests, burned or unburned. Spotted Owl Nesting-Another erroneous assumption regards Spotted Owl nesting in burned forests. The BE (page 10) states "the research does suggest that fire affected habitat could be used for foraging, but not nesting." Actually, Bond et al. (2009) documented 2 California Spotted Owl nests in conifer forest burned at moderate severity in the Sequoia National Forest: "We documented one nest tree in unburned mixed conifer-hardwood, one in conifer forest burned at low severity, and 2 in conifer forest burned at moderate severity. One pair, nesting in a stand burned at moderate severity, produced the only fledgling of the 4 nesting attempts. All 4 nest trees were large (>72 cm) conifers, including one apparently killed by the fire within a moderately burned stand." (Emphasis added.) This may be a small sample but it refutes the statement in the BE that "areas burned with…moderate burn severity are no longer considered suitable habitat for nesting, roosting or long-term occupation…" (BE page 33). I agree that optimal nesting habitat is likely to be in traditionally defined mature and old-growth habitat with large trees and high canopy cover, but the data also show that successful nesting is possible in moderately burned forest.	Generally, in the project area, high severity fire consumed most of the woody debris. This woody debris will be replaced as the dead trees start to fall over. Small snags typically start falling over soon after the fire but larger snags may take a few years to fall over unless some other disturbance (e.g. windstorm) intervenes. Since woody debris is such an important habitat component to small mammals, it is important to consider the amount of current and future woody debris. This why the BA describes woody debris as a habitat attribute in the section called “northern spotted owl use of the post-fire landscape”. The BA states “Areas burned with high burn severity are no longer considered suitable habitat for nesting, roosting or long term occupation by spotted owls because these areas no longer supply the habitat attributes needed for thermal protection, nesting structure and cover from predators necessary for long term viability…” (page 36 of “submitted” BA). As pointed out in the comment, Bond et al. (2009) reported two nests in moderate fire severity affected conifer forest. We are not refuting whether or not moderate severity could provide nesting opportunity in certain circumstances. As described in the BA, moderate severity can contain small inclusions of forest habitat with low fire severity. These small inclusions could provide micro-site conditions to provide nesting opportunity. This is why the Forest is completing spotted owl surveys to find potentially nesting spotted owls prior to implementation and not solely rely on habitat typing to dictate where a spotted owl might nest.
204.01 - NSO	#18909-123	The survey strategy in the Wildlife BA does not give the public or decision maker enough information. It is not known if the surveys preformed will be done according to protocol or what AC's will be surveyed. Assumptions in the BA BA 19, "The NSO habitat layer, derived from the EVEG 2007 remotely sensed data, provides a generally accurate depiction of NSO habitat at the scale at which it was used for this analysis; however, variations exist across the landscape, where habitat will be under-typed in some areas and over-typed in others; generally the habitat is depicted accurately. The majority of the uncertainty in the habitat typing within the layer stems from the category assigned to the habitat (i.e. 'nesting/roosting' or 'foraging'), but the designation as 'suitable' is generally correct." (Emphasis added). We are not sure what the BA means by 'generally'. Furthermore, there is a clear distinction between suitable N/R habitat and Foraging. The DEIS fails to make an accurate distinction between habitat types. BA 19, "NSO home ranges and core areas represent the "best" placement of an activity center that we can make given the lack of recent surveys for the majority of the project area and the uncertainty inherent in using simple circles to represent owl use patterns at the home range and core area scale. Level 1 biologists used the more pertinent and applicable observation data within NRIS and CNDDB databases to establish the location of the activity center." What observations are those and what conclusions have been drawn from them? It is arbitrary and capricious to elect to change Activity Center boundaries, if that is what is being implied by this assumption. It is difficult for the public to ascertain an accurate account of how AC's are being analyzed. BA 19, "When salvage units contain inclusions of habitat that burned at low severity (RAVG grid code 1 and 2), the areas that burned at low severity will not be harvested but will instead be delineated as retention clumps; these clumps will be excluded from treatment unless specific circumstances occur where implementation is hampered and these areas must be entered or crossed in order to access a road. When this occurs, all efforts will be made to retain trees that don't meet the set probability of mortality (70% probability of mortality for salvage units and 60% of mortality for roadside hazard). However, in order to account for this potential impact to NSO habitat, we are assuming that 10% of the total grid code 1 and 2 inclusions will be degraded to the point that the NRF may not function as NFR post-treatment due to residual or unintentional damage during implementation." We are not sure why low severity areas are included in treatment boundaries. The DEIS claims that they are not at all considered for treatment. Which units contain low severity patches? What does the BA mean by 'all efforts'?	Northern spotted owl surveys are not required by the Endangered Species Act; however, the action agency is required to reduce the potential of “harm” to a listed species. Surveys are simply one tool to aid in identifying the location of a particular species; areas that contain a threatened or endangered species can be avoided by project activities in time or space thus reducing the possibility of harm. Survey protocol is designed to provide consistency in survey efforts (methods of surveying) and estimate the likelihood of an individual may be detected (mathematical calculation based the number of times a particular area was surveyed using specific survey method). Deviations in protocol as defined in “Protocol for Surveying Proposed Management Activities that may Impact Northern Spotted Owls” (U.S. Fish and Wildlife Service 2012) can reduce the likelihood of detection of an individual in a particular area when occupied. The Forest has developed a survey strategy that follows the survey methods described in the survey protocol. The Wildlife Biological Assessment describes the spotted owl survey strategy in the section called “northern spotted owl Survey Strategy”. Further, the Wildlife Biological Assessment describes the areas where protocol is not met in the section called “Unsurveyed Suitable Habitat in the Analysis Area”. An EIS is summarization of the various reports drafted by specialists and these reports provide more detailed information than is summarized in the EIS. The commenter is clearly able to find these reports given the fact that the comment cites the Wildlife Biological Assessment. The Wildlife Biological Assessment describes northern spotted owl habitat in great detail in the section called “Methods for assessing pre-fire northern spotted owl habitat suitability” and describes fire affected habitat in the section called “methods for assessing effects to northern spotted owl habitat from wildfire”. These sections combined describe nesting/roosting, foraging, and dispersal habitat and the resulting effects of each fire severity on each habitat type. The assumptions and description of the data used in the northern spotted owl analysis are described in the Wildlife Biological Assessment in the sections called “Assumptions for this analysis”, “Methods for assessing pre-fire northern spotted owl habitat suitability”, and “Methods for assessing effects to northern spotted owl habitat from wildfire”. The methods for analyzing northern spotted owl is available in the section called “Methods and definitions”. Activity centers are created by using spotted owl survey data and habitat. The activity center analysis uses two circles (one-half and 1.3 mile radius) centered typically on the most recent nest site. The purpose of this analysis is to estimate the potential effects the project may have on nesting spotted owl. The process is described in the Wildlife Biological Assessment under the subheading “Placement of Activity Centers” in the “Methods and definition” section.The prescription for salvage harvest is described in Chapter 2 of the final EIS. The Wildlife Biological Assessment is analyzing the effects to habitat; the potential effects are described in the Wildlife Biological Assessment in the section called “Methods for assessing impacts to individual activity centers”.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18909-124	BA 19, "Post-fire foraging (PFF) area is most likely to be used by NSO within 500 feet of an existing patch of suitable habitat (patch size is >5 acres of NR and F combined)." Wildlife BA 50, "Although the exact maximum distance an owl might travel from the edge of suitable habitat into PFF to forage is unclear because the research doesn't report this attribute; we are assuming the likelihood of an owl using PFF will decrease as the distance increases from suitable habitat and consequently, the value of PFF for foraging opportunity will decrease with distance from suitable habitat. After review of recent literature on the use of edge habitat (Comfort 2013; Eyes 2014) and in consultation with Level 1 FWS biologists, and professional judgment, we are assuming that PFF within a 500 foot buffer from existing, currently suitable NRF is the most likely type of PFF used by foraging owls. This doesn't mean that owls will not use areas beyond 500 feet for foraging, rather that the incidence of this is likely uncommon." The Comfort 2013 dissertation states at page 53, "Vegetation communities were significantly closer to old-growth community structure in edges between unsalvage-logged edges and salvage- logged edges 14 years following a wildlife in a northern California mixed conifer-hardwood stand (Hanson and Stuart 2005)."On page 56, "Hanson and Stuart (2005) found an increase in edge influence of 15-30 m in edges created by adjacent low- and high-severity fire when the high- severity portion had been salvage-logged compared to unlogged edges. Our results suggest that edge effects from salvage-logging, increased the patch size of higher severity disturbance." On page 57, "On federally-managed lands that were not salvage logged, fire severity was greater close to the edges of boundaries with privately managed land. The difference in severity was most likely due to edge effects from salvage logging and not from the pre-existing fuel loads or the fire per se." On page 88, "However, spotted owls in this study area had greater local extinction probabilities and a larger reductions in site occupancy than a nearby mature site that did not experience fire and salvage-logging (Clark et al. 2013)." While the Comfort 2013 dissertation, which looked at fire and owl use in one watershed, conclusions imply that NSO's do not use large expanses of high severity. However, NSOs do use the edges of high severity patches adjacent to home ranges. Our understanding of diffuse edge is as defined in Clark 2013, "Diffuse edges were defined as the interface between stands that had less than a 40-year age difference." However it seems the agency is using the more common definition such as dispersed. <u>The Bond 20095 study found that owls had a "high probability of foraging in burned areas, including high severity, within 1.5 km of nests or roosts. The 500' assumption is arbitrary and capricious.</u> 5 Bond M.L., Lee D.E., Siegel R.B., Ward, J.P. Jr. 2009. Habitat selection and use by California spotted owls in a post-fire landscape. Journal of Wildlife Management 73:1116-1124 Page 21, "Due to the scope and scale of this project, it was not practicable to field validate the remotely sensed habitat data (EVEG) for all areas affected by all project activities, but the portion that was field evaluated resulted in an reasonably accurate assessment of the habitat layer depicting NRF habitat even though there was some error in accurately splitting NR and F over the entire analysis area. Even though NR and F are sometimes presented separately in this analysis, most of the analysis combines NR and F to reduce this potential error." There are obvious inadequacies in the project NEPA analysis documents given the scope, scale and rushed timing of the proposed project. The BA does not disclose what portion or percentage of the project was field verified. Given that the project area is over 200,000 acres and that the field verification that was done was 'reasonably' accurate the DEIS and BA fail to take the "hard look" that NEPA requires.	This comment appears to imply that spotted owls may travel long distances through fire affected habitat to forage and cites Bond et al. 2009. Bond and others (2009) state “California spotted owls whose territories included unburned and burned Sierran mixed conifer forest of low- to high-severity made use of all burn severities, with high probability of foraging in burned areas, including high severity, within 1.5 km of nests or roosts, and selectively roosted in low-severity burned areas”. The 1.5 km distance was derived from modeling spotted owl detection data which provided a location of each owl in the landscape among other data like the type of habitat and fire severity. The results of this analysis basically provides information that spotted owls may travel within the core and home (northern spotted owl home range is defined as about 2km) to forage in all fire severities, but Bond et al. doesn’t imply that spotted owls will travel 1.5km from suitable habitat into moderate and high fire severity affected forest to forage. The actual path and associated habitat that a spotted owl may travel through to reach an area to forage is not directly discussed in Bond et al. 2009. We use a 500ft buffer around suitable habitat to define the spatial boundary where Post-Fire Foraging would occur for the analysis. The next comment claims that our analysis fails to take a “hard look” at the habitat data used in the spotted owl analysis. A “hard look” has implications to the quality of the analysis presented in the Biological Assessment. Therefore, the response to this comment will use some of the basic principles of an analysis that constitutes a “hard look” and these are presented below with a response.§ Assumptions are spelled-out;o On pages 19-20 of the “submitted” BA, the section called “assumptions for this analysis” provides several assumptions used in use of the northern spotted owl habitat data.§ Inconsistencies are explained;o On pages 20-24 of the “submitted” BA, the sections called “methods for assessing pre-fire northern spotted owl habitat suitability” and “methods for assessing effects to northern spotted owl habitat from wildfire” describe the process used to identify northern spotted owl habitat and possible error in the data.§ Methodologies are disclosed;o On pages 20-24 of the “submitted” BA, the sections called “methods for assessing pre-fire northern spotted owl habitat suitability” and “methods for assessing effects to northern spotted owl habitat from wildfire” describe the various methods of defining the habitat pre- and post-fire.§ Contradictory evidence is rebutted;o There are several locations in the BA where contradictory evidence is discussed. For example, starting on page 36 of the “submitted” BA, the section called “northern spotted owl use of the post-fire landscape” discusses the contradictory research associated with spotted owl use of fire affected habitat. § Records referenced are solidly grounded in science;o The records referenced in the BA are a result of peer-reviewed literature, peer-reviewed survey design (northern spotted owl survey protocol), or peer-reviewed inter-agency documents (e.g. northern spotted owl Recovery Plan).§ Guess work for the reader has been eliminated (line of logic illustrated); and o The BA provides an ample amount of explanation and discussion to illustrate the evidence presented, facts found, and resulting process and determination of effects based on proposed activities for spotted owl.§ Conclusions are supported in a manner capable of public and judicial understanding.o We developed stepwise process to illustrate the analysis process so the reader would know the categorical reason for the determination assigned to each activity center. For example, starting on page 27 of the “submitted BA, the section called “methods for assessing impacts to individual activity centers” provides a description of each “intensity factor” used in the analysis to make a determination for each activity center. Then the results of the analysis was displayed in a table that provides an activity center number and the associated “intensity factor” and corresponding determination.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18909-26	On page 115 of the DEIS, "Hazard tree removal where it does not overlap with proposed salvage harvest units will decrease fuel loading and, therefore, potential fuels hazard; this will indirectly promote conifer regeneration." This is not supported by the best available science. For instance it is well known that opening forest canopies can increase solar radiation leading to increased brush growth, which increase ground and ladder fuels, in turn increasing fire risk. Also stated on page 115 of the DEIS: "When combined with the direct and indirect effects of the proposed salvage, site preparation, and planting treatments, the end result would be an increase in acres treated for hazardous fuels reduction, an increase in acres of roadside treatments and an increase in acres of planted conifer stands set on a trajectory towards establishing resilience to fire, insects, and disease and towards achieving northern spotted owl dispersal, foraging and nesting/roosting habitat characteristics. The objectives of the proposed project are in concert with those proposed by these overlapping projects which may no longer be implemented within the project area due to changes in conditions." The assumption that conifer plantations would set a trajectory towards establishing resilience to fire, insects, and disease and towards achieving northern spotted owl dispersal, foraging and nesting/roosting habitat characteristics is a broad assumption not based on the best available science, given that the project is contrary to the recovery of the species and would likely negatively affect Northern spotted owls. The proposed project would also remove, downgrade and degrade thousands of acres of Critical Habitat, suitable habitat and negatively affect Activity Centers. Further, it is not clear which NEPA projects will no longer be implemented as this information is not readily available in the DEIS or supporting files. The DEIS fails to consider all of the past, present and reasonably foreseeable national forest timber sales as well as private lands timber harvest plans.	The effects of the proposed activities on northern spotted owl and its critical habitat are presented in the "environmental consequences" in the Biological Evaluation. The past and present effects to northern spotted owl habitat are incorporated into the habitat baseline as reflected in the Biological Evaluation in the section called "affected environment". The current and reasonably foreseeable actions on public and private land are considered for cumulative effects are displayed in Appendix C of draft EIS.
204.01 - NSO	#18909-35	Analysis Indicator #1 is Inadequate to "Provide a Clear Basis For Choice" Among Alternatives The analysis indicators used for the northern spotted owl analysis are insufficient to provide readers with an informed understanding of the different impacts to northern spotted owls from the various project alternatives. Despite numerous hours referencing the DEIS, the BA, and the Wildlife BE, the impacts of the project, particularly the preferred alternative, are unclear. The Wildlife BE makes reference that the analysis indicators were developed using the Forest Plan Standards and Guidelines. The Klamath LRMP does not direct the Forest Service to use this analysis indicator. Please explain how and why you chose the risk to preproduction analysis indicator because: (1) it appears to be novel; (2) it does not help explain or elucidate differences between the various alternatives; and (3) other indicators, which are more commonly used, provide a clearer understanding of the project impact to NSO. First, to novelty: in the hundreds of environmental documents we have reviewed we have not ever seen "risk to reproduction" in any other agency analyses. A cursory Boolean Google search for all websites containing the phrases "northern spotted owl" and "risk to reproduction" returns only 3 websites. None of these 3 links were environmental impact documents, which utilized the risk to reproduction as an analysis indicator. Second, the risk to reproduction, as an analysis indicator, does not provide contrast between the various alternatives, even though the various alternatives have significantly different impacts to NSO. This violates NEPA's command that environmental impact statements "sharply define the issues and provide a clear basis for choice among options by the decision maker and the public." 40 C.F.R. § 1502.14. For example, the DEIS states that as a result of fires, 3 NSO core/home ranges have a very low risk to reproduction, 14 have a low risk, 51 have a moderate risk, and 12 have a high risk. Under Alternative 2, which proposes the most cut of any of the alternatives, only "one activity center moved to a higher risk level from moderate level." (Pg. 148). The DEIS acknowledges that while the various action alternatives all will affect fewer acres than the preferred alternative; however, even Alternative 5-which removes from salvage all units overlapping Late-Succesional Reserves, Riparian Reserves, and Inventoried Roadless Areas- will still have the same risk to reproduction as Alternative 2. By refusing to acknowledge the habitat potential for post-fire landscapes, as discussed above, the agency has muted the very real differences to spotted owls between the alternatives and have failed to sharply define and provide a clear basis for choice. Furthermore, the "risk" to reproduction ignores that many of the affected areas still provide high habitat value. As shown in the Draft Biological Assessment, most activity centers still have high or moderate	Northern Spotted Owl habitat that burned or not burned during the 2014 fires were assessed in the Biological Assessment. However, as described in the Biological Assessment, in the section called “methods for assessing effects to northern spotted owl habitat from wildfire”, suitable habitat that burned at moderate and high severity are categorized into fire affected nesting/roosting or post fire foraging. post fire foraging was further divided into two categories; post fire foraging that occurs within 500 feet of suitable habitat was identified as the area more likely to be used by spotted owls than more distant post fire foraging. Regardless of the name, Nesting/Roosting, Foraging, fire affected nesting/roosting, and post fire foraging were tracked throughout the analysis and considered in the effects analysis.

Code	Comment Number	Comment Text	Response
		habitat fitness potential. In other words, by focusing on the negative impacts from last summer's fires, the Forest Service ignores the fact that most activity centers still provide good quality habitat. Third, the choice of risk to reproduction appears even more unusual, and ultimately inappropriate, in light of other indicators the Forest Service could have chosen (and indeed consider in other documents, such as the project Biological Assessment). While KNF's analysis under the "risk to reproduction" does not show much of a difference between the baseline conditions and the various alternatives, the project Biological Assessment shows that the preferred alternative has potential significant impacts to the threatened Northern spotted owl. As outlined in the Biological Assessment, the preferred alternative would likely adversely affect 70 NSO Activity Centers. The preferred alternative may affect but is not likely to adversely affect an additional 20 NSO Activity Centers. Insofar as a discussion of alternatives must elucidate the environmental impacts of each alternative and provide a meaningful basis for choice, the use of risk to reproduction completely fails. Given that agencies are directed to directed to prepare environmental impact statements concurrently with and integrated with consultation requirements under the Endangered Species Act, 40 C.F.R. § 1502.25, and that the information presented in the Biological Assessment allows for a more meaningful review of the project's impact to NSO, it is unclear why-other than to obfuscate the differences between project alternatives-the Forest Service would choose to examine the risk to reproduction.	
204.01 - NSO	#18909-36	Difficulties comprehending the NSO analysis indicators are compounded by inconsistent baseline numbers. Table 3-6 on page 141 of the DEIS states: there is a very low risk to reproduction for 3 ACs; a low risk to reproduction for 14 ACs; a moderate risk to reproduction for 51 ACs; and a high risk to reproduction for 12 ACs. By contrast, table 3-8 on page 145 of the DEIS states: there is a very low risk to reproduction for 1 AC; a low risk to reproduction for 18 ACs.	Yes, the draft EIS has an error in Table 3-8. Thank you for pointing out the error.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18909-37	Please provide citations to scientific literature to support wildlife assumptions in the DEIS, as these assumptions do not fit the best available science. On page 10 of the Wildlife BE, the DEIS assumes habitat burned at a low severity will still function as it did pre-fire. Further, it states that habitat burned at moderate severity will not function as it did, pre-fire, rather nest/roosting will become foraging habitat and foraging will become post-fire foraging. The BE also states the post-fire foraging will not be part of the analysis criteria because "the analysis doesn't provide a clear understanding on how [post-fire foraging habitat] contributes to satisfying nesting NSO needs." The BE does not discuss KNF's assumptions toward high-severity patches. The agency completely writes off the value of medium severity patches, which served as pre-fire foraging habitat and any high-severity patches. These assumptions do not match the more detailed discussion of post-fire habitat value provided in Appendix A of the Wildlife BE. The BE states that the relationship of post-fire areas to areas with sufficient cover or other features influences NSO use of these post-fire areas: It is the spatial context of the overall habitat available for use by owls that is critical for an analysis of habitat suitability. The proportion and arrangement of unburned or low burn severity suitable habitat in relationship to moderate or high severity burn areas within an NSO home range is one of the key factors in determining the likelihood of use by NSO's. This relationship is important because NSO's will focus their use of burned areas for foraging in areas with adjacent cover. The distance to cover is a key factor influencing use of burned areas. Because habitat selection by NSO's is strongly influenced by abiotic features such as distance to water, proximity to nest, slope position, and elevation it is possible that use of the burned habitats by NSO as described by Clark (2012) or Bond (2009) may occur due to the juxtaposition of the burned areas in relation to some other feature, such as a nest site or water, rather than based on the "suitability" of the area, particularly if the owls were accustomed to using the area prior to the fire. Factors involved in the NSO's periodic selection of burned areas for foraging are not known at this time, and further research is needed to account for the many other aspects of a burned landscape that would factor into the NSO selection process. (Emphasis added). The DEIS' assumptions are even more suspect given the assumptions provided in the Draft Biological Assessment. For example, on page 23 of the Draft Biological Assessment, the agency states that for the evaluation of project impacts, it assumes spotted owls will use areas which once serve as nesting/roosting habitat which burned at high severity if that habitat is currently within 500' of suitable nesting/roosting habitat. Further, it assumes for the Biological Assessment that pre-fire foraging habitat that burned at both medium and high severity will serve as post-fire foraging habitat if within 500' of suitable nesting/roosting habitat. To reiterate, the agency takes radically different positions in two documents, which purport to examine the impacts of fire on spotted owl habitat. In the DEIS, the agency indicates that it believes that high severity patches have no habitat value and medium severity patches only have value if they previously served as nesting/roosting habitat while the Biological Assessment analyzes the habitat potential for both high and medium severity patches. In short, the assumptions would likely have significant impacts on the project analysis in two ways. First, by assuming that moderate and high-severity areas might not provide any habitat value, the agency's evaluation of the impact from the fires of 2014 would be exaggerated-it would show that the owls have been more impacted by the fires than they actually were. By changing the baseline, from which the impacts from alternatives are compared, the actual impacts of the various alternatives are impossible to know. Furthermore, by assuming that owls do not utilize post-fire areas, the agency is able to make it seem that the various alternatives-which allow for drastically different levels of timber removal-will not impact the owl in different ways. See the discussion of the inadequacy of the risk to reproduction for more information. Please indicate why KNF uses different assumptions for different environmental review documents. As stated the DEIS should be rescinded in order to correspond with the best available science and allow for a meaningful evaluation of the project's impacts.	The Wildlife Biological Evaluation analysis is not required to be identical to the Wildlife Biological Assessment. The Biological Assessment is a document used to communicate proposed actions for one Alternative or combination of Alternatives as decided by the Forest Service responsible official and the effects on threatened and endangered species under section 7 of the Endangered Species Act. The effects are used in a determination of effects as "no effect", "may effect, not likely to adversely affect", or "likely to adversely affect" for each threatened or endangered species. The Biological Evaluation reports effects of each Alternative on northern spotted owl to provide the decision and the public a comparison of effects. The Biological Evaluation as amended provides the assumptions used to identify fire affected northern spotted owl habitat.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18909-38	Please explain how and why the agency chose to compare alternatives according to impacts to Critical Habitat. Generally, as an analysis indicator, this option makes more sense than analysis indicator #1-impacts to Critical Habitat is often used as a measure of impacts to NSOs. However, here it is not an appropriate analysis indicator because it fails to provide meaningful analysis for the project's impact to NSO Activities Centers or suitable habitat, which do not fall within NSO Critical Habitat. Part or all of an activity may be outside of identified Critical Habitat and only measuring change to Critical Habitat ignores project impacts to these areas. A cursory review of a map overlaying surveyed NSO Activity Centers with Critical Habitat shows that many owl Activity Centers fall wholly outside of Critical Habitat or only part of the Activity Center is within identified NSO Critical Habitat. Again, the agency has more relevant and useful analysis indicators. In the Draft Biological Assessment, the Forest Service provides information on project impacts to individual NSO activity centers, for example. The unnamed table on page 54, for example, estimates the intensity of impacts to individual owl centers, as do the unnamed tables on pages 55 and 57. The unnamed table on pages 58-60 provides information on acres removed, degraded, and downgraded for each Activity Center. This short table provides more information on the actual impacts of the preferred alternative than the entire DEIS.	The northern spotted owl analysis indicator called "changes to critical habitat" as presented in the Wildlife Biological Evaluation as amended provides the effects to northern spotted owl critical habitat. This indicator was presented in response to public comment during the scoping process. In addition, this indicator provides effects to critical habitat by subunit for each Alternative.
204.01 - NSO	#18909-40	It is impossible to analyze the project impacts because of the numerous inconsistencies in the DEIS and supporting documents. According to DEIS table 3-9 on 149, Alternative 2 will remove a total of 536 acres of nesting and roosting habitat, 605 acres of foraging habitat, and 617 acres of dispersal habitat. The text discussing the changes to Critical Habitat from Alternative 4 on page 149 of the DEIS does not make sense in light of the stated changes under Alternative 2. The DEIS states: "The effects of alternative 4 on critical habitat are similar to alternative 2 except fewer acres of critical habitat will be removed." However, the same paragraph then states under Alternative 4, "There is a loss of 1,195 acres of nesting/roosting, 2,642 acres of foraging and 2,781 acres of dispersal." In other words, though we are told in one sentence that Alternative 4 will remove fewer acres of Critical Habitat than Alternative 2, the number provided by the Service state that Alternative 4 will remove 659 more acres of nesting/roosting, 2,037 more acres of foraging, and 2,164 more acres of dispersal habitat than Alternative 2. Table 2-34 states that Alternative 1 would have cumulatively impact 552 acres of Critical Habitat. However, the test on page 147 states that Alternative 1 would only affect 452 acres. Table 3-10 also states that Alternative 1 will cumulatively impact 442 acres. Again, the DEIS is so faulty that it makes the comparison of alternatives impossible.	Thank you for identifying the errors. These numbers have been updated in the final EIS.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18909-41	Like the assumptions for Analysis Indicator #1, the Wildlife BE states that in evaluating the change to Critical Habitat, KNF assumes that pre-fire NSO foraging habitat that burned at either moderate or high-severity will not function as habitat post fire and that pre-fire NSO nesting/roosting habitat that burned at high-severity will not function as habitat. These assumptions do not match the more detailed discussion of post-fire habitat value provided in Appendix A of the Wildlife BE. The BE states that the relationship of post-fire areas to areas with sufficient cover or other features influences NSO use of these post-fire areas: It is the spatial context of the overall habitat available for use by owls that is critical for an analysis of habitat suitability. The proportion and arrangement of unburned or low burn severity suitable habitat in relationship to moderate or high severity burn areas within an NSO home range is one of the key factors in determining the likelihood of use by NSO's. This relationship is important because NSO's will focus their use of burned areas for foraging in areas with adjacent cover. The distance to cover is a key factor influencing use of burned areas. Because habitat selection by NSO's is strongly influenced by abiotic features such as distance to water, proximity to nest, slope position, and elevation it is possible that use of the burned habitats by NSO as described by Clark (2012) or Bond (2009) may occur due to the juxtaposition of the burned areas in relation to some other feature, such as a nest site or water, rather than based on the "suitability" of the area, particularly if the owls were accustomed to using the area prior to the fire. Factors involved in the NSO's periodic selection of burned areas for foraging are not known at this time, and further research is needed to account for the many other aspects of a burned landscape that would factor into the NSO selection process. (Emphasis added). The DEIS' assumptions are even more suspect given the assumptions provided in the Draft Biological Assessment. For example, on page 23 of the Draft Biological Assessment, the Service states that for the evaluation of project impacts, the agency assumes spotted owls will use areas which once serve as nesting/roosting habitat which burned at high severity if that habitat is currently within 500' of suitable nesting/roosting habitat. Further, the agency assumes for the Biological Assessment that pre-fire foraging habitat that burned at both medium and high severity will serve as post-fire foraging habitat if within 500' of suitable nesting/roosting habitat. To reiterate, KNF takes radically different positions in two documents, which purport to examine the impacts of fire on spotted owl habitat. In the DEIS, the Service indicates that it believes that high severity patches have no habitat value and medium severity patches only have value if they previously served as nesting/roosting habitat while the Biological Assessment analyzes the habitat potential for both high and medium severity patches. In short, the DEIS likely overestimates the impact of the summer's fires on the northern spotted owl and underestimates the impact of logging projects on the owl. We believe the multiple inconsistencies to be a result of the expedited timeline, which reiterates the need to slow down in order to have an accurate account of the effects to threatened and endangered wildlife so as to make an informed decision.	See response to comment number 18909-34
204.01 - NSO	#18909-42	The DEIS, Wildlife BE and BA all fail to consider or disclose the how the proposed actions will affect the designated function of the Critical Habitat subunits e.g. connectivity and demographic support. There is no clarity how they are contributing to recovery by the magnitude of adverse effects to this population of NSOs. Critical Habitat is defined as "the specific areas . . . essential to the conservation of the species and which may require special management considerations or protection." 16 U.S.C. § 1532.	The Terrestrial Wildlife Biological Assessment as amended discloses the effects to Critical Habitat Subunits in section Effects to PCE's. Subunits Klamath West 7, Klamath West 8, Klamath East 6, and Klamath East 7 were established to function for Northern Spotted Owl Demographic Support. The summary of effects tables are included in the Biological Assessment by Critical Habitat Subunits for the consultation Alternative. The determination in the Biological Assessment is build off of these effects. An independent review of the analysis and the determination of effects will be conducted by the US Fish and Wildlife Service in their Biological Opinion.
204.01 - NSO	#18909-43	The Westside DEIS and Wildlife BA do not adequately follow the Recovery Actions 10, 12 or 32 in the 2011 Revised Recovery Plan for the NSO. The minimal attempt through illegal PDF's does not provide adequate forest structure to benefit the owls. Spanning snag retention over 100 acre areas is not consistent with the KNF LRMP or NFP Standard and Guidelines.	Like discussed in comment number 12346-75, the project does meet the Forest Plan. For northern spotted owl, compliance with recovery actions 10, 12, and 32 are discussed in the Biological Assessment under the section called "consistency with recovery plans and other guidance". The Biological Assessment provides a brief description for each of these recovery actions and the associated project designs that were developed to be consistent with the Recovery Plan. However, the northern spotted owl Recovery Plan isn't a regulatory document, but it is used as a tool to provide consistency and minimize effects on northern spotted owl while meeting the purpose and need of the project. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#18909-47	It is unclear what affect the 2014 fires and fire suppression activities had on the owls or their Critical Habitat, suitable habitat or Activity Centers. The DEIS fails to provide this information. The BA and DEIS fail to mention what the spatial analysis area is for NSOs. Do the documents consider ACs 1.5 miles from the project area boundary?	The effects resulting from the 2014 fires and associated suppression actions are analyzed in the Emergency Consultation Assessment. The Westside Fire Recovery Project incorporated those effects created by the 2014 fires and associated suppression actions into the existing northern spotted owl habitat condition. The existing northern spotted owl habitat condition is described in the Biological Evaluation under the section called "Affected Environment" and in the Biological Assessment under the section called "Existing Environment". The Biological Assessment also provides a brief description of the changes in the amount of northern spotted owl habitat under the section called "Existing Environment". The spatial bounds for the northern spotted owl habitat analysis is defined in the Biological Evaluation under section called "spatial and temporal bounds". The northern spotted owl habitat analysis area is the treatment units plus a 1.3 mile buffer from all proposed treatment units.
204.01 - NSO	#18909-48	BA 55, "Salvage harvest is not proposed in core areas for ACs identified as "high" or "moderate" "habitat fitness potential" (except four "moderate" ACs) but all other treatments may occur in both home ranges and core areas." It is not clear in the BA what types of treatments are planned in NSO core areas and home ranges.	The Biological Assessment describes all the potential treatments in this project under the section called "Description of the proposed activities" and Chapter 2 of the draft EIS . Except four moderate activity centers, all the high and moderate activity centers don't contain salvage harvest in the core. However, any of the other proposed treatments (excluding salvage harvest) could occur in the core or home range of any activity center regardless of the potential fitness level. Salvage harvest could occur in any of the activity center home ranges and in the core of the four moderate level activity centers and low level activity centers.
204.01 - NSO	#18909-50	The ESA requires consultation with the Fish and Wildlife Service or the NOAA Fisheries Service for any "agency action" that "may affect" a listed species or its critical habitat. 16 U.S.C. § 1536(a)(2); 50 C.F.R. §402.14(a). The consultation requirement reflects "a conscious decision by Congress to give endangered species priority over the 'primary missions' of federal agencies." Tenn. Valley Auth. v. Hill, 437 U.S. 153, 185, 98 S. Ct. 2279, 57 L. Ed. 2d 117 (1978). The letter attached to the Submitted BA states that the KNF is in formal consultation with the US Fish and Wildlife Service. Is this true? What type of consultation has been happening with the USFWS and has the KNF provided sufficient information for the Biological Opinion? Was the USFS consulted on the submitted BA?	The level of effects for a given project on threatened or endangered species can result in one of the three possible determinations for northern spotted owl and critical habitat: 1) "no effect", 2) "may affect but not likely to adversely affect", or 3) "likely to adversely affect". The Klamath National Forest requested formal consultation for Westside Fire Recovery Project with the U.S. Fish and Wildlife Service because the Biological Assessment prepared by the Klamath National Forest determined that the effects proposed were "likely to adversely " affect northern spotted owl and its critical habitat. The Klamath National Forest projects typically are consulted at the "informal" level which has a coinciding determination of "may affect but not likely to adversely affect". The "submitted BA" is the basis of the Westside Fire Recovery project consultation, but the consultation process may result in changes to the "submitted" Biological Assessment.
204.01 - NSO	#19079-5	Part of the burned area was a roadless area old growth habitat for wildlife. The survivors that fled are in the surrounding forests. Other forest near the burn with other status designation, slated to be logged now become the potential habitat for owls and other animals. Where in the DEIS does it report man hours finding owls?	northern spotted owl surveys are currently being conducted within the project area. The surveys are following the US Fish and Wildlife northern spotted owl survey protocol (2012) with modification in part of the consultation process with U.S. Fish and Wildlife Service.
204.01 - NSO	#5873-129	The Northwest Forest Plan ROD page 66 says that “Salvage is not required to be beneficial” but the February 1994 Biological Opinion for the Northwest Forest Plan disagrees. The Northwest Forest Plan Standards & Guidelines must be interpreted to err on the side of caution and retain all large trees. The BiOp says: a. “ASSUMPTIONS: To ensure that the analysis under section 7 of the Act had a measurable baseline, or starting point, the following assumptions were identified to assist in the development of this opinion: 1. Riparian and Late-Successional Reserves (LSRs) will retain reserve status and will not be available for timber production other than as provided in Alternative 9 (i.e., salvage and silvicultural treatments beneficial to the creation of late-successional conditions).” P 4. b. “the alternatives presented in this SEIS propose a network of designated areas managed primarily to protect and enhance habitat for the northern spotted owl and other late-successional and old-growth forest related species” p 5. c. “Late-Successional Reserves would be managed to protect and enhance habitat for late-successional and old-growth related species including the northern spotted owl and marbled murrelet. Some level of silvicultural treatment (such as thinning young stands) is permitted in certain age stands to accelerate the development of old-growth habitat characteristics, subject to review by the Regional Ecosystem Office…. Stand and vegetation management of any kind, including prescribed burning, is considered a silvicultural treatment and is subject to review.” p 5. d. “SPOTTED OWL ACTIVITY CENTERS: … Salvage of dead trees would be based on guidelines adapted from the Final Draft Spotted Owl Recovery Plan…” p 7. e. “CONSERVATION RECOMMENDATIONS: … Restricting harvest activities in LSRs to thinning and other silvicultural treatments that are beneficial to creation of late successional forests as identified in Alternative 9 is believed, at the present time, to be necessary to promote the conservation and recovery of listed species consistent with Section 7(a)(1) of the Endangered Species Act.” P 48.	The Westside fire Recovery Project is consistent with the management direction of the Late-Successional Reserves including salvage harvest. The Northwest Forest Plan provides a series of Standards and Guidelines that guide management within the Late-Successional Reserves that is described in the document called Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl. In the section of the Standards and Guidelines called Late Successional Reserves, a sub-section called Guidelines for Salvage provides conditions where salvage harvest is appropriate in Late Successional Reserves. In addition to following these standards and guidelines, the proposed project may require Regional Ecological Office review. The Westside Fire Recovery Project is under current review of the Regional Ecological Office to ensure the project is following the intent of the Late-Successional Reserve management.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#5873-132	The agency may not justify logging on the assumption that the fire has destroyed the spotted owls' habitat. The only sure way to destroy the owls habitat is to conduct heavy handed salvage logging. Studies show that spotted owls are capable of returning to habitat even highly altered by fire. Spotted owl biologist Monica Bond found that owls in northern California returned to four sites where the majority of the territory had burned. Bond, M. L., R. J. Gutierrez, A. B. Franklin, W. S. LaHaye, C. A. May and M. E. Seamans. 2002. Short-term effects of wildfires on spotted owl survival, site fidelity, mate fidelity, and reproductive success. Wildlife Society Bulletin 30(4):1022-1028. Severe wildfire can decrease the suitability of northern spotted owl nesting and roosting habitat by removing overstory canopy and setting late seral-stage forests back to earlier seral stages. On the other hand, fire appears to be beneficial to fitness of northern spotted owls by creating ecotones that may improve foraging habitat. Larger-sized snags should be retained because they provide the basis for restoration of late successional forest conditions that will support future spotted owl nesting, roosting and foraging habitat.	The Biological Assessment provides a synthesis of the relevant literature concerning northern spotted owl use of fire-affected habitat in the section called " northern spotted owl use of the post-fire landscape". The effects of the proposed activities are discussed in the section called " direct and indirect effects of the proposed actions". Project design features do provide for the retention of legacy features such as large snags that take many years to develop as described in Chapter 2 of the draft EIS. These legacy features are retained for the purpose of providing forest structure as the stand regenerates after the fire.
204.01 - NSO	#5873-137	Here is a good description of high quality owl habitat that might develop after fire and without salvage logging. "High use northern spotted owl foraging habitat is typically characterized by high density of large snags and diverse canopy structure that provide habitat for prey species as well as hunting perches for owls (North et al 1999)" USDI FWS 2004. S&M BO BLM FS 03-03-04.doc [M]edium and high use areas [for northern spotted owls] often had large rot-resistant snags (western redcedar or Douglas-fir) resulting from the site's past disturbance. … The carry-over of these large structures into the regenerating stands may have produced sufficient foraging habitat for the owl even though other attributes of the stand were typical of younger forests. Old growth legacy structures in younger stands may improve wildlife habitat quality for many late-seral associated species. … Legacy structures, such as large trees and snags, may diversify habitat conditions in young, regenerating stands and eventually improve foraging conditions for future spotted owl use. North, M.P., Franklin, J.F., Carey, A.B., Forsman, E.D., and Hamer, T. 1999. Forest stand structure of the northern spotted owl's foraging habitat. For. Sci. 45: 520-527. http://www.fs.fed.us/pnw/pubs/journals/pnw_1999_north001.pdf. Buchanan et al. (1999) recommend that younger forests managed for Spotted Owls on the Western Olympic Peninsula should contain >10 snags/ ha that are > 50 cm dbh. … Retention of legacy (snags and course woody debris) in current areas of timber harvest will shorten the time necessary for those areas to achieve the habitat complexity deemed to be suitable Northern Spotted Owl habitat." Courtney, SP; J A Blakesley. 2004. Scientific evaluation of the status of the Northern Spotted Owl. http://www.sei.org/owl/finalreport/finalreport.htm pp 5-15, 6-8.	Northern Spotted Owl habitat can be qualitatively described while focusing on particular aspects of the habitat such as large trees and dense tree canopy cover. However, depending on the geographic location, the definition of habitat can vary; comparing coastal influenced conifer forest with eastside mixed conifer can result in different tree size and species composition yet both habitats can provide the opportunity for successful reproduction. Without a localized perspective and definition of spotted owl habitat, the quality and quantity of habitat can be very different. Although the habitat description for the research sighted in the comment is likely accurate for those study areas, the Wildlife Biological Assessment provides a description of habitat that is found in the project area.
204.01 - NSO	#5873-140	A third study relevant to post-fire management supports the idea that abundant structures (i.e. snags & logs) should be retained after fire because complex young forests are more resilient and support more diverse spotted owl prey bases. Our results support hypotheses that: (1) biocomplexity resulting from interactions of decadence, understory development, and overstory composition provides pre-interactive niche diversification with predictable, diverse, small mammal communities; (2) these communities incorporate numerous species and multiple trophic pathways, and thus, their integrity measures resiliency and sustainability.	This is from Carey and Harrington 2000. This quote was the last two sentences of the summary of this article. The study conducted by Carrey and Harrington was in 30- to 70-year-old coniferous forests in western Washington. In particular, the study was conducted on the Olympic National Forest in northern Washington state. The literature does not address post-fire habitats or post-fire management of snags and logs. The results specifically address second-growth forests and small-mammal communities within them. The literature makes no attempt to address post-fire forests and spotted owl prey base.
204.01 - NSO	#5873-153	Salvage logging and regen harvest will reduce populations of small mammals important for spotted owls and other predators Small mammals are important prey for spotted owls and other focal predator species. Canopy removal and reduced stand complexity caused by regen harvest are adverse to small mammals such as red-backed voles, flying squirrels, and red tree voles. "Clearcuts are dryer than intact stands (Tappeiner et al., 2007), thus many conifer clearcutsmay be too dry for red-backed voles (D.E. Pearson, personal communication), which are known for their high moisture requirements (Getz, 1962). … Red-backed voles strongly prefer structurally complex micro-habitats (Pearson, 1994)." Rafal Zwolak 2009. A meta-analysis of the effects of wild?re, clearcutting, and partial harvest on the abundance of North American small mammals. Forest Ecology and Management 258 (2009) 539–545. http://stkctr.biol.sc.edu/Reprints/Reprints_4/Zwolak_2009.pdf	Zwolak (2009) does not mention the species red tree vole or flying squirrels in this article. While the literature does state that salvage logging and regen harvest will reduce small mammal populations, this effect is not consistent for all small mammal species. The article states that that "the impact of different disturbances on the abundance of small mammals (i.e. positive or negative) appears to be species-specific, but disturbance type may influence the magnitude of this effect. In coniferous and mixed forest, all disturbances except for partial harvest triggered significant increases in the abundance of deer mice and declines in red-backed voles. In deciduous forest, clearcutting did not result in a consistent change in abundance of deer mice and red-backed voles." Additionally, Zwolak illustrated that the effects of forest harvest on small mammals are not equivalent to those of wildfire. Effects of clearcutting are milder than those of stand-replacement wildfires, at least for the red-backed voles, which tended to decline in abundance after disturbances, and deer mice, which tended to increase. These responses are consistent with habitat associations of these species, not the effect of the disturbance. Finally, red-backed voles are not found within the project area and are thus not affected by the project's effects.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#5873-177	Salvage in LSRs and CHUs and Dry Forests The Revised Recovery Plan for the northern spotted owl recommends retention and restoration of structure function and process across the dry forest landscape. This includes legacy retention after fires. The 2011 Final Revised Recovery Plan for the Northern Spotted Owl says, In general, we recommend that dynamic, disturbance-prone forests of the eastern Cascades, California Cascades and Klamath Provinces should be actively managed in a way that reconciles the overlapping goals of spotted owl conservation, responding to climate change and restoring dry forest ecological structure, composition and processes, including wildfire and other disturbances (Noss et al. 2006, Spies et al. 2006, 2010a, Agee and Skinner 2005, Healey et al. 2008, Mitchell et al. 2009). … …[O]ur intent in this Revised Recovery Plan is to embed spotted owl conservation and recovery within broader dry forest ecosystem restoration efforts to increase the likelihood spotted owl habitat will remain on the landscape longer and develop as part of this fire adapted community … To accommodate future disturbances and restore ecosystem resiliency, we believe it is essential to restore ecosystem structure, composition and processes. Restoring ecosystem structures that provide resiliency will necessitate maintaining and restoring the biological legacies that typically persist through disturbance events and influence the recovery process in the post-disturbance landscape (Franklin et al. 2000). With respect to the dry forest landscapes, structural legacies include not only the large trees that tend to be fire tolerant, but the snags and downed wood that were created as a result of the disturbance event. Structural legacies serve valuable functions such as reproductive structures that facilitate plant propagation, modifying microclimates, or improving connectivity through the disturbed area (Franklin et al. 2007). … These principles should be part of any dry forest restoration treatment: … Retain and restore heterogeneity within stands (i.e., manage for fine-scale mosaic within stands). This includes both vertical and horizontal diversity. … … [P]ost-fire timber harvest activities “undermine many of the ecosystem benefits of major disturbances” (Lindenmayer et al. 2004:1303) and frequently “ignore important ecological lessons, especially the role of disturbances in diversifying and rejuvenating landscapes” (DellaSala et al. 2006:51). … studies of spotted owls in post-fire landscapes indicate that spotted owls use forest stands that have been burned, but generally do not use stands that have been burned and logged. Consistent with restoration goals, post-fire management in these areas should promote the development of habitat elements that support spotted owls and their prey, especially those which require the most time to develop or recover (e.g., large trees, snags, downed wood). Such management should include retention of large trees and defective trees, rehabilitation of roads and firelines, and planting of native species (Beschta et al. 2004, Hutto 2006, Peterson et al. 2009). We anticipate many cases where the best approach to retain these features involves few or no management activities. … Many researchers supported the need to maintain habitat for spotted owl prey. For example, Lemkuhl et al. (2006) confirmed the importance of maintaining snags, downed wood, canopy cover, and mistletoe to support populations of spotted owl prey species. Gomez et al. (2005) noted the importance of fungal sporocarps which were positively associated with large downed wood retained on site post-harvest. Carey et al. (1991) and Carey(1995) noted the importance of at least 10 to 15 percent cover of downed wood to benefit prey. The costs and benefits of post-fire harvest to the development of habitat for spotted owls and their prey should be evaluated by interagency teams (e.g., Level 1 teams) during the consultation process.	Everything following "the 2011 Final Revised Recovery Plan for Northern Spotted Owls says" are direct quotes from the 2011 Final Revised Recovery Plan for Northern Spotted Owls. The Table 2 and Appendix B of the Wildlife Biological Assessment (in Appendix G of the final EIS) describe how the project is compliant the 2011 Final Revised Recovery Plan for Northern Spotted Owls.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#5873-178	Recovery Action 12: In lands where management is focused on development of spotted owl habitat, post-fire silvicultural activities should concentrate on conserving and restoring habitat elements that take a long time to develop (e.g., large trees, medium and large snags, downed wood). Examples of areas where we believe this recovery action would greatly benefit future spotted owl habitat development include such fire-affected areas as the Biscuit fire, the Davis fire and the B&B complex. USFWS 2011. Final Revised Recovery Plan for the Northern Spotted Owl. pp III-20, III-32 – III-34, III-48 – III-49. Note also, the 1994 Northwest Forest Plan ROD (page C-11, and 1994 FSEIS page F-146) says that " ... activities required by recovery plans for listed threatened and endangered species take precedence over Late-Successional Reserve standards and guidelines." Also, keep in mind the FWS' June 28, 2011 Response to Comments on the Revised Recovery Plan says "Whether a burned area could support nesting spotted owls is not relevant to our recommending focusing on spotted owl habitat restoration and conservation of legacy habitat elements in areas where pre-fire management focused on developing spotted owl habitat. This recovery action is designed to provide for legacy habitat elements remaining after high-intensity fires which will contribute to future habitat development." http://web.archive.org/web/20130315193800/http://www.fws.gov/oregonfwo/Species/Data/NorthernSpottedOwl/Recovery/Library/Documents/Comments.Responses.pdf And, keep in mind "where pre-fire management focused on developing spotted owl habitat" includes all dry forests, e.g. "[O]ur intent in this Revised Recovery Plan is to embed spotted owl conservation and recovery within broader dry forest ecosystem restoration efforts" The 2008 FRP (p 116) also says "Large and old trees, either living or dead, are important wherever they occur." The FWS response to comments on the draft recovery plan says "post-fire harvest recommendations stress the need to conserve large trees, both living and dead, as they are important components to the restoration of owl habitat after wildfire events." And recommends that after fire or other disturbance the agencies should "conserve the remaining large trees and snags." http://www.fws.gov/pacific/ecoservices/endangered/recovery/pdf/NSO_RPApp_F_Response_to_Comments_5_7_08.pdf. Since large snags take a very long time to grow and recruit, salvage logging should retain all large snags. Any salvage logging proposal must also carefully disclose and balance all detrimental effects and alleged beneficial effects of salvage logging and connected actions like road building. Clark looked at post-fire habitat selection by spotted owls after several wildfires in southern Oregon and determined that low severity fire in nesting, roosting, foraging habitat appears to benefit spotted owl occupancy and colonization. Initial occupancy was positively influenced by the amount of roosting and foraging habitat with low severity burn within the core (ß = 0.08, 95% C.I. = -0.02 – 0.17) … Colonization rates were positively influenced by the amount of nesting, roosting and foraging habitat that received a low severity burn within the core (ß = 0.08, 95% C.I. = 0.02 – 0.15). Darren A. Clark. 2007. Demography and Habitat Selection of Northern Spotted Owls in Post-Fire Landscapes of Southwestern Oregon. M.S. Thesis. Oregon State University. Robert Anthony, Advisor. Figure 6.1 shows that nesting, roosting, foraging habitat is used more frequently than random sites even after it has experienced moderate or high severity fire, while areas that were salvage logged were used less frequently than random sites. See also, Clark, Anthony & Andrews 2013. Relationship Between Wild?re, Salvage Logging, and Occupancy of Nesting Territories by Northern Spotted Owls. The Journal of Wildlife Management 77(4):672–688; 2013; DOI: 10.1002/jwmg.523 ("Timbered Rock had a 64% reduction in site occupancy following wild?re (2003–2006) in contrast to a 25% reduction in site occupancy at South Cascades during the same time period. This suggested that the combined effects of habitat disturbances due to wild?re and subsequent salvage logging on private lands negatively affected site occupancy by spotted owls. In our second analysis, we investigated the relationship between wild?re, salvage logging, and occupancy of spotted owl territories at the Biscuit, Quartz, and Timbered Rock burns from 2003 to 2006. Extinction probabilities increased as the combined area of early seral forests, high severity burn, and salvage logging increased within the core nesting areas	"Currently, the most important range-wide threats to the spotted owl are competition with barred owls, on-going loss of spotted owl habitat as a result of timber harvest, habitat loss or degradation from stand replacing wildfire and other disturbances, and loss of amount and distribution of spotted owl habitat as a result of past activities and disturbances." (Revised Recovery Plan for the Northern Spotted Owl (Strix occidentalis caurina) 2011 (page vii))).To ensure the Northern Spotted Owl persists as a species and potentially reach the level where the species no longer needs protection of the Endangered Species Act, the Northern Spotted Owl Recovery Plan was written to provide the basis of spotted owl management and at some point, reach the "recovery objectives" (page ix). One of the three "recovery objectives" states the objective of the Revised Recovery Plan is reached when "…adequate habitat is available for spotted owls and will continue to exist to allow the species to persist without the protection of the Endangered Species Act…" However, wildfire poses a challenge to meeting this objective; the 2014 fires on the Klamath National Forest has considerably increased the amount of habitat lost or degraded by stand replacing fire thus further reducing the likelihood spotted owl Recovery Objectives likelihood of being reached in the near future. There is likely no quick fix to stand replacing fire in spotted owl habitat, but the Westside Fire Recovery Project provides a series of treatments that are designed to reduce the amount of stand replacing fire. The Westside Fire Recovery Project is meeting Recovery Action 12. The Recovery Plan describes Recovery Action as "In lands where management is focused on development of spotted owl habitat, post-fire silvicultural activities should concentrate on conserving and restoring habitat elements that take a long time to develop (e.g., large trees, medium and large snags, downed wood)." Project Design Features focus retaining legacy features such as disproportionately large trees/snags or large coarse woody debris in salvage harvest units. These large features typically take many years to create thus these features are important to retain on the landscape. In addition, Riparian Reserves which typically contain trees within the larger size classes because these areas usually contain slightly better site conditions than the surrounding area outside the Riparian Reserves will be retained in the salvage harvest units. Further, any trees that are likely to live (30% or greater likelihood of surviving) will be retained in the salvage harvest unit thus providing current habitat structure and future legacy components. Northern Spotted Owl use of fire affected areas is discussed in the Biological Assessment in the section called "northern spotted owl use of the post-fire landscape".

Code	Comment Number	Comment Text	Response
204.01 - NSO	#5873-179	First of all, do not assume that fire has rendered spotted owl habitat unsuitable. “The Timbered Rock Study presented evidence that the northern spotted owl has locations in areas with high severity burns. See AR 341-369. Additionally, there was evidence presented by Jerry Franklin, Professor of Ecosystem Analysis at the University of Washington, that ‘[r]etention of large snags and logs are specifically relevant to Northern Spotted Owl since these structures provide the habitat that sustain most of the owl’s forest-based prey species.’” FSEEE and EPIC v. US Forest Service, Civ. No. C 05-2220 SI & C 05-2227 SI (N.D. Cal.) June 27, 2005. Also, page 6 of the BE for the Rogue River National Forest’s Ashland Forest Resiliency DEIS has a very interesting paragraph that references the Timbered Rock Fire telemetry findings AND habitat analysis conducted at Biscuit: "There have been recent large fires in SW Oregon, in particular the Biscuit and the Timbered Rock fires, which have significantly reduced NRF within the province. However, analysis conducted on the effects of the Biscuit Fire using recent work by Zabel et al (2003) showed that of the 49 owl pairs affected by the fire, it was likely that only seven were no longer extant. In addition, of the 15 spotted owl pairs affected by the Timbered Rock Fire, 11 of those pairs continue to occupy their historic activity centers even thought (sic) they were subject to varying degrees of fire severity. There is uncertainty as to how spotted owls respond to fire in SW Oregon and research is currently being conducted in an attempt to answer that question." The referenced study is: Cynthia J. Zabel, Jeffrey R. Dunk, Howard B. Stauffer, Lynn M. Roberts, Barry S. Mulder, and Adrienne Wright. 2003. Northern Spotted Owl habitat models for research and management application in California (USA). Ecological Applications 13:1027-1040. This study suggests that "suitable" habitat within 0.5 miles of the nest site is the best indictor of continued NSO presence. And contends that if more than 20% of "suitable" habitat remains within 0.5 miles of the activity center that the NSOs will stick around post-fire. Second, manage the post-disturbance landscape for owl and their prey by retaining all large snags. The Final Draft Spotted Owl Recovery Plan (USDI 1992 p 71) requirements for post-fire salvage say “management to provide the maximum likely benefits for owls and their prey is an appropriate strategy.” Probably the most important things that the agencies can do after fire are: 1. Make sure that current owl habitat (both suitable and marginal) is protected from disturbance. The adverse effects of wildfire are often over-estimated. Courtney et al 2004. Fires cause incomplete loss of spotted owl habitat elements, so the remaining habitat elements such as surviving green trees and large snags may still provide current habitat for spotted owls. 2. Manage for abundant populations of owl prey species. Where owl prey base is diverse and abundant spotted owl home ranges tend to be smaller which is energetically advantageous and enhances owl survival rates. (Carey 2004). “Numerous patches of low foraging quality can have negative impacts on owl demography and behavior (Carey et al 1992).” (Carey 2004). and this is precisely what salvage logging will do to current and future spotted owl home ranges. A large number of owl prey species have some association with snags and down wood either as sites for denning or as a source of fungal food supplies. Removing large amounts of dead trees and down wood after a fire dramatically simplifies the forest structure for many decades and will have adverse effects on the development and recovery of populations of owl prey species. Retaining all large snags is called for in the spotted owl recovery plan and the Northwest Forest Plan. 3. Protect all large snags. Snags and down wood are integral parts of spotted owl suitable habitat, in fact, snags and down wood are included in the official definition of owl habitat. Removal of snags will directly eliminate primary constituent elements of spotted owl habitat. 4. Allow for slow and natural successional development. The diverse plant communities and complex structures that develop after fire provide excellent habitat for spotted owl prey species. Do not rush to plant conifers at high density which will truncate successional development.	The Wildlife Biological Assessment provides a discussion of the relevant literature concerning spotted owl use of fire affected areas in the section called “northern spotted owl use of the post-fire landscape”. The final EIS provides a response concerning tree planting and salvage harvest in Chapter 3 of the final EIS in the section called “Responsible opposing views and agency’s response to issues raised”. See response to comment12346-55.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#5873-180	Diminishment and Negative effects “Salvage guidelines [for Late-Succesional Reserves] are intended to prevent negative effects on late-successional habitat, while permitting some commercial wood volume removal. … While priority should be given to salvage in areas where it will have a positive effect on late-successional forest habitat, salvage operations should not diminish habitat suitability now or in the future.” Northwest Forest Plan ROD page C-13. These words indicate a "zero tolerance" policy for anything that would degrade habitat now or in the future. The agency has a burden to show in the NEPA document that the snags they want to remove have zero habitat value for spotted owls or other late-successional species now or in the future. The NEPA document must meet this burden. The record clearly shows that these large trees provide both future nest sites for owls and their prey species. Dense clumps of snags may also provide near-term foraging habitat. Every large tree removed is a potential nest site lost or a potential foraging opportunity forgone. Retention of snags shortens the time period when these stands are unsuitable habitat, while salvage logging lengthens the unsuitable timber period. When the agency argues that removal affects only a small area of the reserves and abundant habitat is provided in areas not logged, they fail to recognize the "zero tolerance" language. The agency simply cannot argue that removal of potential nest trees and structures important to prey species will not diminish habitat value. The NEPA analysis never reaches the core question, that is: Whether removal of large snags through salvage "prevents negative effects" or "diminishes late successional habitat now or in the future." Removal of large numbers of large snags from the LSR will have negative effects on habitat and will diminish LSOG habitat now and in the future by: 1. directly eliminating nesting opportunities for owls and their prey; 2. reducing the quality of future LSOG habitat that develops within salvage areas; 3. extending the time period that salvage areas remain non-suitable for owls and other species; causing the premature departure of some LSOG species that are still hanging on in the legacy-rich post-fire environment, and delaying by decades the return of LSOG species to areas that are salvage logged; 4. retarding vegetative recovery that is already ongoing; 5. increasing the uncertainty that LSOG will develop from the homogeneous and simplified initial conditions that result from salvage logging; 6. causing detrimental on current and future LSOG via effects on soils and spreading weeds	Response number 3 in the "Responsible Opposing Views and Agency's Reponses to Issues Raised" Section in Chapter 3 of the final EIS addresses the concern about efficacy of salvage harvest in Late-Successional Reserves, meeting the Northwest Forest Plan (and therefore the Klamath National Forest Plan) Standard and Guidelines and recommendations in Forest Ecosystem Management Assessment Team.

Code	Comment Number	Comment Text	Response
204.01 - NSO	#5873-181	The FEMAT scientists recognized that … Salvage of dead trees has significant effects on the development of future stands and the suitability as habitat for a number of organisms. Snag removal results in long-term impacts on the forest community because large snags are not produced by the new stand until trees become large and begin to die from natural mortality (often a period of 50-100 years). Snags are used extensively by cavity nesting birds and mammals such as woodpeckers, nuthatches, chickadees, squirrels, red tree voles, and American marten. Removal of snags following disturbance can significantly reduce the carrying capacity of these specie for many years. … … Salvage policies of options generally ranged from no salvage to limited salvage as permitted by the Final Draft Recovery Plan for the Northern Spotted Owl (USDI 1992). This plan would allow removal of small diameter snags and logs but would also require retention of snags and logs likely to persist until the new stand begins to contribute significant quantities of coarse woody debris." FEMAT page IV-37. The May 6, 1994 Scientific Analysis Group Q&As clearly indicated the intent of the NFP ROD that salvage for risk reduction in LSRs must be consistent with the salvage recommendations in the Final Draft Recovery Plan for the Northern Spotted Owl (December 1992). See below. The agency must retain all large snags because they are the most likely to last the longest and fill the snag recruitment gap as the post-fire landscape recovers from the fire. The so-called "brain book" that agency staff use to clarify the direction in the Northwest Forest Plan ROD urges the agency to use the requirements from the final Draft Recovery Plan for the Northern Spotted Owl which requires retention of all scorched trees that "may live" as well as all snags over 20 inches because these live trees and larger snags are most likely to last more than 100 years and help to fill the temporal gap in snag recruitment as the post-fire stand develops. Denton K, 1994. "SEIS Team/Scientific Analysis Group Qs &As [Summary]" May 6, 1994 ("[T]hese responses represent what the SEIS Team intended for many of the standards and guidelines… The following document is a compilation of those SEIS Team questions ands SAG responses that relate to standards and guidelines contained in the final Record of Decision."). "Salvage in LSRs to Reduce Fire Risk (SAG2;Q#9): Under Alternative 9, is salvage [in Late-Succesional Reserves] permitted to reduce fire hazard or risk? How and who defines acceptable risk? "SAG response: Salvage can be used to reduce risk throughout the range of the owl based on the salvage guidelines adapted from the final draft recovery plan. Silvicultural prescriptions can be used to reduce risk in areas subject to large scale disturbance (east side) using guidelines for reducing large scale disturbance adapted from the final draft recovery plan. (S&Gs pages C-13 and C-12)"	Response 3 in the "Responsible Opposing Views and Agency's response to Issues Raised" in Chapter 3 of the final EIS argues that the proposed salvage logging meets the Forest Plan and Late-Successional Reserve assessment requirements and recommendations. The Westside Fire Recovery Project is complying with the Standards and Guidelines for Late-Successional Reserve management including guidelines for salvage (pages C-11 to C-16). Any disagreement between the authors of the EIS and the Standards and Guidelines presented in Northwest Forest Plan Record of Decision in Attachment A is outside the scope of this project. It is the responsibility of the Forest to meet the intent of the Northwest Forest Plan through the use of the Standards and Guidelines. In addition, the Regional Ecological Office is reviewing this project to ensure consistency with the Northwest Forest Plan Standards and Guidelines (standards and guidelines page E-16). The Regional Ecological Office "...provides staff work and support to facilitate RIEC decision making and prompt interagency issue resolution in support of implementation of these standards and guidelines" (page E-16).
204.01 - NSO	#5873-76	Back in the early 1990s the Forest Service recognized the their forest plans were not adequate to maintain populations of spotted owls and they tried to develop plans to conserve spotted owl without following NEPA and NFMA procedures. The courts said they had to stop cutting owl habitat until they had complied with environmental laws. This is the same situation we find ourselves in today with dead-wood associated species. The agencies should stop harming dead wood habitat until they have a legal plan to conserve associated species over the long-term. Seattle Audubon Society v. Epsy, 998 F.2d 699, 704 (9th Cir. 1998) (an agency must re-examine its decision when the EIS "rests on stale scientific evidence and false assumptions").	See response to 5873-72. It is an extension of this comment, and is responded to there.

Code	Comment Number	Comment Text	Response
204.02 - Pacific Fisher	#12346-61	As indicated on page 7 of the Wildlife Biological Evaluation Report "[t]he primary goal of forest management is to avoid or minimize impacts to species whose viability has been identified as a concern." Management Direction 8-17 and 8-18 on page 4-28 of the Klamath National Forest Plan indicates that Pacific Fisher are a Sensitive species and directs the agency to "collect information on Sensitive species to assess population distribution and habitat 30 associations." No effort to address fisher population distribution has been made in support of the proposed Westside timber sale. What is disclosed in the DEIS (page 155) is that implementation of "Alternative 2 will affect habitat connectivity in 13 watersheds" such that 7 watersheds will go from having moderate connectivity for Fisher to low or very low and 6 watersheds will go from having low habitat connectivity for Fisher to having very low connectivity. Additionally, page 57 of the WBER indicates the proposed logging will result in three watersheds (Cougar Creek-Elk Creek, Lower West Fork Beaver Creek, and Tom Martin Creek-Klamath River) that currently are within the home range threshold for Fisher habitat dropping below the threshold. Bats	The analysis for this project assumed the possibility that all 7th fields could be occupied by fisher if enough pre-fire habitat occurred. Alternative 2 has the most effect on fisher connectivity and home range potential. However, Alternative 3, 5 and Alternative 2 as modified, have lesser effects to fisher connectivity and home range potential.
204.02 - Pacific Fisher	#17460-3	Retention of habitat for wildlife connectivity, particularly the Pacific fisher; while this concern is mitigated in Alternative 3, it is subsequently discarded in Alternatives 4 and 5.	In the National Environmental Policy Act process relevant issues discovered through the scoping process drive Alternative development. Alternative 3 was developed specifically to address Relevant Issue number 1 (Chapter 1 of the final EIS) which is a disagreement over treatments effects to wildlife habitat and connectivity. Alternative 4 was developed to address watershed concerns and Alternative 5 was developed to address a disagreement over salvage in the Late-Successional Reserves. Alternatives 4, 5 and Alternative 2 as modified all have a reduction in proposed activities so they indirectly reduce effects on wildlife connectivity.
204.02 - Pacific Fisher	#18859-6	Specific to the project and to the Pacific fisher, I would suggest that every potential hazard tree within 250 feet of any publicly accessible road be removed. Mortality due to roadkill is an identified threat to fishers and one that I have personally dealt with while conducting research on fishers. While conducting radio telemetry work on fishers in the coast range of California roadkill was a significant source of mortality, second only to predation. Removing snags from roadside areas would cause no significant reduction in the total number of snags available to species like fisher that depend on snags for some phase of their life history. By removing snags close to roads we would be removing the attraction of these areas to fishers thus lowering the likelihood that individual fishers would be killed by passing vehicles.	Hazard tree removal treatments is intended to remove trees that pose a hazard to Forest infrastructure in the project area as defined by the Regional Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (Angwin et al. 2012).

Code	Comment Number	Comment Text	Response
204.02 - Pacific Fisher	#18909-55	At page 134-135 of the DEIS states, "High connectivity means that there is sufficient habitat to th provide cover for fisher, marten, and wolverine moving within a 7 field watershed. Moderate th connectivity means there is some challenge to the species moving within a 7 field; this increases the risk to mortality and requires extra expense of energy to deviate around large openings. Low connectivity presents a great challenge because these species are likely to shift their territory to a more contiguous placement of habitat or move through areas with little to no cover. The final category, very low connectivity, represents a situation where openings exceed the gap distance th that would let these species move through a 7 increased." field watershed; risk to survival is substantially The DEIS at page 143 states that, out of 67 watersheds none have high connectivity, " 37 watersheds have low (16) or very low (21) habitat connectivity." The DEIS fails to consider how the low connectivity in over half of the project area watersheds are affecting the viability of Pacific fisher populations. The DEIS at page 135 states, "The effect of a loss of a home range is difficult to estimate in terms of population viability. Habitat lost is difficult to replace and it may take many years before the area develops into habitat again." "The loss of one home range may not have large effects on the population, but the loss of several home ranges can result in large effects to the population." On page 23 of the Wildlife BE, KNF states, "All pre-fire habitat that received high fire severity (>75% of basal loss) is considered non-habitat for this analysis." On page 131 of the DEIS, the agency states, "The analyses are based on the best scientific and commercial data available at the time this document was written. This assumption does not appear to fit the best available science. As found in Hanson (2013)11: 11 Hanson, C.T. 2013. Habitat use of Pacific fishers in a heterogeneous post-fire and unburned forest landscape on the Kern Plateau, Sierra Nevada, California. The Open Forest Science Journal 6:24-30 (emphasis added). In surveys on the Kern Plateau in the southwestern Sierra Nevada, within unlogged post- fire forests with mixed-severity effects from large fires, and in unburned forests, I found that fishers selected Sierran mixed-conifer forests in both post-fire and unburned areas, and selected closed-canopied, mature/old forest in unburned forests, as well as burned forests that had this structure in the pre-fire condition. When fishers were near burned/unburned edges, they selected the within-fire side. Fishers used dense, mature/old forest that experienced moderate/high-severity fire at the same level as unburned dense, mature/old forest, and both males and females were found deep inside large fires- several km from the fire perimeter. These results indicate that fishers may benefit from the structural complexity of such post-fire habitat for foraging. On page 20, the Wildlife BE acknowledges that fishers utilize high severity fire areas despite their loss of canopy cover, and that "[f]or high severity fires, retention of large trees and snags may be more important than canopy cover." But this potential foraging habitat is ignored in the Service's assumption. Further, the proposal to heavily log high severity patches would remove the remaining large trees and snags and would remove all remaining cover. The proposed project violates the Klamath National Forest Standard and Guideline 8-18, which directs the agency to "[a]void or minimize impacts to Sensitive species where possible." Please explain how the agency is in compliance given that the DEIS indicates that the project will directly remove 3 home ranges, and cumulatively remove a fourth home range. On page 155 of the DEIS indicates: Alternative 2 will affect habitat connectivity in13 watersheds. There are seven watersheds that will go from moderate habitat connectivity to low or very low connectivity in this alternative; the remaining six watersheds will drop from low to very low habitat connectivity. Three (Cougar Creek-Elk Creek, Lower West Fork Beaver Creek, and Tom Martin Creek-Klamath River) of the 25 watersheds that meet the criteria of possibly containing or contributing to a fisher home range fall below the fisher home range threshold in alternative 2. These three watersheds are not likely to contain a fisher home range after treatments are completed. On page 156 of the DEIS, KNF also states: Adding the direct and indirect effects of all other actions will result cumulatively in one watershed falling below the level of habitat needed for a fisher home range. The Big Ferry-Swanson watershed is affected by the Singleton project and projects on private land that will result in the loss of habitat and home range potential in the watershed; adding these effects to those of alternative 2 will result in measurable cumulative effects. Pacific fishers are commonly observed on the lower 2/3 slope, however the DEIS focuses snag retention on the lower 1/3 slope. Further, the DEIS fails to provide adequate mitigations, including snag and Coarse	The analysis was modified for the final EIS to assume that the denning/resting and foraging habitat burned with high and moderate became movement habitat. Movement habitat was considered habitat in both the connectivity and home range analysis. So areas that met denning/resting and foraging habitat that burned with moderate and high severity where treatment is proposed is assumed to be a modification or removal of fisher habitat. Alternative 3, 5 and Alternative 2 modified all have reduced effects to fisher connectivity and home range potential compared to Alternative 2. Project design features regarding coarse woody debris and snag retention are in Chapter 2 of the final EIS. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
		Woody Debris retention, to protect the survival of this Sensitive and candidate species. The DEIS also fails to analyze and disclose the effects from the proposed projects on the viability of the species.	

Code	Comment Number	Comment Text	Response
204.03 - WL - MIS	#12346-75	The DEIS and its supporting documents make no attempt to quantify project impacts to snag associated MIS species present in the planning area. The Klamath LRMP, Standard & Guide 8-19 (page 4-28) directs the Forest to "[c]ollect information on sensitive species to assess population distribution and habitat associates." Give this clear direction to "collect information…to assess population distribution," and given that MIS are designated by the KNF "because their population changes are believed to indicate the effects of management activities it is difficult to understand how MIS could fulfill their management function if KNF timber planners refuse to collect information about MIS population size, distribution and trends. Please note that in 2006 KNF timber planners responded to concerns about project impacts to MIS Species in the Horse Heli timber sale DEIS by contending that retention of habitat in the "Late Successional Reserve land allocation" was sufficient to "provide for late-successional species" and hence the KNF was somehow relieved of its duty to disclose project impacts to MIS Species. Yet here, in Westside, the KNF is specifically proposing to extensively log snag associate MIS habitat locating squarely within the LSR land use allocation while again refusing to survey for MIS species, analyze project impacts on MIS species, quantify project effects to MIS species, or reveal the population data and trends for snag associate MIS species in the timber sale area. 31 The NFP at C-42 clearly states: "As a minimum, snags are to be retained within the harvest unit at levels sufficient to support species of cavity -nesting birds at 40 percent of potential population levels based on published guidelines and models." Page 162 of the DEIS acknowledges that "units will not provide 5 snags per acre but the project will meet the Forest Plan standards of 5 snags per acre averaged over 100 acres." C-42 above applies to "harvest unit" scale and the KNF cannot avoid implementation of this substantive snag retention requirement by drawing units larger on maps (and not logging adjacent Riparian Reserves) and averaging snag retention outside of actual logging areas in order to avoid providing habitat for snag associated MIS species. Page 49 of the Draft Westside Biological Assessment indicates that "[i]n units less than 100 acres in size, snag retention will occur only in the riparian reserves and will be limited in areas lacking riparian reserves." Hence snag retention requirements will not actually be met in actual harvest units. As stated on page 6 of the Management Indicator Species Report The importance of recently burned forests to breeding cavity-nesting birds is well known. Primary cavity excavators are important members of forest ecosystems because the cavities they excavate may be used by secondary cavity nesters, including bats, American marten, many owl species, and other birds. Rather than disclose the impacts of LSR snag removal across thousands of acres of snagassociate MIS species, both the MISR and the DEIS rely entirely on the retention of 5 snags per acre to mitigate project effects. In fact no harvest unit will actually retain 5 snags per acre in the unit. Rather, the KNF is playing math games with averaging and scale to mask site-specific project impacts while refusing to analyze or disclose project impacts. Even if the KNF were to leave 5 snags per acre in logging units (which it is not) that would still not relieve the agency of its duty to utilize the MIS program to disclose project impacts to MIS populations. Reciting tree standards and guidelines does not constitute disclosure of project effects on MIS species. Further, the contention that "0 acres" of snag associate species habitat will be removed (on the 3/10/15 MIS Table) is arbitrary and capricious. Our organizations intend to photodocument the extensive removal of snag associate species habitat if the Westside project proceeds.	Forest Plan Standard and Guideline 8-22 says "Provide for an average of 5 snags per acre, in a variety of size and decay classes, within each landscape. These snags need not be equally distributed. The actual number of snags to be maintained in areas managed for timber production may vary from 2 to 5, depending on the amount of snags available within the surrounding landscape and the desired future condition of that landscape." Table 4-4 of the Forest Plan goes on to provide the number of snags required over 100 acres required for 'good quality' habitat (page 4-30). The interpretation of this evidence is that the snag retention requirements should be averaged over 100 acres to best meet the Forest Plan intentions. The final EIS summarizes the Management Indicator Species report. The Management Indicator Species report outlines in detail the effects to associated habitat for each assembly and was incorporated by reference into the final EIS. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.03 - WL - MIS	#5873-23	Given the regional deficit of young complex forests and the fact that many species, such as woodpeckers and secondary cavity users, appear to be adapted to exploit the structure and resources available within disturbed forests, the agencies should comprehensively consider and disclose the direct and indirect effects of salvage logging on species associated with young complex forests. The Forest Service has numerous Management Indicator Species whose populations have not been monitored, so the agencies lack the information necessary to that the salvage logging program will maintain species viability. d. the effects of salvage logging on the development of complex forest habitat; “The early post-disturbance period of forest ecosystem development - pre-tree-canopy closure - is profoundly important!” because it is heterogeneous, light-energy rich, structure rich, biodiversity rich, and process rich.	the Forest Service/Bureau of Land Management-administered lands and Interior Columbia Basin as a whole." The article does not provide any information on the historic level of snags within the Klamath Province area and thus does not make any conclusions on the range of availability of large snags within the project area. Korol et. al (2002) states that "Large snags should return to historical levels on Forest Service/Bureau of Land Management lands, but remain at roughly 75% of the historical amount across the Basin. Both small and large down wood amounts should remain above historical levels on Forest Service/Bureau of Land Management lands and across the Basin." The article does not conclude that the increases in large snags will occur in roadless and wilderness areas. The article compares the 3 Alternatives (S1, S2, and S3) and compares how fuels reduction efforts in both Alternatives S2 and S3 should reduce large down wood amounts in actively managed areas. But that this should be offset by increases in late seral forest in unroaded and wilderness areas, creating large down wood levels far above historical conditions. This is outside the scope of the project.

Code	Comment Number	Comment Text	Response
204.03 - WL - MIS	#5873-75	The agencies need to prepare a EIS to consider a replacement methodology for maintaining species and other values associated with dead wood. This is especially critical because adequate dead wood is recognized as an essential feature of healthy forests and the Forest Service has identified lots of “management indicator species” associated with dead wood habitat.	A different EIS about replacement methodology is outside the scope of the project. See response to comment number 5873-72. For the actions proposed, we are already doing an environmental impact statement. Best available science was used during project design and analysis, as referenced throughout the final EIS and supporting documents.
204.04 - WL - S&M	#18909-62	Salvage treatment units will not provide five snags on every acre but the project will meet the Forest Plan standard of five snags per acre- averaged over 100 acres. This is inconsistent with snag retention guidelines. The project would result in 11,693 acres of snag habitat being degraded and 1,692 acres would be removed. Cavity-nesting species are prime beneficiaries of fires, 62 species of birds and mammals use snags, broken-topped, diseased or otherwise "defective" trees for roosting, denning, foraging, or other life functions. The White-headed Woodpecker, Pygmy nuthatch and Flammulated owl all have habitat ranges within the project area. The Northwest Forest Plan (NFP) at C-45-46 states, "White-headed Woodpecker, Black-backed Wood Pecker, Pygmy nuthatch and Flammulated Owl- These species will not be sufficiently aided by application of mitigation measures for riparian habitat protection." It continues, "Specifically, the Scientific Analysis team recommends that no snags over 20 inches DBH be marked for cutting." The KNF LRMP requires that the largest snags be retained as they last longer make the best wildlife habitat. The DEIS fails to comply with the KNF LRMP and the NFP. Forests that burn at high severity burn, snag forests, are often incorrectly assumed to be damaged. Ecologically, this is strongly contradicted by the scientific evidence. Peak biodiversity levels of higher plants and vertebrates are found in patches of snag forest habitat-areas where most or all of the trees are killed by fire, consistent with the principle that pyrodiversity enhances biodiversity, especially where mixed-severity fire effects occur. As a result, avian species richness and diversity increases in heavily burned patches occurring within a mix of low and moderate severity effects. Scientists recommend that forest managers ensure the maintenance of moderate and high severity fire patches to maintain populations of numerous native bird species positively associated with fire. At the landscape level, high severity habitat (unlogged) is among the most underrepresented and rare forest habitat types. Page 144 of the DEIS states, "Prior to the fire, a large portion the project area likely provided habitat for survey and manage species. However, in the area that burned with moderate and high severity effects in the 2014 fires, with the loss of canopy cover, decaying large coarse woody debris and leaf litter to provide micro-site conditions, persistence for most of the mollusk and salamander sites is not likely. Therefore, only habitat that burned at very low and low severity is expected to contain the survey and manage species." As noted above this assumption is not based in common sense or the best available science.	Snag retention requirements will be met by a multitude of mitigations described in Response number 2 in the "Responsible Opposing Views and Agency's Response to Issues Raised" Section in Chapter 3 of the final EIS. Areas that had high severity vegetation burn were not considered to have no habitat value. The Wildlife section in Chapter 3 in the final EIS describes how severely burned areas were considered as habitat for the species analyzed. For instance, the analysis for the Northern Spotted Owl considered post-fire foraging habitat in the analysis of effects and pre-fire Pacific fisher habitat that had high fire severity in movement habitat in the connectivity and home range potential analysis. The reasoning for considering areas with moderate and high vegetation burn severity non-habitat for many of the survey and management species is described in the Survey and Manage Report and Wildlife report amendment. Whether or not fire creates conditions that may affect the species occupancy of a particular site, the intent of the Survey and Manage standards and guidelines is to protect known sites. For this project, project design features were developed to apply the standards and guidelines to protect these sites regardless of the current condition. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.05 - WL - FS Sensitive	#18909-29	The KNF LRMP at page 4-23, states: "6-8 Sensitive species: Project areas should be surveyed for the presence of Sensitive species before project implementation. If surveys cannot be conducted, project areas should be assessed for the presence and condition of Sensitive species habitat." The Terrestrial Wildlife section of the DEIS is so inadequate that KNF must rescind the DEIS. As discussed below, the analysis is plagued by both numerous and pervasive mistakes which make it impossible for the public or for the decision maker to meaningfully evaluate the comparative merits. Furthermore, the analysis indicators chosen by the agency do not provide a clear basis for choice among the decision maker; rather, they cloud the reason and important differences between the project alternatives. The agency cannot merely correct the mistakes identified below in the final EIS because this would inhibit the public's opportunity to comment on the project's impacts and the impacts of the proposed alternatives.	The project meets the requirements of Forest Plan Standard and Guideline 6-8. Surveys for Forest sensitive species were not completed. However, the analysis for Forest sensitive species assumed presence in all areas with suitable habitat as defined by the best available science.

Code	Comment Number	Comment Text	Response
204.05 - WL - FS Sensitive	#5873-34	Bats find favorable habitat in burned areas with abundant and diverse snags and abundant and diverse flying insects. Salvage logging will remove potential roost sites, and food sources. Carol Chambers and Erin Saunders. BATS IN THE BURNS - Studying the impact of wildfires and climate change. BATS. Bat Conservation International. Winter 2013, Volume 3, No. 4. http://www.batcon.org/index.php/media-and-info/bats-archives.html?task=viewArticle&magArticleID=1154	Chambers and Saunders (2013) state that while bats prefer unburned areas if available they will use snags affected or created by wildfire especially large diameter trees. Westside Fire Recovery includes the retention of legacy components such as large fire killed trees and pre-existing snags which will indirectly benefit bat species. The analysis indicator chosen to illustrate effects to Forest sensitive bat species was risk of disturbance focused on potential hibernaculum and maternity roost sites because of the Forest Plan Standard and Guideline directing the focus on underground spaces (Forest Plan page 4-32) and the importance of these areas to populations within fire affected areas.
204.05 - WL - FS Sensitive	#5873-71	An example of how salvage would lengthen the period that a forest remains inhospitable to wildlife is provided by the following study, Payer, D.C., and D.J. Harrison. 2000. Structural differences between forests regenerating following spruce budworm defoliation and clear-cut harvesting: Implications for marten. Canadian Journal of Forest Research 30(12): 196572. ("Summary: The authors looked at the use of clearcuts and areas where spruce budworm has caused mortality in relation to the American marten. When establishing new territories, martens avoid clearcuts but do not avoid stands with a history of extensive tree mortality caused by eastern spruce budworm. Although live tree basal area was similar between stand types, the results showed that the vertical structure provided by large snags can offset the limited availability of live trees for the marten, particularly where coarse woody debris and understory vegetation are plentiful.") http://www.umaine.edu/cfru/documents/payer.pdf	Habitat is defined by biotic and abiotic features that are used by a particular species to meet the needs of survival and reproduction. Fire can create dramatic changes in the habitat by altering the vegetation composition in a particular area; whether or not a particular area is "inhospitable" is determined by the species of interest. Like fire, salvage harvest can further change the vegetation structure, but without context of particular species, it is incorrect to identify salvage harvest as creating "inhospitable" conditions. For marten, fire can remove important habitat components like tree canopy cover which is described in the Wildlife Biological Evaluation (pages 20 and 21). Not all clearcuts are created equally, as described in the Wildlife Biological Evaluation, the size of the clearcut and the amount of residual woody debris can influence the potential movements of a marten.Prayer and Harrison (2000) studied the effects of land management on marten in Maine. The authors examined the difference in marten use of forest experiencing spruce budworm that defoliates the trees and land management that removed all the trees (i.e. clearcut). The authors found that marten avoid clearcuts but marten were found in stands affected budworm. Stands with affected by budworm had more snags, downed logs, and root masses and included taller trees when compared to clearcut stands. This physical vegetation structure is likely an important component for marten use because trees/snags can provide vertical structure while woody debris can provide cover along the ground. The Wildlife Biological Evaluation discusses these same principles and consequentially, an analysis indicator called "habitat connectivity" was developed to measure the effects of salvage harvest because snags and coarse woody debris have been described as important habitat components for marten to move through the home range and across the landscape (i.e. habitat connectivity). Further, the Westside Fire Recovery Project added snag retention areas in the salvage harvest units that will increase the amount of snags and coarse woody debris to reduce the potential effects to marten. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.06 - WL - General	#12346-17	Page 29 of the ACSOR acknowledges that salvage logging may negatively impact temporal connectivity "at the site scale" but dismisses the negative impact because "project design features that require snag retention in the salvage units will meet the standards and guidelines at the site scale." This contention is incorrect, the PDFs do no such thing. In fact, the logging PDFs call for: (1) Counting Riparian Reserves as "units" in order to double-count the Reserves for leave-tree purposes while clearcutting the actual harvest units; (2) Defining units larger than the actual harvest area in order to count trees outside of the logging zone as "leave trees" and (3) Averaging leave tree retention over 100-acre plots such that many "units" will be effectively clearcut. Hence the project will indeed negatively impact terrestrial connectivity at the site scale in violation of ACSO 2. Inexplicably, on page 29 of the ACSOR the Forest Service claims that leaving felled snags greater than 26" DBH on site in the Riparian Reserves for fish bearing streams while removing smaller snags in these areas and all snags in the Riparian Reserves for non-fish bearing streams will retain habitat connectivity. In fact smaller snags and snags in non-fisher bearing Riparian Reserves directly contribute to wildlife connectivity and their removal will inhibit attainment of ACSO 2. Indeed, retention of terrestrial wildlife connectivity was one of the primary reasons the NWFP established Riparian Reserves for non-fish bearing streams.	The Riparian Reserves that occur in the defined salvage units will not be salvage logged as described in Chapter 2 of the final EIS. Snag retention for units greater than 100 acres require the retention of 2-8 snags per acre averaged over the unit which will include any Riparian Reserves or legacy components within the unit. In units less than 100 acres snag retention will only occur in Riparian Reserves and where legacy components occur. The acres of Riparian Reserves in salvage units are only being counted once in the analysis of connectivity in the Wildlife Biological Evaluation and in Chapter 3 of the final EIS. Additional snags may be retained due implementation constraints as well that may increase the number of snags within the unit beyond the planned 2-8 snags. The project design feature described in the comment referring to the retention of 26 inch trees in Riparian Reserves will be applied to hazard tree removal units only. Riparian Reserves help "...enhance habitat conservation for organisms dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for terrestrial animals and plants, and provide for greater connectivity of late-successional forest habitat." (Northwest Forest Plan Record of Decision, page 7). The species that benefit from Riparian Reserve connectivity include the Northern Spotted Owl, survey and manage species and Forest sensitive species. Connectivity analysis was not specifically completed for every species considered in the final environmental impact statement (EIS). However, the connectivity analysis for Fisher, Martin and Wolverine and the logic behind the assumptions in the Terrestrial Wildlife Biological Evaluation (as amended) provides estimated effects that could occur for many more species than these three weasels. Given the activities proposed and the limitation opening pose to fisher, marten and wolverine (to a much less degree) to move through the landscape, connectivity for the fisher, marten, and wolverine can still provide an estimate of connectivity for many other species including spotted owl. Like fisher, marten, and wolverine, spotted owl likely use overstory tree canopy cover to avoid predation and find needed resources while moving through the landscape; however, the spotted owl likely to cross larger opening than the opening sizes presented for the fisher, marten, and wolverine analysis. Therefore, the fisher, marten, and wolverine connectivity analysis likely underestimates the level of connectivity. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#12346-58	As indicated on page 7 of the Wildlife Biological Evaluation Report "[t]he primary goal of forest management is to avoid or minimize impacts to species whose viability has been identified as a concern." Forest Sensitive Species (FSS) are plant and animal species identified by a Regional Forester for which population viability is a concern. Hence the KNF must conduct its management "to avoid or minimize impacts" to bald eagles. That has not occurred in the Westside planning process. 29 As disclosed on page 151 of the DEIS "Alternative 2 will have treatment within 0.5 miles of all four bald eagle nest sites…[And] "the Caroline Creek eagle nest will have a large proportion of potential future nest trees removed from the nearby area." Page 53 of the WBER indicates that "Caroline Creek eagle nest has salvage and roadside hazard treatment within 600 feet of the nest." This will result in "a high risk of the eagle pair not finding a nest tree in the future if the eagles choose to move." (DEIS page 151). It appears that Project Design Feature "Wildlife 4" at page 89 of the DEIS provides an exemption to the Bald Eagle seasonal protections for two log landings located in Caroline Creek. Hence the project does not in fact avoid or minimize impacts to bald eagles.	The projects does minimize effects to nesting bald eagles through project design features by separating the timing of project implementation when the eagle nest is not active. In addition, project design doesn't remove large trees within 330 feet of the nest tree. Although the U.S. Fish and Wildlife Service does recommend to retain mature trees within one-half mile from large bodies of water, this isn't a requirement.
204.06 - WL - General	#12346-59	As indicated on page 7 of the Wildlife Biological Evaluation Report "[t]he primary goal of forest management is to avoid or minimize impacts to species whose viability has been identified as a concern." Yet page 153 of the DEIS indicates that all of the KNF logging alternatives "will remove habitat and result in two nests increasing the level of risk to reproduction from moderate to high." Page 55 of the WBER concludes that the proposed logging "will result in the Hickory and West Whites goshawk nest having a high level of risk to reproduction.	Standard and Guideline 8-18 states "Avoid or minimize impacts to Sensitive species where possible. If impacts cannot be avoided, analyze the potential effects on the population or its habitat within the landscape and on the species as a whole…." There are project design features that limit operating periods around Northern Goshawk nests which will minimize effects to nesting birds. The effects of the project on Northern Goshawks is detailed in the Terrestrial Wildlife Biological Evaluation (as amended) which is summarized and incorporated by reference into the draft EIS and the final EIS.
204.06 - WL - General	#12346-60	As indicated on page 7 of the Wildlife Biological Evaluation Report "[t]he primary goal of forest management is to avoid or minimize impacts to species whose viability has been identified as a concern." Page 61 of the WBER acknowledges that "[t]ractor [yarding] will likely compact the most amount of salamander habitat, followed by cable yarding corridors where several logs are basically dragged over the same ground." The KNF proposes to "mitigate" these direct impacts by buffering 19 "known sites." See DEIS page 158. However, it does not appear that pre-disturbance SMS surveys were conducted prior to the Westside timber sale planning effort. Instead it appears that the 19 "known" sites are "known" from historic surveys and that the KNF has elected to ignore the survey protocols of the NWFP and rely on "mitigation" involving "known sites" that is not informed by a projectspecific effort to determine where salamanders are located.	The Wildlife Biological Evaluation analyzes two species identified as a Forest Service Sensitive Species that are also identified as a Survey and Manage Species in part of the Northwest Forest Plan. Yes, pre-disturbance surveys are required for some Survey and Manage Species for specific types of treatments. However, pre-disturbance surveys are require prior to treatment not prior to planning of a treatment. The Forest is conducting surveys to be compliant with the Survey and Manage Standards and Guidelines.
204.06 - WL - General	#12346-62	The DEIS contains no substantive or quantified information regarding project activities on Pallid, Townsend's Big-Eared or Fringed Myotis bat species. Instead the DEIS offers conclusory statements unsupported by analysis or data of any sort. Page 60 of the WBER concludes (again with no supporting data or analysis) that "the [sensitive bat] sites with potential cave or cave like structures in the 13 sites with a high risk of disturbance are likely the most vulnerable to abandonment which could affect a population." But these effects are not disclosed or quantified.	The analysis on the effects to Forest sensitive bat species is summarized in the draft EIS but the details of the effects are in the Terrestrial Wildlife Biological Evaluation as amended which is incorporated by reference into the draft EIS.

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#12346-66	Page 8 of the Wildlife Biological Evaluation Report acknowledges that the Caltrans and CDFW commissioned California Essential Habitat Connectivity Project indicates that the "Westside Fire Recovery project area contains portions of the identified Essential Habitat Connectivity area" and that "Theobald et al. (2011) found similar important of the Westside Fire Recovery project area for contributing to large scale wildlife connectivity as the California Essential Habitat Connectivity project." Yet these findings and recommendations are not reflected in the Forest Service proposed logging proposal. Westside Salvage KNF timber planners allegedly developed Alternative 3 to "address" the significant issue of wildlife connectivity. Yet all of the developed logging action alternatives (including Alternative 3) target the Grider and Walker Creek watersheds for significant logging, yarding, road, and landing activities. This is not the first time that KNF timber planners have attempted to exploit wildfire to log the Grider Creek wildlife connectivity corridor connecting the Marble Mountains Wilderness with the Red Buttes Wilderness Area. Following the 1987 fire season the KNF proposed significant salvage logging in the Grider Creek. In 1990 the Ninth Circuit Court of Appeals (Marble Mountains Audubon v Rice) noted that fish and wildlife concerns "received only cursory attention" particularly concerning the Grider Creek biological corridor which "represents a corridor of relatively uninterrupted forest habitat connecting the Marble Mountains Wilderness to the Klamath River and the unroaded Ft. Goff and Portuguese drainage and the Red Buttes Wilderness to the north." The Forest Service decision to ignore "fish and wildlife concerns" involving a unique biological corridor of regional significance was struck down. But history is unfortunately repeating itself and every logging alternative that the KNF developed involves removing snags, live trees, and recovering forests in Walker and Grider Creek that provide wildlife connectivity that allows for dispersal and genetic flow between two regionally significant source population habitats. Why has the KNF refused to consider or develop an action alternative that does not convert thousands of acres in Walker and Grider Creek into fiber plantations to the detriment of all other forest values?	The Habitat Connectivity section of the Biological Evaluation discusses the use of the California Essential Habitat Connectivity Project relative to the Westside Fire Recovery project. The product was developed for large-scale (regional) planning and is subject to additional analysis if used at the project scale. Alternative 3 was designed to respond to Relevant Issue number 1 which focused on salvage logging effects to wildlife which includes connectivity. Salvage logging was restricted in the Beaver fire area due to the concern over fragmentation related to private land salvage activities. Wildlife project design features 11, 12, 18, 19, 20, and 21 were also added to mitigate concerns related to Relevant Issue number 1 (Issues section of Chapter 1 of the final EIS). Alternative 5 reduces the acres in the Walker and Grider Creek areas. There is only about 320 acres of salvage in Walker Creek and no salvage in Upper Grider, Lower Grider, Cliff Valley or Rancheria Creek 7th field watersheds in Alternative 5. The effects of each Alternative to fisher and marten connectivity was analyzed in the draft EIS and the Wildlife Biological Evaluation and is a proxy for Northern Spotted Owl (See Wildlife Report Amendment).
204.06 - WL - General	#12354-2	Read More: http://www.esa journals.org /doi /full /10. 1 890 /1OS1-0761(2000)010%SB0233:EOIDOL%5D2.0.C0:2 Radeloff, Volker C., David J. Mladenoff, and Mark S. Boyce. "Effects of interacting disturbances on landscape patterns: budworm defoliation and salvage logging." Ecological Applications 10, no. 1(2000): 233-247. Some Picea and Abies tree species of Pacific rainforests regenerate well, or even better on rotting logs, than directly in soil. Removing /clearing understory or fallen logs , or of dead or dying trees can diminish speed of regrowth. Numerous animal species from predators like Northern Spotted Owl, Pacific Fisher American Pine Marten, nesting raptors, lose habitat. So also do porcupines, flying squirrels, cavity-nesting birds, and even rare tree fungi. Common rodent prey of NSO and other predators: Peromyscus appear to be habitat generalists, and populations are little affected by local changes within typical salvage, small clearcut, or natural fire-affected areas. They DO need ground cover, both coarse woody debris and early to mid-seral stage ground habitat, and thus, herbicide use and fuels red uction may significantly adversely affect their numbers and presence. (Menzel et al., 1999) Owl prey are dependent upon hypogeous fungi for varying parts of their diets, and assist fungal dispersal through fecal pellets. Clearcutting, as in OR, along with drought, may negatively influence both ectomycorrhizal fungi and small mammal populations, reducing Owl prey. Some mammal species switch to lichen, which may also be vulnerable to heavy disruptive influences. Howard F. Sakai and Barry R. Noon Dusky-Footed Woodrat Abundance in Different-Aged Forests in Northwestern California. The Jou rnal of Wildlife Management Vol. 57, No. 2 (Apr., 1993), pp. 373-382 Published by: Wiley on behalf of the Wildlife Society Stable URL: http://www.jstor.org/stable/3809436 Douglas C. Ure, Chris Maser; Mycophagy of red-backed voles in Oregon and Washington. Canadian Journal of Zoology, 1982, 60(12): 3307- 3315, 10.1139/z82-419 Sanjay Pyare and William S. Langland (2001) PATTERNS OF ECTOMYCORRHIZAL-FUNGI CONSUMPTION BY SMALL MAMMALS IN REMNANT OLD-GROWTH FORESTS OF THE SIERRA NEVADA. Ecology Vol. 59, No. 4 (Summer, 1978), pp. 799-809. Published by: Ecological Society of America. Article Stable URL: http: //www.jstor.org/stable/1 938784 Chris Maser, James M. Trappe and Ronald A. Nussbaum. Fungal-small mammal interrelationships with emphasis on Oregon coniferous	The Wildlife Biological Evaluation, Wildlife Management Indicator Species Report, and the Wildlife Biological Assessment analyzes several species such as the northern spotted owl, Pacific fisher, northern goshawk, and cavity nesting birds to determine the level of effects the project may have on these species. Further, these documents disclose the effects of each Alternative including a "no action" Alternative which describes the direct and indirect effects of taking no action. For northern spotted owl, the Biological Assessment describes the effects of the proposed activities on northern spotted owl prey species (e.g. Peromyscus sp.).

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#12354-3	forests Ecology Vol. 59, No. 4 (Summer, 1978), pp. 799-809 Published by: Ecological Society of America Article Stable URL: http: //www.jstor.org/stable/1 938784 Thomas P. Sullivan, R. A. Lautenschlager and Robert G. Wagner. Clearcutting and burning of northern spruce-fir forests: implications for small mammal communities. Article first published online: 25 DEC 2001 DOI: 10.1046/j.1 365-2664.1999.00408.x Marc D Meyer, Malcolm P North, Douglas A Kelt Short-term effects of fire and forest thinning on truffle abundance and consumption by Neotamias speciosus in the Sierra Nevada of California. Canadian Journal of Forest Research, 2005, 35(5): 1061-1070, 10.1139/x05- 032 Marc D Meyer, Malcolm P North, Douglas A Kelt Fungi in the diets of northern flying squirrels and lodgepole chipmunks in the Sierra Nevada. Canadian Journal of Zoology, 2005, 83(12): 1581-1589, 10.1139/z05-156	The excerpt from this letter doesn't provide a project specific comment to respond to. The articles presented in this excerpt appear to reference research on small mammal responses to land management. However, effects of the proposed activities on spotted owl prey species in discussed in the section called "Effects on prey, competitors, or predators" in the Wildlife Biological Assessment.
204.06 - WL - General	#12354-4	2. Thus the immense increase in roading fragments and destroys habitat for numerous creatures, including amphibians, some of which are severely imperiled and/or endemic. Roading and amphibia n dispersal/movement: Salvage roading must allow for proper culverts and other methods of securing streams, spring patches, wet zones from fragmenting amphibian populations. Amphibians tend not to cross active roads successfully, resulting in severe isolation of subpopulations into tiny patches, which are more susceptible to local extinction. (only invasive and damaging bullfrogs might be good crossers, carrying increased chytrid parasites, MORE lethal to native amphibian). Insufficient study of salvage logging's effects on CA species of special concern has occurred. How can salvage logging be permitted when this is the case? Some relevant references : Richard T. T. Forman and Lauren E. Alexander Roads a nd Thei r Ma jor Ecological Effects Annual Review o[Ecology and Systematics Vol. 29, (1998) , pp. 207-231+C2 Published by: Annual Reviews Stable U RL: http://www.jstor.org/stable/221 707 Significant disturbance and red uction of salamander population due to logging roads (but not to Maine frog species - CA Species of Special Concern, like red & yellow legged frogs might suffer more, as they require wetter, cooler habitat: Some species of special concern in CA salamanders: California tiger salamander - Ambystoma californiense, Siskiyou Mountains salamander, Plethodon stormi , Scott Bar Salamander? Red and Yellow-legged Frogs de Maynadier, P. G., and M. L. Hunter J r. "Road effects on amphibian movements in a forested landscape." Natural Areas journal 20, no. 1(2000): 56-65. complete CA Special Animals list http:/jwww.d fg.ca.gov/wildli fe/nongame/list html Trombulak, S. C. and Frissell, C. A. (2000), Review of Ecological Effects of Roads on Terrestrial and Aquatic Communities. Conservation Biology, 14: 18-30. doi: 10.1046/j.1 523-1739.2000.99084.x Abstract: Roads are a widespread and increasing feature of most landscapes. We reviewed the scientific literature on the ecological effects of roads and found support for the general conclusion that they are associated with negative effects on biotic integrity in both terrestrial and aquatic ecosystems. Roads of all kinds have seven general effects: mortalityfrom road construction, mortalityfrom collision with vehicles, modification of animal behavior, alteration of the physical environment, alterution of the chemical environment, spread of exotics, and increased use of areas by humans. Road construction kills sessile and slow-moving organisms, injures organisms adjacent to a road, and alters physical conditions beneath a road. Vehicle collisions affect the demography of many species, both vertebrates and invertebrates; mitigation measures to reduce roadkill have been only partly successful. Roads alter animal behavior by causing changes in home ranges, movement, reprod uctive success, escape response, and physiological state. Roads change soil density, temperature, soil water content, light levels, dust, surface waters, patterns of runoff, and sedimentation, as well as adding heavy metals [especially lead), salts, organic molecules, ozone, and nutrients to roadside environments. Roads promote the dispersal of exotic species by altering habitats, stressing native species, and providing movement corridors. Roads also promote increased hunting, fishing, passive harassment of animals, and landscape modifications. . . . . Our review underscores the importance to conservation of avoiding construction of new roads in roadless or sparsely roaded areas and of removal or restoration of existing roads to benefit both terrestrial and aquatic biota.	Project Design Features have been developed to minimize the effects of project activities on riparian areas including streams, springs, and wet meadows as described in Chapter 2 of the final EIS. We used the best available science which included professional judgement to estimate the level of effects on the amphibian analyzed in the final EIS. However, data gaps in the research don't prohibit actions per 40CFR1502.22 in the National Environmental Policy Act process.

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#12354-5	DeMaynadier, Phillip G., and Malcolm L. Hunter J r. "The relationship between forest management and amphibian ecology: a review of the North American literature." Environmental Reviews 3, no. 3-4 (1995): 230-261. Abstract Questions about the compatibility of forest harvesting practices and conservation of biological diversity are largely driven by concerns that habitat quality for many species may be degraded in intensively managed forest landscapes. We review the literature on relationships between common forest harvesting practices and the distribution and abundance of amphibians, a group that has attracted considerable attention in recent years because of their potential ecological importance in forest ecosystems and because of reports of widespread population declines. Clear-cut harvesting generally has negative short-term impacts on local amphibian populations, especially salamanders.. . . However, research on the influence of forest age suggests that the long-term effects of forest harvesting on amphibians are variable, and for many species these effects can be mitigated if regeneration practices leave adequate microhabitat structure intact. In contrast, long-term effects can be significant in forest plantations, which are often associated with intensive site preparations and stand management practices that modify levels of coarse woody debris and other microhabitats. Other forest practices reviewed for their effect on amphibians include prescribed fire, logging roads, and streamside harvesting. We discuss problems commonly encountered in the experimental design and measu rement of forest amphibian populations, including a notable lack of pretreatment data, and outline several aspects of amphibian-forestry relationships in need of further research. Management recommendations relevant to conserving upland and riparian zone amphibian habitat during forest harvesting are offered.	See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate. The Westside Fire Recovery Project is consistent with the recommendations provided in the document (DeMaynadier and Hunter 1995) presented by the commenter. DeMaynadier and Hunter (1995) provide a review of the available research to aid in lowering the effects of land management on amphibians. In particular, the section called “Management considerations” provides several management recommendations for specific habitat types that are intended to retain important features for amphibians. Summary of recommendations for managing forested areas.For Upland habitats:• Retain sufficient residual structure scattered heterogeneously across the stand, thus minimizing the contrast in abundance and distribution of microhabitats between managed stands and natural stands.• Leave scattered patches of live trees and snags rather than widely spaced individual trees during a clear-cut harvest• Provide for scattered recruitment of dead wood on the future standFor Riparian habitats:• Avoid riparian areas as much as possible when building forest roads.• Limit tree cutting 30 to 100 meters (about 100 to 330 feet) from the watercourse The Westside Fire Recovery Project is currently applying these recommendations:Project Design Features or by project design:Upland habitats• Snag retention patches are distributed across salvage harvest units• Legacy components (as described in the Project Design Features) • Trees that don’t meet the probability of mortality will be retained in the salvage harvest unit• Plus protection buffers around Siskiyou Mountains salamander habitat will retain additional snags in salvage harvest unitsRiparian Reserves• Salvage harvest avoids Riparian Reserves (150 to 340 feet buffer depending on site tree height and whether the watercourse is fish bearing) thus riparian areas will retain snags or live trees. • By project design, new road construction avoids Riparian Reserves.
204.06 - WL - General	#12354-6	Because California has declared the Gray Wolf, Canis lupus, an Endangered Species, and populations of the wolf are moving into Southwest Oregon, we can expect wolves to explore KNF in the next very few years. Roading prevents C. lupus from successfully reproducing, at levels of over .75 kilometers of road per square kilometer. I will not here supply the references, as my letter is getting too long, but suffice to say that this figure is extremely well-supported by decades of study. KNF proposes far too many roads for this private profit logging, and must consider that this may be illegal in itself. I will be contacting agencies and organizations on the subjects of Endangered, Threatened, and Species of Special Concern.	The gray wolf is still protected under the Endangered Species Act. Therefore, the wolf is covered in the Wildlife Biological Assessment As described in the Wildlife Biological Assessment, there are currently no wolves occupying the project area. However, if a wolf is confirmed to in the project area, then the Forest is required to contact the U.S. Fish and Wildlife Service to possibly initiate consultation.
204.06 - WL - General	#17387-13	Retain all trees (live and dead) that are over 30 inches DBH unless they are hazard trees. These large trees provide forest structure and wildlife habitat even if dead."	See response to 18909-30.
204.06 - WL - General	#18747-4	Although I have not seen any comments from Wildlife Personnel about how wildlife was affected I urge that those personnel be actively engaged in the planning in order to protect as much habitat and seasonal feed areas for Elk, Deer and Bear as possible. For instance manzanita brush (especially the low growing variety) is a major source of berries and the chinquapin trees provide an edible nut. These are two examples of food sources that may be removed during clearing, burning or providing landing areas.	Wildlife specialists have been active members of the interdisciplinary team for this project. Site preparation focused on areas historically dominated by conifers (Chapter 2 of the final EIS) areas with a high level of hardwoods including manzanita and chinquapin were avoid where possible. Reforestation prescriptions reflect the need for both conifer and hardwood components in the forest landscape.
204.06 - WL - General	#18857-9	No salvage units in special habitat designations such as Northern spotted owl (NSO) activity centers, peregrine falcon or goshawk activity centers. * No salvage units in Bald Eagle Management Areas.	The decision must balance the effects to resources with meeting the purpose and need of the project. Alternative 1 (no action) is included in this decision process.
204.06 - WL - General	#18876-1	Please avoid this plan, and all activities that could harm existing and proposed Wild & Scenic Rivers, water quality and threatened salmon, and roadless areas that provide refuge for wildlife.	The decision must balance the effects to resources with meeting the purpose and need of the project. Alternative 1 (no action) is included in this decision process.

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#18909-125	The Siskiyou Mountains Salamander (Plethodon stormi) is endemic to 420 square miles of known habitat in northern Siskiyou County, CA and southern Jackson Country, OR. About 25% of its range overlaps the Happy Camp Fire area. The DEIS at page 136 and 143 states that there are 48 known sites for the Siskiyou Mountains Salamanders in the project area and that "Many of these known sites were affected by the 2014 wildfire" and that "Most of the sites experienced high and moderate severity fire." The DEIS fails to analyze and disclose affects to known sites, suitable habitat and populations of the rare and endemic Siskiyou Mountains Salamanders from the 2014 wildfires. This is important, given that at least 25% of its range may have been affected by fire. The DEIS contains opposite statements. On page 144 it states that, "[t]hese sites have not been surveyed after the fire but it is likely that these sites are still occupied." On page 146 in Table 3-8 it states, "48 known sites and the 2014 fires removed most or all of the tree canopy cover leaving very little habitat; sites are unlikely to be occupied." How is the public or decision maker able to gain an accurate understanding of the affects to these extremely rare salamanders? The DEIS fails the "hard look" NEPA requirement. The DEIS at page 139 states, "Requirements of the 2001 Record of Decision include management of known sites as recommended by species review and conducting pre-disturbance surveys of potential habitat and managing any discovered sites for Siskiyou Mountain salamander and Tehama chaparral snail (both analyzed as sensitive species), and the blue-gray taildropper. It is assumed that pre-fire habitat that burned with high or moderate vegetation- burn severity is no longer habitat so pre-disturbance surveys will not be completed. The analysis indicator for effects on survey and manage species is the number of known sites affected by the project activities." (Emphasis added). KNF Fails to adhere to the Northwest Forest Plan's Survey and Manage Requirements. The Siskiyou Mountains Salamander is a Category A species under the Survey and Manage (S&M) provisions of the Northwest Forest Plan. The Forest Service is directed to survey potential habitat prior to proposed activities and manage known sites. Page 8 of the 2001 S&M Guidelines state: "Surveys Prior to Habitat-Disturbing Activities: Surveys will be conducted at the project level prior to habitat-disturbing activities, and in accordance with Survey Protocols, to avoid loss of undiscovered sites by habitat-disturbing activities. Species sites found as a result of these surveys will be managed as known sites." According to the survey protocol, "Most proposed timber management activities, including . . . salvage would trigger surveys. These types of activities involve reduction of canopy and high levels of disturbance to the substrate."8 8 David R. Clayton et al., Survey Protocol for the Siskiyou Mountains Salamander (Plethodon stormi), V. 3.0 (October 1999) Then the Survey and Manage Report states that, "pre-disturbance surveys will be evaluated for salvage units, road construction, and landings within stands over 80 years of age that contain existing habitat for Tehama chaparral snail, Siskiyou Mountains salamander, or blue-gray tail dropper per the decision of the Responsible Official."	Thank you for pointing out the mistake in the draft EIS. We have corrected this error in the final EIS. The Westside Fire Recovery Project is consistent with the Northwest Forest Plan Standards and Guidelines for those species identified as Survey and Manage that occur in the project area and may be affected by the project activities. The Northwest Forest Plan as modified identify the particular species that should be surveyed prior to implementation and any site where the species is known to occur or suspected to occur should have limited activities. The intent of these surveys are to identify the location of this species prior to ground disturbing activities in order to reduce the potential of negative effects to the habitat or individuals. This means that surveys need to be completed prior to ground disturbance for any one acre. In other words, the project doesn't need to be completely surveyed prior to the start of the project as long as the units with activity have surveys completed prior to the start of activities within those units. The Forest is currently identifying Siskiyou Mountains salamander habitat in the treatment units per the Northwest Forest Plan Standards and Guidelines. However, it is important to acknowledge that surveys are not required to be completed prior to the planning of this project. Planning the Westside Fire Recovery Project will not affect this species because no action can occur until after a decision is signed. A decision is signed after the planning process is completed.

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#18909-126	There are two major issues with the Survey and Manage requirement violations. First, surveys are not discretionary. Second, even if the surveys were completed, it is doubtful that they would comply with the survey protocol. As established in the survey protocol, "Surveys for animals must occur during the appropriate months: generally late fall through late spring. These times coincide with the fall and spring rainy seasons."9 As indicated by the agency it intends to begin logging before the rainy season. Either way, the Survey and Manage requirements of the Northwest Forest Plan are violated. 9 David R. Clayton et al., Survey Protocol for the Siskiyou Mountains Salamander (Plethodon stormi), V. 3.0 KNF's Impact and Alternatives Analysis is Based on False Assumption: The Service's analysis of the project's impact on Siskiyou Mountains salamander is based on a false assumption, that is that all moderate and high severity burn areas are no longer habitat. As such, it places un-surveyed and surveyed salamanders at risk. Page 32 of the Wildlife BE assumes that "Surveys have identified all occupied habitat." This is false and the Service employees have already flagged this concern internally. (October 1999) (Page 141, emphasis added) On February 15, 2015, Sam Cuenca sent an email to other interdisciplinary team members titled, "Westside and Salamanders URGENT Concern!" in which he raised a concern about salamander surveys and known sites. He wrote, The concern in this project is the use of tractor logging on talus habitats. This is not an action that is conducive to maintaining populations on occupied habitat. We have very limited data on known sites and I have already helped to consolidate the knows (sic) sources for Chad (FS, FWS, Cal Fish and Game, NRIS, CNDDB sources). The thing that I wanted to share is that according to the protocol and the draft conservation strategy when an animal is detected on a parcel of talus the entire talus parcel is considered occupied. We have never been able to survey a 100% sample of talus so we use the presence as an index to the entire parcel/patch. I am not sure where we are with recommendations and pdf development but I am sure we are running out of time. In essence, I believe that tractors should not be on any occupied or presumed occupied talus. This species is endemic, sensitive to disturbance of impaction, and not very mobile from site to site. If it can at all be considered, I recommend that known sites AND un-surveyed potential occupied talus be managed to minimize tractor use on these very sensitive sites. Salvage operations in this status should either be treated with end lining, or dropped. There are not many situations like this on the ground so it should not have a large impact to the alternatives. These sites are endemic and very unique on with westside of the Forest. Disturbing them could affect an entire localized population. I know the project timelines are critical. I believe maintaining the integrity of these species as we manage our forest is even more critical.10 10 Email from Sam Cuenca to Chad Bell (emphasis added). This false assumption, that surveys have documented all known sites, impacts project implementation. The Service provides for a number of project design features, Wildlife-8, 9 and 10. According to the Service's Survey and Manage Report: In order to avoid potential effects to known sites, a protection buffer will be applied to known sites using a Project Design Feature (PDF) thus mitigating potential effects. Therefore, the use of protection buffers for all known sites and surveys of Tehama chaparral snail, Siskiyou Mountains salamander, and blue-gray taildropper will meet the compliance for Survey and Manage requirements. So, there are no sites directly impacted by the treatments in any alternative. As discussed earlier, the agency is not complying with survey requirements. Thus, the project design features which may protect some known areas do nothing for the un-surveyed and unknown salamander populations. Further, the proposed removal of canopy and shade and possible compaction will likely create conditions that would risk salamander survival. Surveys have shown that salamanders use early seral habitat, such as natural recovery areas post-fire. According to the US Fish and Wildlife Service, http://www.fws.gov/yreka/plethodonspecies.html surveys have detected Siskiyou Mountains and Scott Bar salamanders in drier environments within early seral stage stands. The DEIS fails to consider how both salamander species utilize early seral stands. Further it is not clear in the DEIS if the agency is following recommendations in the Candidate Conservation Agreement for these species.	The Scott Bar salamander is not identified as Threatened or Endangered under the Endangered Species Act, Management Indicator Species, survey and manage, or Forest Service sensitive species thus an effects analysis on the Scott Bar salamander is not required. However, the Siskiyou Mountains salamander, as a survey and manage species, requires predisturbance surveys with exceptions as described in the Survey and Manage Report.

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#18909-127	The spatial scale for Siskiyou Mountains Salamander impacts is set at 130 feet and the Wildlife PDF 8 on page 89 states that sites will be flagged on the ground, however after speaking with Chad Bell at the most recent Sawyers Bar Open House it has come to our understanding that salamander sites are flagged with approximately 20'x 20' buffer. This distance does not provide adequate protection for these rare and endemic species. However, the Wildlife BE states at page 33, "Since this species doesn't move far, we will buffer each known location by 130 feet to represent a maximum distance a salamander might move even though the entire area may not contain suitable habitat." This conflicting information makes writing informed comments difficult. Please do inform us of the proposed distance and length for Siskiyou Mountains Salamander buffers and what types of treatments are happening adjacent to them. Because these species complete their life cycles in an area of approximately 2.5 acres and have not been observed migrating between subpopulations it is crucial to adequately protect all known sites and suitable habitat. The DEIS fails to sufficiently consider the benefits of live green trees in moderate fire severity areas, snags and Coarse Woody Debris (CWD) on shade and microclimates. The DEIS states that, "Even though canopy cover is considered a critical component for Siskiyou Mountains salamander habitat, canopy cover was not analyzed because very little canopy cover is expected to be affected by project activities. Instead, this analysis will focus on assessing the level of risk to local populations based on the amount of habitat disturbed by treatment."	Siskiyou Mountains salamander habitat footprint can vary in shape and size. Depending where on the Forest, the habitat can be rather small (<0.1 acre) or a fair bit larger (several acres). However, the Survey and Manage Survey Protocol does discriminate any site based on the size or shape of the habitat footprint. Per the Survey Protocol for the Siskiyou Mountains Salamander (Plethodon stormii) (1999), a protection buffer is applied around the periphery of the identified site; the periphery is determined by identifying the maximum extent of the habitat. For example, an individual salamander discovered in the center of a habitat patch 100-feet by 100-feet would simply identify that patch as occupied thus the entire 100ft by 100ft habitat patch will be delineated to not receive salvage harvest. In addition to delineating the habitat that is currently occupied or previously confirmed as occupied, the forest is delineating areas that are possibly occupied but no salamanders have been found in the area. The Northwest Forest Plan only requires the protection of known sites or newly discovered sites as a result of pre-disturbance surveys, but given the importance of this species, the Forest has expanded the protection areas to include areas with no detections but contains higher quality suitable habitat that may become occupied in the future. See response to comment 12346-55 about green trees.
204.06 - WL - General	#18909-44	The DEIS and the BA fail to consider the threat of Barred owls within the project area and they provide no analysis of barred owl presence in the project area. The assumption that "salvage would accelerate the restoration of suitable NSO habitat, and fuels treatments would reduce fuel loadings and risk of stand-replacing fire" is not based on the best available science.	The BA provides an analysis of the barred owl and spotted owl interaction in the section called "effects on prey, competitors or predators".

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#18909-51	Eleven goshawk nests have been occupied at some point in the last twenty years within or near the project area. Only one of the nest sites meets the standards for habitat minimums, which is mostly outside the fire perimeter. The project proposes treatment within 0.25 miles of six goshawk nest sites (Kohl, Beaver, China, Elk, Middle, and Hickory). The project would remove habitat around four nests (Beaver, Hickory, Kelsey and West Whites) causing a high level of risk to reproduction. Goshawks, like many other rare, long-lived species, show great fidelity to certain spatial elements within landscapes (meadows, northerly aspects, water sources), and are unlikely to be successfully managed with an approach based solely on acres of suitable forest structure. The DEIS violates the KNF LRMP 8-10 Requirements for goshawks: I. Primary Nest Zone Establish a 0.5 mile radius circle (504 acres) around the last known nest or the geometric center of a cluster of all known nests. Within this circle, maintain 40% (200 acres -- California Cascades/Eastern Klamath Province) or 60% (300 acres -- Western Klamath/California Coastal Provinces) in dense mature forest cover (>>60% CC, >>24 inches DBH [4B,C+]). The existing nest stand should be used to determine desired forest structure. This 200-acre (or 300-acre) area should include the active and historic nest stands and be as contiguous as possible relative to existing conditions. The remaining 60% (or 40%) should be managed for a habitat mosaic dominated by large-tree conditions and open understories (3N,G - 4P,N,G+), but lower canopy closure (40-60%) and small openings are allowable. Encourage the use of underburning, precommercial thinning and fuels reduction to achieve desired habitat conditions. II. Foraging Habitat Zone Establish a 1-mile radius circle (2,010 acres: 1,506 acres excluding Primary Nest Zone) centered on the Primary Nest Zone. Maintain 60% (900 acres) in a mosaic of mid-mature (3N,G+) to late-successional forest condition. Desired conditions include open understories, large CWD, large snags, and small openings. The remaining 40% can be younger stands with small openings. Encourage the use of underburning, fuels reduction, and thinning to achieve desired habitat conditions. III. Disturbance Restrict habitat-modifying activities between March 1 and August 31 within Primary Nest Zone (0.5 mile radius). Restrict loud and/or continuous noise within 0.25 miles of active nest sites during the same period. Normal levels of vehicle traffic on existing roads may be excluded in cases where goshawks appear to be habituated to such activities. Please elaborate on PDF-6. PDF-6 states: A survey strategy will be developed prior to project implementation for goshawk. If survey results locate a nesting pair project activities will not occur within .25 miles of this site location from (March 1- August 31). If preimplementation surveys determine no nesting activity, then seasonal restrictions may be lifted for the year. (Page 89). Please identify which approved survey strategy KNF will utilize. At a Forest Service open house in Sawyer's Bar, Chad Bell indicated that the Forest Service is currently performing broadcast surveys. Note, the Klamath LRMP states, "Planned timber sale areas should be surveyed to Region 5 protocol for goshawks for a minimum of 1 season (intensive protocol) or 2 seasons (broadcast only)."6 The survey protocol utilized by Region 5 requires that broadcast surveys be completed "at least twice in a given year."7 If surveys have already been completed, please indicate so. 6 Klamath National Forest Standards and Guidelines # 8-20. 7 Woodbridge, B.; Hargis, C.D. 2006. Northern goshawk inventory and monitoring technical guide. Gen. Tech. Rep. WO-71. Washington, DC: U.S. Department of Agriculture, Forest Service. 80 p at 3-14	Clarification: The Standard and Guideline the commenter is quoting from is 8-20, not 8-10. Standard and Guideline 8-20 does outline the requirements for primary nest zones, foraging habitat zone and disturbance restriction. The Standard and Guideline is prefaced with a recommendation that "Implementation should be integrated into landscape-level planning for diversity, rather than approached as single-species protection". The Biological Evaluation analyzes relative to the Standard and Guideline and allows the responsible official to compare the effects to Northern Goshawks in concert with the landscape objectives including fuels reduction, hazard tree removal and reforestation. The survey strategy will include stand searches and broadcast surveys to identify new or alternate nests. Known nest sites will be visually surveyed as to minimize disturbance to nesting Northern Goshawks. The survey strategy can be found at http://www.placer.ca.gov/~/media/cdr/ECS/EIR/Homewood/Biological/BIO%2034_Forest Service_2000.PDF.
204.06 - WL - General	#18909-53	The endemic Scott Bar salamander (Plethodon asupak), discovered in 2001, is currently known to occur in a very small area near the confluence of the Klamath and Scott Rivers. The international Union for Conservation of Nature has assessed it as being a "vulnerable species". Both the Siskiyou Mountains and the Scott Bar salamander have the smallest ranges of any western salamanders in their genus. The loss or decline of salamanders from forest ecosystems has important consequences up and down the food chain. Salamanders play a key role in forest nutrient flow, regulating the abundance of soil invertebrates that are responsible for the breakdown of plant detritus. Salamanders' loss from forests is indicative of changes that will likely affect a broad array of species. The Westside project area contains Scott Bar salamander habitat but the agency fails to survey or analyze any effects to this species.	The Scott Bar salamander is not considered threatened, endangered, or proposed under the Endangered Species Act not does this species appear on the Forest Service Sensitive Species, Management Indicator Species, or Survey and Manage species lists. Therefore, the Scott Bar salamander is not required to be analyzed in this project.

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#18909-54	KNF LSRA 1-46, "Although no amphibian surveys have occurred within Eddy Gulch LSR, suitable areas are likely occupied by Del Norte salamander. Del Norte salamanders have recently been confirmed to the south in Cecil Creek; just to the west, at Idlewild Campground; and just to the north near Jessups Gulch." The Westside NEPA analysis fails to consider effects to Del Norte Salamanders another rare and endemic species.	The Survey and Manage species list is subject to change. The Del Norte salamander was originally listed as a Survey and Manage species in 2001, but due to recent legal proceedings, the list of Survey and Manage species has been modified again as described in the Forest Service Regional Guidance 2014. Excerpt from Forest Service Regional guidance: “This memorandum provides direction for implementation of the January 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (Forest Service et al. 2001) and is based on the district court’s remedy order issued on February 18, 2014 (Conservation Northwest v. Bonnie, W.WA number C08-1067-JCC). This remedy order followed after the 9th Circuit Court of Appeals rejected the 2011 Consent Decree executed in resolution of the district court action (Conservation Northwest, et al v. Harris Sherman, et al and D.R. Johnson Company, 715 F.3d. 1181, C.A. 9 (Wash), April 25, 2013).”
204.06 - WL - General	#18909-56	The Forest Service Must Survey for Sensitive Bats: Klamath LRMP 8-39 directs the Service to "[c]onduct surveys of crevices in caves, mines and abandoned wooden bridges and buildings for the presence of roosting bats, including fringed myotis, silver-haired bats, long-eared myotis, long-legged myotis and pallid bats" within Matrix and AMA lands. The LRMP further states, "As an interim measure [until surveys are conducted], timber harvest is prohibited within 250 feet of sites containing bats." The Klamath LRMP at page 4-19 further states, "2-7 Management activities near a cave, or the course of such a cave, should be designed in a way to insure protection of the cave resources until a determination can be made about the significance of the cave resource. Cave inventories and the determination of significance should be based on the process outlined by the 1988 Federal Cave Resources Protection Act." As provided in the Wildlife BE at page 42, there are "a few bridges in the project area that may provide the structure for a bat roost" and "there are 58 sites identified containing a case, mine, or the potential to contain either of these structures." The BE does not contain any information about survey efforts. If the Forest Service does not survey for bats, it must prohibit project operations within 250 feet of potential sites. According to table 10 on page 28 of the Wildlife BE, the Forest Service categorizes prolonged activities within 250 feet of potential habtat-i.e., one of the 58 sites identified above-as having a high risk of disturbance. As indicated in table 31, all project alternatives will include actions within 250 feet of a potential bat site. These actions within 250 feet of a cave are not in compliance with the Klamath's LRMP. The DEIS does not adequately disclose any actual analysis and contains only conclusory results of cumulative effects to bat species. The Wildlife BE at page 60 states, "The direct and indirect effects for each of the alternatives plus the cumulative effects will result in about doubling the number of sites with a high risk of disturbing bats." High risk of disturbance may result in a maternity roost being abandoned with the fate of the offspring likely dependent on their age. High disturbance of a hibernaculum will likely result in all bat ages leaving the warmth of the cave to the colder outside; this may result in death of the bats. The DEIS fails to analyze or disclose how this will affect bat populations and their viability.	A project design feature was added between the draft EIS and final EIS to exclude salvage within 250 feet of cave or mine openings. Hazard trees that are felled within 250 feet of a cave or mine opening will be left on site. Ground based and skyline salvage harvest are the activities likely to affect caves resources in the project area. There only one skyline salvage unit proposed in areas underlain directly by limestone or marble bedrock (unit 208) which have high probability of caves. A field survey was completed by the Forest Geologist and no caves were found in the unit. There are a few locations where hazard tree removal units overlap with limestone and marble bedrock. However, the effects to caves from dropping and leaving hazard trees will be small. The probability of affecting a potential significant cave is very low (Geology report as amended). The effects to Forest sensitive bat populations is analyzed in the Terrestrial Wildlife Biological Evaluation and was summarized in the draft EIS. The Wildlife Amendment clarifies the activities anticipated to disturb bat species and the level of effects. All activities were considered to have some level of disturbance to bats if near potential hibernacula except grazing for cumulative effects. This includes underburning, hand piling and chainsaw noise.
204.06 - WL - General	#18909-58	The Caroline Creek eagles nest area, which has been active for decades would be destroyed. The project would remove 180 acres of habitat within 600 feet of the nest, making a high risk of eagles abandoning the nest during the nesting period and a high risk of the eagle pair not finding a nest tree in the future. Three other nest sites, Donna, Muck-A-Muck, Frying-pan and three winter roost sites exist along the Klamath and Scott Rivers, occur within the project area. The Westside project proposes treatment within 0.5 miles for all four bald eagle nest sites, all four nest sites have been active recently and are likely to continue to be active. The DEIS fails to meet the KNF LRMP MA5-43 which requires that management is to protect and maintain nesting and roosting sites.	Forest Plan Standard and Guideline Management Area 5-43 was considered in the analysis and project design features. However, Forest Plan Standard and Guideline Management Area 5-57 provides an exemption for hazard tree removal and salvage activities that benefit eagle habitat. The salvage harvest reduces fuels around bald eagle nests and roost sites which is beneficial for reducing future wildfire behavior/severity in the future.
204.06 - WL - General	#18909-59	Willow Flycatcher Willow flycatchers breed in moist, shrubby areas, often with standing or running water and winters in shrubby clearings and early successional growth. Habitat for the species was assumed rd to be 3 order streams and wet meadows. The Westside project would result cumulatively in four watersheds shifting from a low to a high level of habitat alteration. The Westside DEIS fails to consider wintering habitat and the effects of grazing on riparian willow habitat.	The Willow Flycatcher is a migratory bird that is a summer resident of California but winters in Central and South America. Therefore, the project doesn't affect Willow Flycatcher wintering habitat. Grazing does occur in the project area and is considered in the cumulative effects of the Willow Flycatcher.

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#18909-60	Western bumblebee (Bombus occidentalis) populations have declined dramatically in recent years and like other species of bumblebees, it is sensitive to habitat disturbance. In the project area, high-quality habitat for bees is likely to occur in the meadows where several species of flowering plants occur. Meadows also offer a high density of plants to provide additional structure and small animal burrows that bees also use for nesting. The western bumble is likely to occur over much of the KNF although it has only been incidentally observed. The actual distribution of the bee on the forest is not known. Although the species is not exclusively associated with meadows, there is a strong relationship with its habitat needs and meadows. As stated in the Wildlife BE at page 36, the Western bumblebee "prefer open meadow like areas with a high diversity of plan structure with an abundant amount of flowering plants." The meadows upon which Western bumblebees rely upon are likely in healthy shape, but for the project. As indicated in the DEIS on page 160: "According to the vegetation burn severity data, most of the 4,000 acres of meadows in the project area burned at low severity in the 2014 fires; therefore it is likely that many of the meadows still contain vegetation which can provide basic structure for a bumble bee nest site and will produce flowering plants this spring." According to the Wildlife BE, all alternatives would produce a "high" level of disturbance in five 7th field watersheds, indicating that five or more acres of meadow habitat will be disturbed. Further, the project alternatives would produce a "moderate" level of disturbance for another five 7th field watersheds. Cumulative effects with other projects would result in another three watersheds going from a low level of disturbance to a moderate level. A high level of disturbance in five meadows would result in affecting at least five bee colonies where reproduction will be compromised. Moderate level of disturbance will result in eight colonies of bees traveling further to find food resources if a colony is present within close proximity to the treatments. The Westside project would diminish eight and destroy five meadows and possibly five colonies. This is contrary to maintaining and enhancing meadows as directed in the KNF Forest Plan. These meadows are possibly culturally significant areas. The Klamath LRMP contains standards and guidelines for Forest Service actions involving meadows. In particular, the Service is directed to "Maintain or enhance meadows where appropriate." (8-42). Further, "Proposed management actions should be evaluated as part of the environmental analysis process. Proposed actions also should consider such factors as the availability of meadow habitat within the landscape and the known or suspected use of the area by wildlife." (8-43). The DEIS and Wildlife BE violate the KNF LRMP and the R5 FSH 2509.22 - Soil And Water Conservation Handbook, Chapter 10 - Water Quality Management Handbook12.11 Exhibit 18, BMP 1.18 - Meadow Protection During Timber Harvesting which states, "As a minimum, meadow protection requirements contained in the forest LRMP must be identified and implemented." Further, the R5 FSH 2509.22 - Soil And Water Conservation Handbook, Chapter 10 - Water Quality Management Handbook12.51 Exhibit 03, BMP 5.3 - Tractor Operation Limitation in Wetlands And Meadows, states: Objective: To limit turbidity and sediment production resulting from compaction, rutting, runoff concentration, and subsequent erosion by excluding the use of mechanical equipment in wetland and meadows except for the purpose of restoring wetland and meadow function. Explanation: This is a preventative practice designed to preclude the concentration of surface runoff and soil compaction, which can lead to rill and gully erosion with associated turbidity and sedimentation. This measure precludes, or reduces the need to take corrective measures to dissipate concentrated surface water runoff.	There are Project Design Features that are designed in the meet the Best Management Practices 1.18 and 5.3. See Appendix D in the final EIS.
204.06 - WL - General	#18909-61	Franklin's bumblebee (Bombus franklini) was historically found only in a small area in southern OR and northern CA. The Westside project has habitat and past known locations for the bee, however, no surveys or consideration are given to this imperiled bee species. Franklin's bumblebee has the most restricted range of any bumblebee in the world (please see Franklin's Bumblebee Range Map). Its entire distribution can be covered by an oval of about 190 miles north to south and 70 miles east to west. Populations were readily found throughout its range throughout the 1990s but have declined precipitously since 1998; subsequent yearly surveys have suggested this bee is in imminent danger of extinction.	The Franklin's bumble bee is not identified as Threatened or Endangered under the Endangered Species Act, Management Indicator Species, Survey and Manage, or Forest Service sensitive species thus an effects analysis on the Franklin's bumble bee is not required. However, the western bumble bee which is identified as a Forest Service species was analyzed for this project and the effects are displayed in the Wildlife Biological Evaluation.

Code	Comment Number	Comment Text	Response
204.06 - WL - General	#18909-63	The cumulative effect will be 1,318 acres of hardwood habitat being removed and would not function as habitat in the near future. Please define hardwood habitat. Many hardwood tree species are culturally significant. Species recognized on the KNF as being associated with hardwoods are the Acorn woodpecker and the Western gray squirrel. The KNF LRMP standards require that pure hardwood stands be managed for wildlife habitat values and to maintain or improve the presence of Oregon white oaks.	Site preparation focused on areas historically dominated by conifers (Chapter 2 of the final EIS) areas with a high level of hardwoods were avoid where possible. Reforestation prescriptions reflect the need for both conifer and hardwood components in the forest landscape. Hardwood stands are defined as areas with more than 40% of the basal area being made up of hardwood species (Forest Plan Final EIS, page 3-35). The species assemblages considered for hardwood management indicator species is in the Forest Plan Final EIS on page 3-37. Oregon white oak is listed here.
204.06 - WL - General	#18909-65	The distribution of marten (Martes Americana) in the project area is not well know and martens have not been detected at any of the fisher survey stations nor have surveys been done to assess population distribution. Martens are known to occupy higher elevations with true fir forest types so while habitat exists in the project area, the DEIS claims they are not likely to occur in the project area. True fir high elevation stands occur near Tyler Meadows, Eddy gulch ridgeline and within the Grider Creek drainage. Like fisher, marten are also associated with late-successional conifer forests characterized by an abundance of large dead and downed wood and large, decadent live and dead trees. The DEIS fails to analyze or disclose where and how many acres of true fir forest stands are located and the effects that treatment will have on marten populations.	In the project area, marten more likely to be moving through the area than establishing a home range. Therefore, we thought habitat connectivity is likely a more important measure of affects than the change in acres of habitat. The habitat connectivity analysis takes into account the change in habitat and provides a measure that reflects how treatment within each Alternative might affect a marten's likelihood to move within a watershed. The analysis indicator is site specific and it is sensitive to the proposed activities.
204.06 - WL - General	#18909-66	There are sixteen documented detections of wolverines (Gulo Gulo) in the project area but the wolverine has not been observed on the KNF since the 1980's. The wolverine's home range is 38 to 347 square miles with the closest located study to the project area reporting an average of 130 square miles. Wolverines are typically associated with high elevation >7,200 feet within conifer forest consisting of Douglas fir in lower elevation to true fir and lodgepole pine at higher elevation. The DEIS fails to adequately consider effects to wolverine.	The Wildlife Biological Evaluation and summarized in final EIS does analyze the effects of the project on wolverine. The wolverine is more closely associated with higher elevations that are distant from humans such as the Marble Mountain Wilderness. The Marble Mountain Wilderness is in the analysis area but no treatment is proposed in the wilderness; if a wolverine occupied the portion of the wilderness that boarders the project, the wolverine may experience some noise disturbance but the project is more likely to affect a wolverine crossing the landscape. Ruggiero and co-authors (1994) identified the need to consider movement corridors for wolverines to ensure wolverine can move from one large block of habitat to the next. As described in the Wildlife Biological Evaluation, providing movement corridors is important for wolverines (discussed in the Wildlife Biological Evaluation). The habitat connectivity analysis estimates the effects the project may have on the likelihood a wolverine being able to move across the landscape.
204.06 - WL - General	#18909-67	The Gray wolf (Canis lupus) is a culturally significant, Federal and State listed Endangered species. The DEIS fails to consider the significant effect of the large scale habitat removal and disturbance, as considered in the Westside project, would have on this Gray wolves. The Wildlife BA page 6 states, "There is no scientific evidence that wolves have occurred within the analysis area for over 100 years. The single individual is currently hundreds of miles from the analysis area." If the agency took the time to look at a map it would see (See Wolf Use Map, January 15) that the Rogue Pack is approximately 60 miles away and the Keno wolves are approximately 80 miles from the project area. OR-7 is not a single individual. He has a pack (information on the Rogue Pack was provided in our Scoping comments). This includes his mate and three pups from last year. It is expected that the pack will have more pups born this year. There have been two individual wolves located in the Keno area. Wolves may not have been in the project area for 100 years but scientific evidence and common sense show wolves will be returning to CA in the next decade, as seen in WA and OR. OR-7 made northern CA part of his home range for four years prior to raising his pack. Wolves need more than food. They need a connected landscape and prefer low road density12. Because much of the expected habitat for wolves is on national forests, particularly the Klamath National Forest13 14, land managers need to start preparing for their return and their recovery. 12 Carroll, Carlos, McRae, Brad H. and Brookes, Allen. Use of Linkage Mapping and Centrality Analysis Across Habitat Gradients to Conserve Connectivity of Gray Wolf Populations in Western North America. Conservation Biology, Volume, No., 1-10 13 California Department of Fish and Game Gray Wolves In California An Evaluation Of Historical Information, Current Conditions, Potential Natural Recolonization And Management Implications. December 2011 14 Larson, Tad and Ripple, William. Modeling Gray Wolf (Canis lupus) habitat in the Pacific Northwest, U.S.A. Journal of Conservation Planning. Vol. 2 (2006) 17-33 We are curious to know if a qualified wildlife biologist wrote this section of the BA. If so, we question the level of competency within the agency and reiterate the need for the US Forest Service to work with the California Department of Fish and Wildlife and more closely with the US Fish and Wildlife Service.	See response to comment number 12354-6

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204.06 - WL - General	#19-4	"A substantial amount of long-term wildlife habitat was lost as a result of the 2014 fire season., including an estimated 31,000 acres of northern spotted owl (a federally listed species under ESA) habitat and an estimated 47,000 acres of Pacific fisher (a candidate for listing under ESA) habitat". DEIS page 13 "Large portions of Late-Succesional Reserves and habitat burned with high severity fire" DEIS page 13 If various "protective" land allocations are to have any positive, on the ground effect in the future, an analysis should detail the end of the implementation of these land allocations within the Westside Fire Recovery Project.	The final EIS summarizes the effects to both Northern Spotted Owl and pacific fisher in the wildlife environmental consequences section in Chapter 3. The simple measure of habitat removed does not capture the complex effects that the Westside Fire Recovery project may have on wildlife and viable populations. So more synergistic indicators were used to describe effects. The analysis outlines the effects to Northern Spotted Owl risk to reproduction and changes in critical habitat. Effects to pacific fisher were based on connectivity and home range potential.
204.06 - WL - General	#3678-21	T&E Wildlife Species – No Action direct and indirect effects "Northern Spotted Owl Alternative 1 will not plant any trees or create fuel breaks to protect the project area from future wildfires. Northern spotted owls lost a large part of their habitat in the project area as a result of the 2014 fires. Planting can play an important part in expediting the forest regeneration and development of northern spotted owl critical habitat. Fuels treatments can also aid in reducing the likelihood of additional northern spotted owl habitat burning at high severity." "Fisher, Marten and Wolverine The 2014 fires removed a large portion of the habitat for these species (habitat associated with older forests with dense canopy cover), thus reducing the number of home ranges for these species. The loss of habitat is likely to continue if another wildfire begins, thus continuing to set back the development of forested habitat. The high-severity burned forest is not likely to provide much habitat for use by these species since most of the vegetation cover has been removed. The connectivity in the watersheds is likely to decline from current condition as this occurs (see the affected environment section). A lack of overhead cover resulting from the 2014 fires is likely to obstruct the movements of fisher and marten but, as the snags start to fall over along with shrub growth, the area may provide enough physical structure for fisher and marten to move across these openings. The loss of cover will affect marten and fisher much more than wolverine. MIS Wildlife – No Action direct and indirect effects "Snag Associated Species In this alternative, there will be no removal of trees, road construction, or any other activities associated with the project. Potential negative effects of no action would be high fuel loads and risk of future high severity fire adjacent to remaining habitat or within regenerating habitat. Positive effects would include the total retention of snags which are important habitat features within remaining late seral closed canopy coniferous habitat. "Hardwood Associated Species Alternative 1 does not have any direct effects on hardwood-associated species. Hardwood stands burned with moderate or high severity effects in the 2014 fires are not likely to meet the needs of these species because they are completely or partly dependent on hardwood mast as a food source. Without a food source, the species are likely to leave this fire-affected habitat to occupy areas with live trees. In the long-term, some of the hardwoods will re-sprout and provide future habitat for these species assuming wildfire doesn't return in the near future. An indirect effect of alternative 1 comes from the large fuel loads within or adjacent to the hardwood stands that are likely to contribute to another wildfire occurring that will prevent these stands from developing into a hardwood forest. "Migratory Bird Species This alternative will have no direct or indirect effect on the compliance with the MOU between the USDA Forest Service and USDI Fish and Wildlife Service. Migratory birds affected by the 2014 fires will continue to be threatened by the possible re-occurring wildfires that may affect unburned habitat. Bird species associated with snags and early seral habitat will have abundant habitat and predicted future wildfires will add to this already abundant habitat." Ms. Johnson, Mr. Yost, and Mr. Bell, please become familiar with the real wildlife/fire science below. Most wildlife biologists learn this in college and apply the knowledge to their work. "Animals, as well as plants, can benefit from fire. Some individual animals may be killed, especially by catastrophic fires, but populations and communities are rarely threatened. Many species are attracted to burned areas following fires — some even during or immediately after the fire." Congressional Research Service Report "Forest Fire/Wildfire Protection" February 14, 2005 http://www.coloradofirecamp.com/congressional_research/forest-fire-wildfire-effects.htm "Recently burned areas represent an important type of habitat that many species of animals have evolved to utilize. Snags (standing dead trees) provide critical nesting and foraging habitat for birds and small mammals, and as they decay and fall, create additional habitat for small mammals and terrestrial amphibians as coarse woody debris." Campbell, John L. Ph.D, Dan C.	The analysis presented in the Wildlife Biological Evaluation, Biological Assessment, Survey and Manage, Management Indicator

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		Donato, Joe B. Fontaine J. Boone Kauffman Ph.D., Beverly E. Law Ph.D., and Doug Robinson "Biscuit Fire Study." Oregon State University Department of Forest Science Terrestrial Ecosystem Research and Regional Analysis. 2003. http://zircote.forestry.oregonstate.edu/terra/biscuit.htm "We do not need to be afraid of the effects of wildland fire in our forests. Fire is doing important and beneficial ecological work," said the report's author, Dr. Chad Hanson, a forest and fire ecologist and Director of the John Muir Project. "It may seem counterintuitive, but the scientific evidence is telling us that some of the very best and richest wildlife habitat in western U.S. forests occurs where fire kills most or all of the trees. These areas are relatively rare on the landscape, and the many wildlife species that depend upon the habitat created by high-intensity fire are threatened by fire suppression and post-fire logging." Hanson, Chad Ph.D. February 2, 2010 "New Report Debunks Myth of 'Catastrophic Wildfire' " http://johnmuirproject.org/documents/Myth%20of%20Catastrophic%20Wildfire%20Media%20Release.pdf "Contrary to what you may think, a forest fire does not reduce everything to a lifeless ash. Instead, it leaves behind a landscape of blackened trees interspersed with remnants of green, intact forest. Post-fire specialists such as wood-boring insects quickly colonize the dead trees (snags), attracting an array of woodpeckers." "Identifying the ecological value of a post-fire structure and the characteristics that make it attractive to wildlife is important." Nappi, Antoine Ph.D., Pierre Drapeau Ph.D., Jean-François Giroux Ph.D. and Jean-Pierre Savard Ph.D. "Snag use by foraging black-backed woodpeckers (Picoides articus) in a recently burned eastern boreal forest." The Auk 120(2): 505-511. 2003. http://www.borealcanada.ca/research_arc_hot_e.cfm Observation: Ms. Johnson, Mr. Yost, and Mr. Bell, perhaps you know about this wildlife/fire relationship and you might have used it had you not been directed to push the timber sale by describing how No Action will be a poor choice whether it's true or not. Opposing Views Attachment #8 contains 26 more science conclusions showing that post-fire conditions benefit wildlife. Did you really believe the public wouldn't notice that your effects disclosures are inconsistent with best science?	
204.06 - WL - General	#5873-138	One study in the southern Oregon Coast Range found that flying squirrels disproportionately chose large snags (80% >50 cm) for nesting. See Carey, Wilson, Maguire, & Biswell; DENS OF NORTHERN FLYING SQUIRRELS IN THE PACIFIC NORTHWEST, J. WILDL. MANAGE. 61(3):684-699 http://www.fs.fed.us/pnw/pubs/journals/pnw_1997_carey001.pdf	Carey et al. 1997 describes the use of den sites by northern flying squirrels from 3 forest sites. Den sites varied widely based on availability of nest site, availability of food, predator avoidance, social interactions and location, weather, understory canopy etc. Size of snags was not the primary factor of use, as squirrels used both snags (cavities) and nests (on branches/boles). Carey does state that there appears to be a relationship between the use of large, old trees (live and dead) and squirrel abundance. Additionally, the article states that two-thirds of all nests were in live trees (not snags), regardless of region and that live trees were most often residual trees >50cm diameter at breast height. "Live trees offer several advantages that snags lack: overhead branches provide extra protection from weather; protection from predators in the form of cover and escape routes; and persistence for a long time, first as a live tree, and eventually as a snag. The high use of live trees suggests that cavity dens of flying squirrels may be best described in terms of decadence and cavity trees (live and dead), rather than snags." In particular, the article states, " live trees are important den structures for mammals (and many birds, including spotted owls), regardless of seral stage. Forest managers should consider live den and nest trees when managing for flying squirrels, spotted owls, and late-successional forests. Leaving large snags is a management option, but current federal safety regulations require leaving a large buffer area around any retained snag (Myers and Fosbroke 1995) and snags may have to be retained in clusters away from management activity. Snag retention may not be feasible in many situations; den tree management can augment cavity tree management. Live trees with cavities can be retained with few safety restrictions. Live trees will continue to grow and persist over a much longer period than snags, eventually develop into snags, and require less management intervention over time. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

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204.06 - WL - General	#5873-25	Jerry Franklin - What is a 'Good' Forest Opening? – Powerpoint http://courses.washington.edu/esrm315/Lectures/FranklinEarlySuccession.pdf e. all the new science related to salvage logging and dead wood, including but not limited to: Beschta R.L., J.J. Rhodes, J.B. Kauffman, R.E. Gresswell, G.W. Minshall, J.R. Karr, D.A. Perry, F.R. Hauer, and C.A.Frissell, 2004. Postfire management on forested public lands of the western USA. Cons. Bio.,. http://pacificrivers.org/files/post-fire-management-and-sound-science/Beschta-etal2004.pdf and Rose, C.L., Marcot, B.G., Mellen, T.K., Ohmann, J.L., Waddell, K.L., Lindely, D.L., and B. Schrieber. 2001. Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management, Chapter 24 in Wildlife-Habitat Relationships in Oregon and Washington (Johnson, D. H. and T. A. O'Neil. OSU Press. 2001) http://web.archive.org/web/20060708035905/http://www.nwhi.org/inc/data/GISdata/docs/chapter24.pdf	There is no project specific comment. However, the final EIS provides information concerning tree planting and salvage harvest in Chapter 3 of the final EIS in the sections called "Responsible opposing views and agency's response to issues raised".
204.06 - WL - General	#5873-27	"[T]here's a looming shortage of diverse young forests - where seedlings intermingle with fallen logs, standing dead snags, and shrubs - that provide specialized habitat for certain animals and plants. … there's a looming gap in diverse, young, early-successional conifer forest, the type of forest that once came in naturally after forest fires. These young forests, up to 10 years old, have a diversity of forest structures - fallen logs and dead snags - and a diversity of plant life. They are important habitat for the western bluebird and other birds that prefer open areas, as well as some shrub species. Today, because of intense timber management on private lands, young forests don't get the chance to develop much diversity." OSU. 2001. Press Release: Researchers Assess Forest Sustainability. http://web.archive.org/web/20060914032259/http://oregonstate.edu/dept/ncs/newsarch/2001/Oct01/assess.htm	Preparing an EIS on young complex forests is outside the scope of the project. The project does not disagree on the value of young early successional forests. Project design features that include snag retention and coarse woody debris considerations are intended to maintain the components of structural complexity in the treatment stands. However it is important to note that these quotes are taken out of context. The article was addressing the shortage of early seral forests such as oak savannas, not post-fire event created early seral conditions. The article pointed out that federal management actions focus on creating and maintaining old growth forests, which are expected to increase in the future. Little management focus has been given to younger forest stand conditions. This article does not make any recommendations regarding post-fire salvage or that post-fire conditions are considered early seral forests. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.06 - WL - General	#5873-37	Not surprisingly, concern has arisen over viability of populations that use broadleaf vegetation in early-seral forest, particularly as this habitat type contributes disproportionately to forest biodiversity (Halpern and Spies 1997).	Early-seral broadleaf habitat is generally described in the article titled Thresholds in Forest Bird Occurrence as a Function of the Amount of Early-Seral Broadleaf Forest at Landscape Scales written by Betts and co-authors (2010) as broadleaf vegetation with a quadratic mean diameter of <10 cm. This habitat type could be created by moderate or high fire severity that may consume a portion of a broadleaf tree, but the tree re-sprouted from the base of the tree or possibly along the trunk of the tree. The Westside Fire Recovery Project isn't targeting hardwoods for removal or stand conversion. Areas for reforestation are conifer dominated stands that were identified using step-wise process described in Chapter 3 of the final EIS. Salvage harvest targets conifers and avoids broadleaf tree species. However, fuels treatments that occur in fuel management zones of roadside fuels treatments for example, may remove some small broadleaf vegetation to reduce fuels but the focus of the treatment is to remove small dead woody material.
204.07 - Migratory Birds	#12346-64	The DEIS and Migratory Bird Resource Report contain no actual data or analysis to support the conclusions reached by the agency. The brief description of habitat types does not constitute a hard look and the effects of project implementation on species at the site scale or the regional level. Population trends are ignored and no attempt is made to link forest practices to population levels or reproductive success. Interestingly, the MBRP mentions the "Partners in Flight specific habitat conservation plans for birds" but neglects to analyze or disclose the PIF recommendations regarding Black Backed Woodpecker conservation in post-fire snag habitat.	The analysis focuses on compliance with the Memorandum of Understanding with the U.S. Fish and Wildlife Service regarding migratory birds. Requirements for complying with the memorandum of understanding are discussed on page 2 of the Migratory Bird Report. The effects are disclosed in the Migratory Bird report including the likely effectiveness of project design features to decrease effects.
204.07 - Migratory Birds	#18909-64	The regional decline of migratory birds is a significant issue. Numerous studies have reported local and regional trends in breeding and migratory bird populations throughout North America. These studies suggest geographically widespread population declines that have provoked conservation concern for birds, particularly neotropical. The 2005 report from the Klamath Bird Observatory indicates that several species of songbirds are suffering declining population trends at the regional level. The DEIS states the project would result in up to 21,650 acres of habitat being affected but fails to consider the actual impacts of proposed treatments on neo-tropical migratory birds.	The draft EIS summarized the effects to migratory birds as a result of the project. The effects analysis is detailed in the Migratory Bird report. The effects analysis is focused on meeting the requirements of the Memorandum of Understanding with the US Fish and Wildlife Service.

Code	Comment Number	Comment Text	Response
204.08 - WL - MIS - BBWO	#12346-76	In KS Wild v. USFS, Eastern District of California 2004, (which is binding precedent for this project) the federal district court held that the Klamath National Forest violated its LRMP, and NFMA, by failing to monitor and survey for snag associated MIS species in the illegal Beaver old-growth timber sale. 32 As recognized by the court in KS Wild v. USFS, the KLRMP (at 5-3) clearly states that "population trends of the management indicator species will be monitored and relationships to habitat changes determined." It simply doesn't get much clearer than that. Hence the court in KS Wild v. USFS ruled that in the Beaver Creek timber sale "because the habitat of the Snag Species Association MIS may be appreciably affected, use of habitat as a proxy for population surveys was arbitrary and capricious." Page 163 of the DEIS does reveal that KNF timber planners hope to remove 728 acres of habitat for Hardwood Associate MIS species via the Westside timber sale and a total of 1,318 acres of such habitat when adjacent logging projects are factored in. This comprises 13% of existing hardwood habitat. Yet no attempt is made to analyze or disclose the impacts to Hardwood Associate populations from removal of a significant portion of their total habitat. Instead of analyzing or disclosing the impacts of removing 728 of exiting hardwood habitat on this MIS assemblage, the DEIS and the MISR limit discussion to the potential negative effects of hypothetical future wildfires on this habitat type.	Terrestrial Management Indicator Species (excluding Steelhead and Rainbow Trout) are not required to be monitored on a population level (Chapter 5 of the Forest Plan, page 5-12)). Since these species represent habitat associations such that the amount of habitat that is available on the Forest is monitored. The effects on hardwood habitat are disclosed in the Management Indicator Species report which is summarized and incorporated by reference into the draft EIS. The focus of the analysis is the habitat represented by the Management Indicator Species as directed by the Forest Plan. The logic for this approach is described in the introduction of the Management Indicator Species report.
204.08 - WL - MIS - BBWO	#5873-183	Retain Extra Snags for white-headed woodpecker, black-backed woodpecker The 2001 survey and manage ROD says: "The white-headed woodpecker, black-backed woodpecker, pygmy nuthatch, and flammulated owl will not be sufficiently aided by applying mitigation measures for riparian habitat protection or other elements of the Northwest Forest Plan. These four species occur on the periphery of the range of the northern spotted owl on the east slope of the Cascade Range in Washington and Oregon. Additionally, the white-headed woodpecker and flammulated owl occur in the Klamath Provinces in northwestern California and southwestern Oregon. "To ensure that the distribution and numbers of all four species do not decline on BLM Districts and National Forests within the range of the northern spotted owl, adequate numbers of large snags and green-tree replacements for future snags in appropriate forest types within the range of these four species will be maintained in sufficient numbers to maintain 100 percent of potential population levels of these four species. "Specific application details are relegated to the Management Recommendation... ... Maintain adequate numbers of large snags and green-tree replacements for future snags within the four species' ranges in appropriate forest types. Where feasible, green-tree replacements for future snags can be left in groups to reduce blowdown. Specifically, snags over 20 inches dbh are particularly valuable for these species. Snags over 20 inches dbh may be marked for cutting only after retaining the best available snags (considering size, longevity, etc.) in sufficient numbers to meet 100 percent of potential population levels of these four species. It is recognized, however, that safety considerations may prevent always retaining all snags. Use of standardized definitions of hazard trees is required. For the longer term, provide for sufficient numbers of green trees to provide for the full (100 percent) population potential of each species. "As depicted by Neitro in Management of Wildlife and Fish Habitats in Forest of Western Oregon and Washington (1985), the 100 percent population potential for white-headed woodpeckers is 0.60 conifer snags (ponderosa pine or Douglas-fir) per acre in forest habitats; these snags must be at least 15 inches dbh (or largest available if 15 inch dbh snags are not available) and in soft decay stages, and must be provided in stands of ponderosa pine and mixed pine/Douglas-fir. The 100 percent population potential for black-backed woodpeckers is 0.12 conifer snags per acre in forest habitats; these snags must be at least 17 inches dbh (or largest available if 17 inch dbh snags are not available) and in hard decay stages, and must be provided in stands of mixed conifer and lodgepole pine in higher elevations of the Cascade Range. However, the snag numbers representing 100 percent potential population levels cited from Neitro must be updated as appropriate new references become available. Provision of snags for other cavity-nesting species, including primary cavity-nesters, must be added to the requirements for these two woodpecker species. Site-specific analysis, and application of a snag recruitment model (specifically, the Forest Service's Snag Recruitment Simulator) taking into account tree species, diameters, falling rates, and decay rates, will be required to determine appropriate tree and snag species mixes and densities. If snag requirements cannot be met, then harvest must not take place.	The Forest Service does not refute information documented in Neitro et. al (1985) but this technical publication covers the states of WA, OR. It does not specifically address the state of California or ecosystems found on the Klamath NF. The Wildlife Management Indicator Species report (see section called snag associated species) presents a full analysis of effects and habitat associations within the proposed Westside Fire Recovery Project. The habitat association analysis includes black-backed , and white-headed woodpeckers. See Klamath National Forest Plan Chapter 4 pg.4-31 for species in Mature Pine Association (pygmy nuthatch, and Flammulated owl). The Mature Pine Association is not found within the Westside Fire Recovery Project Boundary. The cited literature provides a general overview of post-fire snag and habitat conditions however it is not specific to the conditions of the Klamath Province. Retention of all of the dead trees now present on the landscape would create an unacceptable fuel load and increased risk of future high severity fire. See Appendix E and EIS Chapter 3, responsible opposing views and agency response. See also response 5873-72 and 5873-170. See response to comment 12346-55 about green trees. Through the habitat assessments of Management Indicator Species documented in the Management Indicator Species Report prepared for the Westside Fire Recovery Project, habitat types affected by the Project are addressed. The species analyzed within the Westside Fire Recovery Project meet the requirements under the National Environmental Policy Act, National Forest Management Act, and Forest Service Manual direction.

Code	Comment Number	Comment Text	Response
204.08 - WL - MIS - BBWO	#5873-184	More information is needed on habitat use, seasonal occurrence, and use of forest age classes and burns, for the black-backed woodpecker." 2001 S&M ROD p 33-34. NFP ROD page C-45 says, “Specifically, the Scientific Analysis Team recommends that no snags over 20 inches dbh be marked for cutting. … Provision of snags for other cavity-nesting species, including primary cavity-nesters, must be added to the requirements for these two woodpecker species. Site-specific analysis, and application of a snag recruitment model (specifically, the Forest Service’s Snag Recruitment Simulator) taking into account tree species, diameters, falling rates, and decay rates, will be required to determine appropriate tree and snag species mixes and densities. If snag requirements cannot be met, then harvest must not take place. ” Although this language was purportedly changed in the January 2001 S&M ROD, there was no analysis of support for the proposed change and the recommendations of the SAT remain the best available science. If the agency chooses to rely on the illegal 2001 ROD that amended the survey and manage rules, then they must conduct the analysis that the 2000 S&M EIS never did (e.g. consider alternatives and environmental consequences), and provide monitoring data to support the assertion that the requirement to retain snags over 20 inches is inappropriate and that maintaining viable populations of white-headed woodpeckers requires less than all the large snags remaining after fires	The Wildlife Management Indicator Species report presents a full analysis of effects and habitat associations within the proposed Westside Project. The habitat association analysis includes black-backed , and white-headed woodpeckers. See comment number 5873-183. See Appendix E and EIS Chapter 3, "Responsible Opposing Views and Agency Response". See also response 5873-72 and 5873-170.Through the habitat assessments of Management Indicator Species documented in the Management Indicator Species Report (see section called snag associated species) prepared for the Westside Fire Recovery Project, habitat types affected by the Project are addressed. The species analyzed within the Westside Fire Recovery Project meet the requirements under the National Environmental Policy Act, National Forest Management Act, and Forest Service Manual direction.
204.09 - WL - post-fire habitat	#13360-1	Please protect the habitat and wildlife of the Klamath-Siskiyou region. Post fire ecology is a beautiful and delicate system and it would be devastating to so many plants and animals for decades to come if this rejuvenating cycle were to be destroyed by logging. I implore you to do the right thing. Deny the logging permit and allow the natural and wild systems to heal on their own. In this era of civilization, we can not afford to hold on to the mistaken belief that nature needs us to help it heal. It is clearly we who need nature. As a trained wildlife biologist (BS from Humboldt State University 2012), wildlife rehabilitator, naturalist, and person who lives in the shadow of the effected area:	This recommendation is considered in Alternative 1. which analyzes the effects of taking no action in the project area.
204.09 - WL - post-fire habitat	#18883-6	If any dead roadside trees are removed they should be less than 18 inches dbh as trees greater than 18 inches dbh will decay very slowly and will remain as habitat for animals for many decades to come. They pose minimal danger to anything.	Hazard trees are danger) tree is defined as a standing tree that presents a hazard to people due to conditions such as deterioration of or damage to the root system, trunk, stem, or limbs or the direction or lean of the tree (29 CFR 1910.266(c); Forest Service Handbook 6709.11, glossary). Only hazard trees identified by this definition will be removed. A tree can be a hazard regardless of its diameter at breast height. In order to meet the project purpose and need for worker and public safety and access and for safe conditions for firefighters performing suppression for community protection all trees meeting the definition and the prescription described in Chapter 2 will be mitigated. The exception is in Modified Alternative 2 where trees with greater than 45 in diameter at breast height will be considered for removal only if they are dead or have greater than 90 percent or greater change of dying in three to five years (See description of Modified Alternative 2 in Chapter 2 of the final EIS).
204.09 - WL - post-fire habitat	#18909-30	Many of the terrestrial wildlife species utilize snag and coarse woody debris. For example, the Pacific fisher and marten utilize cavities for resting and post-fire forests for foraging, the Tehama chaparral snail uses coarse woody debris to regulate temperature, and northern spotted owls have been shown to utilize high-severity patches for foraging. For that reason, many of the impact assessments for various species rely on the snag retention design features to mitigate the project's impacts. The agency should consider an upper diameter limit as well as follow the LRMP per acre snag retention guidelines. The snag retention project design features (PDFs) are unclear, impracticable, or too weak to provide any real mitigation.	The project design features as described in Chapter 2 of the final EIS are intended to follow the Forest Plan Standards and Guidelines for snag retention and coarse woody debris. The snag retention design including size class retention is currently under review by the Regional Ecological Office for compliance with Late Successional Reserve policies. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#18909-32	The Wildlife-12 PDF, page 90 states: "Retain an average of 2 to 8 snags per acre of the largest size class in addition to the riparian reserves within treatment units >100 acres or aggregations of treatment units totaling >100 acres in size." First, we want to raise a potential concern about the PDF clarity. As we understand, the agency would retain 2 to 8 snags in addition to all snags retained with Riparian Reserves. However, not all people understand this PDF similarly. At the Eureka open house sponsored by the Forest Service, Mike Hupp of the Service stated that he understood the PDF to mean that the Service may count trees within the riparian reserves towards the snag retention number. Second, we are concerned that this PDF conflicts with information presented in other environmental impact documents. For example, in the Draft Wildlife BA on page 49 states that "[i]n units less than 100 acres in size, snag retention will occur only in the riparian reserves and will be limited in areas lacking riparian reserves." PDF Wildlife-12 appears to provide that the Service will retain 2-8 snags in addition to the snags that will be left standing in riparian reserves for both units over 100 acres and for other units where aggregated. If the Service counts riparian areas toward the average snag retention, then vast areas of forest-up to 99 acres-could be clearcut. Based on Appendix B of the Silvicultural Report, only 30 of the units are over 100 acres. The rest, the vast majority of the project, are under 100 acres and may be clearcut. Third, please clarify whether "legacy" trees and snags-where they can be discerned-will count towards the average snag retention. It is also not clear what the snag retention would be for the 3,920 acres of logging in unstable and potentially unstable Riparian Reserves.	The snag retention has been incorporated into the salvage harvest description instead of a project design feature to clarify the design and specifications (see Chapter 2 of the final EIS). Analysis of the efficacy of the snag retention design is described in Response 2 in the "Responsible Opposing Views and Agency's Response to Issues Raised" Section in Chapter 3 of the final EIS. These changes have been incorporated into the Wildlife Biological Assessment and the Terrestrial Wildlife report amendment (See Sections II and III). Legacy components do and will be counted toward the average snag retention. Snag retention includes inner gorges (unstable lands) since they will not be salvage harvested. Active landslides and toe zones where salvage won't occur will be retention areas as well. There are exceptions that allows salvage on areas mapped as active landslides and toe zones that have no observable signs of re-activation in the recent past (see the Geology report and project design feature table in Chapter 2). Steep, weathered granitic lands do not have any planned retention areas. See the Geology report for benefits to salvage and subsequent planting on landslide processes. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.09 - WL - post-fire habitat	#18909-33	PDF Wildife-12 further states that "ideally" snags will be "clumped and distributed throughout the treatment unit and situated with large, live trees where possible." As the Draft Wildlife BA on page 49 states, without well-distributed snag retention, "large openings will be created that NSO are very unlikely to cross due to a lack of cover for predators and general lack of structure for perching." This logic holds true for other wildlife, including the Pacific fisher and marten, which require well-distributed trees for resting and for avoiding predators. Further, snag retention helps to create complex early seral forests, providing impact structure and complexity during early forest development. The agency may clump all the retained trees at one far corner of a unit and clearcut the rest of the unit. The agency must comply with snag retention guidelines and cannot elect to span snag retention over a 100 area.	See response to number 18909-32. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#18909-34	NSO Use of Post-Fire Habitat for Foraging: Please clarify how and under what circumstances the Service believes that NSO can utilize high- severity post-fire stands. The Service vacillates in its treatment of how NSO use post-fire stands. Page 132 of the DEIS states: "The use of post-fire burned areas for foraging is a point of disagreement in the literature because there is little evidence to support idea (sic) that these areas are actually being used for foraging; although owls have been found in these areas, there is no evidence that they are foraging. For the purpose of this analysis, due to the lack of information on how these burned areas are being use, use of post-fire burned areas for foraging will not be discussed further." As discussed below, the assertion that owls do not use post-fire areas influences the analysis indicators, drastically overstating the impact of the fires of summer 2014 on the spotted owl and understating the impact of the proposed actions on the owl. The Agency's assertion that owls do not utilize post-fire foraging areas is inconsistent with other areas of its analysis. Appendix A to the Wildlife Biological Evaluation (Wildlife BE) provides a review of the scientific literature on spotted owl usage of post-fire landscapes for foraging. Among the findings: * NSO appear to display site fidelity in returning to burned areas that were suitable pre-fire, even if they no longer meet the definition of suitable NSO habitat. * NSO foraging activity in these burned areas is supported in the literature, although nesting in these areas is not. * NSO using these burned areas may utilize standing snags and surviving green trees as perch sites for foraging, particularly along edges where sufficient cover is available. * The likelihood of use of a burned area by NSO may be strongly affected by its distance from suitable forest cover, but a maximum acceptable distance from suitable cover is unknown. * Most studies on NSO use of burned areas examine short term occupancy and use and have been unable to factor in duration or persistence at a site over an extended period time Similarly, the Wildlife Biological Assessment (Wildlife BA), prepared as part of Section 7 consultation with the U.S. Fish and Wildlife Service, reflects that NSO utilize post-fire areas, especially if other structural elements are nearby. For example, on page 23 of the Draft Biological Assessment, KNF states that for the evaluation of project impacts, the Service assumes spotted owls will use areas which once served as nesting/roosting habitat which burned at high severity if that habitat is currently within 500' of suitable nesting/roosting habitat. Further, the Service assumes for the Biological Assessment that pre-fire foraging habitat that burned at both medium and high severity will serve as post-fire foraging habitat if within 500' of suitable nesting/roosting habitat. How and why did the agency make this assertion of 500'? The refusal to consider the habitat value of post-fire areas drastically impacts the environmental impact analysis. For example, in analysis indicator 1, discussed below, the Forest Service concludes the despite logging thousands of acres of suitable habitat, Critical Habitat, Late-Succesional Reserves and within Activity Centers, the preferred alternative would have only minor impacts because all areas which had burned at high and sometimes moderate severity were assumed to lack any habitat potential. Not only is this wrong-by KNF's own admission in the Wildlife BA and BE-but it drastically obfuscates the public's ability to understand and comment on the project. In sum, the Forest Service relies on a belief that owls won't utilize a post-fire landscape despite finding that owls can and do utilize post-fire landscapes for foraging. This discrepancy influences many areas of the agency's analysis. Given the importance of this issue, KNF must rescind the DEIS in order to properly considers the role of post-fire habitat.	Since the DEIS, the Northern Spotted Owl analysis has changed to better incorporate spotted owl use of fire affected habitat as displayed in the terrestrial wildlife section of the FEIS. The FEIS contains more information on relevant research and a better description of suitable habitat and fire affected habitat. In addition, the FEIS provides a table in the terrestrial wildlife section that states the criteria for each category including suitable habitat and fire affected habitat. See response to comment 12346-55.
204.09 - WL - post-fire habitat	#5873-127	BLM's Western Oregon Plan Revision DEIS (p. LII) admits that structurally complex young forests develop old forest characteristics twice as fast as structurally deprived initial conditions. This is a serious indictment of salvage logging.	See response to number 18909-62. Project design features that include snag retention and coarse woody debris considerations are intended to maintain the components of structural complexity in the treatment stands. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-139	Another study found that not enough snags are being retained on private land to support viable wildlife populations, so more snags need to be retained on federal lands to compensate. Ohmann, McComb, & Zumrawi; SNAG ABUNDANCE FOR PRIMARY CAVITY-NESTING BIRDS ON NONFEDERAL FOREST LANDS IN OREGON AND WASHINGTON; Wildl. Soc. Bull. 22:607-620, 1994 http://web.archive.org/web/20041107222037/http://www.fs.fed.us/pnw/pubs/journals/ohmann-snagabundance.pdf	Ohman et al. (1994) assessed patterns of snag abundance among plant communities and stand conditions in managed and natural forests on nonfederal lands in Oregon and Washington states. The document did not address snag abundance in forests of California, nor did it address post-fire snag abundance. The literature showed that snag densities greatly varied between the 4 vegetation communities (temperate coniferous forest, conifer hardwood forest, Ponderosa-pine forest, mixed-conifer forest) and within the communities due to stand conditions. Factors that influence amounts and characteristics of snags and logs include "stand age, disturbance history, live tree density, climate, and site productivity". Ohmann et al. does not state that not enough snags are being retained on private lands to support viable wildlife populations. In particular, the literature states, "nonfederal lands can contribute to maintaining populations of cavity nesters. These forests provide most of the snags on sites of low elevation, moderate climate, and high net primary productivity. Nonfederal lands also provide habitat for, animal movement among some forest habitats on federal lands. Management of snag habitat on nonfederal lands could be influenced by education, financial incentives, and regulation." While the literature does state that "Snag abundance on nonfederal lands was inadequate to support 100% of maximum potential population (MPP) of indigenous species of primary cavity-nesting birds simultaneously in all stand conditions of ponderosa pine, mixed-conifer, and conifer-hardwood forest and in all but old-growth stands in temperate coniferous forest. However, old-growth stands represented only 1% of temperate coniferous forest in nonfederal ownership. " When interpreting Maximum Potential Populations and Snag Recruitment Simulator models, it is important to understand the underlying assumptions made. The literature merely states that if snag retention on non-federal lands is desired then great attention greater attention is needed to retaining large snags and live trees when thinning and regenerating stands. The Klamath Forest Plan snag Standard and guideline (8-25, page 4-30) "says to use tables 4-4 and 4-5 as guidelines in ecosystem analysis and project-level planning. The relative numbers of hard and soft snags in various size classes show the habitat needs of the different cavity-association Forest wildlife species. This table displays the number of snags required per 100 acres to support "good" quality habitat for primary cavity-association species. The number of snags on a given acre will vary, depending on the site and on the number of snags within the landscape". These snags need not be equally distributed. The actual number of snags to be maintained may vary depending on the amount of snags available within the surrounding landscape and the desired condition of that landscape. See Project Design Features in Chapter 2 of the final EIS. The Klamath Forest Plan Coarse Woody Debris Standard and guidelines (6-16, page 4-23) mentions retaining 5-20 pieces of Coarse Woody Debris per acre in various states of decay. The combination of project design features for snags and Coarse Woody Debris, legacy components and riparian corridors will meet or exceed the Forest Plan Standard and Guidelines.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-141	Thus, increasing complexity of the environment through increasing horizontal and vertical heterogeneity in vegetation structure, species diversity in vascular plant composition, and forest-floor structure with coarse woody debris may simultaneously (1) increase multidimensional habitat space (Carey et al., 1999a), (2) reduce frequencies and intensities of interspecies interactions (Grant, 1972; Carey et al., 1980), (3) increase or maintain the already high abundance and diversity of seed fall, fungal fruiting bodies, and invertebrates characteristic of mesic, temperate coniferous forests (Church field, 1990), and (4) allow not only coexistence, but abundance of potentially competing species within communities (Carey and Johnson, 1995, this study). As a result of this complexity, Pacific Northwest forests support the greatest diversity of shrews in North America (Rose, 1994) … … These studies do suggest that management can homogenize and simplify (reduce decadence, amounts of coarse woody debris, variety of tree species, diversity and abundance of understory vegetation, and spatial heterogeneity) forest ecosystems. We found local extirpations of a number of species and particularly absence of G. sabrinus and T. townsendii in multiple plots. These absences raise questions about long-term viability of these species in managed landscapes. Management-induced homogeneity and simplification (1) is a real danger to diversity, resiliency, and susceptibility to invasions of exotic plants (Carey, 1998; Carey et al., 2000; Halpern et al., 1999; Heckman, 1999; Thysell and Carey, 2000), (2) may result in small-mammal communities non-supportive of predators populations (Carey et al., 1992; Carey and Peeler, 1995), … Andrew B. Carey, Constance A. Harrington; Small mammals in young forests: implications for management for sustainability; Forest Ecology and Management (2001) 154(1-2): 289-309; http://www.fs.fed.us/pnw/pubs/journals/pnw_2001_carey003.pdf. Large snags and the structural contributions should be quite abundant in young stands. It is only because of widespread clearcutting and salvage logging that we do not have more large snags in our young stands. Evidence indicates that large snags should be as abundant in young stands (40-80 years) as in old–growth (>200 years). See Spies, T.A., J.F. Franklin, and T.B. Thomas. 1988. Coarse woody debris in Douglas-fir forests of western Oregon and Washington. Ecology 69(6)1689-1702. Hazard tree removal will violate NFP ROD requirements to consider cutting and leaving roadside hazard trees in place. The EIS fails to address the “degree and direction of lean,” even though these are important factors according to OSHA.	These quotes are from Carey and Harrington (2000). These are direct quotes from the Discussion section of this literature. This literature does not address post-fire landscapes and/or the idea that snags and logs should be retained after fire. In particular these quotes are specifically addressing ways to address small mammal diversity and inter species interactions as a result of intensive management of second-growth forest in the Olympic Mountains of the Olympic Peninsula of western Washington. In particular, while this document does address small mammals, it does not focus on spotted owl prey bases. The literature does mention that "G. sabrinus and T. townsendii are indicators of ecological productivity (production of seeds, fruits, and truffles) and are important prey for vertebrate predators in Pacific Northwest conifer forests". However, the literature makes no recommendations on snag or log retention in post-fire landscapes nor provides any insight to small diversity in post-fire landscapes.
204.09 - WL - post-fire habitat	#5873-18	“current state of scientific knowledge, … indicates that [salvage logging] would seriously undermine the ecological integrity of forest ecosystems on federal lands. … This post-fire habitat, known as ‘complex early seral forest,’ is quite simply some of the best wildlife habitat in forests and is an essential stage of natural forest processes. Moreover, it is the least protected of all forest habitat types and is often as rare, or rarer, than old-growth forest, due to damaging forest practices encouraged by post-fire logging policies. While there remains much to be discovered about fire in our forests, the scientific evidence indicates that complex early seral forest is a natural part of historical fire regimes in nearly every conifer forest type in the western U.S. (including ponderosa pine and mixed-conifer forests) …	This is a direct quote from a general public letter written to Congress regarding concerns over HR 1526 and HR 3188, both which were not enacted. The authors urge Congress to consider the value of post-fire landscapes for wildlife species, especially the creation of early seral forest. See EIS Chapter 3, Responsible Opposing Views and Agency’s Responses to Issues Raised for additional discussion.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-185	Salvage logging does not mimic natural disturbance because it removes the vast majority of the habitat structure, such as snags and large down wood, that early seral wildlife depend on. Eighty five percent of vertebtates tied to edges and early seral forest in the western Cascades need dead wood. C. Friesen 2010. Early Seral Forests – A Conservation Conundrum. http://www.ecoshare.info/uploads/ccamp/Early-Seral-Forest-Friesen.ppt; http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/synthesis-papers-tools/ "Key attributes" of high quality early seral habitat include "exceptionally high quantities of large dead wood," a condition that is not provided by commercial timber harvest that exports the vast majority of wood from the site. "[P]rompt reforestation and few legacies is unlikely to approximate the role of naturally generated early-seral conditions" M.E. Swanson Mark E. Swanson, Nichole M. Studevant, John L. Campbell, Daniel C. Donato. 2014. Biological associates of early-seral pre-forest in the Pacific Northwest. Forest Ecology and Management 324 (2014) 160–171. http://www.sierraforestlegacy.org/Resources/Conservation/Biodiversity/BD-Swanson-etal-EarlySeral2014.pdf. The agency must avoid any suggestion that natural disturbance reset stand age to zero, or that regen logging mimics stand replacing disturbance. This is an oversimplification of forest ecology. First of all, forests are products of their history. There really is no such thing as a zero-aged stand, because every forest is a product of disturbance while retaining some memory of its past in the form of legacy structures; surviving organism; onsite and nearby seed banks, seed sources, mycorrhizal inoculum, spores, and propagules, that are genetically "family" to the disturbed forest, etc. If the agency treats disturbed forests as a "blank slate" with no history, then they will effectively be erasing their history and their ecological memory.	The final EIS provides a response concerning tree planting and salvage harvest in Chapter 3 of the final EIS in the sections called "Responsible opposing views and agency's response to issues raised".

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-186	The presence of coarse woody debris is critical for biodiversity conservation. … In general, post-fire forest ecosystems include the presence of large numbers of snags and downed woody debris. This dead material provides important habitat elements for many species of plants and animals, while also storing a great deal of carbon (MacDonald 1993; Fleming and Freedman 1998; Freedman et al. 1996). Clearcut harvesting of natural forests results in the removal of most of the aboveground woody biomass from the site because trees are the commodity being harvested. … Because clearcut harvesting concentrates on the removal of biomass, it fails to produce large-dimension snags and coarse-woody debris in intensively managed forests, … Although both harvesting and wildfire kills trees, only fire leaves them as dead standing biomass. … The fire-killed snags and woody debris cast partial shade, which ameliorates the surface microclimate and may enhance the survival of pine seedlings (Fraser and Farrar 1953; Cayford and McRae 1983; Carleton and MacLellan 1994). … Some studies have suggested that the cover and richness of the understorey vegetation of a natural forest may never fully recover from clearcutting. … Wildfires reduce the presence of some hosts that assist the spread of pests and pathogens while clearcutting may promote them. … [E]xclusion of fire from such ecosystems, along with forestry practices that leaves young infected trees in the residual stand, leads to increased abundance of this parasite. In contrast, fire eliminates Dwarf mistletoe. … Numerous studies have determined the potential removals of nutrients with conventional and whole-tree clearcuts … The data show that clearcutting removes large amounts of biomass and nutrients from the site, and that these are equivalent to a substantial fraction of the site capita of these materials. … During a wildfire, biomass capital of the stand is lost by combustion, as is that of nitrogen through the oxidation of organic compounds and the release of gaseous NO and NH3. In intense wildfires these losses of biomass and nitrogen can be comparable in magnitude to what would be removed by the clearcutting of comparable stands. Unlike wildfire, however, clearcutting also removes large amounts of phosphorus, potassium, calcium, and magnesium contained in the tree biomass; these materials are mostly conserved in situ during a wildfire. … Clearcut harvesting with heavy equipment can cause severe soil compaction along skidding lanes and it can also disrupt soil profiles by churning … Permanent roads are not generally associated with wildfire management or suppression (although temporary access routes may be constructed while fighting some wildfires). An extensive road network is, however, necessary for timber harvesting and subsequent stand management. Roads affect biodiversity in many ways. Roads directly remove natural habitat, alter drainage and stream dynamics, cause erosion, introduce edge effects, fragment contiguous ecosystems, alter species movements, and act as corridors for the introduction of non-native species …. Road density is a useful indicator of ecological threat … [I]t is erroneous to assume that forest harvesting plays the same ecological role as wildfire. D.J. McRae, L.C. Duchesne, B. Freedman, T.J. Lynham, and S. Woodley, 2001. Comparisons between wildfire and forest harvesting and their implications in forest management. Environ. Rev. 9. 223-260 (2001); DOI: 10.1139/er-9-4-223 Modelling by Harris (2000) suggests that 12 or more green trees need to be retained during regen harvest for every snag we want to recruit at any given time during the rotation. Harris, R.B. 2000. Estimating large snag recruitment needs in regeneration timber harvests. Western Journal of Applied Forestry. 15: 140-146. http://www.cas.umt.edu/facultydatabase/FILES_Faculty/1152/Harris%202000%20LargeSnagRecruitment%20Western%20J.%20Appl.%20For.pdf. This paper also highlights the concern that without numerical guides, managers could erroneously assume that they are maintaining adequate numbers of snags across the landscape even though they are retaining too few green trees to achieve that goal. Ohmann, JL, MJ Gregory, HM Roberts, RE Kennedy, Z Yang, J Braaten, SL Powell, WB Cohen, V Kane, J Lutz. 2012. Mapping change in live and dead forest biomass with Landsat time-series, remeasured plots, and nearest-neighbor imputation. ForestSat 2012: Corvallis, OR; September 2012. http://lemma.forestry.oregonstate.edu/export/presentations/ohmann_etal_2012_forestsat.pps	Northern Spotted Owl use of fire affected areas is discussed in the Biological Assessment in the section called “northern spotted owl use of the post-fire landscape". The project does retain sufficient snags and large wood; see responses to comments 5873-72, 12346-55, 12346-56, 5873-67, 17280-3, 17111-23.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-21	The agency must prepare a programmatic EIS to comprehensively disclose and consider: a. the natural range of variability and existing rarity of complex young forests (e.g., young forests that are unsalvaged after disturbances). Since large snags are outside the natural range of variability across the landscape, the agency must retain all large snags to start moving the landscape toward the natural range of variability, or the agency must carefully justify in the NEPA analysis every large snag it proposes to remove. See Jerome J. Korol, Miles A. Hemstrom, Wendel J. Hann, and Rebecca A. Gravenmier. Snags and Down Wood in the Interior Columbia Basin Ecosystem Management Project. PNW-GTR-181. http://www.fs.fed.us/psw/publications/documents/gtr-181/049_Korol.pdf. This paper estimates that even if we apply enlightened forest management on federal lands for the next 100 years, we will still reach only 75% of the historic large snag abundance measured across the interior Columbia Basin, and most of the increase in large snags will occur in roadless and wilderness areas.	The Forest Service does not refute the conclusions made in Korol et. al (2002). The Interior Columbia Basin EIS covers the states of WA, OR, ID, MT, WY, NV, and UT. It does not specifically address the state of California or ecosystems found on the Klamath NF. On page 654 of the article, it specifically states that "We used snag and down wood amounts based on the vegetation in the historical scenario as the baseline for our comparisons. We present results for only the Forest Service/Bureau of Land Management-administered lands and Interior Columbia Basin as a whole." The article does not provide any information on the historic level of snags within the Klamath Province area and thus does not make any conclusions on the range of availability of large snags within the project area. Korol et. al (2002) states that "Large snags should return to historical levels on Forest Service/Bureau of Land Management lands, but remain at roughly 75% of the historical amount across the Basin. Both small and large down wood amounts should remain above historical levels on Forest Service/Bureau of Land Management lands and across the Basin." The article does not conclude that the increases in large snags will occur in roadless and wilderness areas. The article compares the 3 Alternatives (S1, S2, and S3) and compares how fuels reduction efforts in both Alternatives S2 and S3 should reduce large down wood amounts in actively managed areas. But that this should be offset by increases in late seral forest in unroaded and wilderness areas, creating large down wood levels far above historical conditions. This is outside the scope of the project.
204.09 - WL - post-fire habitat	#5873-30	Hutto, R.L., 2006. Toward Meaningful Snag-Management Guidelines for Postfire Salvage Logging in North American Conifer Forests. Conservation Biology Volume 20, No. 4, 984–993. http://web.archive.org/web/20090310114517/http://avianscience.dbs.umt.edu/documents/hutto_conbio_2006.pdf ("Species such as the Black-backed Woodpecker (Picoides arcticus) are nearly restricted in their habitat distribution to severely burned forests. Moreover, existing postfire salvage-logging studies reveal that most postfire specialist species are completely absent from burned forests that have been (even partially) salvage logged. I call for the long-overdue development and use of more meaningful snag-retention guidelines for postfire specialists, and I note that the biology of the most fire-dependent bird species suggests that even a cursory attempt to meet their snag needs would preclude postfire salvage logging in those severely burned conifer forests wherein the maintenance of biological diversity is deemed important.")	The Westside Fire Recovery Project includes the retention of legacy components such as large fire killed trees and pre-existing snags which will benefit wildlife species, in particular woodpeckers. Preparing an EIS on young complex forests is outside the scope of this project. Preparation of a snag management guide for postfire specialists is outside of the scope of this project. The project BE and Management Indicator Species reports address the effects of the project on woodpecker species.
204.09 - WL - post-fire habitat	#5873-31	h. A recent study of birds that use post-fire mosaics highlighted the importance of resprouting shrubs and forbs on the re-establishment of nesting birds following wildfire. "Of the 39 species for which nests were found, 14 (37%) used cavities and 25 (63%) built open-cup nests.... Species that built cup nests used snags, residual live trees, resprouting hardwoods, and other ground vegetation and downed wood. The associations between the presence of breeding species and forb and shrub cover indicate that these are important components of the early establishment of bird populations following stand-replacing fires. These data suggest that post-fire management of resprouting hardwoods and herbaceous vegetation should consider potential impacts to bird species that nest and forage in burned forests." CFER 2007. Response of Birds to Fire Mosaics. CFER News. Winter 2007. http://www.fsl.orst.edu/cfer/pdfs/Vol7_1.pdf.	The Westside Fire Recovery Project does analyze several wildlife species including the Northern Spotted Owl, Bald Eagle, and Willow Flycatcher, and snag associated species (Management Indicator Species association) that were likely affected by the 2014 fires. Habitat features described in the literature were used in the analysis. Chapter 3 of the final EIS provides a summary of the wildlife reports that describe the methods used in the analysis and the estimated effects. For migratory birds that may use the fire affected areas, the project uses the Memorandum of Understanding between the Forest Service and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds as described in the Migratory Bird Report. The Memorandum of Understanding provides a series of conservation recommendations to reduce the effects of land management on migratory birds.
204.09 - WL - post-fire habitat	#5873-38	In the northwestern United States, a number of bird species thought to be strongly associated with early-seral broadleaf habitat have declined and are considered conservation priorities (Altman 1999, U.S. Fish and Wildlife Service 2002). Because the PNW represents a substantial portion of the ranges of these species, loss of quality early-seral habitat could increase risk of extinction." M. G. BETTS, J. C. HAGAR, J. W. RIVERS, J. D. ALEXANDER, K. MCGARIGAL, AND B. C. MCCOMB. 2010. Thresholds in forest bird occurrence as a function of the amount of early-seral broadleaf forest at landscape scales. Ecological Applications, 20(8), 2010, pp. 2116–2130. http://www.fsl.orst.edu/flel/pdfs/Betts%20et%20al%202010%20Ecol%20Apps.pdf	See response to comment 5873-37.
204.09 - WL - post-fire habitat	#5873-5	Salvage logging will exacerbate the shortage of snags that will manifest in future decades after many of the snags have fallen and before new large green trees have grown to rebuild the population of snag recruitment trees.	Response number 2 in the "Responsible Opposing Views and Agency's Response to Issues Raised" Section in Chapter 3 of the final EIS describes the balance the Westside Fire Recovery project is striking between the retention of snags and coarse woody debris and fire resilience. It also addresses the concern about long-term retention of legacy components on the landscape until the forest is capable of replacing such components. See response to comment12346-55.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-50	Hutto (2005) says: "Personally, I've come to think we need to change our thinking on salvage logging. There are other values in the forest. In fact, a burned area is probably the most sensitive place you could be working in. The public really hasn't caught on to this yet. People still want to get the cut, get the trees they see as wasting away. They want the economic value. We talk about forest restoration after a fire, but it just got restored. That's what fire does. We know that, but we can't seem to get the message out. Until you start thinking like a black-backed woodpecker, you just ain't going to get it." Richard L. Hutto, Ph.D., Director of the Avian Science Center and Professor of Ornithology and Ecology at the University of Montana. richard.hutto@umontana.edu or 406.243.4292 from Birds in the black: Through following avian wildlife, a UM scientist has discovered that burned forests play a critical role in the health and diversity of the Western landscape By MICHAEL JAMISON of the Missoulian August 11, 2005. Hutto and others have been surveying birds in the Black Mountain fire area and nearly 20 other 2003 fire sites from Glacier National Park down to the Bitterroot, some of which have been salvage-logged. Nearly all woodpeckers have proven absent from salvaged areas, Hutto says, and all other bird species are less abundant in those spots than in areas left unlogged following fires. "I can't think of any other land-use practice where it's uniformly negative, at least in terms of birds," Hutto says. "That's why I end up thinking that a burned place should be lower on our priority list for logging—because it's so sensitive." Hutto's research is some of the first post-fire work that's been done in areas broader than one forest or one salvage-logging job, which may help it yield insightful facts for policymakers as they struggle to find a balance for post-fire salvage logging nationwide.	This is direct quote from the Missoulian and the Missoula Independent newspaper. There is no project specific comment for which to respond.
204.09 - WL - post-fire habitat	#5873-51	Jessie McQuillan. 2006. Still life, with woodpeckers. Missoula Independent. 6/22/2006. http://missoulanews.bigskypress.com/missoula/still-life-with-woodpeckers/Content?oid=1137343 "More than 10 years ago, and again two years ago, I joined eight other scientists to explore whether forests might be restored by logging soon after a fire. We had among us a wealth of knowledge across a wide range of fields. We pored over several decades of research but found nothing to show that fire-adapted forests might be improved by logging in the wake of a fire. In fact, we found just the opposite: Most plants and animals in these forests are adapted to periodic fires; they have a remarkable way of recovering – literally rising from the ashes. These forests have evolved with fire. Periodic fires have been part of a normal cycle lasting thousands of years. Logging a burned forest damages the soil, carrying away nutrients, robbing seedlings of moisture and clogging nearby streams. Trees in a burned landscape, both dead and alive, continue to provide homes for wildlife after a fire and form the building blocks of new forests."	This is direct quote from the Missoula news. There is no project specific comment for which to respond.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-54	A review of 116 research articles, dating from 1960 to 2002, which examined bird-forestry relationships in managed forests across North America found that — … The response of birds to forestry practices has been mixed and highly species-specific, but in general, net change in community richness following timber harvest was negligible. Among silvicultural practices, uneven-aged management (e.g., selection harvest) appears to be the most favorable for birds. In contrast, snag removal was highly deleterious, with >80 percent of studies reporting net species loss; net gain was never reported.... … What seems to be particularly detrimental to forest avifauna is removal of snags. When prescriptions involved manipulation of snag densities, either by removing (Kilgore 1971, Scott 1979, Dingledine and Haufler 1983, Scott and Oldemeyer 1983, Schreiber and deCalesta 1992), retaining (Dickson et al. 1983, Zarnowitz and Manuwal 1985, Stribling et al. 1990, Schreiber and deCalesta 1992, Welsh et al. 1992), or creating (McPeek et al. 1987) snags, bird numbers were typically found to be positively correlated with snag density. Unlike even-aged and unevenaged management practices, removal of snags never resulted in more species increasing in abundance than decreasing. The importance of snags to birds is wellknown (Davis et al. 1983 and references therein, Bull et al. 1997, references above), not only to cavity nesters, but also songbirds (Sallabanks et al. 2002) that may use snags for nesting, perching, foraging, singing, and scanning for predators. … Since large remnant snags and “defective” residual green trees provide much of the snag habitat for cavity-nesters in early- to mid-successional stands, particularly on private lands (Ohmann et al. 1994), retention of these structures will be important for maintaining populations of cavity- and snag-using avian species in managed forests. Snag retention and/or creation were the most commonly listed management recommendations from studies included in our review. We concur that leaving snags wherever possible is another important way that foresters can improve or maintain avian habitat quality within managed forest landscapes. Rex Sallabanks and Edward B. Arnett. Accommodating Birds in Managed Forests of North America: A Review of Bird-Forestry Relationships. PSW-GTR-191. http://www.fs.fed.us/psw/publications/documents/psw_gtr191/Asilomar/pdfs/345-372.pdf.	This is a direct quote from an article titled Accommodating Birds in managed Forests of North America: A Review of Bird-Forestry Relationships authored by Rex Sallabanks and Edward Arnett. There is no project specific comment for which to respond. See response to comment 12346-55.See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.09 - WL - post-fire habitat	#5873-58	Salvage: Protect all large snags Because large snags last much longer than small snags, large snags are disproportionately valuable as wildlife habitat, nutrient and water reservoirs, soil stabilizers, etc. If the agency chooses to conduct a salvage operation in this fire area, they must use a diameter cap and protect these scarce and valuable forest structures. Since large snags last longest, if large trees are retained, maybe there the temporal gap in snag habitat will be partially mitigated. Everett, Richard et al. 1999. Snag Dynamics in a Chronosequence of 26 Wildfires on the East Slope of the Cascade Range Washington Sate, USA. International Journal of Wildland Fire. 9(4) 223-234 (1999). http://web.archive.org/web/20041101184206/http://www.fs.fed.us/pnw/pubs/journals/snag.pdf	The Forest Service does not refute the importance of large snag retention. Everett et al. 1999 focuses on large soft snag retention. Specifically, it states that snag longevity over time varies greatly as a result of multiple factors including: landscape influences (aspect, slope, topography), species, age, diameter at breast height, height, and physical snag structure (bark thickness, bole size). Snag size (diameter at breast height) alone did not solely correlate to snag longevity. While size did help influence longevity, certain species of snags fell regardless of size (due to influences of bark thickness, height, and decay rate). Snag longevity also varied among species, with certain species having greater longevity (ponderosa pine decayed slightly faster than douglas fir and engleman spruce decayed slightly faster than subalpine fir). Snag height also influenced snag longevity. It was suggested that if snag populations are to be maintained over long periods of time following stand replacement fires, it will be necessary to retain snags greater than or equal to 41cm diameter at breast height of Douglas Fir and Engleman Spruce when possible. The literature also states that both small and hard snags are also important for wildlife and ecological processes such as nutrient cycling. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-60	A study conducted in the Black Hills National Forest found that 1) Wildlife disproportionately forage on large diameter snags; 2) Cavity nesters disproportionately utilized large diameter snags for nesting; 3) Cavity nesters were less abundant (usually absent in this case) in managed forest because of the scarcity of large diameter snags; and 4) Logging and thinning has led to serious shortages of large diameter snags. D.J. Spiering, R.L. Knight. 2005. Snag density and use by cavity-nesting birds in managed stands of the Black Hills National Forest. Forest Ecology and Management 214 (2005) 40–52. http://www.sciencebuff.org/content/files/science-staff/spiering_knight_2005.pdf (Note: "large" snags in this study were >48 cm, or 19" dbh). The agency should consider the significant implications of this study. Large snags are critically important for species viability, yet further loss of large snags (such as that caused by this project) will make a bad situation worse.	The Forest recognizes the importance of snags which is evident by the numerous standards and guidelines in the Forest Plan that describe the need to retain multiple size and decay classes of snags in the landscape. Further, the Forest Plan specifically identified a species association called "snag association" which was designed to capture the potential effects of the Forest's management may have on habitat associated with various bird species that are dependent on snags. The commenter also identified the importance of snags for cavity nesting bird species and cited Spiering and Knight (2005). The authors of this research document provide additional evidence on the need to retain snags for cavity nesting birds, particularly large snags. The authors points out that despite a wide range of snag sizes (3 to 25 inches diameter at breast height), larger snags had more cavities built and used by cavity nesting birds. Larger snags more commonly displayed evidence of foraging than the smaller snags, even though all size classes showed evidence of foraging. Despite the difference in tree species composition between the author's study area and the Westside Fire Recovery Project area, cavity nesting birds still need a diverse size and decay classes of snags and sometimes trees. The Westside Project incorporates the need of a variety of snag sizes and decay classes to meet the needs of a wide array snag associated bird species as described in the Forest Plan. Most of the project area will not receive treatment so these areas will retain all the existing snags that vary in size and decay classes. In addition, salvage harvest units will have snags retained in Riparian Reserves that contain all size classes including the trees/snags >25 inches diameter at breast height. In addition, snag retention areas were created in the salvage harvest units to further increase the number of snags plus legacy trees occurring in the salvage harvest units will be retained. Therefore, the Westside Fire Recovery Project was designed to reduce the effects to cavity nesting birds by providing a variety of snags throughout the project area. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.09 - WL - post-fire habitat	#5873-62	Although rate of biomass input and average piece size generally are thought to increase with succession (Harmon and others 1986), the amount of dead wood can follow a U-shaped pattern if young forests inherit large amounts of dead wood and live trees from preceding stands (Spies and others 1988). The snags in our study—especially large snags—increased with succession in almost all of the habitats. No wildlife habitats exhibited a U-shaped pattern, probably because snags tend to be cut within harvest units, which reduces the density found in early successional forests.... … The lack of a U-shaped successional pattern for snags is not surprising.... Snags also are much more likely than down wood to be damaged or intentionally removed by humans through the course of forest management and harvest activities. … All of the habitats we examined had similar patterns: distributions were non-normally distributed and strongly skewed to the right. A large proportion of the plots did not contain snags or down wood, and a very small proportion of the plots contained extremely large accumulations of dead wood. Janet L. Ohmann and Karen L. Waddell; Regional Patterns of Dead Wood in Forested Habitats of Oregon and Washington; USDA Forest Service Gen. Tech. Rep. PSW-GTR-181. 2002. http://www.fs.fed.us/pnw/pubs/journals/PSWGTR181Deadwood.pdf.	This is a direct quote from the document referenced in the excerpt from the comment letter.
204.09 - WL - post-fire habitat	#5873-63	The Trapper Project on the Willamette NF proposed to retain 30 snags per acre in a project intended to mimic a stand replacing fire event. This is an example of how much wood should be retained in salvage projects. Look at the "Snag Gap" with Open Eyes. One of the most significant and lasting effects of stand replacing disturbance such as fire, wind, or regeneration logging is to bring the process of snag recruitment to a virtual standstill for many decades. Even if snags are not removed by the disturbance, snags created by the disturbance will fall down over time and few if any snags are created. This results in a "snag gap" that has serious adverse consequences for habitat and many other ecological processes. The apparent abundance of large snags after a stand replacing disturbance masks a severe shortage of large snags down the road.	See response to number 18909-32

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-66	1. The agency must recognize the asymmetric nature of snag dynamics after all types of stand replacing disturbance. High rates of snag fall would be expected in the decades following disturbance, while low rates of snag recruitment would be expected in the decades following a disturbance. This unavoidably results in a serious deficit of snags at some point in the future. 2. In order for the NEPA analysis to fully address the snag habitat issue it must look carefully at the snag gap from both ends. a. The snag gap begins when too many of the current snags are gone. So the snag gap is exacerbated on the front end by salvage logging which removes too many large snags. b. The snag gaps ends when the next stand grows to the point that it contains large trees and some of them die, so the snag gap is exacerbated on the back end if there is a significant delay in tree regeneration. 3. The agency has a tendency to focus on the back end of the snag gap which is allegedly mitigated by tree replanting, but this benefit is in the distant future and remains speculative. The agencies tend to ignore the effect of logging on the front end of the snag gap (which is concrete and unavoidable). 4. Logging which retains only enough snags to meet snag requirements after harvest will not meet snag requirements in a few years after those few retained snags fall. 5. Both the RMP and the Northwest Forest Plan (p C-13) require that snags be maintained through time, so our goal must be to manage snags to minimize the time period that there is a deficit of snags. 6. The NEPA analysis must account for snag fall rates and figure out how to minimize the snag gap. Every day that the "snag gap" is lengthened by salvage logging is a violation of the RMP. Models that may be used to analyze snag dynamics can be found here: http://www.for.gov.bc.ca/hre/deadwood/DTmod.htm. 7. There is a strong correlation between the size of the snags and the length of time it is likely to remain standing, so salvage must be designed to retain all the large snag and only remove trees from smaller size classes. 8. Consider this example: Assume that the stands currently have 30 large trees/acre and 24 of those will be removed via salvage logging while 6 trees/acre will be retained for snag habitat. Further assume that in 50 years 2 percent of the large snags will remain standing as snag habitat. Two percent of 6 trees/acre is FAR LESS than 2 percent of 30 trees/acre, so there is a virtual statistical certainty that salvage logging will exacerbate the snag gap. 9. The snag gap is really exacerbated by salvage logging in two ways — first by targeting removal of the large and most persistent component of the snag population, and second by accelerating the rate that remaining snags fall and are lost from the snag population. New science from Idaho reveals that Ponderosa pine snags persist longer in unlogged areas. See Russell, R.E., Saab, V.A., Dudley, J.G., and J.J. Rotella. 2006. Snag longevity in relation to wildfire and postfire salvage logging. Forest Ecology and Management 232 (2006) 179-187. http://www.fs.fed.us/rm/pubs_other/rmrs_2006_russell_r001.pdf ("The predicted half-life of a ponderosa pine snag was 7-8 years in salvage logged plots and 9-10 years in unlogged plots.")	See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate. This comment appears to refer to Resource Management Plans (RMPs) which are BLM planning documents. As such it is not responsive to issues related to the Westside Recovery Project. There are about 52,000 acres of moderate and high severity burn areas in the Westside Fire Recovery Project area where most of the trees were killed by the fire. Salvage harvest, even at the highest proposed level (Alternative 2) 85 percent of the moderate and high severity fire area would not have salvage harvest. In the Preferred Alternative, the number is closer to 90 percent. In areas with salvage units, snag retention standards in the Klamath Forest Plan must be met. Regardless of how long snags last, we don't believe there will be a snag shortage in the Westside Fire Recovery Project Area. The comment notes that salvage in LSRs and in particular removal of large trees should be limited and suggest large trees are being targeted.. While the Westside Fire Recovery Project appears to be large, in fact, it affects a small proportion of the LSR that experienced stand replacement fire in 2014. Of the 28,700 acres of LSR that burned at moderate to high intensity (all diameter classes, more than 50 percent of the trees killed) about 3,900 acres or less than 15 percent is proposed for salvage in LSRs (Appendix E, Figure 10). An additional 800 acres of concentrated roadside hazard removal or about 3percent of moderate or severely burned areas within the LSR is proposed (Appendix E, Table 3). Combined an estimated 4,700 acres or about 17 percent of moderate or severely burned areas would be removed between salvage harvest and concentrated roadside hazard removal. That means more than 80% of the stands with moderate or severe fire damage are retained. Concentrated roadside hazard and salvage harvest combined would remove about 6 percent of the 81,200 acres of LSR in all burn severities affected by the Westside Fires.Comments also state that removal of large trees should be limited. When the Eddy Gulch and Seiad LSRs are stratified by stand size using the California Wildlife Habitat Relationship (CWHR) data, there are 29,600 acres of stands with a quadratic mean diameter (QMD) greater than 24 inches in all burn severities in the Eddy Gulch and Seiad LSRs (Appendix E). Of these stands, 8,650 acres of are moderately to severely burned. Using California Wildlife Habitat Relationship data (Appendix E, figure 12) shows that within the Eddy Gulch and Seiad LSRs: • Of the 29,600 acres of stands with a quadratic mean diameter (QMD) greater than 24 inches, in all burn severities, 1,750 acres (6% of the size class) would be removed by the Westside Fire Recovery project in salvage harvest units. An estimated additional 240 acres of stands greater than 24 inches QMD would be removed in roadside hazard cleanup (Appendix E, Table 3) in moderate – high severity burn areas. • With salvage units and roadside hazard combined, approximately 2,000 acres of stands with a QMD greater than 24 inches would be removed within the Eddy Gulch and Seiad LSRs from moderate – high severity burn areas. • Of stands with a QMD greater than 24 inches, this represents about 23 percent of the 8,650 acres of moderate - high severity burn acres and about 7% of the medium / large tree diameter class (29,600 acres) in all burn severities in the LSRs. • Of the stands where the QMD is greater than 24 inches that are in moderate to high severity burn patches, 77 percent would be retained. Overall, in all burn severities, over 90 percent of the stands with a QMD greater than 24 inches in the Seiad and Eddy Gulch LSRs would be retained.From this, we conclude that salvage in the LSRs and removal of large trees is indeed limited, when considered in the context of the scale of the Westside Fires.See response to #5873-68, 5873-2 and EIS Chapter 3, Responsible Opposing Points of View. Snag fall is addressed in EIS Chapter 3 Fuels
204.09 - WL - post-fire habitat	#5873-73	Similarly, the Fremont-Winema NF's Barry Point Fire Salvage EA says: Bull et al. (1997) states current direction for providing wildlife habitat on public forest lands does not reflect the new information available, which suggests that to fully meet the needs of wildlife, additional snags and habitat are required for foraging, denning, nesting, and roosting. Rose et al. (2001) also state that several major lessons have been learned in the period 1979 to 1999 that have tested critical assumptions of earlier management advisory models, including some assumptions used to develop current recommendations in the LRMP Standards and Guidelines. Some assumptions include: • Calculation of numbers of snags required by woodpeckers based on assessing their "biological (population) potential" is a flawed technique (Rose et al., 2001). Empirical studies are suggesting that snag numbers in areas used and selected by some wildlife species are far higher than those calculated by this technique (Rose et al., 2001). • Numbers and sizes (DBH) of snags used and selected by secondary cavity nesters often exceed those of primary excavators (Rose et al., 2001). This suggests the current direction of managing for 100 percent population levels of primary excavators may not represent the most current knowledge of managing for cavity nesters and that these snag levels, under certain conditions, may not be adequate for some species. http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/91686_FSPLT3_1450222.pdf	The Fremont-Wineama National Forest may have used these research documents that are appropriate for the habitat occurring on that Forest, but the Klamath National Forest is using the best information for managing land that occur on the Klamath National Forest. In the final EIS under the heading titled "Responsible opposing views and agencies' responses to issues raised" the second topic called "Whether there is "excess material" that can be removed" provides a detailed description of the various guiding documents used to inform land management and snag retention. See the summary of the Late-Successional Reserve, Appendix E. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-74	Limitations of Existing Approaches for Assessing Wildlife-Dead Wood Relations Models of relationships between wildlife species and snags in the Pacific Northwest typically are based on calculating potential densities of bird species and expected number of snags used per pair. This approach was first used by Thomas et al. (1979). Marcot expanded this approach in Neitro et al. (1985) and in the Snag Recruitment Simulator (Marcot 1992) by using published estimates of bird population densities instead of calculating population densities from pair home range sizes. This approach has been criticized because the numbers of snags suggested by the models seem far lower than are now being observed in field studies (Lundquist and Mariani 1991, Bull et al. 1997). In addition, the models provided only deterministic point values of snag sizes or densities and of population response ("population potential") instead of probabilistic estimates that are more amenable to a risk analysis and risk management framework. In addition, existing models have focused on terrestrial vertebrate species that are primary cavity excavators. Thomas et al. (1979) and Marcot (1992) assumed that secondary snag-using species would be fully provided for if needs of primary snag-excavating species were met. However, McComb et al. (1992) and Schreiber (1987) suggested that secondary cavity nesting birds may be even more sensitive to snag density than are primary cavity excavators. Furthermore, existing models do not address relationships between wildlife and down wood, nor do they account for species that use different types of snags and partially dead trees, such as hollow live and dead trees used by bats (Ormsbee and McComb 1998, Vonhof and Gwilliam 2007), Vaux's swift (Chaetura vauxi) (Bull and Hohmann 1993), American marten (Martes americana) (Bull et al. 2005), and fisher (Martes pennanti) (Zielinski et al. 2004). Bruce G. Marcot , Janet L. Ohmann, Kim L. Mellen-McLean, and Karen L. Waddell. Synthesis of Regional Wildlife and Vegetation Field Studies to Guide Management of Standing and Down Dead Trees. Forest Science 56(4) 2010. http://ddr.nal.usda.gov/bitstream/10113/47366/1/IND44438441.pdf.	This is a direct quote from Marcott et al (2010) and there is no project specific comment for which to respond.
204.09 - WL - post-fire habitat	#5873-78	The potential population models are based on the number of trees needed for nesting cavity-excavator birds, however, “[t]he high value of large, thick-barked snags in severely burned forests has as much to do with feeding opportunities as it does with nesting opportunities they provide birds.” (Hutto. ConBio 20(4). 2006. http://web.archive.org/web/20060904175645/http://avianscience.dbs.umt.edu/documents/hutto_conbio_2006.pdf. The number of snags needed to support bird feeding, escape from predators, and other life functions, is different than, and likely higher than, the number of snags needed to support nesting, so the agencies’ existing “potential population” snag standards are arbitrary and capricious.	The Forest Service does not refute that different species respond differently to different fire severities as described in Hutto et al (2006). This topic is addressed in the project Management Indicator Species Report Part II. The Proposed Action was not designed to - nor would it - eliminate moderate or high severity burn habitat. Effects to other migratory and cavity nesting birds are discussed in Migratory Bird Report and Management Indicator Species Report. Snags and hardwoods will be retained at or above Forest Standard and Guideline levels after treatment. Important habitat components such as large snags will be retained in clumps in salvage treatments to provide for future habitat quality for birds that depend on snags.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-79	There is evidence that retaining more than the minimum number of snags has significant benefits for cavity dependent species. Comparing two sites in Northern California, Blacks Mountain Experimental Forest (BMEF) with little past logging and lots of snags, and Goosenest Adaptive Management Area (GAMA) with lots of logging and fewer snags, the author's found "… three times as many snags (6.38/acre vs. 2.04/acre, respectively) … The use of snags by cavity-nesting bird species was dramatically different between the sites. Thirty-one cavity-nesting pairs from 10 species were detected at BMEF, while only one pair each of two species were detected at GAMA…. This fifteenfold difference is much greater than any measure of snags or cavities reported. …" We feel that forest managers may well be asking a misleading question. "Snags per acre" requirements implicitly assume an equilibrium condition and reflect only one ecological requirement for a given cavity-nesting species. … [C]onsideration of foraging habitat and other ecological requirements must be part of the "snags per acre" management considerations. This is an important, but somewhat daunting proposition, as potential cavity-nesting species are diverse, and each species likely has very different foraging ecologies, as well as other differences in habitat requirements. … [C]avity nesters at BMEF used larger snags on average … [T]he loss of large trees due to logging in eastside pine and other forests, over the past century has major implications for cavity-nesting birds. … [F]orest managers must have a sense of snag recruitment in relationship to snag fall, and the patterns and processes that underlie them, when addressing wildlife needs. … We view the understanding of these complexities to be of primary importance in forest management for wildlife. Steve Zack, T. Luke George, and William F. Laudenslayer, Jr. 2002. Are There Snags in the System? Comparing Cavity Use among Nesting Birds in "Snag-rich" and "Snag-poor" Eastside Pine Forests. USDA Forest Service Gen. Tech. Rep. PSW-GTR-181. http://www.fs.fed.us/psw/publications/documents/gtr-181/017_Zack.pdf.	The Forest doesn't contest the importance of snags for cavity nesting birds. Throughout most of the project area, the existing snags created by the fires will not be affected by the proposed actions. There are large blocks of fire created snags at various elevations, densities, sizes, and tree species that will not be harvest such the large portion (over 4,000 acres) of the Grider Creek watershed. However, the literature quoted in this comment represents research in pine forests. The project area contains small amount of pine dominate stands outside of the plantations thus the literature presented here is not the best information for the project area.
204.09 - WL - post-fire habitat	#5873-8	Salvage logging will not meet standards & guidelines for snag habitat. Leaving just a few snags after salvage logging will meet standards for just a few years, until those few retained snags fall down and are not replaced. 9. The current snag habitat standards in the Northwest Forest Plan are based on outdated science ("potential population" methodology) and these standards do not provide enough habitat for the diverse life needs of many different species that use snags and dead wood. Meeting ecosystem objectives requires more snags than are called for in current standards, and more green trees are needed to recruit those higher snag levels. The FS needs to follow NEPA and NFMA procedures to consider new science, consider alternative standards, and finally adopt new standards that meet all the needs of wildlife (and other ecological functions) provided by snags and dead wood. Reducing snags on such a grand scale as this (and with such long-term impacts on the snag gap) is not permissible until the FS adopts new standards.	The standard and guidelines presented in the Forest Plan on page 4-30 for snag associated species under the Management Indicator Species category are followed in the development of the project. The Project Design Features as presented in the draft EIS plus the lack of salvage harvest in hydrologic Riparian Reserves are designed to meet snag retention standards and guidelines. See response to comment numbers 5873-72 and 6277-1, and 12346-55. Best available science was used during project design and analysis, as referenced throughout the final EIS and supporting documents.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-80	Another recent science publication asked that the agencies salvage polices be brought up to date with current science. Inadequacy of Current Snag Guidelines Current snag-retention guidelines for most North American plant community types fall between 1 and 8 snags/ha. These guidelines emerged primarily from a consideration of the nesting requirements of cavity-nesting vertebrate species in the now classic Blue Mountains book (Thomas 1979). The retention of 8 snags/ha was judged to support 100% of the maximum population density of any of the woodpecker species that occur in the Blue Mountains area (Thomas 1979: Appendix 22). Bull et al. (1997) concluded that about 10 snags/ha in ponderosa pine and mixed-conifer forests should support viable populations of cavity-nesting birds. Thus, most current U.S. National Forest guidelines generally converge on the recommendation to retain 6–10 trees/ha, as do guidelines for Washington State, the Ontario Ministry of Natural Resources, the U.S. Army Corps of Engineers, and many other land management agencies. It has been acknowledged that snag guidelines should be sensitive to forest type and forest age because “the wildlife species that use snags are influenced by the stage of forest succession in which the snag occurs” and by the breakdown stage of the snag (Thomas et al. 1979). Moreover, snag types, sizes, and densities vary significantly with vegetation type (Harris 1999; Harmon 2002; White et al. 2002). Therefore, it follows necessarily that the desired snag types and densities will differ with both plant community type and successional stage and that we need as great a variety of guidelines as there are community types and successional stages (Bull et al. 1997; Everett et al. 1999; Rose et al. 2001; Kotliar et al. 2002; Lehmkuhl et al. 2003). Unfortunately, we have generally failed to adjust snag-retention recommendations to specific forest age, and nowhere is that failure more serious than for those special plant community types that were ignored in the development of the generic guidelines—recently burned conifer forests. Such forests are characterized by uniquely high densities of snags (Angelstam & Mikusinski 1994; Hutto 1995; Agee 2002; Drapeau et al. 2002), and snag use by most woodpeckers in burned forests requires high snag densities because they nest in and feed from burned snags. These facts have been overlooked in the development and implementation of meaningful snag-management guidelines. Indeed, these guidelines have generally converged toward an average of 6–7 trees/ha because that number was deemed more than adequate to meet the nesting requirements of cavity-nesting wildlife species (Thomas et al. 1979:69). Snag guidelines were not originally developed with an eye toward non-nesting uses of snags or from an attempt to mirror snag densities that typically occur on unmanaged reference stands. Snag guidelines are still much narrower than numerous authors have suggested they ought to be, and we currently run the risk of managing coarse woody debris with uniform standards across historically variable landscapes, which is entirely inappropriate. Instead, we should be managing for levels of coarse woody debris that more accurately mirror levels characteristic of the natural disturbance regime (Agee 2002). Clearly, we need more data on what might constitute meaningful snag targets for all forest types and successional stages, and those targets should be set on the basis of reference conditions from natural post disturbance forests, not from managed forest stands and certainly not from consideration of only a single aspect of an organism’s life history. Newer guidelines that are appropriate for snag dependent species that occupy standing dead forests at the earliest stage of succession are beginning to trickle in (Saab & Dudley 1998; Haggard & Gaines 2001; Saab et al. 2002; Kotliar et al. 2002), and authors suggest that 200–300 snags/ha may better address the needs of wildlife in burned forests. The issue has yet to receive the serious management attention it deserves, but the comprehensive review of habitat needs of vertebrates in the Columbia River Basin (Wisdom et al. 2000) and the recently developed DecAID modeling effort in Washington and Oregon represent important efforts toward providing that kind of management guidance (Marcot et al. 2002).	This is a direct quote from the document titled "Towards a meaningful snag-management guidelines for postfire salvage logging in North American conifer forests" by Richard Hutto (2006). The quoted reference is acknowledge but the commenter failed to describe what about the proposed actions or our analysis needs to be changed in response to this comment. Forest Service policy and Forest Plan direction is outside the scope of this project; however we disagree with the commenter's assertion that snag retention requirements are inadequate. We recognize the importance of snag retention and have incorporated best available science into snag retention into project design and analysis for the Westside Fire Recovery project. See response to comment number 5873-81. This comment provides no evidence to support the argument that the Forest Plan direction to snags and down logs is not adequate. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.. See chapter 1 for a discussion of salvage in Late-Successional Reserves. See the discussion of responsible opposing points of view at the beginning of Chapter 3 of the final EIS. The effects to wildlife are chapter 3 of the final EIS for a discussion of effects.

Code	Comment Number	Comment Text	Response
204.09 - WL - post-fire habitat	#5873-81	Current Postfire Management Decisions Related to Snag Retention The following points regarding management decisions apply to western forest types that experience crown fire as at least a minor component of their fire regimes (and that is virtually all western forest types). (1) The USFS uses fire as a motivation to harvest trees. This is evident because in most cases where postfire logging is proposed they had not already sold green-tree harvests in those particular areas prior to the time of fire disturbance. Even though land managers are becoming more aware of the overwhelmingly negative ecological impacts of postfire salvage logging, the management has not shifted correspondingly toward less salvage harvesting. Instead, the most common justification for such harvests seems to have shifted recently from “salvaging” what economic value there might be to preventing another catastrophic fire (McIver & Starr 2000). Recent modifications of legislation and regulations by provincial governments in Canada (cited in Nappi et al. 2003) and by the U.S. government as well (Healthy Forests Restoration Act) expedite or even provide incentives for salvage logging. Such legislation provides no commitment to meaningful snag retention on burned forest lands. This failure to appreciate the value of burned forests to ecosystem sustainability is exacerbated by the fact that industrial lands (and most state lands) are, and probably always will be, completely salvage logged after fire because the value of those lands to those landowners lies entirely with the potential for short-term economic gain. The onus lies squarely on public land managers to provide the necessary protection of snag resources on burned forest land, and that has yet to happen. (2) The usual agency response to questions about the amount or kind of burned trees to leave is that it does not really matter because they propose taking only a small proportion of what burned, so there must be plenty left for wildlife. Although that could be true, there is no scientific basis for such a conclusion. The volume of burned timber needed to enable populations to expand enough so that they can weather the next hiatus without fire in a particular area is unknown. (3) If a partial salvage is proposed, the level of snag retention is generally based on a gross misapplication of current snag guidelines. In short, meaningful snag management guidelines for burned forests are lacking because the general public and the land management agencies that act on behalf of the public do not recognize the biological value of snags in burned conifer forests. Hutto, R.L., 2006. Toward Meaningful Snag-Management Guidelines for Postfire Salvage Logging in North American Conifer Forests. Conservation Biology Volume 20, No. 4, 984–993. http://web.archive.org/web/20090205212350/http://avianscience.dbs.umt.edu/documents/hutto_conbio_2006.pdf	This comment provides no evidence that the guidelines of the Forest Plan are inadequate. See response to 5873-2. This is a direct quote from Hutto et al (2006) and there is no project specific comment for which to respond. We disagree with the opinion that the agency uses fire to harvest trees. See response to comment number 5873-72 about snag retention. In addition to having an economically viable project and the benefits to the local community, we are salvage harvesting in order to reduce fire risk and restore the landscape; see the project's purpose and need (Chapter 1 of the final EIS). Regulations in Canada are not applicable to how the Klamath National Forest is managed. We appreciate the benefits of burned forests. In fact, prescribed burning is proposed in this project where needed to improve fuels, habitat, and watershed conditions. See chapter 2 of the final EIS for a description of proposed actions. We are not only salvage harvesting a small portion of the project, as mentioned by the commenter, but within the units being salvage harvest there is additional retention areas and mitigation, including the retention of important course woody debris, large snags, and legacy components, as described in the watershed and wildlife project design features in chapter 2 of the final EIS. We acknowledge the importance of fire-killed trees for wildlife habitat, as disclosed in the wildlife section of chapter 3 of the final EIS. We do not refute that different species respond differently to different fire severities as described in Hutto et al (2006).
204.09 - WL - post-fire habitat	#5873-82	The bottom line is that current management at both the plan and project level does not reflect all this new information about the value of abundant snags and down wood. The agency must avoid any reduction of existing or future large snags and logs (including as part of this project) until the applicable management plans are rewritten to update the snag retention standards. See also PNW Research Station, “Dead and Dying Trees: Essential for Life in the Forest,” Science Findings, Nov. 1999 (http://www.fs.fed.us/pnw/sciencef/scifi20.pdf) (“Management implications: Current direction for providing wildlife habitat on public forest lands does not reflect findings from research since 1979; more snags and dead wood structures are required for foraging, denning, nesting, and roosting than previously thought.”) and Jennifer M. Weikel and John P. Hayes, HABITAT USE BY SNAG-ASSOCIATED SPECIES: A BIBLIOGRAPHY FOR SPECIES OCCURRING IN OREGON AND WASHINGTON, Research Contribution 33 April 2001, http://www.fsl.orst.edu/cfer/snags/bibliography.pdf..	The Forest is following the standard and guidelines presented in the Forest Plan. The Forest Plan outlines the wildlife Management Indicator Species (pages 4-30 to 4-33), Forest Service Sensitive species as amended by the Regional Forest Supervisor (4-28), Survey and Manage as amended and referenced to the Northwest Forest Plan standards and guidelines (4-24). For these species, standards and guidelines were developed (referenced for survey and manage species) to reduce effects to these species and these standards and guidelines were either incorporated in the design of the project or Project Design Features. Project Design Features are presented in Chapter 2 of the draft EIS. Management Indicator Species within the snag association is intended to represent a group of species strongly associated with snags and woody debris. Standards and Guidelines are presented in the Forest Plan (4-30) were used to reduce effects to wildlife species associated with snags and woody debris. See response to 5873-82.

Code	Comment Number	Comment Text	Response
204.10 - WL - LSR habitat	#12346-10	Oregon Natural Res. Council Fund v. Brong, 492 F.3d 1120, 1127 (9th Cir. 2007) Like the BLM in the Brong case, the Westside timber sale is targeting large-diameter snags for removal from the LSR system in order to maximize the economic return to the agency from logging the Reserves. By removing large snags likely to persist until latesuccessional conditions have developed the Forest Service is violating the NW Forest Plan standards and guidelines concerning post-fire logging in the Reserves. Also like the BLM in Brong, the Forest Service is relying on "retention" of snags outside of actual logging areas in an attempt to circumvent substantive LSR snag retention standards. Page 33 of the DEIS indicates that snag retention for the 7,560 acres of LSRs logging units are being calculated by utilizing a total baseline acreage of 11,710 acres that includes adjacent Riparian Reserves and other lands areas outside of actual logging areas as part of "units" in order to avoid retaining large snags that may persist LSR stands that are subjected to logging. Using math tricks to avoid retaining snags in LSR logging units is not permitted by the Forest Plan.	Response number 2 in the "Responsible Opposing Views and Agency's Response to Issues Raised" Section in Chapter 3 of the final EIS outlines the snag retention design for the Westside Fire Recovery project. These include hydrologic Riparian Reserves and inner gorges inside of the salvage units as well as snag retention areas and retention of legacy components in the salvage harvest units. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.10 - WL - LSR habitat	#12346-11	As stated by the 9th Circuit in Brong: [T]he amount of large snag retention the BLM claims to be enough to satisfy the NFP is only achieved by averaging salvage and non-salvage areas together across all the areas included in the logging… Thus, the BLM's representation that between eight and twelve large snags per acre will still be standing after the logging occurs is grossly misleading, as over two-thirds of the affected acreage will be completely stripped of all salvageable trees. The BLM's attempt to dilute the effects of its proposed activities by averaging the snag retention over such a wide area is inconsistent with the NFP and improper under our precedent.	See response to number 12346-10. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.10 - WL - LSR habitat	#12346-5	Page 106 of the DEIS acknowledges that an action alternative that focused on hazardous fuels treatments and roadside logging would "meet one part of the purpose and need for this project (to reduce safety hazards to adjacent landowners, the public and forest workers) by including fuels and roadside hazard treatments." But the Forest Service insists upon conducting unit salvage logging in LSRs in order to "obtain the maximum economic commodity and value from burned timber." Ibid. The agency also mistakenly contends that unit salvage logging will "increase the likelihood and speed by which burned forests are restored." Ibid. The Forest Service is not permitted to justify logging the LSRs in order to "obtain the maximum economic commodity and value" from these old-growth reserves. As is shown throughout these comments, and as established by the peer-reviewed literature submitted during the scoping process, unit salvage logging will inhibit, rather than contribute to, restoration of late-successional forest character. Please note the recent 2013 BLM publication entitled the Analysis of the Management Situation for the Resource Management Plans for Western Oregon states that: The 1995 RMPs do not provide management direction in Riparian Reserves or Late-Successional Reserves to salvage after disturbance for economic reasons. Since recent science seems to indicate that an ecological rationale for post-disturbance timber 3 salvage is weak, an opportunity exists to add an economic objective related to afterdisturbance salvage activities to these reserved land use allocations.	We agree that the Northwest Forest Plan does not permit a salvage project in Late Successional Reserves solely for recovering the economic value of the timber alone. However, the Northwest Forest Plan allows the consideration of economic interest in the management of Late Successional Reserves if it provides explanation connecting the economic recovery and the need to protect and enhance late-successional ecosystems. This is explained in C-13-14 “[M]management planning for Late Successional Reserves must acknowledge the considerable value of retaining dead and dying trees in the forest as well as the benefits from salvage activities.” The full line of evidence is in response 3 in the "Responsible Opposing Views and Agency's Response to Issues Raised" in Chapter 3 of the final EIS.

Code	Comment Number	Comment Text	Response
204.10 - WL - LSR habitat	#12346-7	As described in our scoping comments, the primary architect of the NWFP LSR system has written that: "Salvage logging of large snags and down boles does not contribute to recovery of late-successional forest habitat; in fact, the only activity more antithetical to the recovery process would be removal of surviving green trees from burned sites. Large snags and logs of decay resistant species, such as Douglas-fir and cedars, are critical as early and late successional wildlife habitat as well as for sustaining key ecological processes associated with nutrient, hydrologic, and energy cycles." -Dr. Jerry Franklin, 1/20/04. The DEIS ignores the role that snags and logs play in sustaining wildlife habitat and key nutrient, hydrological and energy cycles that contribute to ecological (rather than economic) recovery in the Reserves. Franklin concluded that "salvage logging of large snags and logs is absolutely antithetical to rapid recovery of late-successional forest habitat." Yet such logging comprises the bulk of the KNF's "recovery" project. MA-5 of the KNF LRMP only allows post-fire logging in LSRs "if it benefits habitat." As acknowledged by both the Forest Service and the BLM in many projects and contexts, salvage logging of LSRs does not benefit habitat. This is particularly true for the silviculture prescription in Westside that calls for new road construction, clearcut logging on steep unstable slopes, and removal of snags and down wood likely to persist over time. FEMAT 1993, p. IV-36 states that "[m]anagement objectives [following natural disturbances in LSRs) should focus on either simulating natural succession or allowing it to occur unimpeded." The DEIS refuses to implement this guidance and commits the agency to removing forest structure in the LSRs and speeding plantation establishment specifically in order to avoid and prevent natural succession within the Reserves. FEMAT directs that: Because of the important role of dead wood in late-successional and old-growth forest ecosystems, and because there is much to learn about the role of dead wood in development of forests, only limited salvage is appropriate in Late-Successional Reserves…The Final Draft Recovery Plan [for the NSO] would allow removal of small4 diameter snags and logs, but would also require retention of snags and logs likely to persist until the new stand begins to contribute significant quantities of coarse woody debris." (FEMAT 1993, p IV-37)	See EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised for a thorough discussion of issues raised in this comment. The comments and opinions of the BLM and Forest Service on other projects are not applicable to this project. See response to comment number 12346-55.
204.10 - WL - LSR habitat	#12346-8	In the Westside Project the Forest Service has taken the exact opposite approach recommended by the NWFP. The agency is proposing extensive (rather than limited) salvage logging across tens of thousands of acres in the Reserves and is proposing to remove large diameter snags from logging units while leaving the least valuable (for wildlife and mills) small diameter snags in the units.	Salvage is permitted within Late-Successional Reserves following the Standards and Guidelines in the Forest Plan. Project design features call for the retention of legacy components and snags to meet the Standards and Guidelines. (See Chapter 2 of the final EIS). This project is under review by the Regional Ecological Office which means there is a review of compliance with Late Successional Reserve requirements under the Northwest Forest Plan.
204.10 - WL - LSR habitat	#12346-9	At 8944 of the 9th Circuit decision in ONRC v Brong the court concluded: [I]t is not surprising the NFP restricts removal of snags in LSRs. In fact, the NFP's salvage guideline no. 3 expressly limits the removal of such snags: Snags provide a variety of habitat benefits for a variety of wildlife species associated with late successional forests. Accordingly, following standreplacing disturbance, management should focus on retaining snags that are likely to persist until late-successional conditions have developed and the new stand is again producing large snags. Late-successional conditions are not associated with stands less than 80 years old. Despite this clear directive against removing large snags (i.e.. those likely to persist until late-successional conditions have developed), the BLM asserts that the Project, which entails the removal of a significant number of large snags in late-successional areas, is nonetheless consistent with the NFP. We disagree, and find the BLM's reasoning lacking in multiple respects.	A discussion of the snag retention design has been incorporated into Chapter 2's description of salvage harvest in the final EIS. The design includes until the next stand is capable of producing such material by retaining legacy trees, not salvaging in hydrologic Riparian Reserves and inner gorges, designating snag retention areas and protecting these features from future wildfire disturbance. Response 2 in the "Responsible Opposing Views and Agency's Response to Issues Raised" in Chapter 3 of the final EIS describes the efficacy of the snag retention design and the balance between leaving legacy components (snags and coarse woody debris) and reducing future fuel loading. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.10 - WL - LSR habitat	#12549-3	The Northwest Forest Plan states that in LSRs living trees in a fire area should be uncut and Klamath Forest Plan requires that snags be retained on a per acre level. The DEIS assumption that moderate fire severity areas no longer support habitat for native plant and animal species is wildly inaccurate. Further, high-severity patches are of greatest importance to ecological integrity as they provide biological legacies that sustain the diversity of plants and wildlife. Post-fire landscapes are not in need of "restoration" because fire itself is a restorative agent.	Areas that were burned with moderate and high vegetation severity were considered as habitat in the analysis of effects (see response to number 18909-62). Snags, coarse woody debris and other wildlife legacy components will be maintained in salvage units (See response to number 12346-10). Much of the fire affected area is being left to naturally recovery (See Table 2-1 and Figure 2-1 in Chapter 2 of the final EIS). Areas that are being treated will meet the purpose and need of the project,

Code	Comment Number	Comment Text	Response
204.10 - WL - LSR habitat	#17111-11	In summary, general salvage of large snags and logs is clearl y antithetical to the goal of rapid recovery of fully functional late-successional forest habitat and inappropriate within the Late-Succesional Reserves. If large fuels are viewed as a critical fire control issue, then this could be dealt with by creating appropriate Fuel Management Zones or snag-free corridors.	Response 3 in the "Responsible Opposing Views and Agency's Response to Issues Raised" describes the logic behind salvage harvest in Late-Successional Reserves. Forest. The Regional Ecosytem Office of the US Forest Service concurred with the Forest assessment documented in Appendix E that the project was consistent with the Forest Plan and Late-Successional Reserve Assessment (Appendix E of the final EIS).
204.10 - WL - LSR habitat	#17111-19	Planting may be appropriate within LSRs to establish tree seed sources for specific species and locations. However, planting should not be done following traditional approaches, which are directed to establishing uniformly stocked forest stands over large areas. Extensive, uniform plantings -even at the relatively low density proposed for some areas (200 trees/acre) -will not simulate the spatially heterogeneous pattern of natural seedling establishment.	The final EIS provides information concerning tree planting in Chapter 3 of the final EIS in the sections called “Responsible opposing views and agency’s response to issues raised”. In addition, Chapter 2 of the final EIS provides a description of the site preparation and planting in the section called “site preparation, reforestation and release”.
204.10 - WL - LSR habitat	#17111-20	Establ ishment of dense, uniform stands is completel y inappropriate i n LSRs as well as any PAG identified as fire regime types I and I I. We are currently engaged i n major programs of variable density thinning in dense plantations i n existing LSRs in order to accelerate the development of late-successional structure in these overly dense stands; so, why would we set about creating more acreage of these dense unifom1plantations within LSRs? Similarly, establishing uniform stands -even at a relatively low density of 200 trees per acre -on sites characterized by frequent fire is obviously inappropriate; this simply recreates the potential for the next "uncharacteristic" stand replacement fires on these sites!	See comment number 17111-19. See also EIS Chapter 3, Responsible Opposing Views and Agency’s Responses to Issues Raised.
204.10 - WL - LSR habitat	#17111-26	Excepting the proposed roadside salvage, approximately 72% of the proposed salvage logging i n the preferred alternative (#2) is located within LSRs-roughly 4,900 acres out of 6,800 acres total. In part, the logging is justified in the DEIS on the basis that it is needed to assist in rapid re-establish late-successional forest conditions and Northern Spotted Owl habitat with the LSRs. 1 Given the important and well defined ecological role assigned the LSRs in the Northwest Forest Plan (NWFP) I have paid special attention to the scientific rationale offered for the extensi ve salvage logging that is proposed in LSRs. The LSR network was designed as a robust system of ecological reserves, which could accommodate large intense natural disturbances and the natural recovery processes that were expected to follow them. The FEMAT team well understood that salvage operations would interfere with these recovery processes, which is why they recommended that salvage in LSRs should be very limited in the FEMAT report; this conservative direction with regards to salvage in LSRs was incorporated in the NWFP. Salvage logging of large snags and down boles does not contribute to recovery of late successional forest habitat; in fact, the only activity more antithetical to the recovery processes would be removal of surviving green trees from burned sites. Large snags and logs of decay resistant species, such as Douglas-fir and cedars, are particularly critical as early and late successional wildlife habitat as well as for sustaining key ecological processes associated with nutrient, hydrologic, and energy cycles.	Se EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised" for a discussion o f the many points raised in this comment. . The vegetation section of the final EIS reports that if no action is taken to salvage and replant areas suitable for conifer regeneration they will be re-occupied, generally by brush and hardwood species. This compared to the action Alternatives (Alternatives 2, 3,4, 5, modified 2 and modified 3). The vegetation section goes on to say that the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007). There is evidence that under natural regeneration areas that have had high severity fire only had desired stocking levels met around the edges of the fire where a good seed source is still intact (Bonnett, Schoettle, and Shepperd 2005). Salvage is needed before planting to maintain the safety of those planting the trees and to reduce fuel loading in the areas (vegetation section of the final EIS, Alternative 2). Without salvage and planting, areas with high severity fire will likely not regenerate satisfactorily for many decades.
204.10 - WL - LSR habitat	#17111-27	Extensive reforestation by planting is proposed within the LSRs in the Westside Project area. Slow re-establishment of forest cover can be expected after natural stand replacement disturbances in the Pacific Northwest if tree regeneration is allowed to develop naturally. Recent studies of the establishment of natural stands following wildfire has shown that it commonly took 40 to 60 years on average for tree establishment to be completed and closed forest canopies to develop (Freund et al. 2014 and Tepley et al. 2014). This slow natural tree regeneration process contributed positively to sustaining regional forest biodiversity because it allowed shrub dominated habitat to persist for decades, which sustained a large array of early-successional species, many of which are early successional habitat specialists (Swanson et al. 2011).	See comment number 17111-19. See EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised".

Code	Comment Number	Comment Text	Response
204.10 - WL - LSR habitat	#17111-4	Limited planting may be appropriate within the LSRs to establish tree seed sources for specific species and locations but this should not be done using traditional approaches, which are designed to create extensive areas of uniformly stocked forest stands. Uniform tree planting over large areas is inappropriate in LSRs even at low densities. Appropriate plantings in LSRs would be limited in area and spatially heterogeneous. The inappropriateness of creating dense uniform stands is apparent from the fact that since the origin of the NWFP we have undertaken major programs in variable density thinning in existing plantations in LSRs	See comment number 17111-19. See EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised".
204.10 - WL - LSR habitat	#17111-9	One of the major motivating factors in conducting salvage logging in the Westside fire area - including the LSRs - seems to be economic and not ecologic (DEIS, 10-11), which is further indicated by the Chief s "Emergency Situation Determination" and the "Alternative Arrangements" secured from the Council on Environmental Quality. The NWFP specifically directs that, "Salvage will not be driven by economic or timber sale program factors" in LSRs (NFP SFEIS F-21). The teams that put together FEMAT and the NWFP specifically wanted the LSRs to be exempted from the pressures of programmed timber harvest, because the primary drivers in LSRs were ecological and not economic. Hence, it would seem that the salvage proposed within LSR segments as part of the Westside Salvage Project is inconsistent with the goals and principles of LSR management.	See response to number 12346-5. See also See EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised".
204.10 - WL - LSR habitat	#17387-11	Plant conifers on a very wide spacing in burned LSRs as seed trees only.	Thank you for your opinion.
204.10 - WL - LSR habitat	#17460-1	In particular, Professor Franklin clarifies a number of points regarding proposed salvage logging in the Late-Succesional Reserves. Those points can be summarized as follows: 1. The LSRs were designed to be ecologically robust, able to accommodate events such as the 2014 fires. 2. Salvage logging does not contribute to recovery of LSR habitat, and is in fact detrimental to natural recovery in the LSRs. 3. According to the Northwest Forest Plan, any potential economic benefits of salvage logging and timber sales in LSRs are not to be driving factors in LSR management. 4. The importance of coarse woody debris in the recovery ofLSRs impacted by catastrophic fire, and its ecological value to a variety of species in the post-fire landscape. 5. The value of "naturally disturbed habitat undergoing natural reforestation" to regional biodiversity. 6. The reasons why new, large plantations proposed within the LSRs are ineffective and counterproductive approach to restoring LSR habitat. Professor Franklin elaborates on all of these points, and provides substantial citations to support them; for brevity, and to avoid redundancy, I refer you to the literature he cited. A great deal of the DEIS deals with the discussion of potential future fire behavior; while this is appropriate for safety considerations in the WUI, it is not a factor that should determine habitat or recovery within the LSRs. Natural recovery should be the preferred alternative. The vast majority of timber salvage units within the LSRs do not lie within the WUI; hazardous fuels treatments within the WUI and roadside treatments are 1 sufficient to reduce dangers to private property; given these treatments, there is no additional benefit to private property by salvage logging in the LSRs.	See EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised".. The interdisciplinary team found, based on analysis and literature review, that the project is consistent with the Forest Plan goals and objectives for the Late-Successional Reserve. Response 2 in the "Responsible Opposing Views and Agency's Reponses to Issues Raised" in Chapter 3 of the final EIS describes the balance the project is striking between the need to retain snags, coarse woody debris and other legacy components on the landscape and reducing the future fire risk. Snag and legacy component retention in salvage harvest units is incorporated into project design as described in Chapter 2 of the final EIS. The appropriateness of reforestation in Late Successional Reserves is discussed in response 4 in the "Responsible Opposing Views and Agency's Reponses to Issues Raised" in Chapter 3 of the final EIS. Seventy percent of the Late Successional Reserves in the project area affected by high and moderate severity fire will not be planted, and will proceed unimpeded through a natural succession cycle. . The 30% that will be reforested is expected to be restored to coniferous forests more quickly than the areas not planted. The increase in reforestation and the fuels reduction that will be a result of the site preparation will decrease the wildfire risk in the future. All together the areas that undergo salvage, site preparation and planting are have a higher likelihood of achieving the desired late-successional stand conditions than areas that remain unplanted. Salvage units, combined with strategic fuel breaks are intended to create large blocks where fuels have been reduced. This would reduce the likely severity of future fires and help contain large fires at watershed boundaries. Even if not directly in the WUI, this provides a buffer for many WUI areas.
204.10 - WL - LSR habitat	#18852-27	9) The "Late-Succesional Reserves" (LSR) land designation appears to be improperly applied in the "Westside Recovery" plan which calls for intensive even age salvage timber harvest with site preparation and replanting within this designation	The salvage, site preparation and planting are designed to increase the speed at which desired conditions are met. The focus of salvage and site preparation is the removal of dead or dying trees and planting may include a mix of species including Douglas-fir, sugar pine, ponderosa pine, incense cedar, white fir and red fir (reforestation and release section of Chapter 2 of the final EIS). The project meets Forest Plan Standard and Guideline Management Area 5-30 by retaining snags and coarse woody debris on the landscape. The salvage and site preparation also reduce the fuel loading thereby reducing the threat of future wildfire in the project area (Alternative 2 Direct/Indirect effects of the Fire and Fuels Section of Chapter 3 of the draft EIS). See EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised".
204.10 - WL - LSR habitat	#18857-7	No salvage and no tree planting units in Late-Succesional Reserves.	See EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised".

Code	Comment Number	Comment Text	Response
204.10 - WL - LSR habitat	#18870-1	I urge the Klamath National Forest to follow the NW Forest Plan and not log in Late-Succesional Reserves or geologic reserves.	The Northwest Forest Plan does not prohibit salvage logging in any reserve land allocation. See EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised".
204.10 - WL - LSR habitat	#18909-3	The DEIS does not mention the quality or characteristics of the Collins Baldy, Eddy Gulch or the Johnny O'Neil Late-Succesional Reserves nor does it analyze or disclose the effects of fire, fire suppression or the proposed actions within LSRs. It also fails to disclose any information on 100 acre LSRs designated to protect northern spotted owl nest sites. The condition and purpose of LSRs is an important consideration because the existing conditions suggest that they may not be capable of providing long-term, sustainable habitat for imperiled species like Pacific fishers.	There is no requirement to re-assess the condition of Late-Successional Reserves at the project scale. Proposed actions in LSRs are disclosed repeatedly in Chapter 2. See also Appendix E which addresses the Prefererred Alternative's effects in LSRs. The Regional Ecosystem Office reviewed the proposed project and found it consistent with the requirements of the Forest Plan of the Klamath National Forest. 100 Acre LSRs are found in matrix lands. We are not aware of any salvage proposals that affect 100 acre LSRs. Roadside hazard removal is permitted iwthin these areas. The affected environment in the Wildlife reports analyzes the current condition as affected by the 2014 wildfire for the areas in the project area.
204.10 - WL - LSR habitat	#19157-3	In intensely burned Late Successional Areas near ridge tops, roads and locations where future fires can be effectively stopped, salvage logging is extremely important. The gigantic fuel loading of dead timber in these areas will burn again. Salvage the Late Successional Areas now to protect what remains.	Alternatives 2, 3, 4 and Alternative 2 as modified proposes salvage logging in Late-Successional Reserves. Fuels treatments on ridgetops are in all action Alternatives.
204.10 - WL - LSR habitat	#5873-102	Salvage may be undesirable where large diameter snags needed by wildlife are in short supply in adjoining areas. … Many years elapse in high fire severity burns before newly grown large diameter snags can replace the fallen snags, so leaving an ample density of snags following fire can help maintain a minimal snag resource during the 20 to 40 year postfire period when many snags have already fallen. Leaving a high density of snags would require constraints on harvesting. …	This is a direct quote from Brown, J., Reinhardt, E., and Kramer, K. (2003). Coarse Woody Debris: Managing Benefits and Fire Hazard in the Recovering Forest. USDA, US Forest Service. RMRS-GTR-105. There is no project specific comment to respond to.
204.10 - WL - LSR habitat	#5873-128	LSRs provide habitat for cavity dependent species. Diminishment of the habitat for species associated with dead wood will violate the Northwest Forest Plan. The Northwest Forest Plan clearly anticipated that salvage logging within LSRs must be limited to provide quality habitat for Black-backed woodpecker, white-headed woodpecker, and Williamson's sapsucker. To benefit the black-backed and white-headed woodpeckers, and Williamson's sapsucker in the Eastern Cascade Range, potential mitigation measures would be to reduce harvest and salvage in old-growth areas. Because of the strength of Late-Succesional Reserves under the selected alternative, standards and guidelines limiting salvage and thinning in those reserves, and matrix management standards and guidelines that specifically incorporate mitigation for white-headed and black-backed woodpeckers, we conclude that these potential mitigation measures are not necessary. NWFP ROD page 31. Salvage logging will clearly diminish habitat for these three species. If the agencies certainly can't claim to be providing abundant high quality habitat for cavity associated species in the Matrix, so if they don't provide for snag associated species in the reserves, then they really don't provide sufficient habitat for cavity dependent species anywhere, so a new programmatic EIS would be required to rework the regional management framework to provide adequate habitat for viable populations of snag associated species.	Response number 3 in the "Responsible Opposing Views and Agency's Reponses to Issues Raised" Section in Chapter 3 of the final EIS addresses the concern about efficacy of salvage harvest in Late-Successional Reserves.
204.10 - WL - LSR habitat	#5873-131	Jerry Franklin has said of salvage logging in LSRs that "Salvage would be completely antithetical to the goals of reestablishing late-successional forest habitat. Retention of the large snags and logs are essential to natural recovery processes and none of this material can be viewed as in excess to ecological needs." Jerry Franklin, Comments on the Siskiyou NF's Biscuit Fire Salvage DEIS, Jan. 20, 2004.	Chapter 3 of the final EIS under the section called "responsible opposing views and agency's responses to issues raised" provide additional response to this comment.

Code	Comment Number	Comment Text	Response
204.10 - WL - LSR habitat	#5873-145	The Warner Creek LSR salvage project on the Willamette National Forest endeavored to retain trees 20 inches and over. REO found it consistent with the LSR Standards & Guidelines. Consider the following excerpt from the REO review: Snags should be retained when they are likely to persist until late-successional conditions have developed. Complies. The project proposes to remove all dead trees within 1.2 to 2 acre circles in dispersed group selection areas, and all dead trees less than 20" dbh (those less likely to survive as snags during the next 80 to 100 years; i.e., the period of creation of LS/OG conditions) from a 50-foot area around the group selection salvage sites. … The project occurs in an area with nearly 100% tree mortality. The proposal anticipates that within the 492-acre group selection prescription, approximately 98 acres of dispersed openings 1.2 to 2 acres in size would be created. Within the 492-acre group selection, dead trees 20" dbh and larger surrounding these 98 acres of dispersed openings will be retained for snag and coarse woody debris recruitment. REO Review of Warner Creek Salvage. http://web.archive.org/web/20050226202105/http://reo.gov/library/lsr/letters/270lsr.htm	The Regional Ecological Office is reviewing the Westside Fire Recovery project for compliance with Late Successional Reserve policies.
204.10 - WL - LSR habitat	#5873-146	Salvage logging in LSRs must retain typical amounts of large woody debris. Retaining large woody debris is especially important in LSRs because many spotted owl prey species are associated with down wood including flying squirrels, red-backed voles, bushy-tailed woodrat, dusky-footed woodrat, Douglas' squirrel, Townsend's chipmunk. Carey, Andrew B. November 1991. The biology of arboreal rodents in Douglas-fir forests. PNW-GTR-276. Portland, OR. in Huff, Mark H.; Holthausen, Richard S.; Aubry, Keith B., tech. coords.; Biology and management of old-growth forests. http://web.archive.org/web/20030406073837/http://www.fs.fed.us/pnw/pubs/gtr276.pdf. Sztukowski and Courtney. SEI. 2004. Appendix 4: Summary of Prey Biology. in Courtney, Blakesly, et al. 2004. Scientific Evaluation of the Status of the Northern Spotted Owl. http://www.sei.org/owl/finalreport/Appendices.pdf. The Northwest Forest Plan ROD provides Standards & Guidelines for salvage logging in LSRs that include: "Province-level plans will establish appropriate levels of coarse woody debris and decay rates to be used. Levels will be 'typical' and will not require retention of all material where it is highly concentrated, or too small to contribute to coarse woody debris over the long timeframes discussed." Pp C-14 – C-15. The agencies too often provides only minimal amounts of large woody debris in salvage sales and the agencies fail to consider the fact that abundant large woody debris is "typical" after fire and retaining all large wood is necessary to sustain LWD levels over time. "Legacies of snags, logs, and other woody debris are typically very large following an intense natural disturbance …" Dr. Jerry F. Franklin, Professor of Ecosystem Studies, College of Forest Resources, University of Washington, July 15, 2004. TESTIMONY FOR THE RECORD ON OVERSIGHT HEARING ON "RESTORING FORESTS AFTER CATASTROPHIC EVENTS" BY HOUSE COMMITTEE ON RESOURCES, SUBCOMMITTEE ON FOREST AND FOREST HEALTH. (emphasis added). According to Jerry Franklin, after a fire there is no ecological excess of large wood and that if you remove some you are taxing the ecological recovery processes. There is a price to pay and LSRs not the place for that.	The final EIS provides information concerning tree planting in Chapter 3 of the final EIS in the sections called "Responsible opposing views and agency's response to issues raised".

Code	Comment Number	Comment Text	Response
204.10 - WL - LSR habitat	#5873-182	The salvage recommendations in the Final Draft Recovery Plan for the Northern Spotted Owl (December 1992) provide: 1. "Diseased and damaged trees are key structural components of suitable owl habitat... planning must acknowledge the considerable value of retaining dead and dying trees in the forest" 2. "salvage should not diminish the suitability for owls now or in the future" 3. salvage should be limited to areas with less than 40% canopy closure, and >10 acre disturbances, 4. "Surviving trees provide a significant residual of larger trees in the developing stand... Consequently, all standing live trees should be retained, including those injured (e.g. scorched) but likely to survive." 5. "focus on retaining snags likely to persist until suitable owl habitat has developed and the new stand is again producing large snags," 6. "snag retention guidelines should be developed for each physiographic province based on the general guidance provided in this section... Retention of all 20-inch dbh snags should be a starting point... Snags larger than 20 inches dbh are important to cavity nesters in all provinces, and have relatively slow decay rates. Smaller diameter snags are generally less important to cavity nesters and are less likely to persist until suitable habitat develops. Thus, the salvage of these smaller diameter snags should not impair the development of suitable habitat" 7. "guidelines are intended to prevent negative effects on owl habitat" 8. "because there is much to learn about the development of owl habitat, it seems prudent to allow only conservative quantities of salvage material from suitable owl habitat" 9. "although there is some uncertainty concerning the optimum density of snags to be provided for spotted owls, management to provide maximum likely benefit for owls and their prey is an appropriate strategy" 10. "retain adequate CWD quantities in the new stand so that in the future it will still contain amounts similar to naturally regenerated stands," etc. 11. "In addition to the stand level salvage guidelines, the cumulative effects of any proposed salvage should also be considered at a larger scale. One focus of the analysis should be on spotted owl activity centers known before the disturbance and thought to still be occupied after the disturbance. Where owls are still thought to be inhabit the area to be salvaged, the possible effect of the salvage around their activity centers should be considered. In particular, special consideration should be given to stands that could again provide foraging opportunities for owls in the near future. For example, small disturbances or the edges of large disturbances may provide habitat for owl prey and access to that prey by owls. Also, denser clumps of residual dead trees may offer foraging opportunities by owls. The most current knowledge of prey species should be considered in these cases, and special guidelines developed for these areas. The cumulative impact of salvage in these area should be considered." The final draft recovery plan salvage guidelines are partially excerpted in the Feb 1994 Spotted Owl FSEIS Volume II Appendix B, pages B-75 to B-77. The response to comments in Appendix F (page F-37) of the 1994 FSEIS makes clear that the salvage Standards & Guidelines in the NWFP ROD are derived from the Final Draft Northern Spotted Owl Recovery Plan (1992). The FEMAT report also spelled out the consequences if excessive salvage is allowed in LSRS, that is a. “the short- and long-term contributions of salvaged areas to Late-Succesional Reserves would be decreased. b. “There would be greater risks to watersheds [than if salvage were more limited] c. “There would be high levels of distrust of agency motives.” FEMAT page II-18. These are serious adverse consequences that are not disclosed and considered in the DEIS. Proposed activities, especially commercial log removal, will violate requirements to maintain long-term soil productivity. Soil compaction and erosion, loss of coarse woody debris, and erosion all adversely affect long-term productivity. Removal of a major fraction of the available organic matter through salvage of large trees will adversely affect soil productivity for decades or centuries. All the commercial removal activities will impede development of high quality LSR habitat in violation of the NFP ROD and violate the requirement to focus LSR salvage on long-term LSR objectives. See NFP ROD p. C-14. Salvage logging that removes most of the large material from extensive areas will prevent development of complex young forest reduce options to develop complex old forest. LSRs were set aside primarily for spotted owls and other species associated with late-successional old-growth. Salvage logging will adversely affect spotted owls and their prey. Proposed activities, especially commercial log removal, will violate the requirement to maintain optimal late-successional habitat, (such as by reducing cavity nesting opportunities for spotted owl prey such as flying squirrels and reducing woody debris far below optimal levels for ground-dwelling	Response 2 in the "Responsible Opposing Views and Agency's Reponses to Issues Raised" in Chapter 3 of the final EIS describes the balance between maintaining snags and coarse woody material and reducing the future fire risk on the landscape. The Westside Fire Recovery project does not propose to remove all organic material from salvage units. Snag retention, soil cover project design features, and coarse woody debris project design features (See Chapter 2 of the final EIS) are all intended to retain legacy components and soil productivity in salvage harvest units. Response 3 in the "Responsible Opposing Views and Agency's Reponses to Issues Raised" in Chapter 3 of the final EIS argues that as designed in Chapter 2 of the final EIS salvage logging in the Late Successional Reserves is compliant with the requirements and recommendations of the Forest Plan and the Late-Successional Reserve Assessment. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
		spotted owl prey species	
204.10 - WL - LSR habitat	#5873-4	Salvage logging is contrary to the desired objectives for all reserve land allocations, including LSRs and riparian reserves. The Klamath Forest Plan says that the desired condition of LSRs is “Snags are common…” (Klamath LRMP p 4-83) In the decades after fire, snags are NOT common, and salvage logging will make that much worse.	Response number 3 in the "Responsible Opposing Views and Agency's response to Issues Raised" Section in Chapter 3 of the final EIS addresses the concern about efficacy of salvage harvest in Late-Successional Reserves, meeting the Northwest Forest Plan (and therefore the Klamath National Forest Plan) Standard and Guidelines and recommendations in Forest Ecosystem Management Assessment Team.
204.10 - WL - LSR habitat	#5873-6	Salvage logging will remove late successional habitat that LSR were intended to protect. Snags and large logs are key attributes of late successional habitat and these features will help late successional species persist in post-fire landscapes. Salvage logging will remove these late successional features and render the SLR less suitable for the very species that LSR were intended to protect.	The Northwest Forest Plan ROD provides guidelines for salvage harvesting in Late Seral Reserves (Pgs. C-13 - C-16). The guidelines seek to "protect and enhance conditions of late-successional and old-growth forest ecosystem". These guidelines were used during the planning of this project. The project is in compliance with the Standards and Guidelines for salvage in Late-Successional Reserve.
204.10 - WL - LSR habitat	#5873-61	Briefly meeting management plan snag targets is grossly inadequate. Historically, a mosaic of recent and not-so-recent fires, left lots of “snag patches” and patchy accumulations of down wood of various sizes and decay-stages. These snag patches provided tremendous habitat value for a whole host of wildlife species, include birds, mammals, amphibians, insects. 96 species are known to be associated with snags and 86 species are associated with down wood. Most of these species depend upon or prefer large snags and wood. With aggressive salvage policies that continue to this day, these snag patches are an under-represented feature on the landscape. The agency’s snag retention guidelines are based on wildlife needs, but fail to consider or analyze the need to large snags and large down logs for shade, water storage, disturbance (via falling and sliding), nutrient storage, channel forming, sediment trapping, soil conservation, underground processes, etc.	Response number 2 in the "Responsible Opposing Views and Agency's response to Issues Raised" Section in Chapter 3 of the final EIS addresses this concern. Snags and coarse woody debris will be retained to Forest Plan Standard and Guideline requirements which is intended to meet multiple ecological requirements including soil productivity and wildlife and fish habitat. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
204.10 - WL - LSR habitat	#5873-77	Lessons Learned During the Last Fifteen Years … Several major lessons have been learned in the period 1979-1999 that have tested critical assumptions of these earlier management advisory models: • Calculations of numbers of snags required by woodpeckers based on assessing their 'biological potential' (that is, summing numbers of snags used per pair, accounting for unused snags, and extrapolating snag numbers based on population density) is a flawed technique. Empirical studies are suggesting that snag numbers in areas used and selected by some wildlife species are far higher than those calculated by this technique.226 • Setting a goal of 40% of habitat capability for primary excavators, mainly woodpeckers,369 is likely to be insufficient for maintaining viable populations. • Numbers and sizes (dbh) of snags used and selected by secondary cavity-nesters often exceed those of primary cavity excavators. • Clumping of snags and down wood may be a natural pattern, and clumps may be selected by some species, so that providing only even distributions may be insufficient to meet all species needs. • Other forms of decaying wood, including hollow trees, natural tree cavities, peeling bark, and dead parts of live trees, as well as fungi and mistletoe associated with wood decay, all provide resources for wildlife, and should be considered along with snags and down wood in management guidelines. • The ecological roles played by wildlife associated with decaying wood extend well beyond those structures per se, and can be significant factors influencing community diversity and ecosystem processes. Rose, C.L., Marcot, B.G., Mellen, T.K., Ohmann, J.L., Waddell, K.L., Lindely, D.L., and B. Schrieber. 2001. Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management, Chapter 24 in Wildlife-Habitat Relationships in Oregon and Washington (Johnson, D. H. and T. A. O'Neil. OSU Press. 2001) http://web.archive.org/web/20060708035905/http://www.nwhi.org/inc/data/GISdata/docs/chapter24.pdf	This is a direct quote from Rose et al (2001). No project-specific comment for which to respond. We considered snag retention in project design; see wildlife project design features in Chapter 2 of the final EIS. See effects analysis in Chapter 3 of the final EIS. See response to comment 5873-183. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.11 - WL - legacy	#17460-8	The DEIS mentions as project goal of 2-8 snags per acre remaining per acre, but that these snags could be averaged out within units greater than 100 acres, and the retention requirement would not apply on salvage units smaller than 100 acres. In the "Forest Plan Consistency Checklist" published with the Westside project documents, S&G No 8-22 specifies: "Provide for an average of 5 snags per acre, in a variety of size and decay classes, within each landscape. These snags need not be equally distributed The actual number of snags to be maintained in areas managed for timber production may vary from 2 to 5, depending on the amount of snags available within the surrounding landscape and the desired future condition of that landscape. " There is no exclusion given for salvage units smaller than 100 acres to be exempt from snag retention, and while snags may average 5 per acre (although not equally distributed within each acre), clumping groups of snags and averaging them out over 100 acre or more units defeats the purpose of the standards and guidelines given. While clumping snags may provide a minor benefit to fire suppression if a fire is present, does leaving clumped groups of snags provide optimal habitat, versus that of randomly dispersed snags 5 would provide? By leaving clumps, rather than more evenly distributed snags, competition for denning sites between bears, fisher, cats, and nesting sites for birds, and an increased proximity to greater concentrations of different predators would create additional competition for nearby food sources. It also eliminates the flexibility of selecting optimal snags having cavities, complex branching structure, and other desirable features for wildlife where they are randomly distributed through the forest.	A variety of methods for snag retention are being used to produce heterogeneity on the landscape. A discussion of the snag retention design has been incorporated into Chapter 2's description of salvage harvest in the final EIS. The design includes until the next stand is capable of producing such material by retaining legacy trees, not salvaging in hydrologic Riparian Reserves and inner gorges, designating snag retention areas and protecting these features from future wildfire disturbance. Response 2 in the "Responsible Opposing Views and Agency's response to Issues Raised" in Chapter 3 of the final EIS describes how the snag retention design meets the Forest Plan requirements and wildlife needs. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
204.11 - WL - legacy	#18909-31	The DEIS page 90, provides that the KNF will retain "legacy component trees and snags." Legacy trees are "old standing trees that have persisted on the landscape after man-made and natural disturbances" and contain at least one of the following characteristics: "split or broken tops, heavy decadent branching, large mistletoe brooms, otherwise damages to the degree that a cavity may form such as basal fire or lightning scares, or other features that indicate decay and defect." The Service lastly states that "[i]f the legacy component tree or snag must be felled for safety reasons, retain the log whole in the unit." The Service relies on this PDF to mitigate the impact of refusing to retain snags in non-riparian areas in units less than 100 acres in size. Page 49 of the Draft Wildlife BA states that, "all salvage units will retain legacy trees where they occur regardless of unit size, which may help alleviate the effect of a lack of snag retention in areas without riparian reserves." However, if legacy trees are impossible to determine, the legacy tree retention policy will mitigate no effects. In a high-severity area, how will the agency identify legacy trees or snags?	Even in high-severity vegetation burn areas the characteristics of legacy components such as large limbs, broken tops and old fire scars are easily discernable. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
204.11 - WL - legacy	#5873-94	core purpose of this NEPA analysis is to balance the value of retaining snags and down wood spotted owls and other wildlife against the fire hazard caused by retaining snags and down wood. The FEIS fails to acknowledge that balance is best achieved if the agencies retain all large snags because they contribute greatly to habitat value and contribute little to fire hazard, while focusing fuel reduction only on small snags that contribute little to habitat values while contributing disproportionately to fire hazard.	We agree that snags have many benefits, as discussed in the final EIS. While we agree that a balance between retaining snags and downed woody material for fire hazard and resource/wildlife value is needed, this is not a core purpose of National Environmental Policy Act per 40 CFR 1500. In addition, project design features for the Westside Fire Recovery Project help describe this balance (Chapter 2 of the EIS). Snag and down woody retention requirements as it relates to fire hazard and wildlife habitat is described in Chapter 1 of the EIS under the section about salvage in Late Successional Reserves. The Section "Risk Reduction Salvage in Late-Successional Reserves" in Chapter 1 of the final EIS describes how the activities proposed by the project reduce the risk to Late-Successional Reserve objectives and snag retention needs defined in the Forest Plan Standards and Guidelines. Response number 2 in the "Responsible Opposing Views and Agency's response to Issues Raised" Section in Chapter 3 of the final EIS offers reasoning for the treatments prescribed including salvage harvest and how wildlife needs are being met in the project area. This comment provides no evidence that the guidelines of the Forest Plan are inadequate. See response to 5873-2.
205 - Plant	#15479-1	There are so few places left with old growth trees that we need to protect at all costs. These trees often protect the sources of our water as well as contain DNA we should be guarding for future generations.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
205 - Plant	#18857-19	No salvage logging in high elevation sites above 5,500', including mountain hemlock (Tsuga mertiensiana), red fir (Abies magnifica), and white fir (Abies concolor) plant communities. These habitat types are adapted to long fire return intervals and relatively high severity fire effects. Scattered snag patches are natural, and due to the landscape location and short growing season, will recover slowly and create minimal fuels as succession takes place.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The proposed action does include some salvage logging above 5500' in elevation, in areas where white fir and red fir stands have been completely killed by fire. Although the bark of these species can be quite thick on older trees, these habitat types are not adapted to long fire return intervals, as the build-up of fuel from needle cast, diseased limbs, rotten boles with pitchy cankers (in white fir particularly), and general stand decay make these stands prone to adverse effects from fire. There will be no shortage of scattered snag patches on the landscape in areas not proposed for treatment of any kind; these snag patches will remain on site, over and above the fuels generated from the regeneration of the shrub component at this elevation, which is usually snowbrush, and highly flammable in itself, due to the resins in the leaves. The eventual succession of the coniferous species at the higher elevations, will be retarded by the dense shrub component, and lack of available seed source.
205 - Plant	#18926-10	The DEIS indicates on page 176 that the projected actions involved in Alternative 2 may have beneficial and negative effects on Thermopsis robusta in terms of disturbance levels required to increase population viability. There is no explanation of how, specifically, disturbance benefits this species. It is recommended that the specific role of disturbance in benefiting this species be induced in future discussions and is clarified.! !!!	Specifically, disturbance events that scarify (scratch or break) the seed coat of Thermopsis robusta result in germination of the seed. In this case, since the population is largely in a gravel pull-out on the road, the action of vehicles moving gravel that scarifies the seed causes germination. Additionally, disturbance can benefit T. robusta by creating openings in forested areas which may provide suitable habitat. In the case of this population, disturbance may prevent encroaching vegetative establishment therefore maintaining suitable habitat characteristics. In areas where T. robusta populations have been exposed to fire, seed is both scarified and habitat opened from the same event.

Code	Comment Number	Comment Text	Response
205.03 - Plant - FS Sensitive	#17112-3	The DEIS acknowledges that there are no regulations requiring private landowners to protect sensitive plant species or reduce the spread of NNIS species (Chapter 3, p. 179). However, there are no suggestions to integrate private landowners' management activities to align with the Forest Service's goals for this project. It is recommended that guidelines for attempting to gain private landowner cooperation via alignment of management methodology be incorporated into the DEIS.	This suggestion is outside the scope of the analysis for this project.
205.03 - Plant - FS Sensitive	#18878-46	Botany and Non-Native Invasive Species DEIS: Due to the expedited time frame, need to conduct surveys during appropriate times for identification (typically when blooming), and the obligation to assess the condition of known populations, it was unfeasible to conduct unit surveys in search of un-known populations of Sensitive species. (Pg. 170) Comment: While the KNF is refusing to survey previously un-surveyed suitable habitat to locate known sites of Sensitive species, it is re-surveying already known sites in order to remove the protection buffers when possible to facilitate salvage treatments. This is a unique interpretation of the NWFP and the LRMP that does not seem to be protective of culturally 12 of 22 significant and Sensitive species. It seems essential to survey un-surveyed areas to ensure protection and recovery sensitive species and culturally significant species.	The statement, as quoted on page 170 of the draft EIS, is correct. However, the Forest is not "refusing" to conduct surveys. The sentence following the description of surveys for known sites states: "If populations are located within treatment areas and the habitat in its current state is likely to be negatively impacted by the proposed action, a project design feature intended to protect Sensitive species populations from a declining trend in viability (will be applied). For clarification purposes, this sentence should have been prefaced by "Additionally" to clarify surveys that will be conducted in suitable habitat for Sensitive species prior to activities being implemented. Additionally, the Forest plan Standard and Guideline 6-8 (pg. 4-23) states that "if surveys (for Sensitive species) cannot be conducted, project areas should be assessed for the presence and condition of Sensitive species habitat. Past surveys have occurred in all fire areas, which have helped build the Forest's database of known occurrences, and were used when determining where suitable habitat may still be present. Additionally, aerial photographs, RAVG data, treatment unit selection criteria, site visits, and species distribution information were used to determine if suitable habitat for Sensitive species is present within treatment units. Also, on page 171 of the draft EIS, it states: "To be in compliance with Survey and Manage direction pre-disturbance surveys will be conducted for Category A and C species in project activity units where known sites and suitable habitat are still present". Those surveys are currently in progress.
205.03 - Plant - FS Sensitive	#18909-88	Eriogonum hirtellum is restricted to bald serpentine outcrops and gravelly slope and ridges that typically have no overstory cover and little understory vegetation. Due to the open characteristic of E. hirtellum habitat, equipment may be transported through the area, which could potentially damage some individuals within the populations. These effects would have a declining effect on population viability as individuals are impacted. Direct effects to Erythronium hendersonii populations would occur to individuals and portions of the habitat where piles are burned but in the long run may benefit if understory vegetation is controlled. The DEIS provides no real analysis for the possible long-term benefits nor does it describe any actual locations.	E. hirtellum populations that may be affected by project activities occur in rocky, open serpentine outcroppings near Tom Martin Peak in the Happy Camp Complex fire area. Populations slightly overlap with roadside hazard tree removal, helicopter salvage, and site preparation and planting activities. These project activities are almost exclusively focused on the removal of conifers. As previously stated, suitable habitat for E. hirtellum is characterized by open, rocky outcroppings that are often lacking in conifer cover and subsequently project activities are unlikely to occur in areas that currently support or may provide suitable habitat for E. hirtellum. Additionally, the proposed use of helicopter salvage techniques in the overlapping unit would limit the likelihood of damage to suitable habitat from equipment entry. Therefore, affects to these populations are anticipated to be extremely minimal in the short and long-term. This has been clarified in Chapter 3 of the draft EIS. The possible long-term benefits for Erythronium hendersonii would occur after five years, as defined in the draft EIS on page 173. Fuels treatments, as proposed, are likely to provide the benefits of a more open secondary canopy for more than five years. Appendix A of the Botany report indicates unit locations for all species of concern and non-native invasive species infestations.
205.03 - Plant - FS Sensitive	#18909-89	The DEIS claims that there would be no effects to these species because they are not known to occur, but surveys have not been conducted for these species nor has habitat been assessed in the project area in violation of the KNF LRMP. Conifer planting is supposed to benefit sensitive ectomycorrhizal fungi, however the DEIS does not address the benefits of natural regeneration or the benefit of moderate severity fire, the benefit of retained snags and CWD from the creation of favorable micro-climate conditions or undisturbed soils which would all have negative consequences due to the proposed project.	The comment does not specify which species are being referred to in the effects statement. The Forest Plan has not been violated, as habitat assessments have been made for habitat considered suitable on page 180. Since natural regeneration of conifer species in moderate and high intensity burn areas is not likely to happen soon, there are no timely benefits. The benefit of snags and Coarse Woody Debris for microclimate creation has been addressed in Forest Plan Standard and Guideline 6-16, and applied to the project.

Code	Comment Number	Comment Text	Response
205.04 - Plant - S&M	#12346-65	KNF timber planners have elected to simply ignore the NWFP survey and manage protocols that interfere with rapid logging. Page 170 of the DEIS indicates that "[d]ue to the expedited time frame, need to conduct surveys during appropriate times for identification (typically when blooming), and the obligation to assess the condition of known populations, it was unfeasible to conduct unit surveys in search of un-known populations of Sensitive species." While the KNF is refusing to survey previously un-surveyed suitable habitat to locate known sites of Sensitive species, it is re-surveying already known sites in order to remove the protection buffers when possible to facilitate logging. This is an interesting and unique interpretation of the NWFP and the KNF LRMP. 33 The analysis of project effects on S&M and Sensitive species consists of conclusions without data. As stated on page 22 of the Botanical Resources Report, the "[a]nalysis is based on spatial [pre-fire] population records only, field visits to known [and unsurveyed] sites were not conducted prior to analysis."	The statement, as quoted on page 170 of the draft EIS, is correct. However, the Forest is not "refusing" to conduct surveys. The sentence following the description of surveys for known sites states: "If populations are located within treatment areas and the habitat in its current state is likely to be negatively impacted by the proposed action, a project design feature intended to protect Sensitive species populations from a declining trend in viability" (will be applied). For clarification purposes, this sentence should have been prefaced by "Additionally" to clarify surveys that will be conducted in suitable habitat for Sensitive species prior to activities being implemented. Additionally, the Forest plan Standard and Guideline 6-8 (pg. 4-23) states that "if surveys (for Sensitive species) cannot be conducted, project areas should be assessed for the presence and condition of Sensitive species habitat. Past surveys have occurred in all fire areas, which have helped build the Forest's database of known occurrences, and were used when determining where suitable habitat may still be present. Additionally, aerial photographs, RAVG data, treatment unit selection criteria, site visits, and species distribution information were used to determine if suitable habitat for Sensitive species is present within treatment units. Also, on page 171 of the draft EIS, it states: "To be in compliance with Survey and Manage direction pre-disturbance surveys will be conducted for Category A and C species in project activity units where known sites and suitable habitat are still present" Those surveys are currently in progress. The conclusions for the draft EIS analysis were based on the data gathered over many years of survey which resulted in our large data set of known sites. The page numbers associated with the spatial analysis in the comment, are page 8, of the Executive summary, and page 27, under Sensitive species.
205.04 - Plant - S&M	#18909-90	There are 2 known populations of Ptilidium californicum, also known as Pacific fuzz wort, in roadside hazard units, which must be protected. However surveys for this species has not been completed. This is a Category A species, meaning the species is rare and all known sites or population areas are likely to be necessary to provide reasonable assurance of species persistence. The DEIS violates the NFP Survey and Manage Guidelines. Category A species require surveys prior to ground disturbance and requires strategic surveys. It is not clear if strategic surveys have been completed. Page 8 of the 2001 S&M Guidelines state: "Surveys Prior to Habitat-Disturbing Activities: Surveys will be conducted at the project level prior to habitat-disturbing activities, and in accordance with Survey Protocols, to avoid loss of undiscovered sites by habitat-disturbing activities. Species sites found as a result of these surveys will be managed as known sites." There is one population of Albatrellus flettii and one population of Phaeocollybia californica within proposed treatment areas, which are Category B species. The objective for these species is to manage all known sites and reduce the inadvertent loss of undiscovered sites. Strategic surveys are required for Category B species and the objective of strategic surveys in this category is to find additional new sites and to characterize the habitat, improving the ability of the agencies to know where to survey and how to manage and conserve the species. Strategic surveys build upon and incorporate information from previous and ongoing surveys. Species sites found as a result of strategic surveys will be managed as known sites. Strategic survey accomplishments, including completion by province, will be summarized in an annual report. "Old growth" is specified in this standard and guideline to assure retention of what is assumed to be the highest quality potential habitat for Survey and Manage species until strategic surveys are completed or equivalent-effort surveys are conducted. "Province" is specified as the geographic unit in which to assess completion of strategic surveys given that it represents the smallest, logical, well-defined area for which the results of strategic surveys likely could be compiled, analyzed, and presented with meaningful results. The DEIS claims that "flag and avoid" is expected to protect this species, however this project design feature is not guaranteed and has been known in other projects to be ineffective. Eighteen Cypripedium fasciculatum and sixteen Cypripedium montanum populations are present within units. These are Category C survey and manage species. The DEIS at page 180, "to be in compliance with Survey and Manage guidelines populations deemed high priority must be protected. High priority will be given to robust, healthy populations located in areas with intact suitable habitat present following the 2014 fires." However, the DEIS fails to disclose if those high priority areas were adequately designated as required in the S&M Standards and Guidelines. More importantly pre-disturbance surveys have not been completed in direct violation of the NFP Survey and Manage Guidelines. There is one known population of Otidea leporine and one of Tremiscus helvelloides within treatment areas. These are Category D species. The DEIS does not disclose or determine if these sites are high-priority areas. However the S&M Guidelines state that until high-priority sites can be determined, manage all known sites. Two populations of Phaeocollybia olivacea are located within activity units and are	The two known populations of Pacific fuzzwort in roadside hazard units will be protected, per Project Design Feature, Botany-2, noted as "flag and avoid". The commenter states that this project design feature is not guaranteed, and has been known to be ineffective. No project design feature is guaranteed to be effective unless properly implemented, and every effort is made to see that it done in all projects. The draft EIS does not violate the Survey and Manage guidelines for Category A species in roadside hazard units. On page Standard and Guideline 22, of the 2001 S&M Guidelines, in defining habitat disturbing activities, it states: "Routine Maintenance of improvements and existing structures is not considered a habitat-disturbing activity. Examples of routine maintenance include pulling ditches, clearing encroaching vegetation, managing existing seed orchards, and falling hazard trees." Strategic surveys for National Environmental Policy Act documents are required for Category B species only. For Categories A, C, D, and E, strategic surveys are not required for National Environmental Policy Act analysis. Strategic Surveys for Category B fungi are considered complete. The best available science, documenting rationale and results of 12 years of random grid, purposive, strategic, and known site surveys in the Northwest Forest Province was completed in May of 2015 (Hoover, L. et al, 2015). This comprehensive report addresses the four criteria for considering Strategic Surveys complete, as stated on page 30 of the ROD Standard and Guidelines (USDA/USDI 2001). (This response in comments is an update from the following sentence found in the body of the EIS: "In the Assumptions section of the Botany report, on page 172 of the draft EIS, it is stated that Strategic Surveys for Category B fungi are considered complete, pending acceptance of the comprehensive report submitted to Regional Office for approval (this spring).") The designation of high priority sites, on pages 180-181 of the draft EIS, has been clarified in the addendum between draft and final: since high priority sites were not designated to protocol by Regional Ecosytem Office, all sites will be protected.

Code	Comment Number	Comment Text	Response
		a Category E species. It is not clear if strategic surveys have been completed for the A-E as required in the S&M Guidelines.	
205.05 - Plant - Noxious Weeds	#18852-29	11) Non-Native Invasive Species introduction and colonization are anticipated to be "High" as expressed in the DEIS, and exacerbated by the proposed management of Alternatives 2-5. This risk is not adequately addressed, nor mitigating measures over time defined. "Non Native Invasive Species", pose some of the most serious risks to long term ecological health. Resources to ameliorate this risk have not been and will not be forthcoming.	The high risk of introduction and spread of non-native invasive species has been acknowledged, and project design features to mitigate that risk have been included in Table 2-35 in Chapter 2. The commenters statement about resource availability to ameliorate risk makes an un-predictable assumption. Resources, although limited, have been allocated for the prevention and treatment of invasive species.
205.06 - Plant - General, Rare	#12346-46	Page 179 of the DEIS paradoxically claims that there will be no effect to sensitive bryophytes, lichen and fungi from roadside logging of live trees because "no known sites" would be impacted. It would be strange indeed if any "known sites" were impacted given that the agency has refused to survey for these sensitive species. When one chooses not to "look" it is nearly impossible to "know" what is on the landscape that will be impacted by proposed logging activities.	The statement, as quoted on page 170 of the draft EIS, is correct. However, the Forest is not "refusing" to conduct surveys. The sentence following the description of surveys for known sites states: "If populations are located within treatment areas and the habitat in its current state is likely to be negatively impacted by the proposed action, a project design feature intended to protect Sensitive species populations from a declining trend in viability (will be applied). For clarification purposes, this sentence should have been prefaced by "Additionally" to clarify surveys that will be conducted in suitable habitat for Sensitive species prior to activities being implemented. Also, on page 171 of the draft EIS, it states: "To be in compliance with Survey and Manage direction pre-disturbance surveys will be conducted for Category A and C species in project activity units where known sites and suitable habitat are still present" Those surveys are currently in progress.

Code	Comment Number	Comment Text	Response
205.06 - Plant - General, Rare	#18857-13	No salvage in endemic or rare conifer stands and adjacent available habitat. This would include foxtail pine (Pinus balfouriana), Baker's cypress (Cupressus bakeri), and Brewer spruce (Picea breweriana) to allow for natural regeneration.	This comment is suggesting that we do not salvage in rare conifer stands, specifically in foxtail pine, Baker's cypress, and Brewer spruce. This comment is in line with Forest plant standard and guideline 21-57 which directs us to "Maintain a healthy and resilient population of all species, including special interest species such as Pacific yew, Brewer spruce, Port-Orford-cedar, Pacific silver fir, Baker cypress and whitebark pine throughout their native range." The Westside Fire Recovery Project does not propose to salvage log areas that support populations of foxtail pine, Brewers spruce, or Baker's cypress. There are foxtail pine populations within and surrounding the Lake Mountain Special Interest area that may overlap with roadside hazard and fuel break treatments. In order to maintain foxtail pine snags within the Lake Mountain Special Interest Area during implementation of fuels treatments, a project design feature (BOTANY-6) has been included that requires a Forest Botanist be consulted prior treatment in this Special Interest Area. There are two stands of Baker's cypress located within the project area, however these stands are not within any project activity units and thus will not be affected by salvage or other project activities associated with the Westside Fire Recovery Project. There are no Brewer spruce stands located within the Project boundary and therefore this species will not be affected by any activities associated with the Westside Fire Recovery Project.
205.06 - Plant - General, Rare	#18909-87	The DEIS assumes that botanical species of concern located in moderate severity burn areas are extirpated and that all habitat in those fire areas are no longer supports viable populations! While microclimates may have changed in some areas, moderate severity fire is highly variable and may still be providing all necessary elements for growth. Moderate severity fire causes moderate soil heating and occurs where litter is consumed and duff is charred or consumed, but the underlying mineral soil is not visibly altered. The arbitrary and capricious assumptions for rare botanical species and their environs in the DEIS fail to meet the NEPA "hard look" requirement and is contrary the Northwest Forest Plan (NFP) and the Klamath National Forest (KNF) Land Resource Management Plan (LRMP). The DEIS page 170 states that: "Due to the expedited Project time frame, need to conduct surveys during appropriate times for identification (typically when blooming), and the obligation to assess the condition of known populations, it was unfeasible to conduct unit surveys in search of un-known populations of Sensitive species." "Due to the ephemeral appearance of fruiting structures, and the expedited time frame of the Westside Fire Recovery project, surveys for Sensitive fungal species were not practical." The DEIS page 172: "Analysis is based on spatial population records only, field visits to known sites were not conducted prior to analysis." The lack of any information on the actual status of these botanical species fails the "hard look" NEPA requirement. The failure to perform surveys violates the spirit and intent of NFP and the KNF LRMP. Page 173 of the DEIS states, "Modification of the forest structure and composition as a result of fire intensity, duration, and suppression efforts has had a profound effect on microclimate characteristics such as air temperature, relative humidity, and soil temperature and moisture, which could, in turn, result in adverse impacts to native plant communities." (Emphasis added). The DEIS fails to analyze and disclose the actual affect that the fires and fire suppression activities have had on known botanical species of concern and how this affected overall populations. The KNF LRMP at page 4-23, "6-13 Management activities should be designed to maintain or increase population levels of desirable native plant species that currently have low population levels, of desirable plant species with limited habitat distribution and of desirable plant species that have problems with disease." The DEIS proposes to harm rather than protect and maintain sensitive, rare and uncommon native plant species. Genter's fritilary (Fritillaria gentneri) is an endangered lily, which is only known to occur in far northern California and north to Josephine County, OR. Habitat is present in the Beaver Fire area. The DEIS states surveys will be during appropriate times. The flowering season is late March to early April, so surveys should be complete. Please include survey results in the forthcoming NEPA document. Lake Mountain Special Interest Area is special interest area composed of 100 acres and is the northern most known location of Foxtail pine. It is home to at least 6 different conifer species including: western white pine, foxtail pine, Shasta red fir, white fir, mountain hemlock, and Jeffrey pine. Such assemblages of high-elevation conifers are rare throughout California and are restricted to the Klamath-Siskiyou Mountains. While a forest botanist is supposed to be on site, in order to maintain foxtail pine snags within this Special Interest Area it is not guaranteed. The retention of foxtail pine snags is important because it provides an ecological role in stabilizing soils and providing food and habitat for animals. The Lake Mountain foxtail pine population represents the northernmost stand of this species and includes approximately 250 - 300 trees. One tree, cut after it was killed	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The assumptions made for botanical species of concern occurring in moderate fire severity are not arbitrary and capricious. They were made based on field reconnaissance during Burned Area Emergency Reclamation, and previous experience in fire affected landscapes. The commenter may be confusing the terms fire severity for BARC (soil affects) vs RAVG (vegetation). Moderate severity represented in the RAVG data indicates no tree canopy remaining. Prior experience indicates areas where no tree canopy exits for shade, cooling, the maintenance of micro-climate, and production of organic material via litter, no longer provides suitable conditions for growth of species of concern. Regarding actual status and field surveys: The conclusions for the draft EIS analysis were based on the data gathered over many years of surveys of suitable habitat which resulted in our large data set of known sites. While assumptions were made for the analysis using existing spatial data, field surveys are currently being conducted to confirm the accuracy of those assumptions, in various fire severities and activity units. From the Forest Plan, page 4-23, Standard and Guideline 6-8: "If surveys (for Sensitive plant species) cannot be conducted, project areas should be assessed for the presence and condition of Sensitive species habitat." This habitat assessment has been clarified in the addendum between draft and final EIS. The disclosure of the actual affects of the fire on species of concern has been represented, to the best of our ability, in Table 9 in the Botanical Resources Report. The commenter quotes Forest Plan Standard and Guideline 6-13 as referring to herbaceous plants, and the intention of this Standard and Guideline relates to coniferous plant species. Never the less, the draft EIS does not propose to harm Sensitive plant species. The surveys for Fritillaria gentneri, as stated in the draft EIS, have been conducted, and the results were negative. There are no unique (rare) tree species proposed for extraction in any of the Alternatives of the project. The maidenhair fern populations in Cold Creek springs area, will be flagged if necessary, if riparian buffers are not already adequate. The cumulative effects of projects on Sensitive species has been analyzed, and reflected in the species determinations on page 186 of the draft EIS, Chapter 3. Short term trends in population viability may not have long term affects on species viability, which is the basis of the Standard and Guideline. Details of specific populations potentially affected by the project are currently being gathered. Natural regeneration, and the benefits of, have been addressed in the no action Alternative, and will occur in the project area under all Alternatives regardless of the activities proposed.

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		in the 1987 fires, was estimated to be between 550-600 years old. Please detail if any of these rare tree species is proposed for extraction during any of the treatment activities. The Cold Creek springs area within the Happy Camp area is an important resource for maidenhair fern (Adiantium aleuticum), which is frequently utilized by the Karuk tribe for basket weaving and botanical remedies. The KNF Forest Plan Standard and Guidelines require the maintenance and perpetuation of cultural botanical resources. There are 6 units located in the Cold Creek springs area that may affect the continued viability of this resource. Flagging these areas on the ground are supposed to protect this plant, however the agency and logging contractors have been known to enter flagged areas with heavy equipment. Suitable habitat and/or confirmed populations of 3 Sensitive species and 17 Fungi, Lichen and Bryophyte Survey and Manage species are present in the area. The cumulative effects of multiple projects on Sensitive species are expected to cause a short-term declining trend in population viability as individuals are lost. The DEIS assumes that some activities would benefit populations in the long-term but fails to perform required surveys or account actual details of specific places or populations or the benefits of natural regeneration or how retained snags and Coarse Woody Debris (CWD) effects botanical species of concern.	
205.06 - Plant - General, Rare	#18909-91	The project has a high risk potential for the introduction and spread of non-native invasive species, which are likely to persist long term. This is due to the high level of ground disturbing activities and increased vectors. There are 995 acres of known non-native invasive plant populations for 12 different species in the project area. A non-native invasive plant project design feature would require removal of the top few inches soil on approximately 24 landings, resulting in major decreases to soil organic matter on landings. Cumulatively there are 8 grazing allotments that overlap treatment units and may contribute to the long-distance dispersal of infestations in the project area. The Forest Service has a duty to reduce and eliminate noxious weeds on our public lands and proposed project is contrary to this requirement. The DEIS does not fails to consider or analyze the long-term impacts to our watersheds and native plant species.	See response to number 18926-19.

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205.06 - Plant - General, Rare	#18909-92	The project has a high risk potential for the introduction and spread of non-native invasive species, which are likely to persist long term. This is due to the high level of ground disturbing activities and increased vectors. There are 995 acres of known non-native invasive plant populations for 12 different species in the project area. A non-native invasive plant project design feature would require removal of the top few inches soil on approximately 24 landings, resulting in major decreases to soil organic matter on landings. Cumulatively there are 8 grazing allotments that overlap treatment units and may contribute to the long-distance dispersal of infestations in the project area. The Forest Service has a duty to reduce and eliminate noxious weeds on our public lands and proposed project is contrary to this requirement. The DEIS does not fails to consider or analyze the long-term impacts to our watersheds and native plant species.	See response to number 18926-19.
205.06 - Plant - General, Rare	#3678-22	Botanical Species – No Action direct and indirect effects Sensitive Bryophytes, Lichens, and Fungi "Heavy fuel loading from the accumulation of dead, burnt snags and debris from the 2014 fires is likely to have an indirect negative effect on potential habitat for Sensitive bryophyte, lichen, and fungal species by creating conditions conducive to high severity wildfire in the future." Survey and Manage Vascular Plants, Bryophytes, Lichens and Fungi "Accumulation of dead trees would generate high fuel loads creating conditions conducive to high severity wildfire which would cause a negative indirect effect to Survey and Manage species."	General comment. Quotes in the comment were taken directly from the draft EIS.
206 - Fish	#17322-2	These areas are important for the threatened salmon and are too vulnerable to be exposed to the massive logging and road building plans proposed in this Project.	Fisheries biologists analyzed and disclosed the likely effects of the project on salmon and their habitat as shown in the Aquatic Resources section of Chapter 3 of the EIS and in the Biological Assessment and addendum for Threatened, Endangered, and Proposed Fish Species. Fisheries biologists worked with the interdisciplinary team and Deciding Official to minimize potential negative effects to fish and their habitat. The Forest Service consulted with National Marine Fisheries Service and agreed that all action Alternatives May Affect but is Not Likely to Adversely Affect Endangered Species Act-listed Coho salmon. Table 24 of the Aquatic Resource Report for the final EIS describes the effects to other aquatic species.
206 - Fish	#17349-10	Water and Fish -Tributary streams involved in the fires such as Grider Creek, Walker Creek, Elk Creek, etc. will need to be monitored over time for excessive accumulations of logs and other debris. We advocate that streams with significant spawning populations of anadromous fish receive periodic treatment to remove blockages which left untreated will likely reduce their reproductive capacity for long periods of time. In the near term, first through the third winters sediment production from the fires will be high but by year 4 natural compaction and vegetation growth should begin to reduce sediment each succeeding year. Adequate road maintenance during the nearterm should pay good dividends in reducing sediment production.	The Forest Service, and partners, monitor fish habitat in the creeks mentioned regularly as part of spawning and juvenile surveys. The concern for maintaining fish passage in creeks with substantial spawning populations is acknowledged.
206 - Fish	#17375-2	Theh impact on water quality, including water temperature which as it rises is lethal to threatened salmon, is directly linked to logging of big trees, especialaly near streams.	Project-specific Best Management Practices and project design features were developed to reduce potential negative effects and meet the requirement of the Forest Plan (p. 4-106) to prohibit and regulate activities in Riparian Reserves that can retard or prevent attainment of the Aquatic Conservation Strategy Objectives. See the analysis and conclusions in the Aquatic Conservation Strategy Report, especially for Objective 4.
206 - Fish	#17393-1	I'm deeply concerned how over the years what was once one of the West Coast's premier salmon and steelhead fisheries has declined due to habitat degradation from a variety of factors.	Procedural statement. See response to comment number 18918-22.The soil report for this project describes impacts to soil stability and surface organic matter indicators. Chapter 3 of the EIS summarizes the soils effects analysis. When the soil stability indicator is not met, ground cover is likely to be insufficient for erosion control. Project Design Feature Watershed-30 would require additions of mulch to provide for erosion control on approximately 40 acres. The Proposed Action and Alternatives comply with requirements under the Aquatic Conservation Strategy and include protection measures, called Project Design Features to prevent significant negative impacts to salmon and steelhead habitat. See the evaluation of compliance with Objective 1 in the Amendment of the Aquatic Conservation Strategy Report. Also see the Aquatic Species Resource Report for a detailed assessment of impacts to aquatic species, especially the "Summary of Effects" and Table 24. The fish and watershed scientists on the Klamath NF evaluated the effects of the Proposed Action and Alternatives on aquatic species, which is summarized in Table 24 of that report. The Forest Fisheries biologist consulted with the National Marine Fisheries Service staff to ensure significant effects to fish or fish habitat listed under Endangered Species Act and defined as EFH, would not occur. The determination for effects to fish are: The Proposed Actions and Alternatives "May affect individuals, but is not likely to lead to a trend towards listing [under the Endangered Species Act], and/or May affect individuals, but is not likely to lead to a decreasing population trend (for Management Indicator Species).

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206 - Fish	#17458-1	As a fly fisher, I am very concerned about the Project's potential impact on water quality and threatened salmon and other fish species.	Fisheries biologists and hydrologists analyzed the effects of project activities, see Fisheries BA, specialist reports on fisheries and hydrology, and EIS Chapter 3, Aquatic Resources and Water Quality sections.
206 - Fish	#18852-31	14) Fisheries considerations, particularly that of coho salmon, Chinook salmon and steelhead populations affected by management may not be completely understood within the proposed management framework for the "Westside Recovery" project. Disturbance resulting from pre and post-fire management and harvesting is likely to result in deteriorating watershed conditions, this must be fully acknowledged as the aquatic and anadromous species of the "Klamath River Basin" are of paramount concern.	Fish and water scientists analyzed the effects of project activities, see Fisheries BA, specialist reports on fisheries and hydrology, and EIS Chapter 3, Aquatic Resources and Water Quality sections. The project hydrology analysis discusses watershed condition pre and post project in detail. Watersheds were highly disturbed by the 2014 wildfires and the project adds a relatively low level of ground disturbance while planting to speed reforestation and thus slope stability. The fisheries analysis documents, including the National Marine Fisheries Service letter of concurrence, conclude that the project May Affect but is Not Likely to Adversely Affect Coho salmon.
206 - Fish	#18852-48	32) Fisheries will be detrimentally affected by this proposal which includes logging of large contiguous areas within key salmon bearing watersheds.	Fisheries and water scientists analyzed the effects of project activities and developed Project Design Features to protect riparian and aquatic resources. See Aquatic Conservation Report, Biological Assessment for Fish, EIS Chapter 3 - Aquatic Resources section, and the Aquatic Resource Report and addendum for the final EIS. If no action is taken, the watersheds with a high risk of temperature regime alterations, without artificial regeneration that is proposed in the action Alternatives, will have an extended duration of elevated risk. Natural regeneration will occur, but in general it will be more than 80 years to get trees with 10 inch diameters at breast height in areas burned with high and moderate severity (draft EIS page 202-203). The proposed action has beneficial effects to aquatic species, and to the connectivity of aquatic habitat, at the three sites that will have crossings upgraded with bottomless arches. These sites are in the lowest reaches of Twin Creeks and Malone Creek, just upstream of their confluence with Elk Creek (just upstream of confluence of Elk and East Fork Elk Creeks), and in upper East Fork Elk Creek (see project maps). These structures will allow for free movement of special status fish and amphibian species under these road crossings where passage has been blocked for many years during most or all flows.
206 - Fish	#18858-8	It also must address the impacts to aquatics in ways other than vague, broad-scale terms about miles of streamcourses and so forth-that is, in a site-specific manner, as NEPA requires.	The fisheries analysis includes site specific information about where stream habitat may be affected including for actions that would occur in Riparian Reserves which include hazard tree removal, temporary roads and landings, water drafting, and hand treatments to lop and scatter. The EIS Chapter 3, Aquatic Resources section and fisheries Biological Assessment analyses describe where and how effects to stream habitat may occur. See response to comments number 18852-48 as well as the maps and Checklists for Documenting Environmental Baseline and Effects in the Appendices for the Biological Assessment for Fish that provides details as to where actions are proximate to occupied fish habitat. According to the site specific assessments, impacts to fish and fish habitat are not determined to be "discountable", that is to be so minimal that impacts are not meaningfully measured.
206 - Fish	#18872-11	The fisheries are also an integral part of the eco system that is impacted by the fires within the Westside Fire Recovery Project. Wild land fires do have minimum effect of erosion on the Klamath Scott and Salmon River Westside Fire Recovery project. The Shastas as well as the California Fish and Wildlife has noted record fish runs and recovery in the previous several years on these rivers. Natural disturbances in the eco system do provide additional food source to all species in the rivers. Absolutely pure pristine waters offer little nutrients to fish to survive in large numbers.	Comment is a statement of opinion that does not request a change in proposed actions, clarification, or more information. For clarification, as described in the Aquatic Conservation Strategy Report, Klamath NF scientists determined that for many watersheds, "Based on Cumulative Watershed Effects modelling, conditions created by the fire are likely to affect water quality, notably sediment delivery, far more than any of the action Alternatives."

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206 - Fish	#18872-15	The Tribes on the lower reaches of the rivers of North America allowed three days of the run to pass upstream to spawn and then they fished, future runs were preserved in this way.	Comment provides information that does not require a change in proposed actions, clarification, or additional analyses.
206 - Fish	#18926-37	The DEIS is supposed to be in plain language however it waters down any real effects by stating that activities are not directly in the streams and rivers, except water drafting, new landings, temporary road construction and 14 new stream crossings, which are outside of and at least 350 feet above fish critical habitat for Coho salmon. The DEIS relies on unreliable mitigations (Best Management Practices and Project Design Features) and the treatment of 150 out of the 953 legacy sites (at-risk sites or chronic sediment sources mostly associated with roads) as an offset to any effects to aquatic species and calls negative effects discountable. Throughout the aquatics section, the DEIS continually states that treatments are outside Riparian Reserves, however it fails to consider the! 13,215 acres of treatment within steep unstable and potentially unstable areas on decomposed granite soils recognized as Riparian Reserves.! ! This summary is based on the findings in the DEIS, as with wildlife, the Fish Biological Assessment is inconsistent with the DEIS.! ! Roads, Landings and Water Drafting! The DEIS states there would be moderate short-term negative effects to aquatic species and sediment production, due to construction/reconstruction of temporary roads, installation and removal of stream crossings, and new landings in Riparian Reserves. The temporary road actions include fourteen stream crossings (4 perennial and 10 intermittent streams): Doggett Creek, Buckhorn-Beaver Creek, Grider Creek, O'Neil Creek, Kuntz Creek, China Creek, Caroline Creek-Klamath River and Whites Gulch. New temporary roads and stream crossings have a high risk for affecting aquatic species because of their impacts on sediment regimes and drainage networks. Re-opening the 46N62 road in Caroline Creek would require the reinstallation of stream crossings and widening the road on an active landslide, which could reactivate. ! ! It is not clear in the DEIS when or how much water would extracted from numerous streams to fill water tank trucks, which can hold over 4,000 gallons per load during the proposed implementation. Given that the project area is over 200,000 acres and that there would be over 650 miles of roads needed for dust abatement, water drafting could have a significant effect on water quantity and temperature during hot summer months.! !	The Westside Fire Recovery Project Aquatic Resources analysis and Biological Assessment provides transparency with regard to analysis methods (refer to Methodology sections in each document) and is based on reliable and accepted methods of analysis including the following: review of existing information, post-fire field reviews of proposed treatment units, Riparian Reserves and stream channels; analysis of the biological requirements of aquatic species; use of habitat indicators from the Analytical Process (USDA-USDOC-USDI 2004) to determine effects of actions. Integration of upslope watershed dynamics was included where they could generate or impact physical habitat for aquatic species. Fish biologists worked with watershed and geology specialists to minimize effects of the Project on watershed hillslope erosion processes and stream habitat. They worked together to identify and field-review sensitive watershed areas such as active landslides, active surface erosion, stream channels and Riparian Reserves and developed meaningful Project Design Features for the protection of aquatic resources within the Analysis Area. Modified Alternative 2 dropped the Caroline Creek road from the list of proposed actions precisely because of watershed specialists review and input. See Response to comment 18912-1 regarding water drafting. There is no change in landslide risk compared to current conditions for any Alternative (Geology Report, page 18). Also see the Aquatic Conservation Strategy Report for more information. For example, effects are explained in the short and long term: "Within this [Beaver] watershed there are two locations where temporary road actions involve stream crossings, and thus where site-level short-term effects are expected. The stream involved is a non-fish bearing intermittent face drainage to Beaver Creek which is crossed at two locations by an existing roadbed that is proposed for use as a temporary road; the crossings are in relatively close proximity to each other in the upper part of the drainage and downstream the creek flows through private timber land that is currently being salvage logged. Short-term sediment-related impacts over about one mile of stream are expected during the time when the existing roadbed is prepared for use as a temporary road, used, and then hydrologically stabilized. Effects may occur during storms throughout the first few years post-project as the road prism readjusts. Long-term benefits to this drainage are expected because the condition of the roadbed will be improved post-project by out sloping and pulling fills at crossings and appropriately treating the current legacy sediment site."
206 - Fish	#18926-38	Short-term negative effects to aquatic habitat may occur in several stream reaches due to grazing allotments, private timber harvest and Forest Service timber sales, Thom Seider and Eddy LSR, which are expected to contribute sediment delivery to streams. Private land logging would contribute to elevated sediment inputs to the Klamath River, which is admitted in the DEIS but is in violation of the law.! ! Management Indicator Species (MIS)! River/Stream associated species include steelhead, resident rainbow trout, tailed frog, and cascades frog. There are 802 miles of perennial stream habitat and 1,012 miles of intermittent stream habitat. Resident trout may occur in approximately 338 miles and steelhead in approximately 224 miles. Cascades frogs may occur in about 314 miles and tailed frogs may occur throughout all perennial streams. The western pond turtle is associated with marsh, lakes and ponds. The project area contains about 802 miles of stream habitat and 362 acres of lentic habitat that defines western pond turtle habitat.! ! The DEIS assumes that high quality riparian and aquatic habitat does not occur in areas of moderate/high fire intensity, and aquatic habitat in streams downstream of these areas is likely also experiencing negative effects such as increases in sedimentation, water temperature and peak flow events. The quality of MIS ! habitat is expected to be reduced along stream reaches associated with 14 sites where road crossings and landings are constructed. However the DEIS claims, again, that mitigations will reduce or eliminate harm and that the treatment of a fraction of legacy sediment sites will improve habitat.! !!!	Through detailed analyses that is documented in the EIS and supporting reports, this project has been found to meet the Standard and Guidelines in the Forest Plan, including those related to aquatic resource management (Management Area 10). The EIS Aquatic Resources Report analyzes short-term, long-term and cumulative effects including from grazing allotments and timber harvest on private lands, and determined that the Project would not add measurable incremental impacts to these other actions. The Project Aquatic Resources analysis and Biological Assessment provides transparency with regard to analysis methods (refer to Methodology sections in each document) and is based on reliable and accepted methods of analysis including the following: review of existing information, post-fire field reviews of proposed treatment units, Riparian Reserves and stream channels; analysis of the biological requirements of aquatic species; use of habitat indicators from the Analytical Process (USDA-USDOC-USDI 2004) to determine effects of actions. Integration of upslope watershed dynamics was included where they generate or impact physical habitat for aquatic species. Aquatic Resources analysts worked with watershed and geology specialists to minimize effects of the Project on watershed hillslope erosion processes and stream habitat. They worked together to identify and field-review sensitive watershed areas such as active landslides, active surface erosion, stream channels and Riparian Reserves and developed meaningful Project Design Features for the protection of aquatic resources within the Analysis Area. Finally, the Forest Cumulative Watershed Effects were used to assess potential additive effects of the Project to aquatic species, including MIS species. The Forest Cumulative Watershed Effects model is standardized and utilizes the Equivalent Roaded Area, Universal Soil Loss Equation and Mass Wasting models to assess effects of past, present, and reasonably foreseeable activities includes other projects in the action area. The Cumulative Watershed Effects models reflected that there would be no measurable increase in disturbance at the 5th-field watershed scale, and minimal increase at the 7th field watershed scale. Therefore, the cumulative impacts from adding the effects of the proposed action to present and reasonably foreseeable future actions on aquatic resources were determined to be insignificant. Treatment of legacy sites in the Elk Creek watershed was determined to be a top priority and were included in the Project.

Code	Comment Number	Comment Text	Response
206 - Fish	#19076-1	We are very concerned about the Project's potential impact on water quality and threatened salmon.	Comment is a statement of concern that does not request a change in proposed actions, clarification, or more information. The Forest fish and water scientists coordinated with regulatory agencies (National Marine Fisheries Service and Water Quality Board), conducted and documented intensive analysis and field work, and coordinated with other specialists to plan project activities and provide protection measures to meet law, regulation, and policy associated with riparian and aquatic resources. Through coordination with the regulatory agency for species listed under Endangered Species Act, monitoring plans were developed and a determination of, "May Affect, Not Likely to Adversely Affect" Coho salmon was made. See Chapter 3 of the EIS for a disclosure of effects by resource area and Alternative.
206 - Fish	#19076-12	We are most concerned with EFH for UKT (Upper Klamath Trinity) Chinook. Recovering stocks of wild salmon on the South Fork Trinity River must enter at the mouth of the Klan1ath and the young return to the ocean there.	Essential Fish Habitat (EFH) was considered for both Coho and Chinook salmon, with consultation occurring under 305 (b) (4) (A) of the Magnuson-Stevens Fishery Conservation and Management Act. The Biological Assessment for Fish and the Aquatic Resources analysis used habitat indicators from the Analytical Process (USDA-USDOC-USDI 2004) to evaluate effects to watershed condition at the site, 7th, and 5th field watershed scales. As shown in the Checklists in the Biological Assessment, all fish-related habitat conditions are maintained or improved at the 5th field watershed scale. Therefore, fish habitat conditions, including EFH, in the main stem and mouth of the Klamath River would not be affected.
206 - Fish	#19076-3	The water drafting proposed for the project is not acceptable with such low water, since; it would require using the only pools available for fish since those are the only ones deep enough. Using screening of the required size or dependi.ng on the fishes to swim away to avoid drafting equipment may work in more abundant water years.	See response to comment number 18912-1.
206.01 - Fish - Coho Salmon	#12364-2	Last year those harsh conditions included up to 100% of the juvenile salmon migrating down the Klamath River, including ESA listed Coho salmon, to be infected with one or multiple fish diseases. Only 15% of juvenile Klamath River salmon fitted with radio transmitters made it to the estuary. That is an unprecedented disease epidemic and a significant threat to ESA-listed SONC Coho salmon. Your proposed Project will likely result in "jeopardy' for Klamath River Coho.	"Jeopardy" is a formal term described under the Endangered Species Act. When an action is Likely to Adversely Affect a species, further analysis is conducted to determine if an "Adverse Effect" will jeopardize the continued existence of the species. The regulatory agency in charge of compliance with the Endangered Species Act confirmed that the proposed actions will not adversely affect the Coho salmon, therefore additional analyses for Jeopardy is not completed. See the "Consultation to Date" section in the March 13, 2015 Biological Assessment for Fish and the June 19, 2015 addendum to the Biological Assessment for Fish.
206.01 - Fish - Coho Salmon	#12364-4	Do not put Coho and other Klamath Salmon at more risk during this drought.	See response to comments 17393-1 and number 18852-48. Taking No Action has negative consequences for fish and watershed conditions also. Page 16 of the Hydrology Report states, "Over the long-term, the fuel load conditions will lead to fire intensity and flame lengths that are conducive to major fire runs, crown fires, and spotting. The large fuels component (greater than 3 inches) will lead to an elevated fire intensity and duration of fire on the landscape if it should re-burn. In 10 years, the conditions under Alternative 1 will lead to nine percent of the area having flame lengths greater than 11 feet. Sixty percent of the treatment area is likely to experience flame lengths between 4 and 11 feet and thirty-one percent is likely to have flame lengths of less than 4 feet. (See fire and fuels report). High flame lengths are associate with high severity fire and will contribute to accelerated sediment delivery(DeBano et al. 2005), increased stream temperatures (Pabst and Spies 2001)and stream flows (Neary, et al. 2005a)and increased potential for the introduction of toxic chemicals from fire retardant application during future fire suppression efforts(Neary, et al. 2005b)." Alternative 1 will allow for passive recovery of vegetation in the watersheds which will be slower than if treatment, including planting, would occur. The extended duration of decreased interception, use of water by plants, and ground cover will extend the risk to channel morphology over the long-term.
206.01 - Fish - Coho Salmon	#18849-2	Burned and unattended fuels that remain in the forest threaten immediate impacts to drainage, runoff, and roads that will impair waters upon which all salmon, including the threatened coho, depend,	The EIS Chapter 3 Aquatic Resources analysis stated that taking no action could indirectly affect sediment regimes in the Analysis Area. When future wildfires occur there could be increased potential for severe fire effects as mentioned in the comment because fuels were not reduced and because the abundance of burned trees within the fire areas would make fire suppression difficult if not impossible in some areas. This project attempts to balance multiple resource concerns, as well as short and long term impacts with reducing impacts from future wildfires.
206.01 - Fish - Coho Salmon	#18859-9	Burned and unattended fuels that remain in the forest threaten immediate impacts to drainage, runoff, and roads that will impair waters upon which threatened Coho salmon depend,	See response for comment number 18849-2.

Code	Comment Number	Comment Text	Response
206.01 - Fish - Coho Salmon	#18909-83	The rivers in the Westside project are home to some of the most productive fisheries habitat in the world outside of Alaska. They are vital to salmon survival. There are eleven larger watersheds in the project area and seventy-five sub-watersheds. Coho (Oncorhynchus kisutch) salmon are listed as threatened under the Endangered Species Act. The project area contains over 101 miles of Coho Critical Habitat and the Salmon River is the last stronghold for native spring Chinook salmon. The project would cause negative effects to habitat for the following special status aquatic species: resident trout and tailed frog (Management Indicator Species); foothill yellow-legged frog, Cascade frog, and western pond turtle (Forest Service Sensitive). Habitat for Coho Salmon (Threatened), Chinook salmon, steelhead, Pacific lamprey, and Klamath River lamprey (Forest Service Sensitive) may also be negatively affected. The DEIS is supposed to be in plain language however it waters down any real effects by stating that activities are not directly in the streams and rivers, except water drafting, new landings, temporary road construction and 14 new stream crossings. The DEIS relies on unreliable mitigations (Best Management Practices and Project Design Features) and the treatment of 150 out of the 953 legacy sites as an offset to any effects to aquatic species and calls negative effects discountable. Throughout the aquatics section, the DEIS continually states that treatments are outside Riparian Reserves, however it fails to consider the 13,215 acres of treatment within steep unstable and potentially unstable areas on decomposed granite soils recognized as Riparian Reserves. The DEIS fails to consider the cumulative effects of the increased sediment, turbidity, temperature and loss of shade combined with future climate conditions such as increased drought conditions and chance of floods on salmon species. Salmon depend on the cool water at the mouths of creeks where juvenile Chinook and Coho salmon seek refuge from the inhospitable conditions in the Klamath River and Salmon River systems. The proposed action would diminish cold water refugia. Last year up to 100% of migrating juveniles tested were diseased. This is an unprecedented disease epidemic and a significant threat to ESA-listed SONC Coho salmon. Thousands of salmon, including juveniles continue to die from two gill rot diseases known as ich and columnaris, fish disease infection rates go up as flows and water quality diminish and as water temperature rises. The DEIS fails to analyze or disclose the increased risk of disease in combination with climate change and the cumulative effects the project activities.	The aquatic Resources analysis, Biological Assessment for fish, and the Geology Report describes standard analysis methods (refer to Methodology sections in each document) to assess direct, indirect and cumulative effects including the following: review of existing information, post-fire field reviews of proposed treatment units, review of Riparian Reserves and stream channels; analysis of the biological requirements of aquatic species; use of habitat indicators from the Analytical Process (USDA-USDOC-USDI 2004) to determine effects of actions; Cumulative Watershed Effects modeling and analysis that integrates disturbance coefficients from other past, future and reasonably foreseeable projects in the action area. The analysis approach used for fish species listed under Endangered Species Act is dictated by the National Marine Fisheries Service. Fisheries Biologists worked with watershed and geology specialists to minimize effects of the Project on watershed hillslope erosion processes and stream habitat. They worked together to identify and field-review sensitive watershed areas such as active landslides, active surface erosion, stream channels and Riparian Reserves and developed meaningful Project Design Features (project design project design features) for the protection of aquatic resources within the Analysis Area. In addition, integration of upslope watershed dynamics was included where actions could generate or impact physical habitat for aquatic species. Best Management Practices is a system developed in coordination with the California State Water Quality Controlled Board that includes standardized monitoring throughout California. There is no change in landslide risk compared to current conditions for any Alternative (Geology Report, page 18).
206.01 - Fish - Coho Salmon	#18909-85	The biological assessment contains the following finding, at page iv: "The Westside Fire Recovery Project may adversely affect EFH for Coho and Chinook salmon, specifically EFH for Southern Oregon/Northern California Coasts Coho salmon and Upper Klamath-Trinity Rivers Chinook salmon." Later in the BA, it states that, "The effects analysis considers effects to Pacific salmonid habitat in general; and since habitat requirements for Coho and Chinook salmon are similar, the effects of the Project as described above for Coho salmon CH are similar for EFH." The finding for effects to Coho salmon and their CH is "may affect, not likely to adversely affect." Please explain this inconsistency. As you may know, under the Magnuson Stevens Act, a "[t]he trigger for EFH consultation is a Federal action agency's determination that an action or proposed action, funded, authorized or undertaken by that agency may adversely affect EFH. If a Federal agency makes such a determination, then EFH consultation is required." (EFH Consultation Guidance, 1.1). Please explain whether KNF will undergo consultation with NOAA Fisheries because of the "may adversely affect" finding stated in the BA.	Thank you for catching this error. The Forest determination for EFH is correctly stated in the Biological Assessment on page iv and is incorrectly stated in the Aquatic Resource Report in Table 24. The Klamath NF will undergo consultation with National Marine Fisheries Service. The determination in the Aquatic Resource Report for the Westside Fire Recovery Project will be corrected after National Marine Fisheries Service provides the Klamath NF with its final assessment. The analysis for effects under Endangered Species Act follows the interagency agreed upon "Analytical Process" as described in the Biological Assessment for this project. That analysis also provides the information to evaluate EFH. Different from procedures for Endangered Species Act determinations, there are only two possible determinations under MSA: No Effect or Adverse Effect. National Marine Fisheries Service conducts an independent analysis on EFH and has an opportunity to make Conservation Recommendations for projects that may cause Adverse Effects to EFH. But, the criteria to meet Adverse Effects under Endangered Species Act are not the same for EFH. For example, in the February 28, 2012 letter from National Marine Fisheries Service, National Marine Fisheries Service determined that under the MSA, the creation of an off-channel pond to improve winter and summer rearing habitat for juvenile Coho salmon adjacent to O'Neil Creek (a tributary to the mid-Klamath River) would adversely affect EFH for Chinook salmon and Coho salmon. However, due to implementation of Project Design Features and Best Management Practice, National Marine Fisheries Service did not have any EFH Conservation Recommendations... For this same O'Neil Creek Pond Project, project, National Marine Fisheries Service concurred with the Forest that the Project may affect, but is not likely to adversely affect federally threatened SONCC Coho salmon or their designated critical habitat.

Code	Comment Number	Comment Text	Response
206.01 - Fish - Coho Salmon	#18912-1	Being a Freshwater Fisheries Science student at Humboldt State University I first read the Aquatic Resources reports and some of the Watershed reports, and I have a few items to discuss. The first is water drafting. I don't feel that the regulations put forth on water drafting from some of these low order streams takes into account all of the combined effects on fish and wildlife that they can have. As I'm sure you are aware the Upper-Scott and Salmon Rivers, as well as many of the larger tributaries to be salvage logged within the Beaver Fire complex, are thermally limiting to juvenile fish (including Coho salmon). Coho and other fish rely on these cold-water refuges for summer and fall rearing when the main Klamath and Lower parts of the rivers can be dangerously warm. I think that water drafting, even by the regulations laid down in the proposal, could have a terrible effect for these species. Removing water during the summer and fall (presumably when harvest will be safest), will mean drafting from these cold water streams at the critical time. Even if these streams are outside of anadromous reaches, they will warm more quickly from decreased flow. Also, the proposal lays down no regulation on drafting from multiple streams in the same watershed simultaneously, that could result in a compound effect on the higher order (perhaps anadromous fish holding) downstream reaches.	National Marine Fisheries Service water drafting specifications (2001) and Forest Service Best Management Practices and project design project design features (such as project design feature Watershed-55) will be implemented to minimize effects of water drafting including during periods of low water flow. project design feature watershed-34 was refined during consultation with National Marine Fisheries Service and Karuk Tribe and specifies that certain areas (lower reaches of cold tributaries) across the project area and several specific creeks are to be avoided during late summer and fall water drafting. Aquatic species within the Happy Camp Fire area, including Coho salmon, will be provided increased protection from water drafting, particularly within the following creeks: Tom Martin Cr, O'Neil Cr, Little Horse Cr, and China Cr. These increased protection measures further reduce the chance that water drafting would have measurable negative impacts to fish that are utilizing thermal refugia. This modified project design feature helps to avoid reducing cold water inputs to the Klamath River, which is critical to aquatic species when extended drought conditions persist. The June 19, 2015 addendum to the Biological Assessment for Fish states, "As part of the Project consultation, the Forest, National Marine Fisheries Service, and Karuk Tribe jointly developed a strategy to monitor implementation of Project elements that have the greatest likelihood of impacting SONCC Coho salmon and other salmonids. Pre Project, the group will monitor the hazard tree mark where it is proposed near SONCC Coho salmon CH; during the Project (especially June-Sept) all parties will share information about where Project water drafting is occurring, jointly monitor those water drafting actions, and help Forest Service Representatives decide where to shift Project water drafting so that impacts to SONCC Coho salmon and its CH are not adverse. Also see pages 11-13, 37-38, and 64 in the April 13, 2015 Biological Assessment for Fish for additional information on drafting requirements and locations.
206.01 - Fish - Coho Salmon	#18913-1	We are concerned that the Klamath National Forest's Westside Fire Recovery Project threatens water quality and coldwater fish habitat in watersheds that currently support sensitive fish species, specifically the federally threatened coho salmon. The scale of old growth logging and miles of road building - some permanent - is unacceptable in a time when coldwater fishes in the Klamath River watershed are already fighting for survival during unprecedented drought conditions. State and federal recovery plans for these imperiled fish call for better habitat and less sediment, which this project currently ignores.	The EIS Chapter 3 Aquatic Resources Report, fisheries biological assessment, and the EIS Chapter 3 Hydrology section specifically addresses the Project's potential for effects to sedimentation and water quality - findings indicate that impacts to sediment and aquatic habitat will be insignificant. As a result of project design, existing Forest Plan land allocations that protect Coho salmon and their habitat on Forest lands (Riparian Reserves and others), consideration of cumulative effects, and action-specific effects minimization measures, fisheries biologists determined that the Project May Affect but is Not Likely to Adversely Affect Coho salmon. Our analysis did not lead logically to a finding of adverse effects, even when considering cumulative effects using a deliberative, quantitative approach. Permanent roads will not be constructed in this project. Burned trees will be salvaged, but not viable old growth trees.
206.01 - Fish - Coho Salmon	#18941-1	Though I do not live in the immediate area of the Klamath, events such as the fires experienced in 2014 have far reaching impacts. While people in the Klamath River watershed in Oregon are asked to sacrifice their access to critically vital water in order to support salmon runs in the lower river, science has shown that catastrophic wildfires such as occurred this past year produce far more dirty runnoff and silt, remove shade from the water and ultimately cause more harm than any well planned salvage harvest or restoration activities could ever do.	Comment is a statement of opinion that recognizes the potential impacts of catastrophic wildfires. As described in the Aquatic Conservation Strategy Report, Klamath NF scientists determined that for many watersheds, "Based on Cumulative Watershed Effects modelling, conditions created by the fire are likely to affect water quality, notably sediment delivery, far more than any of the action Alternatives."
206.01 - Fish - Coho Salmon	#19078-1	I wish to express my disapproval of the Westside Timber Sale due to impacts to the Klamath River's key salmon refugia, cumulative impacts to forest and watershed, and violations of the Clean Water Act, the Endangered Species Act, NEPA and California's Porter Cologne law. I incorporate by reference the comments of the Klamath Siskiyou Wildlands Center, the Center for Biological Diversity, the Karuk Tribe and the Environmental Protection Information Center and the Klamath Forest Alliance.	See the Summary of Effects in the Aquatic Species Resource Report for the final EIS. The action Alternatives add no incremental increase at the 5th-field watershed scale and only a slight incremental increase at the 7th-field watershed scale in some watersheds, an increase that is determined to be discountable or insignificant (effects may occur but they are not expected to be to a level that can be meaningfully measured or detected). At the site-scale, all of the action Alternatives except Alternative 4 pose a risk to the watersheds identified as being "at risk" post-fire. The impacts are limited to where they occur (at the site) and are associated with temporary roads, stream crossings and landings within Riparian Reserves. Implementation of all of the action Alternatives will allow for a quicker recovery of conifer stands in these burned watersheds. Alternative 4 most fully minimizes impacts at the site and watershed-scale and would have discountable effects to habitat indicators in "at risk" watersheds at both scales. With Alternative 4, the number of acres made safer for fire fighting, community protection, and fire resiliency is reduced by 900 acres and there is a reduction in social benefits such as income and jobs (Table 2-32, draft EIS). All of the action Alternatives include effects minimization measures that will help protect fish habitat. The hydrologist has determined that the effects to watershed conditions from action Alternatives will be indistinguishable from effects from the 2014 wildfire, reforestation will be slower if No Action is taken, and the watershed restoration that is proposed will be delayed. See response to comment number 19076-1 and responses to comments made by Klamath Siskiyou Wildlands Center, the Center for Biological Diversity, the Karuk Tribe and the Environmental Protection Information Center and the Klamath Forest Alliance.

Code	Comment Number	Comment Text	Response
206.03 - Fish - General habitat	#12346-22	The Westside timber sale proposes actions that will further degrade at-risk, Key and sensitive post-fire watersheds and degrade water quality necessary to support healthy riparian, aquatic and wetland ecosystems. Page 219 of the Westside DEIS indicates that "[l]andings located within Riparian Reserves, especially new landings, have a high risk of effects to habitat indicators and aquatic species because landings will disturb soils and vegetation in close proximity to streams." Page 218 of the Westside DEIS acknowledges that "[n]ew temporary roads, particularly temporary road stream crossings, have a high risk for affecting aquatic indicators at the site scale because of their impacts on sediment regimes and drainage networks." Please note that all of the Forest Service action alternatives involve new road construction to facilitate logging activities.	General comment referencing the draft EIS. Chapter 1 Proposed Action talks about landings as does Chapter 2 Alternatives , including the Refined Proposed Action. The Aquatic Resources analysis identified those actions that had the potential to degrade habitat quality including in Key Watersheds and sensitive watersheds, and analyzed the proposed actions in the context of minimization measures that would be implemented to maintain or restore water quality, riparian, aquatic and wetland ecosystems. Landings and temporary roads were identified to pose the highest risk to aquatic resources and the project was designed to minimize adverse effects from these higher risk actions. For example, existing old road beds will be used where ever possible and temporary roads will be hydrologically restored. Landings were kept out of Riparian Reserves except where existing open areas could be used to provide less impact than creating a new landing upslope. The Biological Assessment for Fish on page 65, says: All proposed new landings in Riparian Reserves were reviewed in the field. The magnitude of potential effects is limited in scope to landing number DZ03, DZ10, DZ23, L043, L044, and L090. The criteria for use of existing landings are: existing landings in Riparian Reserves will not be expanded towards stream channels, or on to active landslides, or where vegetation that provides shade to a stream would need to be cut. Existing landings in Riparian Reserves will be shaped and treated for erosion control at the end of each season of use, and hydrologically restored at project completion (including subsoiling and covering with slash/mulch as needed). Reused landings in Riparian Reserves will have site specific erosion control measures to reduce risk of sediment delivery into streams. Site review of all new landings proposed within Riparian Reserves confirmed that these criteria (project design feature Watershed-23) and other project design project design features, along with proper implementation of Best Management Practices, would be sufficient to avoid any meaningful negative effect(s) to anadromous fish habitat. Project Design Features were formulated to protect key indicators of aquatic habitat quality including sedimentation, water temperature and large wood. Soil disturbance associated with temporary roads and landings was addressed through project design project design features as well. The EIS Aquatic Resources analysis and biological assessment considered the status of species and habitat in the action area, the proposed actions, location and extent, and all minimization measures proposed and concluded that effects would be insignificant and not measurable.
206.03 - Fish - General habitat	#12346-23	Page 218 of the DEIS states that implementation of the Forest Service proposed action "would have moderate short-term negative effects to habitat indicators (primarily sediment) and aquatic species at the site scale within these vulnerable drainages, due to construction/reconstruction of temporary roads, installations and removal of stream crossings, and new landings in Riparian Reserves." Please note that all of the agency's action alternatives involve road construction and establishment of new log landings in 303(d) CWA listed watersheds.	The Klamath National Forest prepared the draft EIS in compliance with the National Environmental Policy Act and other relevant federal and state laws and regulations. Direct, indirect, and cumulative effects to wildlife, watershed, soils, fuels, sensitive plants, and aquatic species, among other resources, as well as management requirements to minimize adverse effects, are addressed in the Chapter 3 of the EIS, with appropriate references to the scientific literature. The Forest is also working up-front with the North Coast Regional Water Quality Control Board regarding compliance with the Clean Water Act. All streams in the project area are currently included on the state 303d list as water quality impaired, and the Klamath, Scott, and Salmon Rivers all have approved Total Maximum Daily Load analyses. Any project action Alternative will include a legacy sediment site inventory and treatment plan as part of the application to the North Coast Regional Water Quality Control Board for enrollment of the project in the waiver of waste discharge program. Enrollment in this program through treatment of watershed legacy sediment sites is in order to implement the established Total Maximum Daily Loads and thereby comply with the Clean Water Act. The Aquatic Resources analysis identified those actions that had the potential to degrade habitat quality including in Key Watersheds and sensitive watersheds, and analyzed the proposed actions in the context of minimization measures that would be implemented to maintain or restore water quality, riparian, aquatic and wetland ecosystems. Landings and temporary roads were identified to pose the highest risk to aquatic resources and the project was designed to minimize adverse effects from these higher risk actions. For example, existing old road beds will be used where ever possible and temporary roads will be hydrologically restored. Landings were kept out of Riparian Reserves except where existing open areas could be used to provide less impact than creating a new landing upslope. Project Design Features were formulated to protect key indicators of aquatic habitat quality including sedimentation, water temperature and large wood. Soil disturbance associated with temporary roads and landings was addressed through project design project design features as well. The EIS Aquatic Resources analysis and biological assessment considered the status of species and habitat in the action area, the proposed actions, location and extent, and all minimization measures proposed and concluded that effects would be insignificant and not measurable.
206.03 - Fish - General habitat	#17403-1	It is vitally important that the decisions around forest restoration give top priority to mitigating siltation in the creeks and rivers upon which the migratory fish depend. As the EIS reports, there will be a major impact from erosion related to the forest and logging road system. Don't choose alternatives that might create any more erosion!	The action Alternatives add no incremental increase in sediment at the 5th-field watershed scale and only a slight incremental increase at the 7th-field watershed scale in some watersheds, an increase that is determined to be discountable or insignificant (effects may occur but they are not expected to be to a level that can be meaningfully measured or detected). The impacts are limited to where they occur (at the site) and are associated with temporary roads, stream crossings and landings within Riparian Reserves. All of the action Alternatives include effects minimization measures that will help protect fish habitat. The hydrologist has determined that the effects to watershed conditions from action Alternatives will be indistinguishable from effects from the 2014 wildfire, reforestation will be slower if No Action is taken, and the watershed restoration that is proposed will be delayed. See the hydrology and aquatic resources sections in Chapter 3 of the final EIS.

Code	Comment Number	Comment Text	Response
206.03 - Fish - General habitat	#17910-7	In its appeal of the decision notice and EIS Statement approving the LRMP for the Klamath National Forest, it states on p.72: "To adequately protect water quality and fishery habitat, the Management Plan and its FEIS must evaluate the causes of past and continuing sedimentation in order to realistically anticipate and prevent watershed impacts from management activities. According to professor Robert Curry, "methodology exists to conduct such an evaluation, utilizing channel surveys, sediment sampling and analysis, and assessment of resident and anadromous fish requirements." In addition, Dr. Curry warned that an assessment of management activities MUST ALSO ADDRESS THE POTENTIAL IMPACT OF A SIGNIFICANT STORM EVENT. (This year is the 50th anniversary of the '64 flood.)	Approval of the Forest Plan decision or any appeals of it are outside the scope of this analysis. The ROD for the Forest Plan was upheld and serves are direction for project-level analysis. The project is consistent with the Forest Plan. Comment references an apparent appeal to the Forest Plan, and in particular that the assessment of [potential effects of] management activities must consider the potential impact of a significant storm event. An appeal of the Forest Plan is outside the scope of this project-level National Environmental Policy Act analysis. The project is consistent with the Forest Plan, as required. Any project action Alternative requires enrollment of the project in the North Coast Regional Water Quality Control Board's Waiver of Waste Discharge program. Coverage by the waiver requires that Forest inventory, prioritize, and schedule for treatment existing legacy sediment sites in the project area. The legacy sediment site plan for the Westside Fire Recovery project proposes a schedule to treat all legacy sites in the Elk Creek 6th field watershed. Through this treatment the Elk Creek watershed and the Klamath River will benefit from reduced risk of adverse effects to water quality from road-related erosion and sedimentation that is often manifest during large storm events. The EIS Aquatic Resources Report and Biological Assessment assess potential effects using standard and accepted methodologies including channel survey data, results of cumulative watershed effects modeling and assessment of resident and anadromous fish effects (see Appendix D of the Biological Assessment for Fish). Past and continuing sedimentation is calculated in the cumulative watershed effects modeling. Storms, like droughts, are not predictable but can evaluated if significant changes occur where actions are proposed. The EIS Aquatic Resources Report and Biological Assessment assess potential effects using standard and accepted methodologies including channel survey data, results of cumulative watershed effects modeling and assessment of resident and anadromous fish effects. Past and continuing sedimentation is calculated in the cumulative watershed effects modeling. Storms, like droughts, are not predictable but can evaluated if significant changes occur where actions are proposed.
206.03 - Fish - General habitat	#18912-3	These combined effects of less, warmer and more abrasively sediment-bearing water could be a deadly cocktail for those over summering juvenile fish. But not only juvenile fish, but also declining summer-run Steelhead in the Scott and Salmon as well as the highly diminished Salmon River's spring-run Chinook salmon, may suffer greatly from these changing conditions. To my understanding, the report does not address these effects in tandem, but independently, and I think that they should recognize, address and adjust management based on these effects together.	The EIS Aquatic Resources report and biological assessment reflect interdisciplinary discussions (including water quality, hydrology and geology) and methodologies that consider a suite of key habitat indicators for salmonids including sediment, water temperature and large wood. In addition, environmental baseline information was considered for each watershed to understand the pre-project habitat conditions (refer to Checklists in appendices of the Aquatic Resources Report and biological assessment).
206.03 - Fish - General habitat	#19076-3	The water drafting proposed for the project is not acceptable with such low water, since; it would require using the only pools available for fish since those are the only ones deep enough. Using screening of the required size or dependi.ng on the fishes to swim away to avoid drafting equipment may work in more abundant water years.	See response to comment number 18912-1.
206.03 - Fish - General habitat	#3678-24	Aquatic Resources (including fish) – No Action direct and indirect effects "Management Indicator Species (River/Stream Association) Indirect Effects "Failing to salvage and reforest moderate to high severity stands that were burned in 2014 would have no effect on stream temperature, sediment, or large wood over the next one to five years as postfire conditions include reduced surface fuel loading across the landscape. From five to10 years out, failing to salvage and reforest moderate to high severity stands, and conduct fuels treatments, increases the potential for a wildfire that spreads and is likely to cause adverse impacts to Riparian Reserves and aquatic habitat. As large trees fall and brush accumulates, it becomes more unsafe to fight fires directly and, therefore, fires are likely to burn across more drainages causing more negative effects to aquatic habitat."	Not a substantive comment; the quote is a copy of text from the draft EIS.

Code	Comment Number	Comment Text	Response
206.04 - Fish - General, rare	#12364-1	By opening and using decommissioned roads, constructing new temporary roads, and by logging riparian areas the preferred alternative will increase sedimentation and raise stream water temperatures significantly. This will create great risk of catastrophic storm damage to streams as we saw in the 1997 storm event. Implementing that alternative will also impact conditions in the Klamath River, reducing or even eliminating the cold water refugia at the mouths of creeks which juvenile Chinook and Coho salmon rely on to escape from harsh conditions that occur in the Klamath River.	The preferred Alternative for the final EIS is modified Alternative 3, which incorporates component of Alternative 4 by including less road construction than Alternative 2 (the preferred Alternative in the draft EIS). The Forest acknowledges that Alternative 2 of the Westside Fire Recovery project proposes reopening and use of previously decommissioned roads, and construction of some new temporary road segments. There is no salvage harvest proposed for hydrologic Riparian Reserves under any project Alternative. Road activities are almost entirely proposed for areas outside of hydrologic Riparian Reserves under all project Alternatives. Table 8 of the Aquatic Conservation Strategy Report indicates that there are 0.2 and 0.3 miles of reopening of decommissioned road and new temporary road, respectively, proposed in Alternative 2. This limited amount of road activity in hydrologic Riparian Reserves is not expected to produce adverse effects to water quality resulting from sedimentation or increased stream temperatures. In addition, implementation of any project action Alternative requires enrollment of the project in the North Coast Regional Water Quality Control Board's Waiver of Waste Discharge program. Coverage by the waiver requires that Forest inventory, prioritize, and schedule for treatment existing legacy sediment sites in the project area. The legacy sediment site plan for the Westside Fire Recovery project proposes a schedule to treat all legacy sites in the Elk Creek 6th field watershed. Through this treatment the Elk Creek watershed and the Klamath River will benefit from reduced risk of adverse affects to water quality from road-related erosion and sedimentation. The effects to stream temperature are considered "discountable negative effects", with no effect from salvaging burned trees. As stated in the Aquatic Conservation Report, Klamath NF scientists determined that for many watersheds, "Based on Cumulative Watershed Effects modelling, conditions created by the fire are likely to affect water quality, notably sediment delivery, far more than any of the action Alternatives." Replanting salvage areas is expected in speed up forest recovery to mature stands in 40-60 years rather than 80 years with No Action, and that should lead to slope stabilization and reduced sediment delivery. reopening decommissioned roads was a concern for aquatic specialists and therefore the extent was minimized during project design and Alternative development, to the extent possible, while still meeting the purpose and need of the project. Alternative 2 proposed about 9 miles of decommissioned road to be re-opened. Through the analysis process it was determined that the Caroline Creek road would not be re-opened, thus the miles of re-opened decommissioned roads was reduced to 5.6 miles in Modified Alternative 2. Throughout the design and analysis of the project, watershed and fisheries specialists on the interdisciplinary team focused on road actions since roads can have a major impact on sediment and the drainage network. As a result, all but about 3.6 miles of the temporary roads will be placed upon existing roadbeds, which will not increase the drainage network, and stream crossings were limited to seasonal drainages outside of fish habitat. To further reduce the effects of roads, all temporary roads will be hydrologically stabilized after use - this includes constructing waterbars, outsloping road prisms if appropriate, and obliterating access to the road. Disturbance associated with temporary roads were accounted for in the Cumulative Watershed Effects analysis: at the 5th- and 7th-field watershed scale, disturbance including roads and harvest, will only add slight or insignificant levels of disturbance to the baseline conditions that includes the 2014 fires. At the watershed scale, based on the Cumulative Watershed Effects analysis, and because temporary roads will be hydrologically stabilized and closed post-project, and because there will be no net increase in road density or drainage network after the project is complete, and based on implementation of Watershed project design project design features (20, 21 and 25) we determined that temporary roads will have discountable insignificant effects to sediment and minor effects to aquatic species. Salvage harvest was excluded from Riparian Reserves. While hazard tree abatement may occur within Riparian Reserves, large trees that are felled must be left on site to protect near-stream large wood. Stream temperatures will not be affected by tree removal since no salvage will occur within Riparian Reserves. Fisheries biologists reviewed the hazard tree abatement areas within Riparian Reserves and determined that the extent or scope of hazard tree abatement was not concentrated and was focused on burned trees, and will not affect stream temperatures. The interdisciplinary team is aware of the important role that the project area streams play for fish migrating through the Klamath River and measures were included to minimize sediment from all aspects of the project so that access to thermal refugia would not be changed as a result of the project. Addressing legacy sediment sites in Elk Creek and other road fixes that will occur as part of the project, will reduce ongoing sediment sources.

Code	Comment Number	Comment Text	Response
206.04 - Fish - General, rare	#18909-86	River/Stream associated species include steelhead, resident rainbow trout, tailed frog, and cascades frog. There are 802 miles of perennial stream habitat and 1,012 miles of intermittent stream habitat. Resident trout may occur in approximately 338 miles and steelhead in approximately 224 miles. Cascades frogs may occur in about 314 miles and tailed frogs may occur throughout all perennial streams. The western pond turtle is associated with marsh, lakes and ponds. The project area contains about 802 miles of stream habitat and 362 acres of lentic habitat that defines western pond turtle habitat. The DEIS assumes that high quality riparian and aquatic habitat does not occur in areas of moderate/high fire intensity, and aquatic habitat in streams downstream of these areas is likely also experiencing negative effects such as increases in sedimentation, water temperature and peak flow events. The quality of MIS habitat is expected to be reduced along stream reaches associated with 14 sites where road crossings and landings are constructed. However the DEIS claims, again, that mitigations will reduce or eliminate harm and that the treatment of a fraction of legacy sediment sites will improve habitat.	The EIS Aquatic Resources Report analyzes short-term, long-term and cumulative effects to aquatic resources including Management Indicator Species . The Project Aquatic Resources analysis and Biological Assessment is based on a review of existing habitat information, post-fire field reviews of proposed treatment units, Riparian Reserves and stream channels; analysis of the biological requirements of aquatic species including Management Indicator Species; use of habitat indicators from the Analytical Process (USDA-USDOC-USDI 2004) to determine effects of actions; integration of upslope watershed data, with a focus on where actions could generate or impact physical habitat for aquatic species, including Management Indicator Species. Forest scientists worked together to identify and field-review sensitive areas such as riparian areas and water features, active landslides and surface erosion, and stream channels. Project Design Features (project design project design features) were developed for the protection of aquatic resources within the Analysis Area. Finally, the Forest Cumulative Watershed Effects were used to assess potential additive effects of the Project to aquatic species, including Management Indicator Species . When assessing landscapes it is necessary to prioritize treatments since it is not possible to treat every issue or area at one time. Treatment of legacy sites in the Elk Creek watershed were determined by watershed specialists to be a top priority and thus were included in the Project.
207 - Forest Health, Regeneration	#12346-49	Quoting directly from Shatford: 19 "[O]ur findings suggest that the prognosis for achieving reasonable conifer densities [from natural regeneration] are fair to excellent, even on sites with high cover of broad-leaved shrubs and hardwoods. Although conifer growth may be delayed by competition over the short term, benefits in terms of wildlife habitat and site fertility should be considered. Viewing ecosystem recovery as a variable and dynamic process highlights the limitations of short-term studies that provide an incomplete picture of the regeneration process. In addition, assertions that burned areas, left unmanaged, will remain unproductive for some indefinite period seem unwarranted." It is also telling that the DEIS simply omits reference to findings such as those by Noss et al in 2006 indicating that naturally disturbed, un-salvaged, early successional forests are often the most biologically diverse of all forest conditions and are both more rare and more imperiled than old-growth forests in many regions.2 Noss, R. F., J. F. Franklin, W. L. Baker, T. Schoennagel, and P. B. Moyle. 2006. Ecology and management of fire-prone forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. Society for Conservation Biology, North American Section, Arlington, Virginia. Also available from www.conbio.org/sections/namerica/napolicy.cfm.	The No Action Alternative is responsive to the concerns expressed. The Joint Fire Science Program Final Report was considered in the Environmental Consequences section, Chapter 3 of the EIS: "Successful natural regeneration in one to two decades, though highly variable, has been documented following stand-replacing fires in the Klamath Province within white fir, Douglas-fir, and Douglas-fir/tanoak stand types (Shatford, Hibbs and Puettman 2007; Joint Fire Science Program Final Report, Project 05-2-1-40 2009)." Noss et al. (2006) is a general fire ecology paper that is not specific to the Project area, however the EIS acknowledges the value of early seral plant communities in the vegetation and wildlife sections of Chapter 3. See also Chapter 3, Responsible Opposing Views and Agency's Responses and Appendix E, Proposed Activities in Late-Successional Reserves. We do not agree that early seral plant communities are "imperiled" in the Klamath Province. Since the inception of the Northwest Forest Plan, monitoring has shown that over 150,000 acres of late successional forest in the Klamath Province has experienced stand replacement fire. Across the total Westside Fire area considering all land allocations, approximately 10,800 acres of existing plantations, natural stands and proposed salvage units would be site-prepped and planted in Alternative 3 Modified. This represents about 21% of the estimated 52,000 acres of moderate to high severity fire; over 40,000 acres or nearly 80 percent of moderate and high severity fire in all land allocation would not be planted and would experience the long early seral plant succession cycle described by the commenter (EIS Chapter 3, Vegetation; Appendix E). See also EIS Chapter 3, Responsible Opposing Views and Agency's Responses.
207 - Forest Health, Regeneration	#12354-7	3. Natural insect controls - has the rush to salvage log prevented natu ral predation? (Woodpeckers - cavity-nesting birds, and some other insectivores alsocan assist controls) In he case of natu ral insect controls, what effects may favor natu ral predation? Does salvage logging prevent Histeridae from suppressing increased release of the damaging species - denying development of at species controlling Douglas-Fir Beetle (Dendroctonus Pseudotsugae), Scolytus monticolae and Douglas-fir pole beetle (Pseudohylesinus nebulosus), mountain pine beetle (MPB) Dendroctonus ponderosae? Clown or hister beetles, histeridae, may be predacious, but their effects on Dendroctonus are little studied. Here's an introductory look: Shepherd, William P. "Biology and host finding of predaceous hister beetles (Coleoptera: Histeridae) associated with Ips spp.(Coleoptera: Scolytidae) in loblolly pine (Pious taeda L.)." Ph D diss., Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy in The Department of Entomology by William P. Shepherd BS, Washington and Lee University, 2004.	In Chapter 3 of the EIS the potential for insect effects are provided: "The likelihood and time required for conifer regeneration is affected by bark beetle infestations. Alternative 1 has a sizeable risk of bark beetle population increases, primarily because all stressed trees remain. This results in the maximum potential habitat source for beetles, and the maximum potential loss of living trees as the insect population moves into lightly burned areas and adjacent green stands. Lesser levels of mortality are anticipated in stands outside the fire-affected area than in the project area but some increase in beetle infestation is expected among live trees. Experience from previous wildfires indicates that an outbreak can be intense for the one to two years post-fire." There will be some level of natural predation of insect populations anticipated, but the scale of adverse effects of the Fires relative to the scale of proposed treatments is likely minimal.

Code	Comment Number	Comment Text	Response
207 - Forest Health, Regeneration	#17280-2	On p. 13, this need is further clarified "The long-term desired future condition for the project area is a healthy forested landscape with diverse ecosystem conditions reflective of historic vegetation and the ecological capability of the landscape." As Dr. Jerry Franklin,a national expert in forest ecosystem process, and Joseph Wadell, of the Yurok Tribe, (historic managers of these forests), both point out, the mixed ecosystems resulting from periodic mixed-severity fires are the historic vegetation in this area (Project public reading room, Franklin letter 4/21/15, Wadell letter 11/14/2015) . "Restoring" them by creating high-density conifer plantations is not restoration in any real sense of the word. This issue is particularly problematic in the areas designated "Late Seral Reserves", which were, as Dr. Franklin points out, specifically set aside to allow for natural processes such as fire to operate on the landscape. Large snags are critically important for many late-seral-dependent wildlife species, and removing those snags endangers the survival of the species the reserves were set aside to protect.	The description as noted is a general, but accurate statement of our objectives, but we have added text to clarify this in the final EIS. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. See also Chapter 1 of the EIS for a discussion of historic fire regimes in the Klamath Province. Thompson et al. (2007), in an important study of reburns in the Biscuit fire in southwest Oregon concluded that: “reducing connectivity of surface fuels at landscape scales is likely the only way to decrease the size and severity of reburns until vertical diversification and fire resistance is achieved.” That is precisely the objective of the salvage units in the Westside Fire Recovery Project, and the reason that leaving all of the dead wood now present on the landscape would not meet the Project objectives. There is no intention to create dense plantations. We agree that extensive uniform planting would not create the heterogeneity that we seek to reestablish on the landscape; trees will not be planted uniformly as the comment suggests. The reforestation stocking objective after planting in the Westside Fire Recovery Project is a stand of 75 to 225 variably spaced young trees with treated, discontinuous activity fuels, not densely stocked regularly spaced plantations that form continuous fuel beds. Stand density would vary with slope position and aspect with lower stocking on upper slopes and south and west aspects and higher stocking on north and east aspects that would form a closed canopy on lower slopes. Hardwoods would be included in the target stocking levels so the number of conifers would be less where hardwoods occur. Most reforestation units in the Westside Fire Recovery would be planted at lower densities as most of the units are on upper slopes. We also anticipate there would losses from future fires that would further reduce stand density. Our long term objective is 30-50 large, variably spaced, fire resilient trees per acre with openings as described by Taylor and Skinner (1996). The final EIS and supporting documents incorporate best available science.
207 - Forest Health, Regeneration	#17910-5	REGENERATION: On p. 11, you state “Salvage logging will promote ecosystem sustainability by increasing the likelihood and speed by which burned forest areas are regenerated, while greatly reducing the accumulation of dead/downed fuels in the future.” This is an assumption that flies in the face of both our experience and the science accumulated on the subject to date. The studies show that natural regeneration in areas that are not subject to salvage sales is often significantly higher than those that are salvage logged.	In Chapter 3 in the Vegetation Environmental Consequences section of the EIS the effects of no action and action Alternatives are described in detail. The findings of Shatford et. al. 2007 have been considered in the Vegetation Effects section of the EIS: "Although natural regeneration of conifer species has occurred elsewhere, following more typical wildfire site conditions, the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007)."
207 - Forest Health, Regeneration	#18852-54	-"Journal of Forest Ecology: "Conifer Regeneration after Forest Fire in the Klamath - Siskiyous: How Much, How Soon?" ; J.P.A. Shatford, D.E. Hibbs, and K.J. Puettmann; 2007 Society of American Foresters." Today, many post fire action plans regard tree planting and vegetation control as a relatively straightforward and effective solution to the problem of forest renewal (Lindenmayer 2006). Little is known about how burned areas will recover on their own, how they might differ from stands managed after fire, or how these differences relate to the rate of forest recovery after fire over the short term (1-2 years) or longer (1-2 decades) time frames. The lack of information concerning ecosystem recovery, specifically natural conifer regeneration after wildfires, has allowed speculation on complex ecological processes. We report here on the abundance of natural regenerating conifers occupying sites 9 -19 years after stand-replacing wildfires in northern California and southwest Oregon. Our findings redefine concepts of the role and reliability of natural regeneration in high fire frequency systems in the context of ecosystem management (Christensen et al. 1996). Additionally, they highlight the role of temporal and spatial variation as an inherent feature of forest development. Forest managers relying on natural regeneration should feel increased confidence and need to develop plans that can accommodate high levels of variation and accept the prolonged time line of the regeneration process. Our study advances an understanding of natural forest development after wildfire in the diverse Klamath - Siskiyous region (Minore and Laacke 1992). Clearly, natural regeneration of conifers is an intrinsic response to fires in most locations (Turner et al. 2003), and forests are recovering across the entire range of forest types we investigated and at considerable distances from seed sources. In contrast with previous observations (Hayes 1959, Stein 1986), our findings suggest that the prognosis for achieving reasonable conifer densities are fair to excellent, even on sites with high cover of broad-leaved shrubs and hardwoods. Although conifer growth may be delayed by competition over the short term, benefits in terms of wildlife habitat and site fertility should be considered. Considerable evidence from fire scars, tree ages, and tree growth patterns suggests that frequent low and moderate severity fires have been common in the Klamath - Siskiyous (Agee 1993, Taylor and Skinner 1998), resulting in low-density, multi-aged stands (Sensenig 2002). Fire suppression efforts during the 20th century have altered the fire regime and have led to changes in forest structural characteristics (Agee 1993, Sensenig 2002). Highseverity, stand-re- placing fires also have been known in this region,	In Chapter 3 in the Vegetation Environmental Consequences section of the EIS, the effects of natural regeneration and site preparation and planting are discussed. "If fuels are treated effectively, and the area is planted, the amount of time needed to restore the site to a sustainable coniferous forest may be reduced. Removing large trees by salvage alone is not sufficient fuel treatment. Research has shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less intensity or not at all (Thompson, Spies and Ganio 2007; Weatherspoon and Skinner 1995). Therefore, effective fuel treatment is an essential component of sustainable reforestation in the Klamath Province (Peterson et al. 2014). Research has shown that the quickest way to reestablish a coniferous forest after stand replacement fire is by active reforestation (Zhang et al. 2008). The reduction of residual fuels will be necessary to prevent future fire events from becoming stand-replacing fires that destroy planted seedlings. Research has shown fuel treatments increase the likelihood of the planted trees surviving future fires (Weatherspoon and Skinner 1995, Omi and Kalabokidis 1991). Heavy residual fuels need to be reduced substantially to help assure sustainability of plantations. Follow-up reforestation surveys will be completed to assure that the reforestation objectives are achieved."The findings of Shatford et. al. 2007 have been considered in the Vegetation Effects section of the EIS: "Although natural regeneration of conifer species has occurred elsewhere, following more typical wildfire site conditions, the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007)." See EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised".

Code	Comment Number	Comment Text	Response
		where complex topography and fire behavior typically resulted in a patchy distribution of canopy openings, intact stands, and scattered surviving trees (Wills and Stuart 1994, Alexander et al. 2006).	
207 - Forest Health, Regeneration	#18878-23	DEIS: In addition to using professional judgment and visual cues during site visits, the 1944 Wieslander vegetation mapping was used to assess historic species composition and conifer dominance throughout the project area (Kelly et al. 2005). (Pg 109) Comment: From our scoping comments we suggested using the Wieslander vegetation maps and 1944 Aerial Photos. It would seem difficult for the specialist to utilize "1944 Weislander vegetation mapping" when the efforts of Weislander and other were accomplished in the1920-1930s.	As described in Chapter 2 of the EIS "Were identified as areas determined to have been historically dominated by conifers, as determined by the 1945 Wieslander Vegetation mapping (Kelly, M.B. et. al 2005) in addition to visual cues based upon Forest Service professional judgment"
207 - Forest Health, Regeneration	#18878-29	DEIS: Successful natural regeneration in one to two decades, though highly variable, has been documented following stand-replacing fires in the Klamath Province within white fir, Douglas-fir, and Douglas-fir/tanoak stand types (Shatford, Hibbs and Puettman 2007; Joint Fire Science Program Final Report, Project 05-2-1-40 2009). Pine and mixed-conifer associations were not sampled in the Shatford et al. study (Pg. 112) Comment: The Shatford et al study concluded the natural establishment of conifers post fire to be "highly variable from year to year, and place to place, resulting in high variation in tree density and size." This conclusion would seem to suggest a complex un-even aged tree stands, which would be more conducive to Late-Succesional Reserves rather than an evenaged stand matrix as proposed in the Refined Proposed Action. Furthermore the sampling plots seem to have encompassed a broad range of sites. "Thirty five plots were established across a broad gradient of productivity and forest types. Our sampling encompassed three broad forest types (hereafter plant series) ranging from dry to wet (Atzet et al. 1992). Within the Douglas-fir series, sites ranged from dry, low-elevation interior valleys occupied by the Douglas-fir/ponderosa pine series to more mesic, transitional, and inland sites within the Douglas-fir/tanoak series." Without further explanation as to what the author is referring to as a pine and mixed-conifer association it is unclear as to why the concluding sentence was added.	The findings of Shatford et. al. 2007 have been considered in the Vegetation Effects section of the EIS: "Although natural regeneration of conifer species has occurred elsewhere, following more typical wildfire site conditions, the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007)."

Code	Comment Number	Comment Text	Response
207 - Forest Health, Regeneration	#18878-32	DEIS: If fuels are treated effectively, and the area is planted, the amount of time needed to restore the site to a sustainable coniferous forest may be reduced. Removing large trees by salvage alone is not sufficient fuel treatment. Research has shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less intensity or not at all (Thompson, Spies and Ganio 2007; Weatherspoon and Skinner 1995). Therefore, effective fuel treatment is an essential component of sustainable reforestation in the Klamath Province (Peterson et al. 2014) (Pg 114) Comment: This seems to be contrary to the following statement in the Fire and Fuels Section, "A key finding observed by Ritchie, Knapp and Skinner (2012) found no support for the debate that post-fire salvage logging necessitates subsequent fuel treatment for elevated fuels". (Pg. 123) please clarify for reviewer.	We agree with the findings from the commenter. The sentence in the fuels section of Chapter 3 of the final EIS has been updated to clarify the reference to Ritchie, Knapp, and Skinner (2012).The findings from Ritchie, Knapp and Skinner (2012) of the commenter and the Fire and Fuels report relates to whole tree yarding for ground based units. Whole tree yarding is one form of slash disposal, but it's use is restricted to ground skidding units by feasibility and yarding systems. We acknowledge that where whole tree yarding is not used, that follow-up fuels treatments will be necessary to reduce activity fuels. Resultant fuels conditions of post-treatment logging slash and high fuel loading are not be desired conditions of the project. Within the salvage harvest and hazard tree abatement, follow-up fuels treatments are proposed to reduce post-harvest fuel loading. See comment 18878-16 for a discussion of economics and funds available to accomplish necessary follow-up slash treatments. See Fire and Fuels and Vegetation Reports for further analysis.
207 - Forest Health, Regeneration	#18878-78	Another broad statement in the Purpose and Need for Action section which needs further explanation and justification is "Following a high severity wildfire, heavy fuel loading predisposes an area to higher intensity and higher severity wildfires in the future". Current available best-science suggests that the combined influence from a pulse input of surface fuels resulting from salvage-logging (Mciver et al 2007), Donato et al 2006) followed by the establishment of uniform young plantations may increase susceptibility to severe reburns in the early stages of forest development. A similar conclusion is areas that were salvage-logged and planted after the initial fire burned more severely than comparable unmanaged areas, suggesting that fuel conditions in conifer plantations can increase fire severity despite removal of large woody fuels (Thompson et al 2007). Lastly, a Literature Review of post-fire logging studies, completed by the Forest Service's Pacific Northwest Research Station in 2000, "found no studies documenting a reduction in fire intensity in a stand that had previously burned and then been logged." (Mciver and Starr, 2000). The explanation and justification of this statement should demonstrate a strong scientific ecological basis for using post-fire salvage logging as a tool for wildfire prevention, post-fire "recovery" objectives, or ecosystem restoration objectives.	A significant consideration in comparing past studies to the Westside fire recovery rests in the details regarding activity undertaken after the harvesting of commercially valuable material. While McIver and Ottmar (2007) and Donato et al. (2006) suggest that post fire salvage logging can result in a pulse of fine fuels that can increase fire intensity and severity in the short term, none of these studies undertakes to explain the results in a scenario where post logging slash is treated in all harvested areas. Post-harvest treatment of slash is proposed in all Alternatives (see Chapter 2 of the EIS for full discussion of proposed Alternatives), and the predicted effects of this post-harvest treatment is a significant reduction both fine and coarse woody debris, as noted in Chapter 3 of the EIS. This type of treatment for post-salvage fuels is called for by Donato et al. (2006) when they sate "Our study underscores that, after logging, the mitigation of short-term fire risk is not possible without subsequent fuel reduction treatments." In addition, fire severity predicted in post-salvage areas in the McIver and Ottmar study from 2007 is based on flame length, and does not account for additional soil, cambium and fine root heating that are associated with large concentrations of large down wood during a fire event. In fact, this study found that there would be at least double the large wood debris in stands that are not salvaged 50-100 years following the initial high severity wildfire event. This is something that is not accounted for in their re-burn modeling, and it is this long heat residence time and resistance to control (as noted in Chapter 3 of the EIS) that we aim to avoid with our salvage treatments. Additional attention must be paid to the second post-harvest activity that can confound results in re-burn studies of both empirical and modeled evidence. We agree that densely planted, uniformly spaced plantations are highly susceptible to high severity fire, even if the fire itself is of low intensity. In fact, this was a pivotal piece of the results found in two of the studies cited here (Thompson et al. 2007, McIver and Ottmar 2007). Thompson et al. (2007) noted that the plantations they studied in the re-burn of the Silver fire by the Biscuit fire, stem density averaged 240-440 trees per acre; McIver and Ottmar (2007) modeled stands with 388 trees per acre. The trees per acre level used in these studies is likely to have contributed to the severity and intensity observed and modeled respectively. Our proposal does not include trees at his high stocking level, thus resulting in a lower likelihood of such high severity re-burn in the Westside fire footprints. See response to number 17910-2 for further discussion planting density as it relates to this topic. Although McIver and Starr (200) “found no studies documenting a reduction in fire intensity in a stand that had previously burned and then been logged” the question is far from decided. They go on to state “In general, logging of large-diameter material in green tree stands will lead to decreases in total fuel accumulations over the intermediate term but increases in fine activity fuels over the short term (Brown 1980). Logging in post fire stands, however, would be expected to produce less fine activity fuel because the fine material burned, and one would expect removal of large-diameter material to have an intermediate-term effect similar to green tree stands. Retrospective studies that look at twice-burned stands in which different levels of fuel reduction were undertaken after the first fire would possibly shed light on the issue of post fire logging, fuel reduction, and re-burn intensity.” To our knowledge, the only such study conducted in the intervening time since publication, is the previously mentioned Thompson et al. study from 2007, where post salvage fuel treatments are incomplete and post-harvest planting levels far exceed the stocking proposed in the Westside Fire Recovery. See response to comment12346-55 about green trees.

Code	Comment Number	Comment Text	Response
207 - Forest Health, Regeneration	#18878-84	Accountability Office (GAO) report commissioned by Congress confirmed that the Forest Service in Regions 5 and 6 (California and Oregon) failed to move beyond outdated management standards for reforestation (GAO 2005). According to one regional official, the Forest Service's history of timber production permeates current thinking, and many procedures do not reflect the current management emphasis on ecosystem health. The GAO reported that regional culture emphasized planting - the most expensive approach - to reforestation projects. A more economical approach would be allow natural processes to occur and for the forest to revegetate naturally. Any reforestation plans should at least meet the following criteria: 1. Consider all vegetation cover in stocking estimates (not just conifers) including grass, shrubs, other herbaceous plants, and hardwood tree species; 2. Plant conifers only where there is an historical basis (Pre-USFS) for establishing a forested landscape; 3. Encourage natural regeneration and succession whenever possible; 4. Count natural hardwood regeneration in stocking requirement goals; 5. Review 1944 aerial photos and Wieslander maps to ascertain historic vegetation to shape desired condition; 6. Minimize the connectivity of fuels throughout the development of the planted stand; and 7. Facilitate the application of cultural burning practices throughout the development of the planted stand. Donato DC, Fontaine JB, Campbell JL, Robinson WD, Kauffman JB, Law BE (2006) Science 311:352. Lindenmayer, D. B, Burton, P., and Franklin, J. 2008. Salvage Logging and Its Ecological Consequences. Island, Press. 227 pgs. Mclver JD, Ottmar R 2007. Forest Ecology Manage 238:268-279. Mclver JD, Starr Lynn 2000. Environmental Effects of Postfire Logging: Literature Review and Annotated Bibliography General Technical Report PNW-GTR-486 January 2000 Jonathan R. Thompson, Thomas A. Spies, and Lisa M. Ganio 2007. Reburn severity in managed and unmanaged vegetation in a large wildfire USDA Forest Service 2001a. Sierra Nevada Forest Plan Amendment, Final Environmental Impact Statement. Pacific Southwest Region. January 2001.	General comment, opinion, or position statement. See Chapter 2 of the EIS for a description of what is being proposed in terms of planting, which incorporates the suggestions provided in this comment.
207 - Forest Health, Regeneration	#18883-24	There should be a half mile no disturbance zone outside the boundary of all Wilderness, Backcountry, Research Natural Areas, Recommended Wild Rivers, and Inventoried Roadless Areas to protect the scenic beauty and allow for natural regeneration of natural forest conditions.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. This comment reflects the opinion of the author, not the requirements of the Forest Plan. The commenter has recommended a no disturbance zone around areas of special concern that is not consistent with the Forest Service Manual 2320.3(5) which does not require buffers around wilderness. For other areas, this recommendation is not in line with the Forest Plan final EIS; none of the Alternatives, including the one selected for the Forest Plan, include blanket requirements to buffer reserves (Forest Plan final EIS, Appendix K, page K-36). No site-specific amendment to the Forest Plan is considered for the Westside project.
207 - Forest Health, Regeneration	#18909-109	Recent data shows that the highest biomass and carbon levels are maintained by periodic high-intensity fire, due to the combined biomass of the snags and logs from the previous fire and the vigorous natural tree regeneration spurred by the fire and the nutrient cycling resulting from the fire. Vigorous natural conifer regeneration is the rule, not the exception, in high-intensity fire areas in Northern California. Undisturbed complex early successional post-fire forests are often the most biologically diverse of all forest conditions and are both more rare and more imperiled than old-growth forests in many regions. Although tree regeneration after disturbances is important, a narrow view of this issue ignores ecological lessons, especially the role of disturbances in diversifying and rejuvenating landscapes. High-severity patches are of greatest importance to the ecological integrity of a large burn area as they provide a unique pulse of biological legacies that sustains the diversity of plants and wildlife. Post-fire landscapes are not in need of "restoration" because fire itself is a restorative agent. Public lands may be the last stronghold for maintaining these unique ecosystems. Please see more information on natural regeneration in the vegetation section of these comments page 7.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

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207 - Forest Health, Regeneration	#18909-113	Without going into specific detail of all the agency responses, we would like to highlight one article that the Review of Publically Provided Literature references at least a dozen times. That is Sessions et al. 2003. The agency does not provide a full citation. Was the agency referencing Sessions, et al. 2003, The Biscuit Fire: Management Options for Forest Regeneration, Fire and Insect Risk Reduction and Timber Salvage, OSU College of Forestry, 8 July? If so, this report ,which was not scientifically sound or written by biologists, was central to the controversy surrounding the Biscuit Fire Salvage project. Please see, Mechanisms Of Policy Change- An Analysis of Salvage Logging on Federal Lands Including a Case Study of the Biscuit Fire Salvage Sales a Thesis by Jothan Kelvyn McGaughey. Pertinent quotes from the study are highlighted below. The report concluded that 2.5 billion board feet was economically salvageable from the Biscuit area (R. Fairbanks, personal communication, May 16, 2009; Sessions et al., 2003). The increase in volume was accomplished by including environmentally sensitive areas for salvage that had originally been excluded for consideration because of their importance to the biodiversity of the region. Mr. Fairbanks called into question some of the timber used to arrive at the 2.5 billion board feet: Of course when you look at the tables in the back of his report [Sessions Report] you found out he was counting dead tan oak. There's very little market for live tan oak, none for dead tan oak. What was he talking about? Dead tan oak was part of his 2.5 billion board feet. It was nonsense. (R. Fairbanks, personal communication, May 16, 2009, appendix H, p. 290). It (Sessions report) allowed wildly overestimated timber volumes available for salvage harvest to seem like legitimate and moderate judgments. Fairbanks was far from the only person who found problems with the Sessions Report. Professor Agee had this to say about the report: "It was not well thought out and it didn't have a very good sense of place." (J. K. Agee, personal communication, May 8, 2009, appendix G, p. 274). Sessions reasoned that the severity of the burn would prevent tree regeneration (Sessions, et al., 2003). This assumption was later proven false by a scientific study that found that salvage logging in the Biscuit fire area had hindered tree regeneration and had actually increased the short-term fire risk (Donato et al. 2006). There are several serious flaws in logic within the Sessions report, due to its weak assumptions and comparisons. One is the comparison of the Biscuit area with a salvage operation in Arizona that was extensively logged. The Arizona fire was not in a roadless area, was of an entirely different fuel type and had major differences in its ecology. Eighty-four percent of moderate to high burn severity areas of the Biscuit burn were within 200 meters of potential natural seed sources (Strittholt and Rustigian, 2004). Recent studies have established that the Biscuit burn was capable of natural regeneration (Shatford, Hibbs &Puettmann, 2007). The point here is that very sloppy science was used to help justify an extremely harmful series of events on an environmentally unique and sensitive landscape. The predominant trend in ecological research clearly reveals that salvage logging is environmentally detrimental and does not reduce fire risks (Donato et al. 2006; Beschta et al. 1995; Lindenmayer et al. 2008). Of note is the one million dollars given to Oregon State University's College of Forestry by the wife of the founder of Columbia Helicopters after the Sessions report came out (Pope, 2006; Fairbanks, 2006). Although the Sessions report was used to justify the major increase in board feet harvested, its "environmental friendly" rational of creating healthy forest regeneration had been switched to economic reasons by the time policies were written pertaining to salvage operations on the Biscuit Fire area. That economic reasoning, at least for the Biscuit sales, turns out to be just as flawed as the scientific reasoning. The real world economics of salvage logging are extremely opaque, mainly due to the complicated record keeping of governmental agencies involved (U.S. Government Accountability Office, 2006). There are many factors that influence the end result, not least of which is who actually does the accounting. The GAO Report for the Biscuit Fire is relevant to the Westside project. Please see the "Social, Economic And Community Costs And Impacts" on page 57 of these comments.	The reference to Sessions 2003 appears to be a typographic error. Following is the correct citation for Sessions, 2004 as used in the Silviculture Report. This appeared in The Journal of Forestry, a peer reviewed professional journal. This does not appear to be the article questioned by the commenter. Sessions, J., P. Bettinger, R. buckman, M. Newton and J. Hamann. 2004. Journal of Forestry. April/May 2004: Abstract: Over 54 days in 2002, the Biscuit Fire, the largest fire in recorded Oregon history, burned morethan 400,000 acres. Much of the burned land was being managed under the federal NorthwestForest Plan to provide habitat for species that live in complex, older conifer-dominated forestsas well as for recreation purposes. Only a narrow window of opportunity exists to hastenconifer restoration to complex forest conditions in a cost-effective manner, to reduce risks ofinsect epidemics and future fires, and to capture some economic value that could offsetrestoration costs. Delays in decision-making and implementation will likely destine much of themost intensely burned area to cycles of shrubs, hardwoods, and recurring fires for manydecades. This is the opposite of what current management plans call for—maintenance ofmature forests.

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207 - Forest Health, Regeneration	#18909-18	The DEIS at page 112 states: "Successful natural regeneration in one to two decades, though highly variable, has been documented following stand-replacing fires in the Klamath Province within white fir, Douglas-fir, and Douglas-fir/tanoak stand types (Shatford, Hibbs and Puettman 2007; Joint Fire Science Program Final Report, Project 05-2-1-40 2009). Pine and mixed-conifer associations were not sampled in the Shatford et al. study." Shatford et al 2007 page 141, states: "Within the Douglas-fir series, sites ranged from dry, low- elevation interior valleys occupied by the Douglas-fir/ponderosa pine series to more mesic, transitional, and inland sites within the Douglas-fir/tanoak series (Atzetet al. 1992)." Although the agency's interpretation of the Shatford et al 2007, study seems incorrect, that pine and mixed conifer forest types were not sampled. Further, it may be a moot point given that the project area is within mixed conifer forests and not pine dominated forest types. The study of post-fire natural regeneration took place across a range of forest types throughout southwest Oregon and northern California. The focal region was the Klamath National Forest in northern California, primarily the Happy Camp/Oak Knoll Ranger District (RD) from Yreka to the Siskiyou Wilderness west of Happy Camp, Ca., which is were a majority of the Westside project is proposed.	The findings of Shatford et. al. 2007 have been considered in the Vegetation Effects section of the EIS: "Although natural regeneration of conifer species has occurred elsewhere, following more typical wildfire site conditions, the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007)."
207 - Forest Health, Regeneration	#18909-21	The DEIS at page 113 states: "Although post-fire observations may indicate surprisingly prolific regeneration, even on severely burned sites, natural regeneration establishment in local wildfires in the past led to desired stocking levels typically only being met around the edges of the fire where a good seed source is still intact (Bonnett, Schoettle, and Shepperd 2005)." The Bonnet et al. 2005 study looks at ponderosa pine forests in South Dakota. Nonetheless, there are very good points in the document at page 37-38: "Large-scale disturbances such as wildfire and small-scale disturbances such as lightning, tree falls, and diseases contribute to forest ecosystem structure and functioning. These disturbances create macro- and micro-environmental heterogeneity that affects population and community spatial distributions. Microenvironments are particularly important for tree seedling establishment in harsh environments. Habitats suitable for seed germination and seedling establishment, called 'safe sites' by Harper et al. (1961), are created by processes at the macro- and micro-scales. Understanding at multiple spatial scales the complexity of factors controlling tree regeneration and distribution constitutes one of the fundamental goals of forest ecology." (References omitted) At page 42 of Bonnet et al 2015: "Relative germination success was highly positively correlated with scorched litter on burned mineral soil (r = 0.136), high cryptogam cover (r = 0.070), and high cover of tall trees with greater than 50% of their crowns burned (r = 0.040)." At page 43: "Scorched needles on the surface of burned mineral soil, which are conditions most favorable for seedling occurrence, reduced soil temperature variation during the day." At page 45: "The abundance of mosses, lichens, and trees with burned crowns was also highly correlated with seedling occurrence, whereas high herbaceous and total vegetation covers negatively affected seedling incidence at the plot level (2 m Å~ 6 m). Evans and Johansen (1999) demonstrated the enhancement of seed germination and seedling survivorship through mechanical protection by microbiotic crusts. The protection of seeds by lichen crusts is particularly effective in extreme systems such as xeric (Houle and Phillips 1989) or high-elevation habitats (Moir et al. 1999)."	The findings of Shatford et. al. 2007 have been considered in the Vegetation Effects section of the EIS: "Although natural regeneration of conifer species has occurred elsewhere, following more typical wildfire site conditions, the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007)."The action Alternatives would remove primarily dead vegetation and may damage live trees or plants during harvest operations, but the extent of damage would be localized and long term effects to vegetation would be negligible. See response to 12346-55.The range, sensitive plants, soils, watershed and wildlife sections disclose any localized effects on specific vegetation. While studies following wildfire indicate that regeneration tends to be highest in low to moderate severity patches (Lentil et al. 2005), Bonnet et al. (2005) found that seedling establishment was very successful in patches of high severity that were within 39.4 ft. (12 m) of unburned forest canopy. The ability of a forest to regenerate on its own after a stand replacing fire is highly dependent upon available seed sources. As patch sizes increase, the distance to the nearest seed source increases and seed availability drops off at an exponential rate (Bonnet et al. 2005).
207 - Forest Health, Regeneration	#18914-2	When sprouting hardwoods are found within FMZs, select the most vigorous sprout for retention. Removing all sprouts will only serve to exacerbate the fuel loading over the long term. As stated in my initial scoping letter, hardwood trees add a lot of resilience to our landscape and should be highly regarded in any fire landscape restoration strategy.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Fuel management zones will be treated with a variety of treatments to address fuels conditions, including selective thinning, mastication, and underburning. See Chapter 2 of the EIS under fuels treatments for details.
207 - Forest Health, Regeneration	#18914-3	For restocking needs assessment, hardwoods should have equal weight as a conifer.	Growth of existing hardwoods will be encouraged; hardwoods will be included in the target stocking for units in areas where they exist. See Chapter 1 (changes to the proposed actions) and Chapter 2 under site preparation, planting and release for details about what is being proposed.

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207 - Forest Health, Regeneration	#18926-22	Forest Carbon - The Karuk Alternative or # 6 adds the least amount of carbon to the environment as compared with the other action alternatives - #2, #3, #4, or # 5. ! ! Retention of Hardwoods and Softwoods! The current Forest Service policy related to fire- safing areas by removal of all softwood trees up to 9 inches and all hardwood trees up to 7 inches. Removal of the hardwood trees, some of which might have taken 50 years or more to reach this size, impacts severely the food sources for deer, squirrels, birds, and other creatures. Further, the hardwoods represent a far lesser fire hazard than the conifers. The hardwoods should be left for the future to provide shade quicker too and they may be forest of the future. ! !	As described in Chapter 2 of the EIS "Growth of existing hardwoods will be encouraged; hardwoods will be included in the target stocking for units in areas where they exist." See Chapter 1 (changes to the proposed actions) and Chapter 2 under site preparation, planting and release for details about what is being proposed.
207 - Forest Health, Regeneration	#18934-16	Re-vegetation Science is clear that salvage logging followed by plantation establishment will increase future fire hazard and inhibit forest recovery. According to Jerry Franklin's Westside comments (incorporated her by reference), "Salvage activities proposed within LSRs as part of Westside Fire Recovery Plan are inconsistent with NWFP intent and direction for management of LSRs, including their treatment following a major disturbance. Salvage will make no positive contribution to the reestablishment of late-successional forest habitat for NSO prey species, among many others. Retention of large snags and logs are critical parts of the natural recovery processes and none of this wood legacy can be demonstrated as being in excess to ecological needs on moist forest sites; indeed, all of the scientific evidence is to the contrary." In order to meet the need for restored and fire-resilient forested ecosystems, re-vegetation should not hinder prescribed fire within the fire footprints within the next 5-10 years. The current modeling on 30 year fire return interval for plantation success of even the most progressive planting methods proposed, is not adequate, these high severity landscapes need fire on the ground within 10 years to begin to reestablish a healthy fire regime, create a heterogonous forest and not be reburned at high intensity. Re-vegetation, if implemented at all should be based on pre-fire suppression vegetation for the site, using variable density, and be either easily defensible for Rx Fire or inconsequential if/when they burn up. A possible alternative approach could be to wait to replant until after the area gets fire back in for the first time in the next 5-10 years, then replant where appropriate with pre-fire suppression species mixes. The fire prescribed fire will reduce fuel loading as well as brush competition for young trees, help to prep the sites for planting, and the time lapse and burn results will illuminate where natural regeneration is taking place. We also recommend retaining and giving preference to hardwoods with a potential for bole sprouting, especially on south, west, and east facing slopes; giving preference to sugar pine and cedar where appropriate when planting; and counting natural hardwood regeneration in stocking requirements	We agree that retention of large structures is beneficial for northern spotted owls and many other species, and that any material over time would serve an ecological function for the simple reason that there is no “excess” in nature. We also agree that we should strive to maintain large structures that would persist until the next stand is capable of producing large material. That is a requirement of the Forest Plan (4-87; MA 5-30). We do not agree however that salvage logging followed by reforestation will inhibit forest recovery. Retention of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current Late-Successional Reserve land allocation (EIS Chapter 3 – Fuels). See EIS Chapter 3, Responsible Opposing Views and Agency’s Responses to Issues Raised.We also agree that reforestation should not preclude the application of prescribed fire to the landscape. Dense plantations of continuous fuels such as those noted by Thompson et al. (2007) would be at risk of being consumed in future fires, and can in fact help propagate high intensity fire. We know that when dense young stands are combined with untreated, or inadequately treated logging slash, the result is a volatile mix that is prone to high severity fire. In the Westside Fires, 70 percent of plantations exposed to fire survived. The common denominator in plantations that survived was treated activity fuels (Varak, personal communication). This is consistent with findings of Weatherspoon and Skinner (1995). In the Westside Fire Recovery, we propose to treat the activity fuels (slash) from salvage logging, and plant at lower densities and variable spacing to create stands with discontinuous fuel that would be resilient to fire and could tolerate low to moderate severity fires typical of the Klamath Province. Thompson et al (2007) note that “reducing connectivity of surface fuels at landscape scales is likely the only way to decrease the size and severity of reburns until vertical diversification and fire resistance is achieved.” That is exactly the objective of the Westside Fire Recovery Project in salvage harvest units. The reforestation stocking objective after planting in the Westside Fire Recovery Project is a stand of 75 to 225 variably spaced young trees with treated, discontinuous activity fuels, not densely stocked regularly spaced plantations that form continuous fuel beds. Stand density would vary with slope position and aspect with lower stocking on upper slopes and south and west aspects and higher stocking on north and east aspects that would form a closed canopy on lower slopes. Hardwoods would be included in the target stocking levels so the number of conifers would be less where hardwoods occur. Most reforestation units in the Westside Fire Recovery would be planted at lower densities as most of the units are on upper slopes. We also anticipate there would losses from future fires that would further reduce stand density. Our long term objective is 30-50 large, variably spaced, fire resilient trees per acre with openings as described by Taylor and Skinner (1996). Text has been added to Chapter 2 of the EIS and silvicultural prescriptions to make this point clear. Although future management of plantations is beyond the scope of this document, our goal is to create stand conditions where low intensity fire can be reintroduced at an early age and fuel discontinuity maintained. The Forest Plan for the Klamath National Forest specifically provides for the reintroduction of fire to accomplish this objective (Forest Plan 4-8). The comment recommends delaying replanting, burning five years or so from now and then planting. This not likely to succeed. The longer we delay site preparation, the less likely the likelihood of successful reforestation. Fire-scarified seed species, including many of the Ceanothus spp. species, which are likely to be primary competitors with the conifer seedlings are able to re-occupy a broader and deeper portion of the available water-holding capacity (AWC) of the soil profile. AWC is the limiting factor in successful conifer regeneration in our Mediterranean climate, including the Klamath NF. The future fire event would need to be of such intensity that the fire-scarified competing vegetation would need to be almost completely controlled, but soon enough that the competing vegetation not be old enough to root-crown re-sprout for even swifter soil profile re-occupation. In time, the primary future fire carriers, the fine fuels would substantially decrease, and the live-fuel moisture would dramatically increase, requiring a more intense fire event to control competing vegetation. Controlling competing vegetation is the key to successful conifer regeneration, and the longer the delay, the more fully the competing vegetation can exploit the soil profile and available water. Without planting, trees will slowly become reestablished over a period of 10-50 years in severely burned areas, but the probability of a late-successional coniferous forest becoming established is low because of probable reburns. It is probable that areas where fuels are not treated will

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			go through several cycles of stand replacement fire until surface fuels have been reduced to the point that a low to moderate fire severity regime has been reestablished. This would maintain areas where fuels have not been reduced in semi-permanent brush fields for decades rather than accelerating the development of late-successional stand conditions.See also comment 17111-1, which addresses the concept of "excess" wood, and persistence of snags and down wood on the landscape and Appendix A, which has been developed to address issues related to salvage in Late Successional Reserves and compliance with Standards and Guidelines for activities in Late Successional Reserves. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate. See EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised".
207 - Forest Health, Regeneration	#5873-111	Similarly, Dan Donato, looked at the effects of salvage logging at the Biscuit fire in SW Oregon and found that cutting down dead trees and hauling away logs killed 71 percent of the naturally established seedlings which were abundant after the fire but scarce after logging. D. C. Donato, J. B. Fontaine, J. L. Campbell, W. D. Robinson, J. B. Kauffman, B. E. Law. Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk. www.sciencexpress.org. 5 January 2006. Shatford and Hibbs recently found similarly encouraging results of natural regeneration. Over the 2005 field season, natural regenerating conifers were sampled in 38 plots within 11 historic fires in the Klamath-Siskiyou Region … Years since stand replacing wildfire ranged from [18 years to 9 years] … The density of natural regenerating conifers ranged over three orders of magnitude … Although the abundance of natural regeneration was frequently high, the age and size of saplings ranged considerably … Frequently, the regenerating saplings were overtopped by shrubs and hardwoods. There was no evidence of recent conifer mortality (i.e. no dead or dying saplings) caused by competition … Saplings were generally in good condition with dominant trees having live crown ratios of 50% or greater.	Response to: "Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk" The review of Donato et al 2006 by Newton et al 2006 (M. Newton, S. Fitzgerald, R. R. Rose, P. W. Adams, S. D. Tesch, J. Sessions, T. Atzet, R. F. Powers, C. Skinner) is applicable to Westside Resource Recovery Project EIS reforestation circumstances. As per the findings of Newton et al in the review of Donato et al, they noted the following: "Donato et al. (1) recently concluded that logging 2 to 3 years after wildfire kills natural regeneration and increases fire risk. The research may make a valuable contribution, but the study lacks adequate context and supporting information to be clearly interpreted. Here, we discuss the papers methods and conclusions in the context of relevant management objectives and the forestry knowledge base concerning natural regeneration processes, mortality from logging, and fuel accumulations in southwestern Oregon and northwestern California. Donato et al. (1) made inferences about natural regeneration processes, mortality from logging, and fuel accumulations without presenting key information regarding (i) agency postfire management directives for reforestation or downed wood levels (2), (ii) implications of delays in postfire plan implementation, or (iii) important environmental and disturbance descriptors such as plant associations, fire intensity, seed tree proximity, and weather patterns. Results from their study cannot be readily extrapolated because it was a short-term observational study of site-specific forest operations governed by agency management objectives. Other management plans, operations, or conditions could yield different results (3). In the case of the 2002 Biscuit Fire, logging was postponed for 2 years, allowing more seeds to germinate and increasing seedling exposure to injury during logging (4). Donato et al. cite a lack of scientific data regarding the management of public forests after large fires. However, it should be noted that conifer reforestation (planted and natural) and vegetation ecology have been widely studied in the region. Studies show variable responses with plant association, competing vegetation, local climate, soils, and other factors (5, 6). Hobbs et al. (5) provide a synthesis of 13 years of research in southern Oregon and northern California. Fewer studies have examined reforestation after wildfire, especially over longer periods (4, 7–9), but damage to natural regeneration after delayed salvage logging was reported more than 50 years ago (4, 8)…"
207 - Forest Health, Regeneration	#5873-112	Shatford, J., Hibbs, D.E. 2005. Predicting Post-fire Regeneration Needs: Spatial and Temporal Variation in Natural Regneration in Southwestern Oregonadn Northern California. Pp 29-32 in Cooperative Forest Ecosystem Research Program (CFER) 2005 Annual Report. http://www.fsl.orst.edu/cfer/pdfs/CFER_ar05.pdf. This data reveals that natural regeneration is not only demonstrably successful but also species diverse and variable both spatially and temporally. All of these attributes are highly beneficial in terms of both wildlife habitat and fuel hazard	The findings of Shatford et. al. 2007 have been considered in the Vegetation Environmental Consequences in Chapter 3 of the EIS: "Although natural regeneration of conifer species has occurred elsewhere, following more typical wildfire site conditions, the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007)."
207 - Forest Health, Regeneration	#5873-113	The adverse effects of salvage logging on vegetative recovery described by Sexton are not unique to the Ponderosa pine forest type. The results are in fact quite consistent with the results found by Michael Grifantini et al after salvage logging in Douglas fir forests in northwestern California. Grifantini, M.C., Stuart J.D., and L. Fox III, 1992. "Deer Habitat Changes Following Wildfire, Salvage, Logging and Reforestation, Klamath Mountains, California," Proceedings of the Symposium on Biodiversity of Northwestern California, Oct 28-30, 1991, Santa Rosa, CA. UC Wildland Resource Center Report 29. December 1992. The adverse effects described by Sexton appear to be long lasting. Busse at al 1996 found that the annual growth rate of pines was reduced by almost 20% where understory vegetation had been removed thirty years earlier. In addition, research has shown a direct relationship between the level of on-site coarse woody debris and the amount active ectomycorrhizal root tips. Graham, R. T., Harvey, A. E., Jurgensen, M., F., Jain T. B., Tonn, J. R., and Page-Dumroese, D. S. 1994. Managing coarse woody debris in forests of the Rocky Mountains. Res. Pap. INT-RP-477. Ogden, UT: U. S. Department of Agriculture, Forest Service, Intermountain Research Station, 13 p. See also Russell T. Graham, Theresa Benevidez Jain, and Alan E. Harvey FUEL: LOGS, STICKS, NEEDLES, DUFF, AND MUCH MORE. The Joint Fire Science Conference and Workshop http://web.archive.org/web/20060829024013/http://jfsp.nifc.gov/conferenceproc/T-	The proposed action provides for retention of coarse woody debris and other habitat and soil elements, as described in detail in the Project Design Features section of Chapter 2 of the EIS.

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207 - Forest Health, Regeneration	#5873-167	Prepared under contract for USFS, Central Cascades Adaptive Management Partnership. Here are some relevant excerpts: "… disturbances create snags and down woody debris (Harmon et al. 1986), volatilize nutrients and biomass (Campbell et al. 2007), and open growing space for the establishment of new cohorts of shrubs, trees, and forbs (Oliver and Larson 1996)." (p 2) "Wind as a disturbance agent tends to superimpose a fine-scale mosaic pattern (Lertzman et al. 1996), frequently on a coarser mosaic created by large fire-created patches (Spies and Franklin 1989)." (p 2) "An important operation of most types of natural disturbance is that biological legacies are created or retained in the disturbance phase, and these enrich the developing stand (Franklin et al. 2000, Franklin et al. 2002)." (p 4) "The percentage of the regional landscapes of the Pacific Northwest in early succession was a highly variable parameter, …" (p 4) "Time to crown closure (and therefore the cessation of the early seral phase) is highly variable in Northwestern forests (Franklin et al. 2002). Assuming a very conservative low-end estimate of 30 years to crown closure (see Tappeiner 1997 and Poage et al. 2009 for context on this assumption), this would suggest that at any one point in recent history, 5-20% of a given landscape would have been in an early seral condition.: (p 4) "Even following clearcutting, burning, and planting with a commercial conifer tree species such as Douglas-fir, there may be a period of enhanced shrub and forb cover. On clearcut sites in the western Oregon Cascades, Schoonmaker and McKee (1988) identified a peak in cover at stand age 10-20 of ecologically important shrubs…" (p 7) "Many of these are important for nutrient fixation or cycling (e.g., nitrogen fixation by Ceanothus), forage (Ceanothus, Bromus, Salix, Rubus), and other values (e.g., nectar provision to pollinators by E. angustifolium). … Many of the shrubs and forbs, especially, are important fruit and forage producers. … Provision of food resources via fruit and seed production is a very important role of early seral forest ecosystems." (p 8). "Biological legacies, living or dead residual structures from the pre-disturbance ecosystem (Franklin et al. 2000), are crucially important to early seral functionality." (p 8) "Down woody debris and snags are key structural elements of highly functional early seral forest ecosystems (Swanson et al. 2011). The early seral phase following disturbance often represents a period of peak volumes for down wood and snags (Harmon et al. 1986); …" (p 8)	The comment provides general citations, but does not provide any information that is specific to the Westside Recovery Project, or show how the Westside Recovery Project is inconsistent with these papers. It should be noted that the conditions of the Central Oregon Cascades are not typical of the conditions in the Klamath Province. The fire regime of old-growth Douglas fir dominated forests of the Klamath Mountains differs from more mesic old-growth Douglas fir forests of Oregon and Washington (described in Franklin et al. (1981)) in fire frequency, fire severity, and structural attributes such as amount and persistence of snags and coarse woody debris (Taylor and Skinner 1997). The characteristic fire regime of the Klamath Mountains is actually one of frequent low to moderate intensity fire with low to moderate severity effects (Skinner et al. 2006), not "stand-replacement or mixed" that is typical in the Coast Range and western Oregon and Washington Cascades. This affects structure and amounts of snags and coarse woody debris. See Response 5873-171 for a discussion of early seral plant communities. See Response 5873-72 for a discussion of snags and coarse woody debris. See EIS Chapter 3 "Responsible Opposing Views and Agency's Response to Issues Raised".
207 - Forest Health, Regeneration	#5873-168	"Over longer time periods, spatially irregular development initiated early in succession, accompanied by a diversity of life-forms, may lead to structurally complex forests (Zenner 2005). Furthermore, the recently proposed 'precocity' pathway (Donato et al. 2011) states that diverse structure and spatial heterogeneity in early seral stands may actually accelerate the onset of structural and compositional attributes associated with late seral forests." (p 9) "It is fitting to note that few species are absolutely obligate in early seral communities, but robust populations of many species are primarily found in early seral communities." (p 9) "Many birds are characteristic of early seral habitats (Hagar et al. 1997). In the northern Rockies, Hutto (1995) found fifteen bird species occurring primarily in recently burned areas, with one species, the black-backed woodpecker (Picoides arcticus), relatively restricted to early seral post-fire environments. He also found that many species are relatively more abundant in post-fire	The comment provides a number of general literature citations but does not show how those are applicable to the conditions of effects of the Westside Fire Recovery. About 52,000 acres burned with moderate to high severity where most of the trees were killed. Over 80% of that area would remain untreated ascollectively described in the citations. Areas where salvage harvest would not occur includes all forested high mortality burn patches that are less than 20 acres in size and all areas that are less than 50 percent mortality. Retaining these areas maintains the complex fire mosaic pattern created by the Westside Fires and heterogeneity more closely resembles the habitat needs of northern spotted owls species described by Franklin et al. (2000) and other species. Areas that would not be planted also include multiple large patches ranging in size from a few hundred acres to well in excess of 1000 acres of fire-killed older trees in the Grider Creek Inventoried Roadless Area. Thus all patch sizes from very small to very large are represented in areas where no salvage harvest or site preparation and planting occurs. This contributes to the heterogeneity described by Franklin et al. (2000). The combined effect of these snag retention and recruitment measures will result in a mosaic of

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		environments, although they may not specifically select for them. Woodpeckers, especially, often have a limited period of high abundance during the first few years following severe wildfire (Covert-Bratland et al. 2006). Bosakowski (1996) examined breeding birds in relation to stand types and ages on an industrial forest landscape in southwest Washington. From a total of 78 species observed, he identified eight birds associated with early seral conditions that declined as harvested stands matured: white-crowned sparrow, song sparrow, rufus-sided towhee, willow flycatcher, black-headed grosbeak, orange-crowned warbler, yellow-rumped warbler, and American kestrel." (p 10) "Insects contribute tremendously to species diversity in ecosystems worldwide (Wilson). In the Pacific Northwest, a number of insects are associated with early seral habitats." (p 12) "The western bluebird (Guinan et al. 2008) and the black-backed woodpecker (Hutto 1995) are bird species almost emblematic of early seral habitat, and are on several state-level conservation lists. … A significant number of state-listed organisms associated with early seral habitats are lepidoptera (butterflies and moths), since their larval stages depend on herbs, shrubs, or broadleaf trees that occur primarily in early seral habitats, and adults may require floral nectar as a food source." (p 12) "Disturbances of greater spatial extent cover a wider range of edaphic and topographic conditions, engendering diverse recovery pathways in ways a smaller opening could not. Turner and Dale (1998) emphasize that large disturbances have persistent effects on ecosystems, present tremendous internal heterogeneity …" (p 14) "Smaller disturbance patches tend to fill in more rapidly, since dispersing plant propagules (especially from trees) can access most or all of the disturbed area, decreasing time to recovery (Foster et al. 1998). Furthermore, small patches are generally still under the microclimatic control of the adjacent forest, and experience an array of biotic and abiotic edge effects. However, they may still generate substantial ecological benefits associated with early seral habitats. Hagar (2007) indicates the need to conserve non-conifer vegetation in forest understories, including in gaps across a broad range of sizes. Maintenance of areas of low tree density in young plantations may promote persistence of shrubs into later seral stages. … In general, thinning and gap creation are important for revitalizing or initiating understory development (Bailey and Tappeiner 1998, Chan et al. 2006) and creating certain types of wildlife habitat (Hayes et al. 1997), especially when accomplished in a spatially variable manner (Carey 2003). However, for many processes and organisms, these activities do not substitute for the physical and biological changes engendered by a large disturbance that creates a spatially heterogeneous template for ecosystem development. " (p 15) "The early seral habitat produced by clearcutting is highly variable in its resemblance to naturally occurring early seral conditions. Woody debris and snags in clearcuts is frequently less abundant than in legacy-rich forest (Pedlar et al. 2002), with attendant consequences for wildlife. Clearcutting can recreate some of the natural processes associated with fire, but is not a functional substitute with regard to many ecosystem attributes (Means et al. 1996). … However, even retention approaches may not provide the functionality of naturally-created early seral habitats." (p 16) "Salvage logging can result in reductions in available habitat structure, increased erosion, and other negative effects (Lindenmayer and Noss 2006, Lindenmayer et al. 2008). Salvage, especially when followed by dense replanting of conifers, can substantially curtail the early seral phase. … In a very substantial review, Russell et al. (2006) found that salvage logging tends to reduce snag longevity." (p 16) "Compositional simplification of young stands via pre-commercial thinning and herbicide application can reduce or eliminate ecologically important processes." (p 16) "Potential management responses may include: • Deferring salvage and dense replanting across all or parts of major disturbed areas (Lindenmayer and Noss 2006, Lindemayer et al. 2008)) • When salvaging, practice variable retention to retain significant structural elements such as large-diameter live trees, snags, and down woody debris (Franklin et al. 1997, Eklund et al. 2009). • Avoiding reseeding with exotic plant species such as perennial ryegrass (Lolium perenne) following fire or volcanic eruption (see Dale et al. 2005b). • Attempt to incorporate elements of natural disturbance regimes into landcape-scale management (Lindenmayer and Franklin 2002) • Deliberate creation of large, early seral areas via silviculture (Swanson 2010)." (p 17) "It is hoped that the diversity and value of early seral conditions, from clearcuts to structurally and compositionally complex early seral habitat, will come to be recognized and widely incorporated into contemporary land management." (p 18)	areas with low to high densities of snags, consisting of a variety of sizes, and occupying the project area both in the present and future. The proposed action provides for retention of coarse woody debris and other habitat and soil elements as described in detail in the Project Design Features section of the EIS. See also EIS Chapter 3, Responsible Opposing Views and Agency Response.

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207 - Forest Health, Regeneration	#5873-27	"[T]here's a looming shortage of diverse young forests - where seedlings intermingle with fallen logs, standing dead snags, and shrubs - that provide specialized habitat for certain animals and plants. … there's a looming gap in diverse, young, early-successional conifer forest, the type of forest that once came in naturally after forest fires. These young forests, up to 10 years old, have a diversity of forest structures - fallen logs and dead snags - and a diversity of plant life. They are important habitat for the western bluebird and other birds that prefer open areas, as well as some shrub species. Today, because of intense timber management on private lands, young forests don't get the chance to develop much diversity." OSU. 2001. Press Release: Researchers Assess Forest Sustainability. http://web.archive.org/web/20060914032259/http://oregonstate.edu/dept/ncs/newsarch/2001/Oct01/assess.htm. According to the CLAMS project: "Diverse young forests: also rare but receiving less attention. Legacy tree habitat: uncertain future.." Ohmann, Spies, Gregory, Johnson. 2002. Vegetation Biodiversity in the Oregon Coast Range. http://www.fsl.orst.edu/clams/download/presentations/j02s_ohmann_10june02.pdf (slide 24).	While this quote is informative, it does not provide a substantive comment on the Westside Fire Recovery Project proposed actions or analysis. Project design features as detailed in the EIS are designed to contribute to stand structural diversity.
207 - Forest Health, Regeneration	#5873-32	i. BLM's Western Oregon Plan Revision (WOPR) DEIS (p. LII) admits that structurally complex young forests develop old forest characteristics twice as fast as structurally deprived initial conditions.	While this is informative, it does not provide a substantive comment on the Westside Fire Recovery Project proposed actions or analysis. Project design features as detailed in the EIS are designed to contribute to stand structural diversity.
207 - Forest Health, Regeneration	#5873-35	"Leaving a damaged forest intact means the original conditions recover more readily," says David Foster, … director of the NSF Harvard Forest LTER site. "Forests have been recovering from natural processes like windstorms, fire and ice for millions of years. What appears to us as devastation is actually, to a forest, a natural and important state of affairs." 10-16-2012 Press Release 12-198, In Blown-Down Forests, a Story of Survival To preserve forest health, the best management decision may be to do nothing. http://www.nsf.gov/news/news_summ.jsp?cntn_id=125744; Audrey Barker Plotkin, David Foster, Joel Carlson, and Alison Magill 2013. Survivors, not invaders, control forest development following simulated hurricane. Ecology, 94(2), 2013, pp. 414–423. http://harvardforest.fas.harvard.edu/sites/harvardforest.fas.harvard.edu/files/publications/pdfs/BarkerPlotkin_Ecology_2013.pdf	While this is informative, it does not provide a substantive comment on the Westside Fire Recovery Project proposed actions or analysis. Alternative 1, the no action Alternative, is considered in detail in the EIS.
207 - Forest Health, Regeneration	#5873-36	"Unmanaged early-seral stages of forest development are now considered to be among the most threatened habitat types in coniferous regions of the western United States (Noss et al. 2006, Thomas et al. 2006).	While this is informative, it does not provide a substantive comment on the Westside Fire Recovery Project proposed actions or analysis.

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207 - Forest Health, Regeneration	#5873-40	The agencies should not conduct any more salvage logging until they have fully disclosed and considered these issues.New synthesis on early seral forest A few things to consider before conducting salvage logging or regen harvest to enhance early seral forest: a) we might already be on a trajectory to restore early seral habitat via natural disturbance alone, accompanied by increase in fire (and insects) due to climate change. b) early seral species tend to be generalists/opportunists, and that few early seral obligate species are truly at risk, c) the great abundance of low quality early seral habitat resulting from clearcutting on non-federal lands at least partially mitigates for the lack of high quality early seral resulting from fire suppression; d) there are opportunities to enhance early seral habitat by modifying non-federal forest practices, such as legacy retention, tolerating more vegetation diversity and longer periods of conifer re-establishment; e) there are opportunities to harmonize the goals of restoring both young and old forest by including structure rich gaps in variable density thinning projects and experimenting with variable regen in a portion of the young stem-exclusion stands which are over-represented relative to the historic range; and f) the historic extent of early seral habitat was artificially increased by cultural burning practices. The Forest Service recently commissioned a science synthesis on early seral forests: Swanson, M.E., 2012. Early Seral Forest in the Pacific Northwest: A Literature Review and Synthesis of Current Science. http://ncfp.files.wordpress.com/2012/06/swanson_20120111.pdf.	This is a general comment that expresses the opinion of the commenter, and includes general literature citations, but does not provide information specific to the Westside Fire Recovery Project as to why early seral communities would not occur. We agree that early seral habitats are valuable, however those habitats do not appear to be in short supply. Monitoring of the Northwest Forest Plan shows that about 150,000 acres of northern spotted owl nesting and roosting habitat has been converted to early seral forest by stand replacement fire in the Klamath Province of northern California. Since the inception of the Northwest Forest Plan (Davis et al 2015). As noted by Skinner et al (2006), “The extent of recent high-severity burns appears to be different than historic burning patterns. More area is burning at higher intensity, and this is related, in part, to higher quantities and more homogeneous fuels caused by accumulation during the fire-suppression period." Considering climate change scenarios, most fire scientists expect that high severity fire will continue to increase in size, frequency etc. There is not likely to be a shortage of early seral habitats in the future either given the fuel conditions created by fire suppression and the effect of likely climate change. On the Klamath, the Westside Fires burned over 50,000 acres at a level of intensity and severity that create early seral conditions. Proposed Salvage and site preparation and planting affect about 20-25% of that area. That means that 75-80% will go through an unimpeded early seral stage as recommended by the commenter. As a practical matter, the areas that are site prepped and planted will also go through an early seral plant community phase, although it likely won’t be as long as that where reforestation does not occur. There are areas in the Westside Fires where very large patches of forest burned. Most of the proposed salvage actions occur in these large patches. Breaking up these large patches with some areas that have been reforested would provide a more heterogeneous landscape over time such as that described by Franklin (2000). See also EIS Chapter 3, Responsible Opposing Views and Agency’s Responses to Issues Raised.
207 - Forest Health, Regeneration	#5873-47	“There has been a loss of diverse young forests on all ownerships. … Conservation of diverse young forests has received little attention in forest policy.” Janet Ohmann; Science Findings, Issue 56; Seeing the trees for the forest: mapping vegetation biodiversity in coastal Oregon forests; (September 2003). http://www.fs.fed.us/pnw/sciencef/scifi56.pdf.	General comment and quote not specifically associated with this project. Forest Service policy is beyond the scope of this project's analysis. We acknowledge the need for early seral forests; this project is only salvage harvesting and planting a fraction of the burned areas, leaving a majority of the area for natural regeneration and early seral stages.
208 - Forest Health, likelihood to persist	#19146-3	I honestly would have liked more of the burned area to be treated, and salvageable wood to be recovered, but hopefully, this can be an initial step to the long term improvement in our forest's health, survivability and productivity.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest is strategically treating areas in most need of treatment within the sidebars of forest plan and other laws, including but not limited to the Endangered Species Act.
208 - Forest Health, likelihood to persist	#5873-130	This much is clear: Traditional salvage logging results in a 100% probability that large snags will NOT persist and will not contribute to current habitat or future development of late successional habitat. On the other hand, retaining all large snags will result in a >>0% chance that they will dodge the bullets of decay and reburn. Traditional salvage logging clearly removes snags that have a >>0% probability of persisting, and therefore, even in the event of reburn, logging large snags "diminishes" this important component of late-successional old-growth habitat.	The commenter fails to provide evidence of these statements. The proposed action provides for retention of snags, coarse woody debris and other habitat and soil elements as described in detail in the Project Design Features section in Chapter 2 of the EIS.
208 - Forest Health, likelihood to persist	#5873-59	The Siskiyou National Forest’s Biscuit Fire FEIS admits that up to 53% of small Douglas-fir snags (10-30” dbh) and up to 85% of large Douglas-fir snags (>30” dbh) are likely to remain standing for 50 years or more. Even after 100 years, up to 63% of the large Douglas-fir snags may remain standing. In a natural ecosystem these snags play critical roles as habitat and microclimate modifiers. If they are salvaged or knocked down for safety reasons they are not able to fulfill these purposes. Biscuit FEIS Appendix G-9 http://web.archive.org/web/20040610234842/http://www.biscuitfire.com/proj_plan_index.htm.	The Biscuit Fire project's analysis is outside the scope of this analysis. This project includes the retention of snags and legacy components; see project design features under wildlife in Chapter 2 of the final EIS. From the project design feature table in Chapter 2, "Legacy trees or snag size will vary depending on site condition, but are usually disproportionately large diameter trees that are often remnants of the previous stand on a given site. They are old standing trees that have persisted on the landscape after man-made and natural disturbances. For example, large trees containing one or more of the following characteristics: split or broken tops, heavy decadent branching, large mistletoe brooms, otherwise damaged to the degree that a cavity may form such as basal fire or lightning scars, or other features that indicate decay or defect. If the legacy component tree or snag must be felled for safety reasons, retain the log whole in the unit." From Chapter 1 of the final EIS, "Few forested regions have historically experienced fires as frequently and with such high variability in fire severity as the Klamath Mountains Bioregion (Skinner 2006). The fire regime of the forests of the Klamath Mountains differs from the more mesic old-growth Douglas-fir dominated forests of Oregon and Washington (described in Franklin et al. 1981) in fire frequency, fire severity and structural attributes such as the amount

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			and persistence of snags and coarse woody debris (Taylor and Skinner 1997)."
208 - Forest Health, likelihood to persist	#5873-68	The BLM has previously admitted that a "high proportion" of snags "are expected to persist for at least 50 years." Roseburg BLM 2009, Little Wolf 3 Density Mgt EA. http://www.blm.gov/or/districts/roseburg/plans/files/LittleWolf3EA.pdf. This means that salvage logging can exacerbate the snag gap the front end by at least 50 years.	There are about 52,000 acres of moderate and high severity burn areas in the Westside Fire Recovery Project area where most of the trees were killed by the fire. Salvage harvest, even at the highest proposed level (Alternative 2) 85 percent of the moderate and high severity fire area would not have salvage harvest. In the Preferred Alternative, the number is closer to 90 percent. In areas with salvage units, snag retention standards in the Klamath Forest Plan must be met. Regardless of how long snags last, we don't believe there will be a snag shortage in the Westside Fire Recovery Project Area. Other locations like Roseburg BLM may have different snag longevity because of location, species mix, tree size, fire history etc. We note that Roseburg, OR is in an infrequent fire, high fire severity environment where the period between fires is much longer than the Klamath. That certainly affects snag longevity. Our assessment is that over the next 10-30 years, most of the fire killed trees from the 2014 fires will break off or fall and become ground fuels. Some, but by no means the majority, will last longer than that, and a very few may last until the next stand is capable of producing large snags. In a recent study in Black's Experimental Forest on the Lassen National Forest, eight years after the Cone Fire, most of the ponderosa pine snags had fallen. Only 16% of pine snags between 30 and 45 cm and 41% greater than 45 cm were still at least partially intact (Ritchie et al, 2012). In their snag fall model, Harrod et al. choose 45 years as the time when all snags have fallen, which they term as "generous". The literature summarized by Harrod et al. 1998 shows most snags don't last more than 20-25 years. Occasionally, large snags in sheltered locations may persist until the next stand is producing large material, but this is likely rare in the frequent fire environment of the Klamath. As noted by Skinner (2002) dead wood does not last long enough to decompose in the Klamath Province because of fire history. As previously noted, retaining all of the fire-killed trees, is likely to create fuel loading that would actually increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; EIS Chapter 3 – fuels; Appendix E Figure 7). Because of fire frequency in the Klamath Province it is highly unlikely that any dead wood could persist for 80-100 years until the next stand is capable of producing large wood (Taylor and Skinner 1998; Skinner 2002) without effective reduction of the amount and continuity of surface fuels. Even with fuel reduction from salvage and activity fuel treatment, it is possible that much of the dead wood now present could be consumed by future fire (EIS Chapter 3 – Fuels). Within salvage units the Westside Fire Recovery Project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by: • Retaining large "legacy" green trees wherever they occur. By virtue of their location and / or inherent resistance to fire, large green trees are more likely to persist until the next stand can develop large structures than snags. We are also marking dead legacy trees for retention however it is not likely that many of these dead trees will persist for 80-100 years (Harrod et al. 1998) because of fire history, however we acknowledge the contribution these trees make while they are on the landscape. • Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less intensity. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in Alternative 3 Modified in association with Riparian Reserves (see map packet) or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity. • Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels and fuel continuity, the risk of future high severity fire affecting remaining snags and down wood is reduced (Appendix E, Figure 7).

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			• Treating small fuels in Riparian Reserves and snag retention areas by allowing fire to back into these areas at the time that activity fuels are burned. This reduces the small surface fuels that readily ignite and carry fire but is unlikely to harm larger snags because they would not yet have developed the partially decomposed surface that is receptive to embers. See response to comment no. 5873-59. See also EIS Chapter 3, Reasonable Opposing Points of View and Agency Response. .
209 - Snag Retention (general, non-WL)	#17280-3	Removal of snags in other areas is also problematic, particularly in the Beaver fire area, where most of the snags on adjoining private property have already been removed, so snag-dependent species are more dependent on the remaining snags on Forest Service land. In addition to the loss of snags and the interference with natural regeneration processes, Alternative 2 would also result in damage to critical fish habitat due to roadbuilding and ground disturbance on unstable slopes. Alternative 4 is supposedly designed to reduce those effects, however, that alternative still includes 10, 221 acres of salvage harvest and 7907 acres of planting (DEIS p. 438), with all of the problems listed above. Therefore, it also would not produce a "healthy forested landscape with diverse ecological conditions reflective of the ecological capability of the landscape."	Alternative 3 and 3 Modified have no proposed salvage harvest in the Beaver fire area for the reasons noted in the comment. The no action Alternative is also responsive to concerns expressed. We recognize the importance of large snags and logs on natural recovery processes. The project is required to meet standards in the Forest Plan for snag retention and coarse woody debris. We agree that retention of large structures is beneficial for northern spotted owls and many other species, and that any material over time would serve an ecological function for the simple reason that there is no “excess” in nature. We also agree that we should strive to maintain large structures that could persist until the next stand is capable of producing large material. That is a requirement of the Forest Plan (4-87; MA 5-30). Retention however, of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current Late-Successional Reserve land allocation. Removal of large wood within recruitment zones for streams was analyzed in the EIS Aquatic Resources Report and biological assessment. Salvage harvest was excluded from Riparian Reserves to avoid reducing wood available for recruitment to streams. Hazard tree removal proposed along roads was mitigated through a project design feature that required all large trees be left on site within Riparian Reserves to maintain wood in the recruitment zone and for soil productivity. Project design features, Best Management Practices and Watershed project design project design features would be implemented to avoid unstable areas and minimize potential adverse effects to sediment from roads and at stream crossings during project implementation (see EIS Aquatic Resources Report Environmental Consequences section). project design project design features would protect unstable and potentially unstable areas from ground disturbance including through the prohibition on using skid trails in unstable areas. Temporary roads (re-opened and new) that were hydrologically linked via stream crossings were of greatest concern as were log landings (re-opened and new) in Riparian Reserves, and unstable areas crossed by roads. These features were analyzed by watershed specialists on a site-specific basis using GIS data and field surveys to determine if minimization measures would be adequate. Based on project design and implementation of effects minimization measures, we believe the project is consistent with Forest Plan. See the EIS Chapter 3- Aquatic Resources and Aquatic Conservation Strategy Assessment in the Appendices for additional information. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
209 - Snag Retention (general, non-WL)	#18852-25	7) Snag and roadside salvage of hazard tree and live trees with .7 percent probability of mortality prescription is not based on the best science nor ecologically justifiable. Retention of old growth snags and partially living large diameter trees should be emphasized for habitat values.	Salvage harvest treatment will identify trees for harvest using the Report #RO-11-01 “Marking Guidelines for Fire-Injured Trees in California” (Smith & Cluck, 2011). Treatment in salvage harvest units is limited to moderate to high severity areas (>50% mortality) outside of Riparian Reserves. Fire-damaged green trees with a 70 percent or higher probability of mortality in the next three to five years were included in the salvage harvest proposal. See response to comment number 12346-55.Please see snag retention project design features in the Project Design section of the draft EIS. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

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209 - Snag Retention (general, non-WL)	#18852-46	30) Consider upper diameter limits for timber harvesting of 50" DBH, larger trees have been shown to have greater habitat value as downed wood or standing snags. Snags leaning away from the road prism should be considered for retention as the hazard value is significantly reduced. The role of large woody debris within the Klamath mountain ecosystem should not be underestimated, nor the risks of retention during future fires be exaggerated.	Within Riparian Reserves, the upper limit of dead tree removal was reduced from 16 to ten inches diameter at breast height. Within salvage harvest units, which are outside of hydrologic Riparian Reserves, no diameter limit is proposed. That being said, general snag retention areas within salvage harvest units is proposed in addition to the retention of legacy components, as described in Chapter 2 of the EIS under the wildlife project design features. We acknowledge the importance of coarse and large woody debris, which is already being retained sufficient to meet or exceed Forest Plan direction; see Chapter 2 of the EIS under project design features. The fire regime of old-growth Douglas fir dominated forests of the Klamath Mountains differs from more mesic old-growth Douglas fir forests of Oregon and Washington (described in Franklin et al. (1981)) in fire frequency, fire severity, and structural attributes such as amount and persistence of coarse woody debris (Taylor and Skinner 1997). See the salvage in Late-Successional Reserve section in Chapter 1 of the final EIS and the responsible opposing views at the beginning of Chapter 3 of the final EIS. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
209 - Snag Retention (general, non-WL)	#18857-18	Maintain adequate snag fields and forested sites impacted by high severity fire across the landscape. The biological legacies present and complex early seral habitats are necessary for the maintenance of biodiversity and landscape heterogeneity.	General snag retention areas within salvage harvest units is proposed in addition to the retention of legacy components, as described in Chapter 2 of the EIS under the wildlife project design features. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
209 - Snag Retention (general, non-WL)	#18859-7	Critics of this project will say that the removal of dead trees will negatively impact certain species such as fisher and spotted owl. I disagree. The fact that the project covers such a small portion of the areas burned in 2014 (4%) means that even if every tree was removed from these areas there would only be a 4% reduction in the number of available snags to these species. A 4% reduction in snags over such a large area is inconsequential to these species. The greater long term threat is not restoring these forests, thus preventing them from becoming suitable habitat for these species in the future. The fact is, even in the areas proposed for restoration not all the trees will be removed. Project Design Features Wildlife 3, 4 and 5 will ensure that adequate number of snags will remain in the treated areas. Additionally, there will be sufficient numbers of damaged live trees remaining in these areas to provide for all the life requisites of species that require decadent forest conditions. These scattered snags and legacy trees will provide more than adequate foraging perches for spotted owls in the burned treated areas.	Thank you for your comments on the Westside Fire Recovery Project. We agree and acknowledge that we are salvage harvesting a small portion of the project area, and within the areas being harvested, that we are retaining sufficient amounts of snags and legacy components.
209 - Snag Retention (general, non-WL)	#5873-102	Salvage may be undesirable where large diameter snags needed by wildlife are in short supply in adjoining areas. … Many years elapse in high fire severity burns before newly grown large diameter snags can replace the fallen snags, so leaving an ample density of snags following fire can help maintain a minimal snag resource during the 20 to 40 year postfire period when many snags have already fallen. Leaving a high density of snags would require constraints on harvesting. …	The Klamath Forest Plan snag Standard and guideline (8-25, page 4-30) "says to use tables 4-4 and 4-5 as guidelines in ecosystem analysis and project-level planning. The relative numbers of hard and soft snags in various size classes show the habitat needs of the different cavity-association Forest wildlife species. This table displays the number of snags required per 100 acres to support "good" quality habitat for primary cavity-association species. The number of snags on a given acre will vary, depending on the site and on the number of snags within the landscape". These snags need not be equally distributed. The actual number of snags to be maintained may vary depending on the amount of snags available within the surrounding landscape and the desired condition of that landscape. See Project Design Features in Chapter 2 of the final EIS. The Klamath Forest Plan Coarse Woody Debris Standard and guidelines (6-16, page 4-23) mentions retaining 5-20 pieces of Coarse Woody Debris per acre in various states of decay. The combination of project design features for snags and Coarse Woody Debris, legacy components and riparian corridors will meet or exceed the Forest Plan Standard and Guidelines. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate. See EIS Chapter 3, Responsible Opposing Viewpoints and Agency Response.

Code	Comment Number	Comment Text	Response
209 - Snag Retention (general, non-WL)	#5873-147	"[T]he only way to mimic natural snag densities for harvests that seek to mimic the very earliest stage of succession (immediately after a fire) would be to leave close to the same number of burned trees per unit area that would occur through a stand-replacement disturbance event." Hutto, R.L., 2006. Toward Meaningful Snag-Management Guidelines for Postfire Salvage Logging in North American Conifer Forests. Conservation Biology Volume 20, No. 4, 984–993. http://web.archive.org/web/20090310114517/http://avianscience.dbs.umt.edu/documents/hutto_conbio_2006.pdf	The cited literature provides a general overview of post-fire snag conditions however it is not specific to the conditions of the Klamath Province. Retention of all of the dead trees now present on the landscape would create an unacceptable fuel load and increased risk of future high severity fire. See Appendix E and EIS Chapter 3, responsible opposing views and agency response. See also response 5873-72 and 5873-170. See Also: Knapp, E. J. 2015. Long-term dead wood changes in a Sierra Nevada mixed conifer forest: Habitat and fire hazard implications. Forest Ecology and Management 339 (2015) 87–95 Ritchie M.W. , E. E. Knapp, C. N. Skinner.2012. Snag longevity and surface fuel accumulation following post-fire logging in a ponderosa pine dominated forest. Forest Ecology and Management 287 (2013) 113–122 Peterson , D. W., E. K. Dodson and R. J. Harrod. 2003. Post-fire logging reduces surface woody fuels up to four decades following wildfire Erich K. Forest Ecology and Management 338 (2015) 84–91 Skinner, C. N. 2002. Influence of fire on the dynamics of dead woody material in forests of California and Southwestern Oregon. Pages 445-454 in Symposium on the ecology and management of dead wood in western forests, November 2-4, 1999, Reno, Nevada. Skinner, C. N., A. H. Taylor, and J. K. Agee. 2006. Klamath Mountains bioregion. Pages 170-194 in N. G. Sugihara, J. W. van Wagtendonk, K. E. Shaffer, J. Fites-Kaufman, and A. E. Thode, editors. Fire in California's Ecosystems. University of California Press, Berkeley and Los Angeles, CA. Taylor, A. H., and C. N. Skinner. 1997. Fire regimes and management of old-growth Douglas fir forests in the Klamath Mountains of Northwestern California. Pages 203-208 in Fire Effects on Threatened and Endangered Species and Habitats. International Association of Wildland Fire, Fairfield, WA, Coeur d'Alene, ID. Taylor, A. H., and C. N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111:285-301.
209 - Snag Retention (general, non-WL)	#5873-148	The Trapper Project on the Willamette NF proposed to retain 30 snags per acre in a project intended to mimic stand replacing fire event. This is an example of how much wood should be retained in salvage projects. Although in lodgepole forest types the number may need to be much larger.	Comment provides no evidence why the standards of the Trapper Project should be applied to the Westside Project other than their opinion. See response to comment number 5873-72 about the concern of snag retention not being adequate.

Code	Comment Number	Comment Text	Response
209 - Snag Retention (general, non-WL)	#5873-169	Since this project involves post-fire commodity extraction (also often referred to erroneously as "salvage" logging) please carefully analyze, consider, and disclose the site-specific analysis of the many reasons NOT to do post-fire commodity extraction, including but not limited to: • adverse impacts to soil, such as erosion, compaction, displacement, litter disturbance, nutrient depletion; loss of chemical buffering; loss of soil organic matter; loss of burrowing wildlife that help aerate soils; reduction of nitrogen fixing plants that boost soil fertility; loss of slope and snow stabilizing effects which could lead to mass wasting or eliminate mechanisms that may mitigate mass wasting; • loss of down wood functions s such as trapping sediment and aiding water infiltration, and creating microsites favorable for germination and establishment of diverse plants, and habitat for diverse wildlife; • loss of decaying wood and depletion of the "savings account for nutrients and organic matter" which affects site productivity through the removal of dead trees which store nutrients and slowly release them to the next stand. Marañón-Jiménez, S., Fernández-Ondoño, E., and J. Castro. 2013. Charred wood remaining after a wildfire as a reservoir of macro- and micronutrients in a Mediterranean pine forest. International Journal of Wildland Fire. http://dx.doi.org/10.1071/WF12030 ("Partially charred wood represented a considerable pool of nutrients, due to both the relatively high concentrations and to the great amount of biomass still present after the fire. Potential contributions of the charred wood were particularly relevant for N and micronutrients Na, Mn, Fe, Zn and Cu, as wood contained 2–9 times more nutrients than the soil. Post-fire woody debris constitutes therefore a valuable natural element as a potential source of nutrients, which would be lost from ecosystems in cases where it is removed") • Recent studies indicate that wood may release nutrients more rapidly than previously thought through a variety of decay mechanisms mediated by means other than microbial decomposers, i.e. fungal sporocarps, mycorrhizae and roots, leaching, fragmentation, and insects; • loss of nutrients from live trees that are determined to be "dying." Live trees produce serve as refugia for animals, invertebrates, and mycorrhizae; produce litter fall; and help cycle nutrients which are all extremely valuable in the post-fire landscape; • loss of wood that serves to buffer soil chemistry and prevent extreme changes in soil chemistry; • water quality degradation; • loss of water storage capacity in down logs; • altered timing of storm run-off which could lead to peak flows that erode stream banks and scour fish eggs; • delaying the pace of vegetative recovery and reducing the quality/diversity of the vegetation community; • dead trees serve as a natural fence that protects young seedlings from browse by cattle and big game. This is one way that young aspen and other valuable species can get their start; • spread of invasive weeds through soil disturbance and extensive use of transportation systems; • loss of legacy structures that can carry species, functions, and processes over from one stand to the next; • loss of terrestrial and aquatic habitat (mostly snags and down logs) potentially harming at least 93 forest species (63 birds, 26 mammals, and 4 amphibians) that use snags for nesting, roosting, preening, foraging, perching, courtship, drumming, and hibernating, plus many more species that use down logs for foraging sites, hiding and thermal cover, denning, nesting, travel corridors, and vantage points for predator avoidance; • Depletion of large wood structures in streams that can cause: 1) simplification of channel morphology, 2) increased bank erosion, 3) increased sediment export, 4) decreased nutrient retention, 5) loss of habitats associated with diversity in cover, hydrologic patterns, and sediment retention; • commercial salvage usually removes the largest trees, but this will disproportionately harm wildlife because: (1) larger snags persist longer and therefore provide their valuable ecosystem services longer and then serve longer as down wood too, and (2) most snag-using wildlife species are associated with snags >14.2 inches diameter at breast height (dbh), and about a third of these species use snags >29.1 inches dbh. • Truncation of symbiotic species relations and loss of biodiversity. Sixteen species are primary cavity excavators and 35 are secondary cavity users; 8 are primary burrow excavators and 11 are secondary burrow users; 5 are primary terrestrial runway excavators and 6 are secondary runway users. Nine snag-associated species create nesting or denning structures and 8 use created structures.	This comment is addressed in the analysis of the No Action Alternative (Alt. 1) in the draft EIS. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
209 - Snag Retention (general, non-WL)	#5873-170	• Reduced avian and terrestrial species diversity which affects plant and invertebrate diversity. Since different wildlife help disperse different sets of seeds and invertebrates, reduced wildlife diversity can significantly affect pace of recovery and the diversity of the regenerating stand. Snag- associated wildlife play a greater role in dispersal of invertebrates and plants, while down wood-associated wildlife play a greater role in dispersal of fungi and lichens. Down wood-associated species might contribute more to improving soil structure and aeration through digging, and to fragmenting wood which increases surface area encouraging biological action that releases nutrients. • loss of partial shade that helps protect the next generation of forest; • loss of cover quality and fawning areas for big game; • loss of future disturbance processes such as falling snags that help thin and diversify the next generation of forest; • increased human activity and human access that can increase fire risk; • increased fine fuels on the forest floor that can cause an increase in fire hazard; • loss of seed sources, and • loss of diversity of vegetation and microsite conditions. • The fact that regional standards for snags and down wood fail to incorporate the most recent science indicating that more snags and down wood (especially large snags and logs) are required in order to maintain species viability and sustain site productivity. • Arguments in support of the “reburn hypothesis” are specious. (1) partial reburn may be completely natural and desirable in some cases to consume some fuel and diversify the regenerating forest, and (2) salvage logging will cause a pulse of fine fuels on the ground and actually increase the reburn risk/hazard above natural levels, and (3) fuels that fall to the ground over time will to some extent decay as they fall. • Uncertainty calls for a cautious approach. Compare these adverse impacts of salvage logging to the few scant reasons to salvage (e.g., economic recovery of fiber	We agree that retention of large structures is beneficial for northern spotted owls and many other species, and that any material left over time would serve an ecological function because there is no “excess” in nature. We also agree that we should strive to maintain large structures that would persist until the next stand is capable of producing large material. That is a requirement of the Klamath Forest Plan (page 4-87; MA 5-30) although the fire history of the Klamath Province makes that goal unrealistic without fuel reduction. However, retention of all of the dead wood now present on the landscape from the 2014 fires would create an undesirable risk of future high-severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late-successional stand conditions in Late Successional Reserves (Fuels section of this Chapter of the final EIS; Appendix E). We do not agree that all fire-killed trees, or all large fire killed trees, must be retained. To determine how much dead wood should be retained on the landscape, we use the guidelines provided by the Forest Plan for snags (page 4-30, Table 4-4) and coarse woody debris (page 4-23). The forest-wide Late Successional Reserve Assessment (Late-Successional Reserve Assessment, pages 1-5, Table 1-1) also provided metrics for snags and coarse woody debris that closely match the metrics in the Forest Plan (Appendix E). These metrics were developed from studies of late-successional and old-growth forests. Since the Forest Plan was published in 1995, new research has shown that even the amounts of snags and coarse wood debris noted in the Forest Plan may be excessive for the Klamath Province when compared to historical norms. Skinner et al. (2006) observed that: "Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve." - Skinner et al. (2006).This suggests that even the levels of snag and coarse woody debris retention described in the Forest Plan, which are far lower than the post-fire conditions of current landscape, would increase the risk of future stand replacement fire above historical levels. As previously noted, retaining all of the fire-killed trees and snags is likely to create fuel loading that would actually increase the probability of future high-severity fire that would consume snags and down wood (Skinner et al. 2006; Figure 7 of Appendix E; Fuels section of this Chapter of the final EIS). Because of fire frequency in the Klamath Province, it is highly unlikely that any dead wood could persist for 80 to 100 years until the next stand is capable of producing large wood (Taylor and Skinner 2007; Skinner 2002) without effective reduction of surface fuels. The Westside Fire Recovery project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by:• Retaining large “legacy” green trees wherever they occur. By virtue of their location and/or inherent resistance to fire, large green trees are most likely to persist until the next stand can develop large structures.• Retaining snags in Riparian Reserves. This has the effect of retaining the larger trees, on average, on the landscape in locations that historically burned with less intensity. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in association with Riparian Reserves or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity.• Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity-fuel treatment. By reducing surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Figure 7 of Appendix E). • Treating small fuels in Riparian Reserves by broadcast burning at the time that activity fuels are treated. This reduces the small surface fuels that readily ignite and carry fire but is unlikely to harm most of the larger snags because they will not yet have developed the surface that is receptive to embers.Peterson et al. (2015) observed that: “…post-fire logging can serve as an effective tool for managing fuel loadings in forests regenerating after high severity wildfires. By strategically applying and varying post-fire logging treatments within landscapes, post-fire logging could reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects. If applied using best management practices and with consideration for possible environmental impacts and meeting other management objectives, post-fire logging could serve as an effective option – along with mechanical thinning, prescribed fire, and managed low to mixed severity wildfires – for reducing fuels and restoring low and mixed severity fire regimes in dry coniferous forests of western North America and other fire-prone forest types.”Leaving all of the dead wood created by the 2014 West Side Fires is:• in excess of amounts typically found in the Klamath Province (see response to issue 1 above); • in excess of amounts required in the Forest Plan; and• likely to create unacceptable fuel loads in the future. The Westside Fire Recovery project has a higher probability of retaining large structures until the next stand is capable of producing them than does taking no action (Alternative 1) because salvage of fire-killed trees reduces the severity of future fires that would likely kill surviving green trees and consume snags and down wood present on the landscape (Fuels and Vegetation sections of this Chapter of the final EIS; Appendix E)See response 5873-72, EIS Chapter 3, Responsible Opposing Views and Agency’s Responses to Issues Raised and Appendix E.See Also:Knapp, E. J. 2015. Long-term dead wood changes in a Sierra Nevada mixed conifer forest: Habitat and fire hazard implications. Forest Ecology and Management 339 (2015) 87–95Ritchie M.W. , E. E. Knapp, C. N. Skinner.2012. Snag

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			longevity and surface fuel accumulation following post-fire logging in a ponderosa pine dominated forest. Forest Ecology and Management 287 (2013) 113–122Peterson , D. W., E. K. Dodson and R. J. Harrod. 2003. Post-fire logging reduces surface woody fuels up to four decades following wildfire Erich K. Forest Ecology and Management 338 (2015) 84–91Skinner, C. N. 2002. Influence of fire on the dynamics of dead woody material in forests of California and Southwestern Oregon. Pages 445-454 in Symposium on the ecology and management of dead wood in western forests, November 2-4, 1999, Reno, Nevada.Skinner, C. N., A. H. Taylor, and J. K. Agee. 2006. Klamath Mountains bioregion. Pages 170-194 in N. G. Sugihara, J. W. van Wagtendonk, K. E. Shaffer, J. Fites-Kaufman, and A. E. Thode, editors. Fire in California's Ecosystems. University of California Press, Berkeley and Los Angeles, CA.Taylor, A. H., and C. N. Skinner. 1997. Fire regimes and management of old-growth Douglas fir forests in the Klamath Mountains of Northwestern California. Pages 203-208 in Fire Effects on Threatened and Endangered Species and Habitats. International Association of Wildland Fire, Fairfield, WA, Coeur d'Alene, ID.Taylor, A. H., and C. N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111:285-301
209 - Snag Retention (general, non-WL)	#5873-67	The agency often compares their proposed snag retention levels to the average number of snags across the landscape, without recognizing that after a significant disturbance such as fire "the rate of input [of snags] to the CWD pool is 100-1000x the rate expected for an unburned steady-state forest (Harmon et al 1986). Even afterwards, in the next 5 or 6 years, the rate of input is still 5 or 10 or even 100 times that steady-state rate." http://web.archive.org/web/20050428020846/http://www.brownandbrown.tv/warner-presentation-2002-05-14b.pdf	This comment appears to equate the snag and down wood trajectories of the fire regime of the Klamath Province with that of more mesic areas of the Northwest Forest Plan. That is not correct (See Background, EIS Chapter 1; Appendix E). The fire regime of old-growth Douglas fir dominated forests of the Klamath Mountains differs from more mesic old-growth Douglas fir forests of Oregon and Washington (described in Franklin et al. (1981)) in fire frequency, fire severity, and structural attributes such as amount and persistence of snags and coarse woody debris (Taylor and Skinner 1997). The characteristic fire regime of the Klamath Mountains is actually one of frequent low to moderate intensity fire with low to moderate severity effects (Skinner et al. 2006), not "stand-replacement or mixed" that is typical in the Coast Range and western Oregon and Washington Cascades. With frequent fire, surface fuels are maintained at low levels – too low for intensity sufficient to produce much stand-replacement fire, except under unusual circumstances. Also, as noted by Taylor and Skinner (1997) and Skinner (2002), dead wood in the Klamath province rarely lasted long enough, even in a low to moderate fire severity environment, to actually decompose because snags and down logs are receptive to embers, and once partially rotted, are easily consumed by fire. In a fire regime dominated by low to moderate severity effects, tree mortality with wildfire is by definition generally low. In the Klamath Mountains, patches of moderate to high severity fire, when they did occur historically, were more likely on upper slope positions and on south and west-facing aspects (Skinner et al. 2006). Patches of high severity would produce a pulse of snags and then eventually down logs, until those logs were consumed by subsequent fires. Because frequent low-moderate severity fires consume wood, it is unlikely that coarse woody debris accumulated to levels seen in more mesic old-growth Douglas fir forests of Oregon and Washington (Taylor and Skinner 1997). In the Klamath Mountains snags and logs were likely clustered in time and space, with long intervals and large areas where dead wood was sparse (Skinner 2002). The large areas of nearly continuous fire-killed trees in the West Side Fire Recovery Project are not characteristic, nor is the Project area a "stand-replacement or mixed fire regime" where large fuel loads would have been experienced in past post-fire environments. See EIS Chapter 3 - Responsible Opposing Views. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
209 - Snag Retention (general, non-WL)	#5873-79	There is evidence that retaining more than the minimum number of snags has significant benefits for cavity dependent species. Comparing two sites in Northern California, Blacks Mountain Experimental Forest (BMEF) with little past logging and lots of snags, and Goosenest Adaptive Management Area (GAMA) with lots of logging and fewer snags, the author's found "… three times as many snags (6.38/acre vs. 2.04/acre, respectively) … The use of snags by cavity-nesting bird species was dramatically different between the sites. Thirty-one cavity-nesting pairs from 10 species were detected at BMEF, while only one pair each of two species were detected at GAMA…. This fifteenfold difference is much greater than any measure of snags or cavities reported. …" We feel that forest managers may well be asking a misleading question. "Snags per acre" requirements implicitly assume an equilibrium condition and reflect only one ecological requirement for a given cavity-nesting species. … [C]onsideration of foraging habitat and other ecological requirements must be part of the "snags per acre" management considerations. This is an important, but somewhat daunting proposition, as potential cavity-nesting species are diverse, and each species likely has very different foraging ecologies, as well as other differences in habitat requirements. … [C]avity nesters at BMEF used larger snags on average … [T]he loss of large trees due to logging in eastside pine and other forests, over the past century has major implications for cavity-nesting birds. … [F]orest managers must have a sense of snag recruitment in relationship to snag fall, and the patterns and processes that underlie them, when addressing wildlife needs. … We view the understanding of these complexities to be of primary importance in forest management for wildlife. Steve Zack, T. Luke George, and William F. Laudenslayer, Jr. 2002. Are There Snags in the System? Comparing Cavity Use among Nesting Birds in "Snag-rich" and "Snag-poor" Eastside Pine Forests. USDA Forest Service Gen. Tech. Rep. PSW-GTR-181. http://www.fs.fed.us/psw/publications/documents/gtr-181/017_Zack.pdf.	The paper cited is part of Proceedings of the Symposium on the Ecology and Management of Dead Wood in Western Forests (PSW GTR 181). We agree that leaving snags in various size ranges in sufficient quantities is important for birds and many other species. As previously noted, retaining all of the fire-killed snags is likely to create fuel loading that would actually increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; Appendix E Figure 7, ; EIS Chapter 3 - fuels). The Klamath Forest Plan provided guidelines for retention of snags (Forest Plan 4-30). The Forest Plan direction does not require that these snag metrics be met on every acre; the Forest Plan requires that within any 100-acre area, the appropriate number of snags be retained. This allows project design to more closely approximate the natural snag distribution described by Skinner (2002) and Taylor and Skinner (1996) with concentration of snags in time and space, and large intervening areas in time and space where snags would be relatively sparse. As noted by Zack et al. (2002), the authors of the cited paper, a "snags per acre" prescription is inadequate, as tree size, rate of snag generation, and mode of tree death have been disrupted this past century. Average snag counts on a per-acre basis provide one measure of snag density, but this does not reflect the patterns of dead wood that occurred on the landscape in the Klamath Province as described by Skinner (2002). Snags are being retained in Riparian Reserves and Snag Retention Areas. This concentrates snags in time and space as discussed by Skinner (2002). An assessment showed that snag standards are being met (Appendix E, Attachment 2). Thirty 100 acre areas were randomly sampled. Within those areas, an average of 1800 snags / 100 acres greater than 14 inches and 700 snags / 100 acres greater than 20 inches were being retained. See Response 5873-72 and 17111-1. See also EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised.
209 - Snag Retention (general, non-WL)	#5873-83	Consider and disclose reasons NOT to remove snags Science tells us that natural forests develop after disturbance with abundant structural legacies. These legacy features include snags and down wood which play a wide variety of valuable ecological services for the developing forest, including but not limited to: • nutrient uptake, storage, and release • water uptake, storage, and release • mycorrhizal colonization • wildlife habitat, in particular for primary cavity species which are recognized as a "keystone" element of healthy forests • allowing some forest species to linger in burned forests after disturbance and to recolonize burned forests sooner after disturbance, thereby shortening the period during which burned stands are unsuitable for wildlife • providing food for insects that in turn feed a wide variety of other wildlife such as birds and bats • favorable sites for seed germination and establishment • mechanical thinning of the regenerating stand due to the process of snag fall • shade and cover for everything from seedlings to big game • perches, nest, and den structures, In general, the larger the piece size, the longer they tend to last. But salvage logging removes those very elements that are most valuable for wildlife and most difficult to replace.	We agree with description of benefits provided by snags. Snag retention and coarse woody debris standards in the Klamath's Forest Plan are being met throughout the project. This comment provides no site-specific information other than the commenter's opinion that the desired ecological services of snags and down wood are not accruing, or that the guidelines for snags and down wood in the Forest Plan are inadequate. See also response 5873-72 and EIS Chapter 3, Responsible Opposing Views and Agency's Responses to Issues Raised.
230.01 - Env. Quality & Ecosys. Integrity	#13834-1	Forests should be managed in a way that protects endangered species, preserves clean water and allows the natural ecosystem to heal itself from fire as it has done for millennia. Let nature take back what it has created, so it can give it back to the world again.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See responses to comments 12414-1 and 6924-1. Best available science was considered and is referenced in the EIS and supporting documentation. The project was designed to be and is compliant with the Endangered Species Act and The Clean Water Act. The Klamath National Forest is consulting and conferencing with the U.S. Fish and Wildlife Service about the effects of the project on the Endangered Species Act-listed northern spotted owl and Endangered Species Act listing candidate Pacific fisher, respectively. The Forest is also working with the North Coast Regional Water Quality Control Board regarding compliance with the Clean Water Act.

Code	Comment Number	Comment Text	Response
230.01 - Env. Quality & Ecosys. Integrity	#16672-1	The drought in California is creating a more delicate situation in the state, which only makes forest ecosystems more important. We call on you to preserve the Klamath National Forest and log in a sustainable and ecologically appropriate way.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest Service acknowledges that we are in a drought; however, a drought condition is not sufficient rationale to not support the purpose and need of the project, as described in Chapter 1 of the EIS, including habitat and watershed improvement. The project is designed to meet legal requirements and to protect resources; see Chapter 2 of the EIS for the proposed actions, including project design features for resource protection.
230.01 - Env. Quality & Ecosys. Integrity	#18852-9	There is no single immediate solution to our ecological circumstance through such large scale and intensive management actions, as this project proposes. We need to understand the longterm process of forest restoration as occurring over time through multiple events and dynamic ecological processes. This plan does not achieve this level of site or species specificity, ecological consideration or temporal understanding, in large part due to the expansive area involved, and the limited time-frame involved in the plans consideration.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for the actions proposed. Long-term vegetative conditions are described in Chapter 3 of the EIS for both the no action and action Alternatives. The agency has conducted site-specific analysis of the proposed actions in accordance with National Environmental Policy Act regulations (40 CFR 1500-8). This is evidenced throughout the analysis and the project record.
230.01 - Env. Quality & Ecosys. Integrity	#18926-21	Biological Diversity is the foundation for many forest resources and benefits (including Scenery). There appears to be no tracking of how this project benefits, or impairs KNF westside biodiversity overall. The Klamath National Forest, and much of the Western US is known to be Highly Departed from its ecological Reference Conditions (primarily due to historic wildfire suppression). It would seem essential to demonstrate how well the project's alternatives would support the attainment of the Forest's ecological target conditions (The Historic "Reference condition" plus necessary adjustments to compensate for climate change, etc). Could it be that some areas should be reforested in approaches that are adjusted to meet the KNF's target conditions ? Isn't that the true purpose of Klamath Forest Plan Biological Diversity S&Gs 6-1 and 6-14, to identify how well a project would attain this target ?! ! Klamath-Siskiyou Bioregion! The KNF is central to the Klamath-Siskiyou bioregion, which is home to the largest expanse of wild lands on the West Coast. The International Union for the Conservation of Nature recognized it as one of seven areas of global botanical significance in North America. These forests are a stronghold for rare species and wild salmon. The region is third in species richness (for taxa ranging from butterflies and plants to birds and mammals) for all temperate conifer forests across the continent and contains some of the highest biomass-dense forests in North America, sequestering carbon and storing carbon long after a fire.! The Klamath Mountains in the K-S are renowned for their wealth of conifer species and are recognized worldwide as a center of plant biodiversity. In the Russian Wilderness Area eighteen different conifers grow ! within one mile.! !	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to 12414-1 and 6924-1. The project is consistent with the goals and standards and guidelines of the Northwest Forest Plan, as incorporated into the Forest Plan, including ones related to biological diversity. The agency recognizes the importance of the resources found within the Klamath Province and Klamath-Siskiyou Bioregion. Project design features in Chapter 2 of the EIS are designed to mitigation resource impacts and meet legal requirements. See Chapter 3 of the EIS for a disclosure of effects by resource area, including botany, climate change, air quality, aquatic resources, and fuels.
230.01 - Env. Quality & Ecosys. Integrity	#5873-57	11 Reasons Why Burned Forests are Beautiful 1. Severely burned forests provide rich habitats. 2. Severely burned forests are rich in bird life. 3. Severely burned forests support a wonderful variety of insects. 4. Severely burned forests still have lots of living trees, it just takes time for them to say hello. 5. Natural regeneration is everywhere. 6. If left alone, severely burned forests are fun to watch as they explode with new life over the years. 7. Shrubs and trees live together in harmony. 8. Severely burned forests provide habitat where it might be least expected! [e.g., bird nesting in root wads] 9. Severely burned forests still have patches of green. 10. The usual alternative to letting severely burned forests alone is an ecological disaster. [e.g. clearcut salvage and replanting and herbicides on private land] 11. Severe fire is a natural part of forest ecosystems. California Chapparal Institute. 2014. http://hosted.verticalresponse.com/652874/13cc17b39e/289104753/39addbbd1d/	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Forest Service reviewed the article and acknowledges the role of fire in the ecosystems and the beneficial effects of fire. See Chapter 2 of the EIS for a description of proposed actions of this project. See the affected environment section of Chapter 3 for a description of the post-fire condition by resource. See Chapter 3 of the EIS for effects of the proposed actions on resources by resource area.

Code	Comment Number	Comment Text	Response
230.01 - Env. Quality & Ecosys. Integrity	#6646-1	I'm writing because I'm very concerned that the "Westside Fire Recovery Project" in Klamath National Forest may cause undue harm to our local forest resources. As an environmental scientist, born and raised in Oregon, I have come to understand that fire is an integral part of ecosystem functioning, as are old growth trees. Post-fire logging will stunt the natural recovery processes of the forest and remove essential ecosystem elements. Salmon, one of our area's most charismatic and prized species, will be negatively impacted, not to mention numerous other organisms and ecosystem function overall. While economic development is important to the success of many communities, it is not an excuse to exploit the ecosystem resources on our reserved lands. Post-fire logging would cause undue harm for years to come, and leave our forests beyond a recoverable state. Please, if you value our forest resources, which make the Pacific NW so unique, please implement the Northwest Forest Plan and withdraw the proposal to clearcut up to 6,800 acres of burned forest in the Westside project.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See responses to comments 12414-1 and 6924-1. The Forest Service reviewed the article and acknowledges the role of fire in the ecosystems and the beneficial effects of fire. The purpose and need for the Westside Fire Recovery Project includes fuel reduction, restoration of wildlife habitat and watershed condition, and public safety as major components of ecosystem recovery, in addition to recovering value from deteriorating timber. See response to comment number 6271-1 for rationale behind salvage harvest in Late Successional Reserves. No clearcutting is planned as part of this project See Chapter 2 of the EIS for a description of proposed actions of this project, including project design features for resource mitigation. .See the affected environment section of Chapter 3 for a description of the post-fire condition by resource. See Chapter 3 of the EIS for effects of the proposed actions on resources by resource area. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. See Chapter 1 of the EIS for a discussion about salvage in Late Successional Reserves. Project impacts are found throughout Chapter 3 of the EIS. The Forest Plan, which incorporates all direction from the Northwest Forest Plan, does allow for salvage harvest in Late Successional Reserve.
230.01 - Env. Quality & Ecosys. Integrity	#7776-1	Please reconsider the "Westside Fire Recovery Project" in the Klamath National Forest, which is actually a plan to clear cut old-growth trees. A naturally occurring forest fire is part of nature and the forest ecosystem that maintains the balance so necessary for endemic life to thrive. A clear cut may be profitable, but it is not good science and it is definitely not good for our environment or us. Please let nature take its course unhindered.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See responses to comments 12414-1 and 6924-1. Best available science was considered and is referenced in the EIS and supporting documentation.
230.02 - Inherent Worth of Nature	#17873-1	It has much more financial and social value as a nature reserve. there is no need to log and the financial value of logging is minimal	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project area is not in a nature reserve; see Chapter 1 of the EIS for a description of land allocations within this project area.

Code	Comment Number	Comment Text	Response
232.03 - Riparian Areas, Wetlands	#12346-17	Page 29 of the ACSOR acknowledges that salvage logging may negatively impact temporal connectivity "at the site scale" but dismisses the negative impact because 7 "project design features that require snag retention in the salvage units will meet the standards and guidelines at the site scale." This contention is incorrect, the PDFs do no such thing. In fact, the logging PDFs call for: (1) Counting Riparian Reserves as "units" in order to double-count the Reserves for leave-tree purposes while clearcutting the actual harvest units; (2) Defining units larger than the actual harvest area in order to count trees outside of the logging zone as "leave trees" and (3) Averaging leave tree retention over 100-acre plots such that many "units" will be effectively clearcut. Hence the project will indeed negatively impact terrestrial connectivity at the site scale in violation of ACSO 2. Inexplicably, on page 29 of the ACSOR the Forest Service claims that leaving felled snags greater than 26" DBH on site in the Riparian Reserves for fish bearing streams while removing smaller snags in these areas and all snags in the Riparian Reserves for non-fish bearing streams will retain habitat connectivity. In fact smaller snags and snags in non-fisher bearing Riparian Reserves directly contribute to wildlife connectivity and their removal will inhibit attainment of ACSO 2. Indeed, retention of terrestrial wildlife connectivity was one of the primary reasons the NWFP established Riparian Reserves for non-fish bearing streams.	The Aquatic Conservation Objectives are intended to be reached at the 5th field watershed scale, just as Key Watersheds are defined at the 5th field watershed scale. In order to assess compliance, the Klamath NF considered what occurs at the site, models impacts at the 7th field watershed scale, and then a conclusion for compliance with Aquatic Conservation Strategy is made at the 5th field watershed scale. Removed fire-killed trees in areas outside Riparian Reserves is a reasonable approach to maintain protection of the stream course. The primary concern for maintaining "connectivity" is to avoid creating habitat fragmentation. The amount of acres proposed for treatment is not significant enough to create habitat fragmentation. Also, the No Action Alternative may be more detrimental to wildlife habitat connectivity than taking action: The Silviculture Report states on page 9, "Alternative 1 [No Action] and Alternative 5 will, in time, result in reestablishment of a coniferous forest (Zhang et al. 2008; Shatford et al. 2007), but that forest may not be sustainable in terms of fuels and fire history because residual fuels will not have been treated or will only be treated in part. It may also take decades to reach that stage (Zhang et al. 2008). Given the fire return interval of the Klamath Province and the fuels present on the site, a stand replacement reburn is likely, because it takes so long for a coniferous forest to reestablish itself. Without fuels reduction and active reforestation in these conditions, reburns where fuels are heavy tend to be stand replacement events (Skinner et al. 2006; Weatherspoon and Skinner 1995). The result would likely be a loss of forest cover in this area and a conversion to brush/hardwoods." On pages 12-13 the Silviculture Report states, "Not all burned areas within the project area are proposed for post-fire treatment. The untreated areas, which include stands that are largely intact post-fire, would recover via natural processes. Also, deforested areas outside of the areas proposed for salvage harvest and fuels treatment, which include a variety of stocking densities and size classes that suffered moderate to heavy mortality, would be left to recover naturally over time. Some moderately burned areas still have a functional forest cover and have adequate seed sources to provide for natural regeneration, but stocking is less than desired to meet management objectives. Small forest gaps created by the fire would re-establish over time without active intervention relying on natural regeneration without site preparation. Dead and dying trees would be left in those areas to provide snags for wildlife. With no current fuels treatments, these areas will also be prone to future high intensity, stand-replacing fires. “Natural recovery” describes the intent to accept conditions that result from natural processes which may take many years to obtain. Vegetation expected to re-establish in larger openings include grass and brush and in some places hardwoods." Removing burned trees to reduce fuels and help pay for reforestation will create positive conditions for wildlife than taking no action. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
232.03 - Riparian Areas, Wetlands	#17478-2	stringent protection of riparian zones and remaining green trees in the burn area is an important consideration to plant and animal species.	See response to comment numbers 17375-2 and 12346-55. Green trees will be retained; see Chapter 2 of the final EIS for a description of what is being proposed.
232.03 - Riparian Areas, Wetlands	#17481-11	Remove slash and debris from drainages.	See response to comment number 17478-2.
232.03 - Riparian Areas, Wetlands	#17481-12	Need to discuss drainages; i. Removing fire debris that is effecting culverts and re-diversion of drainages for enhancing water quality and sedimentation. ii. Removing fire debris from burned out riparian areas. iii. Treat snags in riparian reserves at roads. iv. Hazard tree removal should also occur along roads and riparian reserves. v. Seek chainsaw authority in the next 5-10 years as part of ongoing emergency to use mechanical means.	See response to comment 17403-1. Removal of fire-related debris affecting culverts is conducted throughout the year as part of road maintenance.
232.03 - Riparian Areas, Wetlands	#17481-20	Mosaic approach should include meadows.	Comment is a statement of opinion. Proposed actions do not treat meadows. Range-3 project design feature was modified to add clarifying language that no planting is proposed within site preparation and planting or salvage units that overlap historic wet or dry meadows (as defined in Range-3); these are now just site preparation units that are site-prepared to improve growth of meadow vegetation (Chapter 2 of the final EIS). Also, equipment will be excluded from wetlands or wet meadows (excluding small springs and seeps); see project design feature watershed-4 in Chapter 2 of the final EIS. Please refer to 17478-2.

Code	Comment Number	Comment Text	Response
232.03 - Riparian Areas, Wetlands	#18857-8	No salvage units in Riparian Reserves.	Salvage is not occurring in hydrologic Riparian Reserves. Please see response to comment number 17478-2.
232.03 - Riparian Areas, Wetlands	#18878-49	DEIS: There is limited removal of large trees from the Riparian Reserves so coarse wood is not likely to be measurably reduced on the watershed scale. (Pg. 205) Comment: This is contradicted within the DEIS. On Pg. 204 it states, "there is no treatment in the Riparian Reserves in the salvage units and site preparation and fuels treatments are only removing dead vegetation." On Pg 166 it states, "specific project design features to minimize negative impacts include retaining snags within treatment units which include riparian reserves, and retaining legacy components and snags mixed in with green trees. Any soft (snags existing prior to the fires) snags (greater than 14 inches in diameter) felled for safety reasons will be left on site as downed woody debris." While on Pg. 123 the DEIS reverses upon itself and states "No planned salvage harvest will occur in riparian reserves." In another instance on Pg. 103 "No salvage logging will take place in hydrologic Riparian Reserves. Where hazard trees are felled in hydrologic Riparian Reserves for safety, they will be left for large woody debris recruitment. Watershed project design features that address this concern." So the ultimate question is how does one "remove large trees from Riparian Reserves" without harvesting them or are these critical components euphemistically considered "dead vegetation"?	See Chapter 2 of the EIS for a description of proposed treatments. There is not a contradiction. The Salvage Harvest and Roadside Hazard Treatments are two different prescriptions. No salvage harvest is proposed in hydrologic Riparian Reserves; however, trees may be removed in Riparian Reserves if they are a roadside hazard (per roadside hazard treatments). There is also fuels, site preparation, and planting proposed in Riparian Reserves as needed to improve the condition of the Riparian Reserves (see Aquatic Conservation Strategy analysis in Chapter 3 of the EIS). See page 57 of the Biological Assessment for Fish in the section for Hazard Tree Abatement and page 61-63 of the Biological Assessment for Fish in the sections for Salvage harvest and Hazard Tree Removal. There are hazard trees in three burned areas that pose a safety hazard, thus there is not discretion with regard to felling/removal. See Chapter 2 under wildlife project draft design features about what is being retained.
232.03 - Riparian Areas, Wetlands	#18883-21	The DEIS does not describe the width of Riparian Reserves near streams where trees up to 16 inches dbh will be removed. Although the DEIS says that only trees that can be harvested remotely, without equipment, will be cut; it is physically impossible to prevent damage to other trees and the forest soil within a riparian reserve. No trees of any size and no equipment should be allowed to trespass into riparian reserves. No trees of any size or condition should be taken from within riparian reserves as these areas provide the highest value for wildlife and natural regeneration.	See page 55 of the Biological Assessment for Fish: The width of Riparian Reserves, not just shade canopy is key to maintaining micro-climate conditions. Forest Ecosystem Management Assessment Team (1993) called for protection of two site potential tree heights or 300 feet, for all fish-bearing streams. Spence et al. (1996) note that the absolute minimum buffer width for maintaining cool air flow over the stream is one site potential tree height. The proposed action includes Riparian Reserve widths of two site potential tree height along fish-bearing streams and one site potential tree height along non-fish bearing streams. For this project, Riparian Reserves are excluded from salvage harvest, but some vegetation management will occur within Riparian Reserves (fuels treatment, hazard tree removal, legacy site treatments). Page 56 of the draft EIS references Forest Plan Management Area - 10 as describing Riparian Reserves, including the widths. It is not the intent that no actions will take place in Riparian Reserves as evidenced by what is written in the Forest Plan for Management Area - 10. See the relevant Standards and Guidelines in the Forest Plan such as MA10-7: The use of heavy equipment within Riparian Reserves for riparian habitat restoration may be approved after interdisciplinary review, MA10-58: Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees on-site when needed to meet Coarse Woody Debris objectives. MA10-54, MA10-60: Locate skid trails, cableways and skyline corridors to minimize impacts to Riparian Reserves from adjacent management activities, and MA10-61: Protect stream banks from adjacent timber management activities by fully suspending logs above stream banks during yarding.
232.03 - Riparian Areas, Wetlands	#18907-25	The DEIS does not describe the width of Riparian Reserves near streams where trees up to 16 inches dbh will be removed. Although the DEIS says that only trees that can be harvested remotely, without equipment, will be cut; it is physically impossible to prevent damage to other trees and the forest soil within a riparian reserve. No trees of any size and no equipment should be allowed to trespass into riparian reserves. No trees of any size or condition should be taken from within riparian reserves as these areas provide the highest value for wildlife and natural regeneration.	See response to comment number 18907-25 and 18883-21.
232.03 - Riparian Areas, Wetlands	#5873-117	Minshall, G.W. 2003. Responses of stream benthic macroinvertebrates to fire. Forest ecology and management. 178: 155-161. NOTE: Volume 178, issues 1-2 was a special issue of Forest Ecology and Management on the effects of wildland fire on aquatic ecosystems in the western USA. http://www.famu.org/mayfly/pubs/pub_m/pubminshallg2003p155.pdf.	Not substantive - comment is a scientific citation. The commenter fails to describe how this citation is relevant to the proposed actions or the effects of this project.

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232.03 - Riparian Areas, Wetlands	#5873-144	Where safety and LSR objectives conflict the agency must consider the no action or minimal restoration alternatives as acceptable methods of attaining LSR objectives. For instance, to ensure safety the proposed action would remove virtually all the snags in large patch cuts (i.e. clear cuts). This is inconsistent with the NFP ROD requirement to retain all snags likely to persist until the stand begins to recruit large snags. In other words, the type of cutting needed to ensure worker safety would degrade the development of high quality older forest that retains adequate legacies from the previous stand. Since salvage is not necessary to meet LSR objectives, it makes sense to forgo salvage and keep workers out of hazardous areas. Hazard trees must be carefully and conservatively selected. This is not a high use recreation area and anyone who visits the area would not expect the same degree of safety as one would find along paved public highways. Experience shows that most of the hazard is from smaller hemlocks that fall apart faster and from trees and lean noticeably toward the road. Removal of trees in an LSR could lead to perverse incentives to take trees that provide significant ecological benefits and do not present a significant hazard. Large roadside hazard trees should be left on the ground in the LSR and Riparian Reserves. The EIS fails to explain whether they are needed to meet biological objectives or not.	This comment reflects the author's opinions rather than the content of the Forest Plan concerning Late-Successional Reserve objectives and safety. The Forest Plan has no requirement that no action or minimal action is appropriate if there is a conflict with safety and Late-Successional Reserve objectives. The EIS does however have a "No Action" Alternative that is responsive to this comment. See Chapter 1 of the EIS for a discussion of salvage treatments in Late Successional Reserves which included a "No Action" Alternative. For the No Action Alternative, Table 2-34 in the draft EIS states: An unsafe condition for the public, forest workers and firefighters and for the communities adjacent to the Forest exists in the short term that would increase in risk in the long term. Safety is only one of the factors that must be addressed by the Westside Fire Recovery Project (See Purpose and Need, Chapter 1). We agree that we should strive to maintain large structures that would persist until the next stand is capable of producing large material. That is a requirement of the Forest Plan (4-87; MA 5-30). Retention however, of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current Late-Successional Reserve land allocation (Skinner 2002, Skinner et al. 2006, Knapp 2015; See also EIS Chapter 3 – Fuels). We do not agree that all fire killed trees, or all large fire killed trees must be retained. To determine how much dead wood should be retained on the landscape, we use the Guidelines provided by the Forest Plan for snags (4-30, Table 4-4) and coarse woody debris (4-23). The Late-Successional Reserve Assessment (1-5, Table 1-1) also provided metrics for snags and coarse woody debris that closely match the metrics in the Forest Plan. These metric were developed from studies of late successional and old-growth forests. Since the Forest Plan was developed in 1995, new research has shown that even the amounts of snags and coarse wood debris noted in the Forest Plan may be excessive for the Klamath Province when compared to historical norms. Skinner et al. (2006) observed that: "Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve." - Skinner et al. (2006). This suggests that even the levels of snag and coarse woody debris retention described in the Forest Plan, which are far lower than the post-fire conditions of current landscape would increase the risk of future stand replacement fire above historical levels. As previously noted, retaining all of the fire-killed snags, is likely to create fuel loading that would actually increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; Appendix E Figure 7; EIS Chapter 3 - fuels). Because of fire frequency in the Klamath Province it is highly unlikely that any dead wood could persist for 80-100 years until the next stand is capable of producing large wood (Taylor and Skinner 2007; Skinner 2002) without effective reduction of surface fuels. The Westside Fire Recovery Project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by • Retaining large “legacy” trees wherever they occur. By virtue of their location and / or inherent resistance to fire, these trees are most likely to persist until the next stand can develop large structures. • Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less intensity. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in association with Riparian Reserves (see map packet) or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity. • Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Figure 7). • Treating small fuels in Riparian Reserves by broadcast burning at the time activity fuels are treated. This reduces the small surface fuels that readily ignite and carry fire. Peterson et al. (2015) observed that:

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			"post-fire logging can serve as an effective tool for managing fuel loadings in forests regenerating after high severity wildfires. By strategically applying and varying post-fire logging treatments within landscapes, post-fire logging could reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects. If applied using best management practices and with consideration for possible environmental impacts and meeting other management objectives, post-fire logging could serve as an effective option – along with mechanical thinning, prescribed fire, and managed low to mixed severity wildfires – for reducing fuels and restoring low and mixed severity fire regimes in dry coniferous forests of western North America and other fire-prone forest types."
232.04 - Water Quantity	#18909-80	It is not clear in the DEIS when or how much water would extracted from numerous streams to fill water tank trucks, which can hold over 4,000 gallons per load during the proposed implementation. Given that the project area is over 200,000 acres and that there would be over 650 miles of roads needed for dust abatement, water drafting could have a significant effect on water quantity and temperature during hot summer months. The KNF LRMP at page 4-21 states, "5-3: A dust abatement strategy should be considered for all projects. Each strategy should address the reasonable opportunities to reduce the level of short-term and long-term dust generated from existing roads and those constructed in the future." The DEIS fails to discuss a dust abatement strategy and should clarify when and how much water would be extracted to fill tanks. Although we understand that exact numbers likely cannot be provided, projections or at least projected ranges and locations and timing should be provided to enable the public to better assess the impacts of the project. Aquatic species present could be at risk due to rapid changes or sustained reductions in flow, reduced dissolved oxygen, and/or increased water temperature. Exposed surfaces of water holes or other developments could erode and discharge sediment back into the waterway. In addition to direct hydrogeomorphic (forming and shaping landform by water) disruption to the channel and subsequent impacts to aquatic species, water-quality impacts can occur from road approaches that access the water drafting site. Many water drafting sites have steep approaches and in the absence of adequate drainage or surfacing, these approaches can become chronic sources of sediment and runoff to the channel. Water trucks often leak oil, and sometimes fuel, onto drafting pads, becoming a source of petroleum product contamination to surface waters.	The Forest acknowledges the importance of controlling water drafting during project implementation. Watershed-35 Project Design Feature (project design feature) details restrictions placed on water drafting for the project. Specifications are that no more than 10% of surface flow rates of Coho salmon critical habitat streams will be pumped. Restrictions are also established for non-Coho salmon critical habitat streams and nonfish-bearing streams in Watersehd-35 project design feature. Drafting will only occur at sites designated by the Forest Service and coordinated by a Forest service fisheries biologist such that potential impacts to anadromous fish are sufficiently minimized. Designated drafting sites are ones that typically are at lowest risk for erosion and sedimentation. Per Best Management Practice 2.11 in the project draft EIS no servicing or refueling of equipment will take place in Riparian Reserves except at designated landings that are most disconnected from water resources. National Marine Fisheries Service water drafting specifications (2001) and Forest Service Best Management Practices and project design project design features will be implemented to minimize effects of water drafting including during periods of low water flow. The June 19, 2015 addendum to the Biological Assessment for Fish states, "As part of the Project consultation, the Forest, National Marine Fisheries Service, and Karuk Tribe jointly developed a strategy to monitor implementation of Project elements that have the greatest likelihood of impacting SONCC Coho salmon and other salmonids. Pre Project, the group will monitor the hazard tree mark where it is proposed near SONCC Coho salmon CH; during the Project (especially June-Sept) all parties will share information about where Project water drafting is occurring, jointly monitor those water drafting actions, and help Forest Service Representatives decide where to shift Project water drafting so that impacts to SONCC Coho salmon and its CH are not adverse. also see pages 11-13, 37-38, and 64 in the April 13, 2015 Biological Assessment for Fish for additional information on drafting requirements and locations.
232.04 - Water Quantity	#5873-107	MPB-attack and salvage harvesting in Baker Creek, a 1570 km2 watershed, has been modelled using DHSVM to estimate the effects on streamflow. Flood frequency analysis was carried out for the baseline and three disturbance scenarios: conventional harvest, MPB epidemic and salvage harvest. In Baker Creek watershed, two major land use changes effect the streamflows: the MPB attack and the salvage of the attacked trees. Conventional harvesting in Baker Creek watershed before the MPB-attack did not substantially alter the streamflows. However, the combination of conventional harvesting and MPB attack, to 2006, has significantly increased the magnitude and timing of flood events. For example, former 20-year peak flow events can now be expected every 3 years. On average, peak stream flows will be 60% larger than baseline. As salvage harvesting takes place in the next few years, there will be further increases in peak flow and water yield, for example the 20-year peak flows will increase by 90% compared to baseline. These peak flow changes have implications on the channel stability and fish habitat of the stream network within Baker Creek watershed, as channel forming flows will occur more frequently.")	Comment references 2007 Forest Practices Board special investigation. Study is from a tributary of the Fraser River watershed in British Columbia. The Forest acknowledges that peak streamflow characteristics have been altered by the 2014 wildfires. Table 6 of the project Hydrology Report presents estimated post-fire increased unit peak flow (cubic feet per second per square mile) based on 2014 fire Burned Area Emergency Response reporting. Post-fire peak flows were estimated to increase by factors of 1.3 to 1.9. Peak streamflow increases of this magnitude were not expected to be large enough to produce adverse effects to channel morphology due to the inherent stability of steep, armored channels in the project area. Post-fire increased peak flow is partly attributed to the presence of water-repellent soils. Post-fire water repellency is expected to reduce significantly in the first few years post-fire and thus have diminished effects on peak flow. Effects of salvage harvest are incorporated in to the cumulative watershed effects equivalent roaded area model. Results of this modelling indicate that none of the project 5th field watersheds exceed the equivalent roaded area risk ratio under Alternative 2. These results are interpreted as a low risk for adverse effects to hydrologic function and water quality.

Code	Comment Number	Comment Text	Response
232.05 - Water Quality	#12346-14	Similarly, page 11 of the ACSOR acknowledges that the Lower Scott Watershed Analysis indicates that Deep/Middle, Tompkins and Snow/Isinglass creeks are impaired 6 in part due to "high road density." Again, the Forest Service proposes numerous activities (such as log haul, yarding, landing construction, roadside logging and road construction) that will increase the cumulative and direct impacts of its transportation system rather than implementing the recommendations of the Lower Scott Watershed Analysis to decrease the impacts of the agency's road system on these water quality impaired water bodies. Such an action threatens violation of both the NW Forest Plan and the Clean Water Act. Page 17 of the ACSOR indicates that the Forest Service is aware that the Beaver Creek Watershed Analysis recommends that the agency "manage public lands to maintain connectivity" because "Beaver Creek is providing late-seral connectivity from the Oregon Cascades to the Klamath Mountains." Yet page 30 of the ACSOR acknowledges that "new landings may have site level impacts to terrestrial habitat connectivity where large trees or snags are removed" and that in the Beaver Creek Watershed "hazard tree removal will occur on 1,420 acres which will have a site scale effect on terrestrial wildlife connectivity." In other words, the Forest Service is proposing to implement actions that cut directly across the recommendations contains in its own Watershed Analysis.	Watershed Assessments (WA, also called Watershed Analyses) are intermediate planning documents used to document watershed conditions and provide recommendations for management. Watershed Assessment recommendations are not however binding management direction because they have not gone through the administrative procedures of public notice and comment nor has there been any appealable decision made concerning the recommendations made in the respective Watershed Assessments. A Watershed Assessment does not constitute or replace management direction in the Forest Plan, nor are their recommendations binding on decision makers. The comment speculates that certain Westside Fire Recovery Actions are not consistent with the WA where the action occurs, and as such the Project is not consistent with the Forest Plan or the Clean Water Act. The comment however provides no evidence other than a general description of actions to support this contention.The comment refers to the Lower Scott Watershed Analysis that was published in 2000. This watershed analysis is not Forest Plan direction; it describes existing conditions on or before 2000 with some recommendations of the time. Since 2000 road decommissioning, upgrade, and repair work has been ongoing across the west side of the Forest. In order for vegetation management (timber, fuels) projects to be implemented the Forest must comply with the requirements of the Clean Water Act. To demonstrate compliance, the Forest may apply for enrollment of the project under the North Coast Regional Water Quality Control Board's (herein Water Board) Waiver of Waste Discharge Requirements program. Alternatively, the Forest could apply for a Waste Discharge Permit. Either enrollment of the project under the Waiver, or issuance of a Waste Discharge Permit would demonstrate compliance with the Clean Water Act. With regard to habitat connectivity in the Beaver Creek watershed the Forest acknowledges potential adverse habitat effects at the site-scale from project implementation. However, site-scale effects are not anticipated to limit connectivity on the landscape scale such as connections between the Oregon Cascades and the Klamath Mountains. Alternative 3 and Alternative 3 Modified are responsive to this recommendation because they forego salvage operations in order to maintain connectivity.
232.05 - Water Quality	#12346-26	The Forest Service is proposing numerous actions that will directly increase sediment production and delivery to streams in addition to the significant sediment production that has already occurred from the wildfire events, wildfire suppression (including dozer lines), and the existing crumbing road system located on steep decomposed granitic slopes. On page 92 of the DEIS the KNF indicated that it would refuse to develop and implement an action alternative that avoided salvage logging on severely burned soils and prohibited road construction on erosive and fragile soil types. On page 99 the KNF indicated that under all developed action alternatives the Forest Service is committed to clearcut salvage logging on unstable slopes that comprise geological Riparian Reserves. Page 101 of the DEIS indicates that the Forest Service hopes to conduct commercial logging and yarding activities on 2,000 acres of "steep, weathered granitic lands" consisting of geological reserves and an additional 4,400 acres of roadside logging is "proposed on unstable lands considered to be geological Riparian Reserves." "All streams in the project area are listed as impaired under §303(d) of the Clean Water Act, which means that current conditions do not meet water quality standards and streams are not supporting their beneficial uses. The 303(d) list identified stream temperature and sediment as the pollutants causing impairment in small tributary streams." ACSOR at 46. Hence additional temperature and sediment pollution in this project area is precluded. The KNF acknowledges that its road system is the primary source of sediment pollution in the project area. Page 46 of the ACSOR indicates that a "majority of the legacy sediment sites are associated with the road system…" Interestingly, agency planners then try to distinguish prior road construction practices with those proposed in the Westside timber sale. "Road construction often did not avoid unstable slopes or riparian areas that are protected by today's BMPs." ACSOR at 46. In fact the Westside DEIS proposes postfire road construction on both unstable slopes and in riparian areas.	The comment refers to Alternative A which was developed based on the Beschta (1995) report. Alternative A was considered but not analyzed in detail because it did not meet the purpose and need of the project. Table 2-36 in the draft EIS describes how other project Alternatives (1-5) address recommendations from Alternative A. Based on the modeling, field review, and professional judgment of earth, water, and fish scientists that evaluated the effects of all Alternatives, the effects to watershed conditions are indistinguishable from the short and long term effects of the 2014 wildfire. These scientists are also recognize that the proposed actions, as modified, are better for watershed conditions and aquatic beneficial uses than the No Action Alternative. The comment correctly states that project action Alternatives propose salvage harvest in geological Riparian Reserves. These activities are proposed because salvage harvest and site preparation and planting will reduce fuels and hasten revegetation resulting in reduced risk of high-severity fire, surface erosion, and mass wasting in the future. The Forest acknowledges that streams in the project area are on the state 303(d) list of impaired waters due to temperature and sediment impacts (see response to comment number 12346-25). Project Design Features and Best Management Practices are implemented to minimize potential adverse effects to hydrologic function and water quality. In addition the project Legacy Site Inventory and Treatment Plan will reduce future risk to water quality from sediment. This plan is a requirement of the North Coast Regional Water Quality Control Board's waiver program. If the plan is not viewed as adequately reducing risk to water quality from legacy sediment sites (mostly old roads) then the project will not be enrolled in the waiver program and no project work can be implemented. The comment states that agency planners "try to distinguish prior road construction practices with those proposed in the Westside timber sale". In fact current road construction practices have higher standards with regard to identification of unstable landforms (no new road segments constructed on inner gorges, active landslides, or toe zones of dormant landslides), culvert sizing to convey the 100-year magnitude flow without failing, and the utilization of rolling dips and critical dips to guard against road erosion and storm damage. These measures result in newly constructed roads having lower risk of adversely affecting water quality. There is only very limited new temporary road and landing construction proposed for Riparian Reserves in the project. See Chapter 2 of the final EIS for the modified Alternative 2 and 3 for details. Also see response to comment 18878.63.
232.05 - Water Quality	#17455-1	The proposed project threatens water quality in several existing and proposed Wild & Scenic Rivers and may harm fish habitat and the threatened coho salmon!	Equipment will be excluded from wetlands or wet meadows (excluding small springs and seeps). Project Design Features, Best Management Practices, and Forest consultation with outside agencies such as National Marine Fisheries Service, and the Karuk Tribe have designed and shaped the project such that risk to fish habitat and special status fish species has been reduced. Consultation is ongoing. The comment expresses an unsupported opinion; the effects to Coho salmon are described in Chapter 3 of the EIS.

Code	Comment Number	Comment Text	Response
232.05 - Water Quality	#17481-30	Alternative 4: Likes/Dislikes - I like the aspects of this Alternative that involve activities identical to Alternative 2. I dislike the aspects of this alternative that reduce recovery activities for the perceived benefits to water quality and fish. I believe the reduction in salvage activity and the loss of economic value, reforestation opportunities, fuel reduction, and future wildlife habitat is a very unbalanced trade for the small reduction in watershed effect.	Equipment will be excluded from wetlands or wet meadows (excluding small springs and seeps).The comment appears to be in favor of the project and critical of Alternative 4 because of reduction of salvage harvest (and fuels and planting) acres for little reduction in watershed risk.
232.05 - Water Quality	#17910-8	"Management activities that reinforce negative effects or undermine positive effects of fires must be avoided if streams are to recover. In particular, management activities that add to the risk of increased sedimentation or that remove ecologically important large wood from the watershed present a substantial and long term threat to the recovery of streams. In this regard, logging and roadbuilding represent one of the most significant forces threatening to retard stream and watershed recovery. Logging and roadbuilding (including, and maybe especially, temporary roads) accelerate sediment delivery rates, and are particularly risky in areas of steep slopes, shallow soils, unstable geology, and intense storms—precisely the areas already at greatest risk from the fires themselves. Roads distort the movement of groundwater, surface water and sediment through the watershed and greatly increase the risk of mass failure—landslides and debris torrents. Both logging and roadbuilding increase the risk and severity of scouring floods that degrade aquatic food chains. Adding timber harvest and road construction to an already fire-damaged watershed can only have negative and potentially severe effects. We know of no scientific reason to engage in salvage logging or roadbuilding in burned areas and we know of many sound reasons not to." (excerpt from a letter to the President, September 19th, 1994 by G. Wayne Minshall, Judy L. Meyer, Jack Stanford, James Karr and Christopher Frissell)	Comment appears to be a quote from a 1994 letter, but review of the WFR_PublicallyIDLiteratureCited.xlsx file failed to identify the reference. Entry also appears to lack a substantive comment related to the effects or analysis of effects for this particular project. See Chapter 2 of the EIS for a description of proposed actions; see Chapter 3 of the EIS for a discussion of effects. The project meets the purpose and need, while being consistent with law, regulation and policy, including consistency with the Forest Plan.
232.05 - Water Quality	#18726-3	The proposed 22 miles of "temporary" new roads, 14 new stream crossings and 152 new landings will fragment habitat and increase sediment in streams. The proposed logging will reduce shade and increase water temperature.	See Chapter 2 of the EIS for a description of proposed actions. The new preferred Alternative is modified Alternative 3, per the final EIS, which is a reduction in treatments compared to Alternative 2. Per the draft EIS; comment is in error in that Alternative 2 of the Westside Fire Recovery project proposes 3.6 miles (rather than 22 miles) of new temporary roads, with another 9 and 9.3 miles along reopened decommissioned roads and along temporary roads in existing roadbeds, respectively (see Table 7 in the Aquatic Conservation Strategy Report). Also see response to comment number 12364-1. Temporary road activities within hydrologic Riparian Reserves are much more limited with 0.3, 0.2, and 1.3 miles proposed in Alternative 2 of new temporary road, reopened decommissioned road, and temporary road in existing roadbed, respectively (see Table 8 in the Aquatic Conservation Strategy Report). As well there are only six new landings proposed for hydrologic Riparian Reserves under Alternative 2. These landings were approved for use after field inspection by watershed staff. The landings deemed acceptable for use were approved because they were characterized by some or all of the following conditions: 1) the landing was in the outer zone of the Riparian Reserves, 2) the landing was uphill or separated from the stream channel by an existing road, 3) the landing was not on an unstable landform, 4) the landing was not demonstrating active erosion, 5) the landing or landing edge was not vegetated with mature live trees that would need removed for landing use. Given the conditions stated above use of temporary road segments and landings in hydrologic Riparian Reserves is not expected to produce adverse effects to hydrologic function or water quality from sedimentation or increased water temperature. Unacceptable habitat fragmentation is not anticipated from these temporary road and landing activities.

Code	Comment Number	Comment Text	Response
232.05 - Water Quality	#18878-47	The Karuk Tribe and others including the State of California have issued a State of Drought Emergency for two consecutive years running. We find it disconcerting that although the continued drought conditions are mentioned throughout the document, there is no discussion, much less an analysis, on the impact of the drought on aquatic species, cultural beneficial uses, or domestic water supply from water drafting. DEIS: Pumping rate will not exceed 350 gallons-per minute or 10% of the flow of the anadromous stream drafted from (Pg. 87) Below 4.0 cfs, drafting rates should not exceed 20 percent of surface flows. Water drafting should cease when bypass surface flows drop below 1.5 cfs. Water drafting sites located in non-fish-bearing waters only may include minor instream modification, such as fine sediment removal and building of board/plastic dams. (Pg. 88) Comment: During baseflow months, cold water from major and minor tributaries including nonfish bearing portions of the stream are critical to the health and survival of federally-listed and culturally sensitive aquatic species. Drafting from streams can have a direct impact on these species and beneficial uses. What analysis has been conducted to look at the effects on aquatic resources and create these best management practices (BMPs)? There is great concern over the described methodology as most individuals are untrained to gauge stream flows by direct observation. This leads to many questions that need to be answered before drafting can occur. Who is going to measure the flows (cfs)? What are their qualifications to perform such a task? Is there going to be qualified personnel onsite with the ability to gauge with calibrated flow meters? Additionally, does this allow for the temporary dewatering of smaller tributaries?	The effectiveness of Best Management Practices is monitored through a state-wide program, in agreement with the Water Quality Control Board. The water drafting restrictions were designed by the National Marine Fisheries Service, which regulates protection of salmon listed under Endangered Species Act, such as Coho. Therefore, the Forest is following direction from agencies with jurisdiction to protect water and fish. The June 19, 2015 addendum to the fish Biological Assessment states, "As part of the Project consultation, the Forest, National Marine Fisheries Service, and Karuk Tribe jointly developed a strategy to monitor implementation of Project elements that have the greatest likelihood of impacting SONCC Coho salmon and other salmonids. Pre Project, the group will monitor the hazard tree mark where it is proposed near SONCC Coho salmon CH; during the Project (especially June-Sept) all parties will share information about where Project water drafting is occurring, jointly monitor those water drafting actions, and help Forest Service Representatives decide where to shift Project water drafting so that impacts to SONCC Coho salmon and its CH are not adverse; also during the Project, the Forest Service and National Marine Fisheries Service level 1 team will coordinate in closer monitoring of the status of ground disturbing actions if/when operations are occurring outside of the Normal Operating Season (NOS) or within the NOS during wet weather - to ensure compliance with Forest Service Best Management Practices and Wet Weather Operations standards." The Forest appreciates the cooperative efforts of the Karuk Tribe and National Marine Fisheries Service.
232.05 - Water Quality	#18878-48	DEIS: Effects to water quality of proposed temporary roads, stream crossings, and landings are assessed. The long-term temporal bounding for this analysis is up to 10 years because recovery of the fire-disturbed hydrologic function (from ERA modeling) and surface erosion (from USLE modeling) is appreciable in the first decade. The short-term is between 2 and 4 years after implementation. (Pg 199) Comment: Not included in the analysis are the effects of existing road infrastructure and the effects that the salvage logging will have on water quality. We are doubtful that just by using BMPs, water quality impacts will be effectively mitigated due to the size and scope of the Refined Proposed Action. The increased use of the road infrastructure by heavy equipment, salvage logging units, roadside logging, addition of landings, and other associated activities will have a cumulative effect on water quality regardless of location within or outside of riparian reserves.	The Forest Cumulative Watershed Effects analysis methodology includes past, present, and reasonably foreseeable future vegetation management actions along with past wildfires and wildfire suppression (fire lines). In addition, effects of the existing forest road network, temporary roads, log landing construction and enlargement, and road improvements and decommissioning are also modelled. Results of the cfs modelling indicate that potential effects of project Alternative 2 on hydrologic function and water quality are indiscernible from potential effects of the 2014 wildfires at the 5th field watershed scale. The Forest acknowledges that temporary road and landing construction does effect hydrologic function and water quality. However, results of the hydrology analysis indicate that these effects will be at the site-scale. IN addition, any project action Alternative will include with it the Westside Fire Recovery project Legacy Site Inventory and Treatment Plan. Implementation of this plan will reduce the risk of road-related erosion and sedimentation below pre-project levels in the Elk Creek 6th field watershed. Effects to water quality are in Chapter 3 of the final EIS.
232.05 - Water Quality	#18878-50	DEIS: With alternatives 2, 3, and 5 there are several sites (along tributaries of Doggett and Grider) where project temporary road actions involve using roads that currently have legacy sediment sites, or areas that are at risk of erosion (and therefore a threat to water quality) due to past land use. When/if the project uses these roads they will be hydrologically stabilized and any active erosion, or risk of erosion will be addressed. (Pg. 215) Comment: Since it is logical to conclude these sites have been identified for years, if not decades, as a known "threat to water quality", why haven't they been addressed in an expedient manner? Also the statement "they will be hydrologically stabilized and any active erosion, or risk of erosion will be addressed" is vague. It what manner are they going to be stabilized? Is this before project activity or at some unknown point in the future? In light of the projected shortfall of funding post salvage for restoration what priority level would these activities receive?	Many but not all existing legacy sediment sites in the project area were inventoried prior to analysis of the Westside Fire Recovery project. Numerous proposed temporary road segments were field reviewed by watershed staff prior to approval, and this field assessment could result in the identification of new legacy sites. Implementation of the Westside Fire Recovery project will reduce the risk of road-related erosion and sedimentation over the mid- and long-term because any project action Alternative will include the Westside Fire Recovery Legacy Site Inventory and Treatment Plan as required by the North Coast Regional Water Quality Control Board's Waiver of Waste Discharge program. Hydrologic stabilization refers to any combination of treatments such as water barring, de-compacting, removal of crossing culverts and fills, or recontouring (see the 2011 R5 Soil and Water Conservation Handbook, Chapter 10 Water Quality Management Handbook, Best Management Practice 2.1). These stabilization activities would occur after the project was implemented and the road was no longer needed for travel. See response to comment number 18878-16 about project funding for implementation.

Code	Comment Number	Comment Text	Response
232.05 - Water Quality	#18909-68	As stated in the Hydrology Report, page 22,"All streams in the project area are listed as impaired under section 303(d) of the Clean Water Act, which means that current conditions do not meet water quality standards and streams are not supporting their beneficial uses (USEPA 2010). The 303(d) list identified stream temperature and sediment as the pollutants causing impairment in small tributary streams." (Emphasis added). Project activities will adversely affect water quality in multiple ways. For example, for alternative 2, site scale effects to channel morphology are anticipated from infrastructure (DEIS, 204); and risk of sediment regime alteration and temperature regime alteration are increased for certain watersheds (DEIS p. 206). These negative impacts will be mitigated by treatment of legacy sites. Please explain how this approach is consistent with the following Watershed and Habitat Restoration Standard and Guideline contained in the NWFP Standards and Guidelines at C-37: "WR-3. Do not use mitigation or planned restoration as a substitute for preventing habitat degradation."	The Forest acknowledges that all streams in the project area are listed as impaired under Section 303(d) of the Clean Water Act. However, site-scale effects to channel morphology are not expected to adversely affect water quality as is stated in the comment. Results of cumulative watershed effects analysis indicate that no project area 5th field watersheds are moved in to the elevated risk (risk ratio > 1.0) category for adverse effects to hydrologic function or water quality as a result of implementation of Westside Fire Recovery project Alternative 2. Only the Beaver Creek 5th field watershed is at elevated risk per the Universal Soil Loss Equation and mass wasting cumulative watershed effects models post-fire, and the risk ratios are not increased when effects of Alternative 2 are included. In order for any action Alternative to be implemented it must include the Westside Fire Recovery Legacy Site Inventory and Treatment Plan. Inventory, prioritization, and treatment of legacy sediment sites is required by the North Coast Regional Water Quality Control Board for Total Maximum Daily Loads compliance, and is necessarily planned restoration.
232.05 - Water Quality	#18909-70	All streams in the project are impaired for temperature and thus are not meeting their beneficial uses related to water temperature. (See Hydrology Report, page 22). The Klamath Stream TMDL action plan allocates "no temperature increases year round" (Water Quality Control Plan for the North Coast Region, 4-96). (Emphasis added). Despite this, the DEIS and Resource Reports indicate that the project may increase river and stream temperatures. Table 3-22 at page 209 of the DEIS indicates that the "risk to temperature regimes" will be increased in Alternatives 2 through 5 as compared to Alternative 1. Specifically, nine additional 7th field watersheds will have a "moderate" risk to temperature regimes, and one additional 7th field watershed will have a "high" risk to temperature regimes in Alternatives 2 through 5 as compared to Alternative 1. This violates the Klamath Stream TMDL, which prohibits anthropogenic temperature increases.	The Forest acknowledges the information referenced from Table 3-22 of the draft EIS. The risk of temperature regime alteration was assessed in the project hydrology report as follows: Watersheds with less than 20% of the live vegetation affected by the fire or treatments in the project in the Riparian Reserves have a low risk of temperature regime alterations. Watersheds with between 20-50% live vegetation affected or a highly likely landslide likelihood have a moderate risk of temperature regime alteration. Watersheds with more than 50% of the live vegetation affected or an almost certain landslide likelihood have a high risk of temperature regime alterations. A low risk means that the stream temperatures will remain within the range of natural variability. A moderate risk means that the stream temperatures will be affected on the short-term until shrubs and hardwoods re-sprout in the Riparian Reserves. A high risk means that the temperature will be measurably affected and it will take more than 10 years to recover. Moderate risk watersheds are expected to recover due to streamside vegetation growth within the first few years.
232.05 - Water Quality	#18909-71	The DEIS, page 198, admits that the project will potentially cause loss of shade, stating that, The effects of the project on shade are estimated by intersecting the treatment areas likely to remove live vegetation with Riparian Reserves. These areas are assumed to have the potential for shade loss. Shade will not be lost over much of the treatment area because the treatments focus on removal of only dead or small live trees. However, large live trees may be felled for safety. So the areas are considered to have the potential to loss stream shading. (Emphasis added). This potential loss of shade violates the Klamath Stream TMDL action plan's "no temperature increase" requirement.	See response to number 18909-71.
232.05 - Water Quality	#18909-72	The KNF Stream Sediment Monitoring Report 2009 to 2012 Revised: April 11, 2013 lists the monitored managed streams with sediment indicators not meeting reference conditions. Modeling of project impacts show an increase in risk of increased sedimentation under the Preferred Alternative, but dismiss this increase as insignificant because "[t]he effects of alternative 2 do not change the risk categories for any watershed compared to alternative 1." The DEIS states: "The effects of alternative 2 do not change the risk categories for any watershed compared to alternative 1. The USLE model increases for nine watersheds and the mass-wasting model increase for seventeen watersheds. The risk ratio increase is less than 0.2 in all cases." DEIS page 204. However, as the Hydrology Report states at page 2, "Model results fall on a continuum…," and dispute not changing the risk categories, alternative 2 nonetheless does increase the risk of sedimentation. Furthermore, the DEIS acknowledges that the project will have "[p]otentially sizeable effects on sediment at the site scale." Page 70. The DEIS at page 218 also states: "New temporary roads, particularly temporary road stream crossings, have a high risk for affecting aquatic habitat indicators at the site scale because of their impacts on sediment regimes and drainage networks." DEIS, page 218. Any increase in sediment is contrary to the requirements of the Clean Water Act, since the streams and rivers in the area are already impaired for sediment and for temperature which is increased by additional sedimentation.	The Forest acknowledges that results of the stream sediment monitoring program indicate numerous managed streams in exceedance of reference conditions for in-channel sediment indicators. Results of cumulative watershed effects analysis do indicate that effects of Alternative 2 do not change the risk category for any project area 5th field watershed for any on the three component models (equivalent roaded area, universal soil loss equation, mass-wasting). Post-fire only the Beaver Creek 5th field watershed is in the elevated risk category (risk ratio > 1.0) and incorporating effects of Alternative 2 in the model does not change this risk level. The comment references model results for 7th field watersheds. For the equivalent roaded area model results comparing seventy seven 7th field watersheds the average increase in risk ratio between Alternative 1 (no action) and Alternative 2 is 0.04. This value is within the margin of error of the model and thus the results are interpreted to mean that implementation of Alternative 2 does not change risk to hydrologic function or water quality at the 7th field watershed scale. The exceptions were in Jessups Gulch, Whites Gulch, and Upper North Russian Creek where Alternative 2 produced risk ratio increases of 0.8, 0.3, and 0.3, respectively. These increased risks will be mitigated by Project Design Features and Best Management Practices for any action alternative.

Code	Comment Number	Comment Text	Response
232.05 - Water Quality	#18909-73	The Final SONCC Coho Recovery Plan at 2014. 3-13 states: One of the most important ecological requirements of coho salmon is cold, clean, well oxygenated water. Impaired water quality parameters in the SONCC coho salmon ESU include increased water temperature, changes in pH above or below optimum levels, reduced dissolved oxygen, increased nutrient loading, and increased extent or duration of turbidity. (Emphasis added). Studies have linked timber harvest with increases in turbidity harmful to salmonids. For example, "Logging and turbidity in the coastal watersheds of northern California,"3 a study indexing chronic turbidity in 28 watersheds in Del Norte, Humboldt, and Mendocino counties in California found that "[t]he rate of timber harvest…explained much of the large differences in chronic turbidity among the study watersheds, with drainage area playing a subordinate, but still significant role."(Klein et al. (2011), 7). This study notes that, "Stream biota, such as salmonids, suffer not only from turbidity extremes but also from chronic turbidity." (Klein et al. (2011), 1). However, the DEIS does not appear to have any discussion of the impacts of the extensive timber harvest proposed on turbidity. The DEIS only mentions turbidity impacts of water drafting (Aquatic Resources Report, page 52) and culvert upgrades (Aquatic Resources Report, page 54). It also notes the for many watersheds, turbidity levels are elevated an likely to remain elevated for years. (See, e.g., Aquatic Resources Report, pages 105, 111, 116, 133). Analysis of the project impacts on turbidity must be done.	While the project hydrology report does not explicitly use the term "turbidity" the assessment of the risk of turbidity is inherent in the analysis of risk of sediment regime alteration. Results of this analysis are presented in the project hydrology report and draft EIS and indicate that implementation of Alternative 2 does not affect risk at the 5th field watershed scale, is minor to indiscernible at the 7th field watershed scale, but will likely be detectable at the site-scale particularly as related to temporary road and landing use in hydrologic Riparian Reserves. However, these effects will be balanced in the mid- and long-term by implementation of the Westside Fire Recovery Legacy Site Inventory and Treatment Plan that will be included in any action Alternative.
232.05 - Water Quality	#18909-74	The Westside Project relies extensively on best management practices (BMPs) to mitigate impacts of the proposed logging to water quality. For example, the DEIS page 92 states: "Action alternatives (2 through 5) minimize negative effects of salvage through implementation of watershed project design features." Appendix D details BMPs "developed to comply with Section 208 of the Clean Water Act. " DEIS page 404. However, even well-implemented BMPs cannot completely eliminate erosion from harvested slopes and forest roads-and thus impacts to water quality. For example, in the study "The incidence and role of gullies after logging in a coastal redwood forest" (Reid et al. 201015), "[t]he distribution and morphological characteristics of channels were mapped in a redwood forest at Caspar Creek, California, USA, to evaluate the extent to which recent logging has influenced channel conditions in the area." Page 155. This study concludes: 15 Reid, L.M., Dewey, N.J., Lisle, T.E., Hilton, S., 2010. The incidence and role of gullies after logging in a coastal redwood forest. Geomorphology 117, 155-169. Because an appreciable portion of the increased sediment input at Caspar Creek is associated with hydrologic changes caused by logging and because a significant portion of the excess sediment is generated along channels in and downstream of the logged areas, the strategies most often used in the region to reduce sediment inputs from logging-control of road-related erosion and establishment of riparian buffer strips-are not effective for reducing an important component of the logging-related sediment input at Caspar Creek. Klamath National Forest 2012 BMPEP Report, page 4, reported that BMPs were effective 87% of the time in 2012. The Klamath National Forest should make clear whether the failure rate of BMPs are being taken into account when deciding how many sediment sites will be treated to mitigate the project's adverse water quality impacts-and, if not, the Forest should build the BMP failure rate into their mitigation plans. Because of the very large size of the project, we believe that there may be an even larger failure of BMPs than usual, because of the operational challenges of overseeing and carrying out a project of this scale. Thus, a safety margin should be included in the number of sediment sites that are treated to better offset the negative water quality impacts of the project.	The Forest concurs that even well-implemented Best Management Practices may not completely eliminate erosion from harvested slopes and forest roads. However, surface erosion from uplands and roads is not automatically delivered to stream channels. Project Design Features (project design feature) of Chapter 2 of the EIS that prohibit salvage harvest and significantly limit temporary road and landing activities in hydrologic Riparian Reserves are expected to protect riparian values without adverse effects to beneficial uses. In addition, the risk of road-related erosion and sedimentation will be reduced over the mid- and long-term with implementation of the Westside Fire Recovery Legacy Site Inventory and Treatment Plan as a part of any project action Alternative. Soil, hydrology and aquatic resource effects are discussed in Chapter 3 of the EIS.

Code	Comment Number	Comment Text	Response
232.05 - Water Quality	#18909-75	A total of 953 legacy sediment sites were inventoried within the project boundary." (DEIS page 201). However, only "approximately 150 legacy sediment sites will be repaired under any action alternative." (Hydrology Report at page 36). The DEIS fails to consider how the treatments in one watershed will offset the impacts of the entire project area. A much higher percentage of legacy sediment sites treatments within the project boundaries would be needed in order to make up for the adverse water quality affects. R5 FSH 2509.22 - Soil And Water Conservation Handbook, Chapter 10 - Water Quality Management Handbook states: NEPA analyses for timber harvest, fuels, vegetation management, engineering, and recreation activities that include ground-disturbing activities will include an inventory of controllable sediment discharge sources and other legacy sites that may affect water quality within project boundaries and along appurtenant Forest Service roads. The DEIS and resources reports fail to provide an inventory of all legacy sites in the project area.	The Forest acknowledges that not all inventoried legacy sediment sites in the project area are included in the Westside Fire Recovery Legacy Site Inventory and Treatment Plan. This is primarily due to funding and feasibility limitations. The Forest has evaluated watershed conditions and prioritized restoration at the Forest-wide scale. The Forest proposes to treat all of the legacy sites in Elk Creek in combination with the sites treated by the 2014 wildfires Burned Area Emergency Response. Several additional sites may be improved incidental to road work completed on haul routes. No other sites will be treated as part of the Waiver coverage for the Westside Fire Recovery Project. This approach completes some restoration work in each Total Maximum Daily Loads (Klamath, Scott, and Salmon Rivers), but focuses most of the future work and funding into the Forest's priority watersheds (Elk Creek). The complete inventory of legacy sediment sites while not published along with the draft EIS is available.
232.05 - Water Quality	#18909-84	This report at page 46 incorrectly asserts that, "Cutting of trees for salvage harvest will not occur within Riparian Reserves under all methods of removal (tractor, skyline and helicopter)." As the Geology Report, page 5, about 2,000 acres of salvage logging is proposed in Riparian Reserves and on page 237 of the DEIS it states that 3,920 acres of salvage units are on steep granitic land. Because the Aquatic Resources Report fails to assess the impacts of the proposed logging in Riparian Reserves on aquatic resources, the report is incomplete and the report must be revised to include analysis of the proposed salvage harvest in Riparian Reserves on aquatic resources. Furthermore, at page 9, the Aquatic Species Resources Report states that "The WSF Project Area includes three Key Watersheds: Elk Creek, Grider Creek and the North Fork Salmon River." However, in the DEIS, at page 7, four Key Watersheds are identified: Elk Creek, Grider Creek, North Fork Salmon River, and South Fork Salmon River. The inconsistencies throughout the NEPA analysis reiterate their insufficiency.	See Chapter 2 of the EIS for a description of proposed actions. The Forest acknowledges that some salvage harvest is proposed for geologic Riparian Reserves, however, no salvage harvest is proposed for hydrologic Riparian Reserves. The Aquatic Conservation Strategy Report assessed potential effects of vegetation treatments and temporary road and landing activities in Riparian Reserves, including the steep granitic land referenced in the comment. See Chapter 3 of the EIS for a summary or see the project record for the full Aquatic Conservation Strategy Report.
232.05 - Water Quality	#18912-2	In addition to warming water from drafting in a critical time, albedo affects from recently clear-cut and burned areas will be working simultaneously to warm these waters. The rush to begin cutting will exacerbate the warmth of these streams, before natural succession (or planting) has time to replenish riparian and hillside cover. To make matters even worse, many of the proposed stream crossings within the burn, as well as the new and re-commissioned roads are located at sediment legacy sites. While the proposal does mention that these sites tend to be outside of anadromy, anyone who has hiked in the Klamath Mountains knows that these streams flow from steep mountains and are high gradient. These streams have the capacity to carry sediment!	No salvage harvest is proposed for hydrologic Riparian Reserves thus natural post-fire vegetative succession will proceed along stream courses naturally. The comment does not make the link between the occurrence of legacy sediment sites at stream crossings and warming water. The Forest does acknowledged that Klamath Mountain streams can and do carry sediment. Sediment transport is a natural part of stream dynamics that creates pools, builds banks, and provides spawning gravel. The risk of road-related erosion and sedimentation will be reduced over the mid- and long-term with implementation of the Westside Fire Recovery Legacy Site Inventory and Treatment Plan that will be a part of any project action Alternative. For clarification, there are no recent clear cuts on lands managed by Klamath National Forest.
232.05 - Water Quality	#18912-4	While my heart is with the Salmon, Steelhead and Lamprey populations of the Klamath system, I think it also important to note that the amphibians in these headwaters streams are particularly fragile. Warming temperatures and changes in trophic processes from light intrusion of the stream (fire or logging based) can lead to bottom up control of the stream. More algae and cyanobacteria (with their toxins), more grazers and fewer Ephemeropterans and Plecopterans will greatly change the vertebrate communities i.e. the amphibians and resident fish species that are already extirpated from or ill suited for the main Klamath. I hope that more of these heritage watersheds are left uncut, with an emphasis on selective replanting, temperature and sediment control, and awareness of the myriad of biological responses to altering the physical characteristics of these environments.	Comments states an opinion with information that does not request a change in proposed actions or clarification in information provided. The proposed action complies with the Aquatic Conservation Strategy Objectives that promotes managing aquatic habitat for the long term persistence of aquatic species.
232.05 - Water Quality	#18918-11	I understand that the WFRP would bring a deterioration in habitat along more than 3000 acres of streamside along the Klamath River, Scott River, and North Fork Salmon Wild and Scenic Rivers, and proposes more damage along the proposed Wild and Scenic Rivers of Elk Creek, Grider Creek, and South Russian Creek Wild and Scenic Rivers. The combination of a lot of road-building under the WFRP, while combined with the considerable soil disruption leading toward siltation of salmon stream and river segments due to removal of lots of snags and older forests, will spell disaster for native salmon streams of Siskiyou County. Specifically examine what the WFRP means for the Spring Chinook run in the Salmon River.	The comment is not consistent with the findings documented for this project. Fisheries biologists analyzed and disclosed the likely effects of the project on salmon and their habitat as shown in the Aquatic Resources section of Chapter 3 of the EIS and in the Biological Assessment and addendum for Threatened, Endangered, and Proposed Fish Species. The effects to Coho salmon and its habitat (including that used by Spring Chinook Salmon in the Salmon River) were determined to be "May Affect Not Likely to Adversely Affect". Fisheries biologists worked with the interdisciplinary team and Deciding Official to minimize potential negative effects to fish and their habitat. The Forest Service consulted with National Marine Fisheries Service and agreed that all action Alternatives May Affect but is Not Likely to Adversely Affect Endangered Species Act-listed Coho salmon. Table 24 of the Aquatic Resource Report for the final EIS describes the effects to other aquatic species. See Response to comments 12364-22, 17393-1, 19076-13.

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232.05 - Water Quality	#18926-39	Water quality in the Klamath River, Scott River, and North Fork Salmon River is listed as impaired and is on the 303(d) Clean Water Act. While the DEIS is supposed to use plain language it skews and blurs actual effects through models and relies on unreliable mitigations and the treatment of a fraction of legacy sediment sites. For instance, models show an increase in risk but it is so slight it does not change the risk ratios. However, any increase in sediment is contrary to the intent of the Clean Water Act, the Basin Plan and the Magnuson-Stevens Fishery Conservation and Management Act.! ! The DEIS considers different indicators of risk for water quality including: risk to channel morphology, risk of sediment regime alteration, risk of temperature regime alteration and the trend of riparian function for fisheries. The project includes portions of eight watersheds: Beaver Creek; Humbug Creek-Klamath River; Horse Creek-Klamath River; Seiad Creek-Klamath River; Lower Scott River; Thompson Creek-Klamath River; Elk Creek; and North Fork Salmon River (the DEIS Aquatics section includes eleven watersheds) and seventy-five sub-watersheds that intersect portions of the three fire-related areas. Post-fire sediment has already been delivered to project areas streams such as Elk and Grider creeks during winter 2014-2015 storms.! ! Risk to Channel Morphology! There will be nine watersheds that will continue to have a moderate risk, and two with a high risk to channel morphology. Cumulative effect on risk to channel morphology would result in Jessups Gulch moving from a low to high risk.! ! Risk of Sediment Regime Alteration! Models show increases for nine watersheds and mass-wasting increase for seventeen watersheds. Site-scale alteration of the sediment regime is anticipated in some cases.! Cumulatively thirteen watersheds had an increase in risk and three for the mass-wasting. The largest increase was in Jessups Gulch.! ! Risk of Temperature Regime Alteration! Nine watersheds move to high risk, including Robinson Gulch. There are ten watersheds that move to a moderate risk, including Miller Gulch-Klamath River, Upper Grider Creek, Tom Martin Creek, Horse Creek-Klamath River, Headwaters of Elk Creek, Upper Elk Creek, Lower East Fork Elk Creek, Hoop & Devil, Lower South Russian Creek and Big Creek. Cumulative effects increased the shade loss potential for 19 more watersheds. Big Ferry-Swanson, Quigley's Cove, Doggett Creek and Dutch Creek had the largest increase in percentage of the watershed with shade loss potential! !	The models are intensive and require interpretation. The Biological Assessment for Fish, including the appendices, and the Aquatic Resource Report provide an interpretation as to what the potential effects mean to aquatic organisms of concern. See response to comment number 18878-48. The Forest acknowledges the 303(d) listing of streams in the Klamath, Scott, and North Fork Salmon Rivers. Analysis and planning to support the Westside Fire Recovery project employed an established Cumulative Watershed Effects modeling process that was described in detail in a 2004 Forest process paper and also in the Westside Fire Recovery project Hydrology Report. Use of cfs models is not intended to "blur actual effects", but rather to integrate forest management and disturbance (wildfire) activities over space and time (past, present, and reasonably foreseeable future activities) to better understand existing and potential levels of risk to hydrologic function and water quality at various watershed scales. Project Design Features are not "unreliable mitigations" but rather are based on existing Forest Service Pacific Southwest Region Best Management Practices. While the Westside Fire Recovery project Legacy Site Inventory and Treatment Plan does not treat all legacy sediment sites in the project area implementation of this plan as a part of any project action Alternative will result in reduced risk of road-related erosion and sedimentation in the priority watershed of Elk Creek and the receiving Klamath River. Results of cfs modeling indicate that risk to hydrologic function and water quality, as assessed by watershed risk ratio, is not increased by any project action Alternative at the 5th field watershed scale. Equivalent Roaded Area (ERA) risk ratios are only increased by more than a value of 0.2 under Alternative 2 for three 7th field watersheds. The Forest acknowledges that post-fire sediment was delivered to Elk and Grider Creeks during the winter of 2014-15. Post-fire erosion and sedimentation is a natural process in the Klamath Mountains, and fish and other aquatic species have evolved with these watershed processes. Comment references low, moderate, and high risk "categories" that were erroneously utilized in the draft EIS Hydrology Report but were revised to "low risk" and "elevated risk" in the Amendment to the Hydrology Report. Regardless, results of the cfs models indicate that cumulative effects of project action Alternatives are indiscernible from 2014 wildfire effects at the 5th field watershed scale, and minor to indiscernible at the 7th field watershed scale (with the exception of Jessups Gulch). Any action Alternative will employ Project Design Features (project design feature) to minimize potential site-scale and local adverse effects to hydrologic function and water quality.
232.05 - Water Quality	#18934-11	Use of Roads & Roadside Hazard Tree Removal Although the Klamath National Forest was able to obtain agreement from the North Coast Regional Water Quality Control Board that allows deviation from the typical requirement to treat legacy sites on road networks simultaneously with project activities, the Westside project will have considerable impacts involving erosion and sedimentation from these legacy road networks. It is insufficient to treat a small subset of the most easily managed legacy sites rather than correct known issues at all legacy sites in the project area, especially considering the scope and scape of the project. The Westside project clearly prioritizes resource extraction over resource protection and its failure to adequately address legacy sites is a prime example of this. Decommissioned roads are just that: roads that have been removed from the National Forest system and "put to bed." They should be considered non-existent and not as avenues to reopen (sometimes with considerable impact) whenever there is a desire to return them to use, however temporarily. Project activities should utilize only existing NFTS roads without creating any new roadways (even temporary) or reopening decommissioned roads. This is of particular applicability to Grider Creek, Walker Creek, and the West Fork of Whites Gulch where several decommissioned roads are planned for reconstruction and use. These areas are located on steep, highly erosive decomposed granite and, in fact, this susceptibility to erosion and problems with sedimentation were the reason that these roads were removed from the road system and decommissioned. Roadside hazard tree removal should be limited to roads depicted in the Motor Vehicle Use Map and key roads needed for administrative purposes. These are the roadways used by the public and the ones needed to perform standard forest management activities. Maintenance level 1 & 2 roads do not need hazard tree removal since they are virtually unused. Opening closed roads to perform hazard tree removal is illogical for obvious reasons and should be eliminated from the proposed project. The Karuk Alternative does an excellent job of carefully selecting roads that should receive roadside hazard removal and fuels reduction treatments by prioritizing main access routes, roads to trailheads and locations of importance, as well as roads that are critical for strategic fuel breaks for both reintroduction of prescribed fire at the landscape level and/or	The purpose and need for this project was driven by the 2014 wildfires. There is a need for worker and public safety and access, there is a need for safe conditions for firefighters performing fire suppression for community protection, there is a need for a project that is economically viable, meeting project objectives and benefiting our local communities, and there is a need for restored and fire-resilient forested ecosystems. To meet those objectives, opening decommissioned road has been proposed and evaluated through modeling, field review, and professional judgment. The hydrologist found that watershed effects from the action Alternatives would be indistinguishable from the effects of the wildfire, and in the long term, it is anticipated that the proposed actions benefit watershed conditions and beneficial uses. Any Westside Fire Recovery action Alternative requires implementation of the Westside Fire Recovery project Legacy Site Inventory and Treatment Plan. This plan is not simply direction to treat the most easily managed legacy sites, but rather, was developed from pre-existing inventories and prioritization of legacy sediment sites. Legacy Site treatments in the Westside Fire Recovery project plan include diversion prevention, culvert upgrade, aquatic organism passage, infrastructure repair, and fill removal/reduction. The re-opening of decommissioned roads by the Westside Fire Recovery project is limited to an estimated 0.2 miles within hydrologic Riparian Reserves. Re-opening of any decommissioned roads will be done to current Forest Service standards, will employ erosion control Best Management Practices, and the road segments will be returned to the same (or better condition) with regard to hydrologic risk after use. Maintenance Level 2 roads are used by the public with high-clearance vehicles and Level 1 roads are used for forest management and fire suppression, for example. As such, hazard tree abatement along these roads will be a benefit. The Forest has consulted with the Karuk Tribe on development of the Westside Fire Recovery project. Also see response to comment number 12364-1.

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		for use in fire suppression or management in future wildfires.	
232.05 - Water Quality	#19072-1	In reviewing and analyzing the preferred alternative (Alternative 2), we are concerned that this alternative proposes activities with potential impacts to water quality that will not be mitigated to Jess than significant. Although this letter does not serve as a final determination, Regional Water Board staff currently does not believe that the Alternative 2 project would be eligible for coverage under Order No. RI-2010-0029, Waiver of Waste Discharge Requirements For Nonpoint Source Discharges Related to Certain Federal Land Management Activities on National Forest System Lands in the North Coast Region (Waiver). It is possible that Alternative 4, with some modifications, may be eligible for Waiver coverage. A final determination cannot be made until the final EIS with the alternatives is prepared and finalized and a Decision is issued. We will outline our concerns below.	Consultation with the Water Quality Control Board is ongoing. The Forest will follow the agreed upon procedures with the Water Quality Control Board to apply for Waiver coverage following a Decision for this project.
232.05 - Water Quality	#19072-2	The Waiver waives certain activities conducted on NFS lands from the waste discharge requirements of Article 4 (commencing with Section 13260) of Chapter 4, Division 7 of the California Water Code, except as provided within the Waiver. In order to receive coverage under the Waiver, projects must meet specific eligibility criteria and conditions. Projects are defined as Waiver Category A (lower threat to water quality) or Category B projects depending on the risks of water quality impacts. The Westside Fire Recovery Project is considered a Category B project because it is a timber harvest project. Condition number 14 on page 16 of the Waiver states, "Compliance With Waiver conditions will ensure that no significant environment impact to water quality occurs from an activity covered by this Waiver.· Activities that have potentially significant impacts to water quality that cannot be reduced to less than significant levels are not eligible for coverage under this Waiver and the USFS will need to submit a Report of Waste Discharge to the Regional Water Board." Our staff analysis of Alternative 2 suggests that potential impacts to water quality have not been mitigated to less than significant levels for the following reasons:	Consultation with the Water Quality Control Board is ongoing. The Forest will follow the agreed upon procedures with the Water Quality Control Board to apply for Waiver coverage following a Decision for this project.

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232.05 - Water Quality	#3678-23	Water Quality – No Action direct and indirect effects "Over the long-term, the fuel load conditions will lead to fire intensity and flame lengths that are conducive to major fire runs, crown fires, and spotting. The large fuels component (greater than 3 inches) will lead to an elevated fire intensity and duration of fire on the landscape if it should re-burn. In 10 years, the conditions under alternative 1 will lead to nine percent of the area having flame lengths greater than 11 feet. Sixty percent of the treatment area is likely to experience flame lengths between 4 and 11 feet and thirty-one percent is likely to have flame lengths of less than 4 feet. (See fire and fuels report). High flame lengths are associate with high severity fire and will contribute to accelerated sediment delivery(DeBano et al. 2005), increased stream temperatures (Pabst and Spies 2001)and stream flows (Neary, et al. 2005a)and increased potential for the introduction of toxic chemicals from fire retardant application during future fire suppression efforts(Neary, et al. 2005b)."	Comment is a quote from the Hydrology Report that recognizes an effect of No Action.
232.06 - Watershed Condition	#10450-1	California forests are much too endangered by drought to allow short-sighted, profit-for-this-quarter, exploitation. It is essential to leave these watersheds undisturbed. The economic costs of mismanaging the watersheds can far exceed the quick profits available from logging. Please follow the rules and common sense by continuing to protect California watersheds from logging.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment 6646 and 6271-1. . See response to comments 17393-1 and number 18852-48. Taking No Action has negative consequences for fish and watershed conditions also. Page 16 of the Hydrology Report states, "Over the long-term, the fuel load conditions will lead to fire intensity and flame lengths that are conducive to major fire runs, crown fires, and spotting. The large fuels component (greater than 3 inches) will lead to an elevated fire intensity and duration of fire on the landscape if it should re-burn. In 10 years, the conditions under Alternative 1 will lead to nine percent of the area having flame lengths greater than 11 feet. Sixty percent of the treatment area is likely to experience flame lengths between 4 and 11 feet and thirty-one percent is likely to have flame lengths of less than 4 feet. (See fire and fuels report). High flame lengths are associate with high severity fire and will contribute to accelerated sediment delivery (DeBano et al. 2005), increased stream temperatures (Pabst and Spies 2001)and stream flows (Neary, et al. 2005a)and increased potential for the introduction of toxic chemicals from fire retardant application during future fire suppression efforts (Neary, et al. 2005b)." Alternative 1 will allow for passive recovery of vegetation in the watersheds which will be slower than if treatment, including planting, would occur. The extended duration of decreased interception, use of water by plants, and ground cover will extend the risk to channel morphology over the long-term. The No-action Alternative displays the effects of leaving the watersheds treated.
232.06 - Watershed Condition	#12346-20	Page 35 of the ACSOR acknowledges that "[s]ite scale impacts are direct impacts to bank and stream bottom such as from stream crossings on temporary roads." Numerous stream crossings are associated with proposed post-fire road construction. "There are temporary road crossings proposed which will directly affect the bank and channel integrity at the site scale. The banks will likely show effects of temporary crossings for the long-term." ACSOR. Long-term direct impacts to bank integrity violates ACSO 3. Page 35 of the ACSOR also indicates that "[g]round based salvage units with Riparian Reserves may involve crossing dry intermittent stream channels which could have a site scale effect on banks and aquatic integrity." Rather than disclose and analyze the location and effects of such crossings, the Forest Service relies entirely on generic BMPs and PDFs to mitigate (rather than avoid, or analyze) the negative environmental consequences.	The comment is correct that described in the Aquatic Conservation Strategy Report and Amendment, several stream crossings included in temporary road actions would have site level impacts to stream banks. In Modified Alternative 3, two perennial stream crossings and two intermittent stream crossings on temporary roads are included. One of the perennial crossings involved has not been appropriately hydrologically stabilized, and therefore the current condition is a legacy sediment site or risk to water quality. Because the project would address this legacy site after the road is used, the current and future condition of stream bed and banks would be improved and restored. For the other perennial crossing, and the two intermittent crossings, there are no legacy sediment sites present. These crossings are on old road beds that were decommissioned about 10-13 years ago. At these crossings, stream banks continue to show site level effects of the former crossings even though they have been appropriately hydrologically stabilized. Although there are some lingering effects to natural hillslope processes from these former roadbeds and crossings, they do not translate into meaningful negative impacts to aquatic resources or the distribution and abundance of aquatic species. The project will involve temporary site level impacts to aquatic habitat at these crossings and those impacts have been disclosed. Because project use would be temporary and the crossings would be again appropriately hydrologically stabilized after use, the current condition at these sites will be maintained and restored. At this point in the planning process it is not clear if any dry stream channel crossings within ground based units will be necessary, or where. These crossings involve low risk of impacting aquatic resources down stream and they must be designated by Forest Service representatives who seek input from watershed specialists and follow Best Management Practice guidelines that have been shown to be effective in minimizing potential site level disturbance and potential erosion related effects. See response to comment number 18909-83.

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232.06 - Watershed Condition	#12346-24	Page 219 of the DEIS acknowledges that the Forest Service proposes to take actions such that streams will "be negatively affected by temporary road actions and landings" in eight watersheds.	As described in the draft EIS for Alternative 2, there would have been short term negative effects to aquatic resources in Doggett Creek and a face drainage to Beaver Creek from use of these temporary roads, but long term benefits to water quality through addressing sediment sources on these road beds. Modified Alternative 2 drops these temporary road actions and therefore would result in less short term negative effects related to roads and sediment production, however, the opportunity to reduce sedimentation from these old road beds long-term would be foregone. Effects from Modified Alternative 2 from temporary road construction would be discountable to habitat indicators and minor to aquatic species. Modified Alternative 2 would remove three landings from use in the Beaver Fire area; as with all the Alternatives, there are no new landings in Riparian Reserves proposed in Beaver Fire area. The effects described for landings in the draft EIS Aquatic Resources Report would be reduced with Modified Alternative 2. The cfs modelling indicates that landings proposed under Alternative 2 would not add incremental increases to disturbance at the 5th-field watershed scale, and only a slight incremental increase in some watersheds at the 7th-field scale. Modified Alternative 2 further reduces the effects of landings that were described for Alternative 2 in the draft EIS Aquatic Resources Report. Due to project design project design features that would be implemented to minimize site scale effects, and due to reduced acreage of landings in the Beaver Fire area, effects of landings on habitat indicators would be reduced but similar to those described in the draft EIS. Modified Alternative 2 is similar to Alternative 2 (described in the draft EIS Aquatic Resources Report) within the Beaver Fire area with respect to the potential for indirect effects to aquatic resources from landings. Effects to habitat indicators would be discountable and effects to aquatic species would be minor.
232.06 - Watershed Condition	#12346-25	Page 220 of the DEIS indicates that the Forest Service intends to move watersheds away from attainment of ACS objectives such that "short term negative effects to aquatic habitat may occur in several stream reaches due to the project." Page 41 of the ACSOR acknowledges that the North Fork Salmon River, the Scott River and the Klamath River are 303(d) listed under the Clean Water Act for temperature and that TMDLs have been established to limit sediment pollution into these river systems. Page 42 of the ACSOR indicates that "roadside harvest may affect shade in areas where green hazard trees would be removed in the riparian reserve. This may affect shade at the site scale…" It is a violation of the Clean Water Act (and the ACS) to "affect shade at the site scale" of 303(d) listed watersheds. Page 42 of the ACSOR also indicates that the "effects to shade from temporary road actions in Riparian Reserves will likely be at the crossings and very localized." Interestingly, this section of the ACSOR declines to mention the link between sediment production from road construction and stream temperature. The Forest Service again 10 relies upon the assumption that it may violate the ACS at the localized scale as long as the agency doesn't degrade the entire watershed in one action.	The intent of the Westside Fire Recovery project is not to "move watersheds away from attainment of Aquatic Conservation Strategy objectives" as the comment states, but rather to reduce hazardous fuels and hazard trees, recover economic value, and restore forests following the 2014 wildfires. The draft EIS states that "these effects to habitat are likely restricted to within the first year post project". As the comment indicates, project documents describe inclusion of the Salmon, Scott, and Klamath Rivers on the state 303(d) list of impaired waters and the existing Total Maximum Daily Loads for these watersheds. Green hazard tree removal could have effects on Riparian Reserves shade as the comment suggests. However, green roadside hazard trees are infrequent and loss of shade from their removal will not be significant enough to result in increased stream temperatures. The comment erroneously states that it is a violation of the Clean Water Act to affect shade at the site scale in 303(d) listed watersheds. Rather, compliance (or violation) of the Clean Water Act depends on beneficial use support. Support of beneficial uses in project watersheds are not expected to be prevented by the removal of infrequent green roadside hazard trees in Riparian Reserves. The comment states a link between sediment production from road construction and stream temperatures. Such a link is not expected to be manifest relative to Westside Fire Recovery project temporary roads as they are typically located outside of Riparian Reserves, and project area channels are typically steep and not at risk for aggradation and widening and subsequent increased solar insolation and temperature increases. Page 220 is the section describing cumulative effects, such as those related to past, present and future foreseeable actions. Relative past actions are accounted for in the cfs modelling. The impact described on page 220 is related to ongoing private timber harvest: "Additive effects related to sediment delivery to streams are likely only as a result of private timber harvest, particularly in Doggett Creek." The Forest water, earth, and fish scientists worked together to protect beneficial uses for all action Alternatives. Alternative 2 was modified to reduce impacts (see response to comment number 12346-24) to the extent possible while meeting long term goals. Removal of hazard trees (roadside harvest) is a safety issue. The effects are evaluated at the site scale (some loss of shade is possible) and the 5th field watersheds, see Aquatic Conservation Strategy Report). The loss of shade at the site is not likely to change stream temperature at the 5th field scale because there are few places where stream shade is reduced. Since only fire-killed trees are being removed, shade is not affected in the long term. The Addendum to the Aquatic Resource Report acknowledges the risk of change in temperature as well as the link to sediment: Shade in Riparian Reserves protected by project design project design features which minimize effects of roadside hazard, temp road and landing, and fuels treatments resulting in discountable negative effects. Sedimentation can affect temps – see above for sediment impacts. Refer to the Aquatic Conservation Strategy Report that analyzes effects at the site and 5th field scales and in the long and short term. Also see response to comment 18296-37. The hydrology report explains that increased in temperature and sediment will be indistinguishable from the effects of the 2014 wildfire, and there are beneficial effects from the action Alternatives. If Aquatic Conservation Strategy compliance was managed at the site scale, one could reasonably argue that hiking on a trail, swimming in a river, taking water from a creek when backpacking, or clearing a spot for a tent would not comply.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#12346-27	Similarly, page 48 of the ACSOR attempts to define away the impacts of roadside logging in Riparian Reserves by contending that based on "design features for hazard tree removal that require hazard trees to be left on site in near-stream zones, and field review of hazard tree removal areas, hazard tree abatement along roadsides will have discountable effects to sediment regimes." In fact, there are no "design features" that prohibit the removal of the majority of hazard trees (those smaller than 26" DBH) in any Riparian Reserves and only fish-bearing streams will retain hazard trees greater than 26" DBH on site which will do nothing to reduce sediment production from yarding large diameter trees in headwater non-fish bearing streams that exist upstream of fish habitat. "At the site scale [road stream] crossings may increase sediment delivered to streams." ACSOR at 48. It is precisely this result that the ACS and the CWA seek to prevent. 11 "[L]andings constructed within Riparian Reserves has (sic) a high risk of impacts to sediment supply and delivery at the site-scale. At the site scale new landings in Riparian Reserves may delivered (sic) to streams" ACSOR at 49. Such impacts violate the ACS and the CWA for these 303(d) listed streams. The KNF is proposing multiple actions that will add to the cumulative and synergistic degradation of 303(d) listed streams through additional sediment production. For instance, page 49 of the ACSOR states that in the Horse Creek Watershed "[p]roposed ground based harvest and one temporary road action are likely to result in short term site level impacts to sediment in Doggett Creek during implementation and post project storms. These impacts would be additive to current and future sediment related impacts in this watershed due to heave fire impacts and private timber harvest (and associated road building).	Between draft and final, several additions were made to the ACS assessment to clarify impacts. Also, landing configurations and have changed, as have use of roads. The ACS assessment in the FEIS reflects these modifications. As a matter of interpretation, nothing in the ACS prohibits site scale impacts from an action. The ACS prohibits site scale impacts that prevent attainment of ACS objectives. The comment as written provides no information other than opinions to demonstrate the ACS objectives would not be achieved. In order to ensure those objectives are achieved, the Forest Plan provides Standards and Guidelines for activities in Riparian Reserves. The Westside Fire Recovery Project complies with those Standards and Guidelines. The Forest Supervisor will determine whether the Project meets, does not prevent, or fails to achieve the ACS objectives. See also response to 5873-142.
232.06 - Watershed Condition	#12346-30	The Forest Service is proposing roadside logging (and yarding) in Riparian Reserves throughout the project area. The agency is also proposing landing construction and new road construction in Riparian Reserves. Additionally the Forest Service is proposing to establish yarding corridors through and across hydrological Riparian Reserves. All of these activities will remove forest structure (standing live, dying and dead trees called snags, future down wood and canopy cover) that contribute to terrestrial and riparian plant communities and ecosystems. Page 31 of the Botanical Resources Report indicates that implementation of the logging project would involve "[t]he creation of roads and landings [that would] indirectly increase short-term sedimentation of springs and headwater causing a more precipitous decline in potential [Sensitive lichen] population viability." Page 56 of the ACSOR indicates that in recovering post-fire Riparian Reserves that the proposed "removal of green hazard trees may have a minor short-term effect on site scale species recruitment and thus composition because a potential seed source would be removed." Page 56 of the ACSOR incorrectly contends that the effects of hazard tree removal on forest structural diversity will be minor because large hazardous trees "felled within Riparian Reserves will be left on site and thus continue to contribute to structural diversity." In fact the Forest Service is proposing to remove such structural diversity in the Reserves for all non-fish bearing streams, which comprise the majority of Riparian Reserves in the project area. The 5th field Watershed Analysis for ACSO 8 (starting at page 58 of the ACSOR) relies upon the assumption that all roadside trees greater than 16" DBH will be retained on site. This assumption is incorrect. In fact all hazard trees up to 26" inches will be removed in all Riparian Reserves and all hazard trees regardless of size will be removed most Riparian Reserves. Hence the ACSOR analysis rests on a false assumption.	Fisheries, earth, and water scientists analyzed the effects of project activities and developed Project Design Features to protect riparian and aquatic resources. See Aquatic Conservation Strategy Report, Biological Assessment for Fish, EIS Chapter 3 - Aquatic Resources section, and the Aquatic Resource Report and addendum for the final EIS. If no action is taken, the watersheds with a high risk of temperature regime alterations, without artificial regeneration that is proposed in the action Alternatives, will have an extended duration of elevated risk. Natural regeneration will occur, but in general it will be more than 80 years to get trees with 10 inch diameters at breast height in areas burned with high and moderate severity (draft EIS page 202-203). For landslide risk, the Geology Report states: There is a reduction in the duration of elevated risk due to planting for nine watersheds compared to Alternative 1 [No Action]. The reduction in duration of elevated risk will benefit natural resources and infrastructure in the long-term. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#12346-31	By removing large wood from non-fish bearing hydrological Riparian Reserves the Forest Service will directly negatively impact populations of invertebrate riparian dependent species. Landing construction and new road construction in hydrological Riparian Reserves will also negatively affect invertebrate the riparian dependent species that this ACSO is designed to protect. Sediment production from upslope salvage logging activities will also negatively impact invertebrate riparian dependent species in the project area. Geological Riparian Reserves The Klamath National Forest proposes to ignore the NWFP ACS objectives for designated Geological Riparian Reserves in order to facilitate proposed salvage logging. Several action alternatives call for re-constructing and widening road 46N62 in the Caroline Creek Watershed. This action would necessitate mid-upper slope channel crossings, construction through debris flows and construction above an active landslide. DEIS page 218. Indeed, "proposed reconstruction of this segment could add weight to the head of the landslide which could cause it to re-activate if a landslide producing storm should occur before vegetation is reestablished." Ibid. "Reopening the mid slope decommissioned road in Caroline Creek-Klamath River drainage may have short term adverse effects to aquatic habitat in Gard Creek, Caroline Creek, and the Klamath River." ACSOR page 50. Interestingly, page 46 of the ACSOR describes the very practices proposed above as the types of activities that the Forest Service has learned to avoid: "A majority of the legacy sediment sites are associated with the road system, most of which was constructed in the 1960s and 1970s prior to modern best management practices…Road construction often did not avoid unstable slopes or riparian areas that are protected by today's BMPs." While an action alternative was (wisely) developed to avoid the effects of road construction described above, there is no guarantee that the Forest Service will select it. Indeed, all of the Forest Service action alternatives propose salvage logging and roadside logging on "steep weathered granitic lands" and "unstable lands considered to be Geological Riparian Reserves." DEIS page 101. Page 68 of the DEIS indicates that 57% of the project area in which the logging project is located has a "high erosion hazard rating" and page 101 acknowledges that 2,000 acres of salvage unit logging, 4,400 acres of roadside logging and 3,900 acres of fuel hazard treatments are proposed on "unstable lands considered to be Geological Riparian Reserves." The NW Forest Plan does not permit the Forest Service to conduct logging and road construction in unstable Geological Reserves. In 2007 the 9th Circuit Court found that "[p]ursuant to the ACS, (and thus the NWFP), lands that are "potentially unstable" must 14 be designated and managed as Riparian Reserve. ONRC v. Goodman, 13069. In the Westside Salvage Logging Project the Forest Service is not managing unstable designated Geological Riparian Reserves as Reserves. While hydrological Riparian Reserves are not proposed for salvage unit logging and (some) have a diameter limit to retain large diameter snags and future coarse woody debris, the KNF is proposing to log and yard unstable Geological Riparian as if they were instead designated as the matrix timber land use allocation.	Salvage will not occur in hydrologic Riparian Reserves unless there is a safety risk. Standard and Guideline MA10-58 says: Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees on-site when needed to meet Coarse Woody Debris objectives. Aquatic Conservation Strategy does not prohibit silviculture activities in Riparian Reserves. See response to comment 18852.48. Also see response to comment number 12364-1.
232.06 - Watershed Condition	#17112-4	The DEIS states that "Alternative 2 proposes construction or reconstruction of temporary roads, installation and removal of stream crossings, and construction of log landings in Riparian Reserves" (Chapter 3, p. 201-202). This seems counter-intuitive to the established goal of protecting riparian reserves, since salvage logging has already been excluded from these areas, and only hand-methods of site preparation will be used. The additional disturbance created by the construction of roads, stream crossings, and landing sites will undermine the Forest Service's efforts to minimize disturbance in these areas. It is recommended that alternative sites for roads and landings be established, if possible. Some stream crossings are inevitable, but they should be minimized in number and placed strategically to provide access to the greatest possible area of the treatment unit while minimizing adverse effects on Riparian Reserves.	Site reviews and professional judgment by fish and water scientists helped determine necessary Project Design Features for actions in Riparian Reserves. See Chapter 2 of the draft EIS for Project Design Features, especially project design project design features for Watershed-22 and 23. Also see response to comment 173403-1 for a description of Alternative 4 that was developed to reduce road construction.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#17387-12	Do not construct any new roads or landings. These watersheds have too much disturbance from the high severity fire - watch cumulative watershed effects.	See response to number 12346-32 and 12354-6 for road construction. There would be no difference in cumulative watershed effects between the action Alternatives due to road construction because no new roads are being constructed and temporary roads would be closed and hydrologically stabilized following project implementation. Analysis of the No-action Alternative displays the effects of not constructing any new roads. New road construction is reduced to two miles in Alternative 4 and one mile in Alternative 5. Cumulative watershed effects were analyzed and are displayed in the Water Quality section of Chapter 3 of the EIS. Also see response to comment 173403-1 for a description of Alternative 4 that was developed to reduce road construction and includes a description of some of the trade-offs.
232.06 - Watershed Condition	#18845-1	Please do not approve the massive logging project on the Klamath River. It will destroy the watershed	Chapter 3 of the EIS displays the effects of implementing the No-action Alternative. Position statement; see response to Comment number 16695-4.
232.06 - Watershed Condition	#18852-24	6) Physical disturbance to sensitive watersheds (i.e. salvage logging) as expressed by the total percentage of watershed area proposed for resource extraction (i.e. Walker Creek) is excessive and exacerbates areas which are already categorized as impaired. Previous land management plans have determined that these watersheds are incapable of sustaining such intensive treatments (i.e. USFS, 1997 flood review).	Project Design Features prohibit salvage harvest in most sensitive areas to watershed disturbance including stream course Riparian Reserves, inner gorge, active landslides and landslide toe zones. Even though salvage harvest may occur in deeply weathered and dissected granitic terrain, project design features prohibit the use of ground-based yarding and require full-suspension cable or helicopter yarding to minimize ground disturbance in these areas. Most of the deeply weathered and dissected granitic terrain includes stream course Riparian Reserves and inner gorges that will not be harvested. Even though roadside hazard salvage would occur in these areas, project design features restrict these operations below the road and limit the size of trees being removed which in turn results in less ground-disturbance.
232.06 - Watershed Condition	#18852-55	National Forest Management Act 1976 Timber will be harvested from National Forest lands "only where..soil, slope or other watershed conditions will not be irreversibly damaged. Protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment, where harvest are likely to seriously and adversely affect water conditions or fish habitat."	Quote from NFMA - not substantive
232.06 - Watershed Condition	#18878-89	de la Fuente, Juan, and Elder, Don, 1997. The Flood of 1997 Klamath National Forest Phase 1 Final Report: November 24, 1998 USDA Forest Service Klamath National Forest, Internal Document. PROCEEDINGS of the Eighth Federal Interagency Sedimentation Conference (8thFISC), April 2-6, 2006, Reno, NV, USA JFIC, 2006 http://pubs.usgs.gov/misc/FISC 1947-2006/pdf/lst-7thFISCsCD/ 8thFISC/Poster de la Fuente.pdf	There is no comment only a citation - not substantive

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#18909-128	It is interesting to note that during the 1997 flood event that slope aspect and slope greatly influenced landslide behavior. Roads undoubtedly have the greatest effects on slope stability. Rock pits, waste areas and timber landings behave similar to roads and involve the same types of features on the landscape (fills, cuts, and surface drainage features). However, they are often much larger. As a result, they can have significant effects on flood processes. The DEIS fails to adequately consider peak flows, floods, and as stated above, floodplains throughout the project area. The steep and unstable watersheds in the project area have seen multiple severe weather events. It would be wise for the KNF to learn from the past. Quoted below (emphasis added) is the KNF Flood of 1997 Phase 1 Final Report by Juan De La Fuente and Don Elder: Page 13, "Flood effects were greatest in their headwaters of Walker, Deep, Ukonom, Tompkins, Grider, Kelsey, Middle, Portuguese, and Elk Creeks. These all experienced many landslides in headwaters, and debris flows in many of the tributary channels. Similar, but less severe effects occurred in the headwaters of Beaver, Thompson, and Indian Creeks." Page 10, "Estimated recurrence intervals for these peaks ranged from 16 years at Indian Creek (near Happy Camp), to 37 years at Salmon River. The recurrence interval for the 1997 Flood was 14 years on Scott River, 32 years on the Shasta River, 15 years on the Klamath River at Seiad, and 18 years on the Klamath River at Orleans." Page 25, "Nonetheless, the concentration of road damage and flood altered channels in localized areas such as around Lake Mountain and upper Elk and Ukonorn Creeks suggests that intense storm cells or variations in snowmelt did in fact occur. The Lake Mountain area experienced the most severe flood effects on the Klamath Forest (Map 10). This area is drained by Kelsey, Deep, Middle, and Tompkins Creeks, (tributaries to the Scott River), and Grider, and Walker Creeks (tributaries to the Klamath River above the Seiad). The peak flow in the Scott River had a 14 year recurrence interval, and the peak in the Klamath River below Seiad had a 15 year recurrence interval (Map 5). By contrast, the Salmon River experienced a peak flow with a much higher recurrence interval (37 years), but landsliding, channel alteration, and road damage there was much less severe than in the Lake Mountain Area." Page 18, "The flood of 1997 involved the movement of soil, rock, and organic debris from hillslopes to stream channels at a scale not experienced since 1974 (the most recent landslide episode) on the Klamath National Forest. Approximately 1100 landslides were identified in Phase I. Air photo inventory identified about 446 miles of stream channels which were altered (scour, deposition, or removal of riparian vegetation) by the flood." Page 18, "Field observations revealed that landsliding was the dominant hillslope process associated with the flood. However, evidence of surface erosion was observed locally, primarily on poorly vegetated sites and on road cuts and fills. Scour and deposition are evident in many ephemeral channels which lacked these features prior to the flood. Large (about 20 acres) slumps and earthflows occurred in the Walker, Tompkins, Kelsey, and Thompson Creek watersheds." The largest of these originated on the toe zones of reactivated slumps and earthflows high in the watersheds. One on Road 46N6 1 in Walker Creek (Photos 4a & 4b) mobilized more than 300,000 cubic yards of material." Page 19, "With the exception of Deep and Walker Creeks, most streams retained the majority of their 30 year old (post-1964 flood) alder stands growing within andjadjacent to channels. These stands served to trap sediment and large logs. Streams such as Grider, Walker, Kelsey, Deep, Middle, Tompkins, and Ukonom Creeks delivered large volumes of sediment to the Klamath River, where remnants are still visible for a considerable distance downstream of their moliths."	The comment appears to reference information regarding the 1997 flood. For the Westside Fire Recovery Project , the hydrology report and Biological Assessment for Fish, and water and aquatic resources sections of Chapter 3 addresses existing conditions and project effects on peak flows, floods and floodplains.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#18909-129	Page 21 and 22, "Most of the field observations and temperature data presented here were provided by Jon Grunbaum. A total of 446 miles of altered channel were identified by air photo inventory within the air photo study area. In addition roughly 90 miles of the Klamath, Scott, and Salmon Rivers were altered within the photo area. Channel alterations were most severe in Walker and Deep Creeks, where major debris flows traversed the entire channel length. In these streams, the floodplain was significantly altered and most of the riparian vegetation removed. The alluvial fan at the mouth of Walker Creek was built up considerably. Effects were less pronounced at Tompkins, Grider, Kelsey, and Indian Creeks." Page 22, "Based on observations of fisheries personnel, there appeared to be considerable reduction in size, volume, and depth of pools in Elk, Indian, Beaver, Grider, Tompkins, South Fork Salmon, and Walker Creeks, and there is a larger proportion of fine sediment in the substrate. Alluvial reaches were made shallower and wider due to sedimentation." Page 25 and 26, "To date, no definitive correlations have been identified which link variations in precipitation intensity, snowpack, or peak flows to variation in severity of flood effects. Nonetheless, the concentration of road damage and flood altered channels in localized areas such as around Lake Mountain and upper Elk and Ukonom Creeks suggests that intense storm cells or variations in snowmelt did in fact occur. The Lake Mountain area experienced the most severe flood effects on the Klamath Forest (Map 10). This area is drained by Kelsey, Deep, Middle, and Tompkins Creeks, (tributaries to the Scott River), and Grider, and Walker Creeks (tributaries to the Klamath River above the Seiad). The peak flow in the Scott River had a 14 year recurrence interval, and the peak in the Klamath River below Seiad had a 15 year recurrence interval (Map 5). By contrast, the Salmon River experienced a peak flow with a much higher recurrence interval (37 years), but landsliding, channel alteration, and road damage there was much less severe than in the Lake Mountain Area." Page 28, "Due to this combination of factors, landsliding is a common process today, and much of the recent landsliding consists of localized slumps and earthflows (reactivations) and debris slides on the toes of slump and earthflow deposits." Page 50, "Three primary conclusions are drawn, all of which have direct implications to future management of the Klamath National Forest. These are: (1) Sensitive Lands- Certain land types displayed particularly high landslide and debris flow rates under flood conditions; (2) Roads- Of the typical forest management practices, roads exhibited the largest directly observable effects on flood processes; (3) De-vegetation- Widespread de-vegetation of some watersheds by a combination of wildfire and timber harvest was associated with high rates of landslides and debris flows, particularly when it occurred on sensitive land types." Page 51, "6. The Effect of Roads on Landslide Rates- Roads obviously had a large effect on flood processes. About 25% of all landslides identified on air photos (1 82) occurred in the road corridor, and the landslide density (landslides per square mile) in road corridors was about 27 times that on undisturbed land." Page 52, "Rock pits and waste areas often involve very large cuts and fills (up to several hundred thousand cubic yards) and have the potential to destabilize hillslopes and alter drainage patterns. The large fills associated with landings and waste areas initiated a number of landslides." Page 52, "Predicting Landslide Sites- Many of the 1997 landslides occurred in areas with well- defined landslide features, such as on toe zones with well-fined slope breaks or on steep swales with clearly defined boundaries which would have identifiable as having a high landslide potential prior to the flood. However, some occurred in areas where evidence of previous landsliding was subtle, and poorly-defined, and it would have been difficult to have predicted a landslide of the magnitude which occurred at the site in 1997. Examples of debris slides in poorly defined swales were observed at McCash and Deep Creeks where debris slides occurred on 55% slopes. Similarly, subtle slump features were reactivated in Tompkins and Grider Creeks."	The comment appears to reference information regarding the 1997 flood. For the Westside Fire Recovery Project , the hydrology report and Biological Assessment for Fish, and water and aquatic resources sections of Chapter 3 addresses existing conditions and project effects on peak flows, floods and floodplains.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#18909-130	Page 52, "The Effect of Timber Harvest and Fire on Landslide Rates- De-vegetated areas (logged areas or areas burned at high to moderate intensity) experienced landslides at a rate 6 times that of undisturbed land (exclusive of landslides in road corridors)." Page 52, "Physical Factors & Interactions Influencing the Flood Effects and Interactions- There is a strong correlation between the distribution of flood effects (landsliding and road damage sites) and physical attributes of the landscape. This was particularly true with geomorphic terrane, and elevation, and to a lesser degree with slope, and aspect. Combinations of Factors- Pre-flood disturbance to the soil and vegetation (roads, harvest, fire) exerted considerable influence on flood effects. Areas of concentrated de-vegetation and roads likely experienced cumulative effects, or the, results of multiple individual effects that accumulated ' over time and space. Threshold Conditions- Field observations revealed that all types of landslides (shallow debris slides, deep-seated slumps and earthflows and debris slides on road fills) occurred together in watersheds like Walker and Tompkins Creeks. This suggests that high groundwater conditions were attained at a variety of depths." Recommendations: 1. Sensitive Lands- (a) Identify and delineate sensitive lands (Riparian Reserves) at the watershed (during Watershed Analysis) and site levels (when projects are done). Utilize sound proven tools such as topographic maps, 30 meter digital elevation models DEM), air photos, and field investigations as well as new developments such as high resolution laser-generated DEM's; (b) Develop vegetative and soil objectives for Riparian Reserve lands; (c) Manage Riparian Reserves toward obtaining the stated objectives. 2. Roads- (a) Repair ERFO sites in accordance with guidelines in Appendix C of this report; (b) Decommission high risk, un-needed roads; (c) Focus road maintenance where most needed to prevent watershed damage, and with attention to repairing road drainage and diversion problems; (d)Avoid unstable lands when new roads are constructed, and utilize state of the art geotechnical techniques in landslide terrane and at streamcrossings; (e) Place special attention on constructing stable fills, whether for ERFO repair, new roads, waste areas, landings, etc.; (f) Initiate a process for inventorying high risk road segments and sites; (g) Prioritize road repair, upgrading, maintenance, 'and decommissioning projects on a watershed basis to maximize the benefit to aquatic resources; (h)Seek funding from multiple sources. 3. Vegetation Management- (a) Assure that timber harvest avoids unstable lands and other Riparian Reserves by utilizing skilled technical personnel during field layout; (b) In combating wildfire, employ strategies to minimize the amount of high and moderate intensity fire on Riparian Reserves; (c) Design prescribed fire to avoid high and moderate intensity fire on Riparian Reserves. 7. Map of Peak Flood Levels- Prepare a simple map and photographs showing maximum water levels which occurred during the 1997 flood on the Klamath River and some major tributaries. 11. Vegetation Management- In Riparian Reserves, develop and apply vegetation management objectives and guidelines for unstable lands and other types of Riparian Reserve. Outside of Riparian Reserves, apply the following vegetation management guidelines: Avoid regeneration harvesting and intense site preparation fire on landslide deposits and granitic terrane over large contiguous drainage areas. This can be accomplished by utilizing skilled earth scientists during layout. Avoid denuding discrete swales, which may be prone to debris slides in granitic terrane. Avoid de-vegetation of large contiguous area of landslide deposits, particularly within the same local hydrologic catchment. Maintain down logs to interact with future debris flows, in balance with desired fuel loading. Review pre-existing timber sales and find whether trees are marked within Riparian Reserves associated with landslides and altered channels associated with the 1997 flood. Use this process to refine Riparian Reserve mapping. Please see page 66a-e to observe photographs of road related landslides throughout Walker, Elk and Tompkins Creeks and the Salmon River. We hope the KNF will have the foresight to learn from the past.	The comment appears to reference information regarding the 1997 flood. For the Westside Fire Recovery Project , the hydrology report and Biological Assessment for Fish, and water and aquatic resources sections of Chapter 3 addresses existing conditions and project effects on peak flows, floods and floodplains.

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232.06 - Watershed Condition	#18909-69	The DEIS, page 205, says that Riparian Reserve function will be improved by Alternative 2, because the speed of reforestation will be increased. However, there does not appear to be any discussion supporting this bare conclusion. Please scientifically justify this statement, particularly in light of the statement at page 9 of the DEIS that a "relatively small acreage of Riparian Reserve [] burned at moderate- and high-severity in 2014," which would seem to indicate that a majority of the Riparian Reserves will be able to recover naturally. Further, the DEIS and ROD cannot rely on the Dec. 31, 2010 Forest Supervisor Memo instructing staff to disregard the 1995 ROD and FEIS KNF LRMP concerning areas with watershed concerns.	The Biological Assessment for Fish describes reforestation in Riparian Reserves: Treatments within Riparian Reserves are proposed within the plantation site-preparation and planting units in the Whites Fire and Happy Camp Complex to achieve ground cover and encourage natural recovery of vegetation and soils. Treatment will be focused in areas of high and moderate vegetation mortality and where the overhead hazards can be mitigated without equipment entry into Riparian Reserves. Page 42 describes the effects. The 2010 Forest Supervisor Memo states: I have determined that compliance with State of California requirements meets the intent of the Areas with Watershed Concern designations and provides a more consistent approach to protection and management of water quality on the Forest. The term "impaired water bodies," as defined by the State of California, in conjunction with identified locations of these impaired water bodies and associated management expectations as part of compliance with the Clean Water Act, replaces the term Areas with Watershed Concerns.
232.06 - Watershed Condition	#18909-76	The DEIS improperly obfuscates the effects of the Proposed Alternative on Riparian Reserves. This is effectuated in part by KNF's creation of two separate categories of Riparian Reserves- "Geologic Riparian Reserves," and "Hydrologic Riparian Reserves." (See DEIS, at 30, "This refers to hydrologic not geologic riparian reserves."). As a legal matter, under the Northwest Forest Plan, no such distinction exists. Instead, the Northwest Forest Plan makes clear that certain unstable areas are included within the definition of, and receive the same protections as, Riparian Reserves. The NWFP Standards and Guidelines define Riparian Reserves as "a key element of the Aquatic Conservation Strategy" which " provide an area along all streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. Riparian Reserves are important to the terrestrial ecosystem as well, serving, for example, as dispersal habitat for certain terrestrial species." Page A-5. The Northwest Forest Plan requires the Forest Service is establish that commercial logging in Riparian Reserves is "needed" in order to attain the objectives of the Aquatic Conservation Strategy (ACS) prior to authorizing such logging. While some parts of the DEIS and Resource Reports make this (improper) distinction clear, others do not, making the information in the DEIS about treatments within Riparian Reserves extremely confusing and misleading. For example, in the ACSO Report, Table 8 ("Proposed activities in Riparian Reserves (RR) by watershed for each alternative") indicates that no salvage logging will occur within Riparian Reserves, without any clarification that this refers only to "Hydrologic Riparian Reserves." Similarly, at page 9, the DEIS states, with no caveat, that "[n]o treatment is proposed within riparian reserves, except roadside hazard treatment and within one- quarter mile of private property structures" (DEIS, 9). The Geology Resource Report at page 5, rather ambiguously hints at the fact that logging will occur in Riparian Reserves, stating "[t]here are about 3920 acres of salvage units (about 2,000 acres of salvage logging) on steep, weathered granitic lands (Riparian Reserve) proposed in this alternative." Because the Klamath National Forest made the effects of the proposed alternative on Riparian Reserves so difficult to understand, in part by misleading the public into believing that "Geologic Riparian Reserves" are exempt from the standards to apply to Riparian Reserves, the "draft statement is so inadequate as to preclude meaningful analysis" and the Service should "prepare and circulate a revised draft of the appropriate portion." See 40 C.F.R. § 1502.9. The Westside DEIS fails to give unstable and potentially unstable areas a "hard look" and fails to consider, R5 FSH 2509.22 - soil and water conservation handbook, Chapter 10 - Water quality Management Handbook12.11 Exhibit 06, BMP 1.6 - Protecting Unstable Lands which states: Objective: To provide special treatment of unstable areas to avoid triggering mass slope failure with resultant erosion and sedimentation. Explanation: This practice is an administrative and preventative control. Where unstable lands are delineated, they are taken out of suitable forest lands and are reclassified as unsuitable forest land. Using existing harvest technologies, unsuitable forest lands cannot be managed for timber production where irreversible adverse effects to soils, productivity, or watershed conditions may occur. Timber harvesting is deferred pending technology development proven to be operational on these sites without causing adverse environmental effects. Implementation: The interdisciplinary team will prepare plans and environmental documents, utilizing information provided by specialists trained and qualified to identify unstable areas. When warranted, based on location and size of the sale, proposed harvest units may be assessed for relationships to unstable areas through aerial photo reconnaissance (most recent photos at least 1:24,000 or larger scale) and a landslide hazard map, where available. These	The Geology report clearly states activities that are occurring in Riparian Reserves. For example, on page 8 it is stated, "Unstable lands are designated as Riparian Reserves in the Forest Plan (Standard and Guideline MA 10-2, page 4-108). The unstable lands component of Riparian Reserves includes active landslides, inner gorges, toe zones of dormant landslides and severely weathered and dissected granitic lands (Forest Plan, page 4-18)". For Alternative 2 as you mention, a component of unstable lands are again identified as Riparian Reserves: There are about 3,920 acres of salvage units (about 2,000 acres of salvage logging) on steep, weathered granitic lands (Riparian Reserves) proposed in this Alternative. No salvage will occur on inner gorges, active landslides or toe zones of dormant landslides (see Chapter 2 for project design features). Also proposed are about 960 acres of site preparation and planting, 4,395 acres of roadside hazard tree removal and 3,940 acres of fuels treatments on unstable lands considered to be Riparian Reserves. The effects are also described: Alternative 2 does not change the landslide risk for any watershed. The final documents will be reviewed for errors in use of the term "Riparian Reserves". In the early time of implementation of the Northwest Forest Plan and Klamath NF Forest Plan there was a tendency for people to overlook the geologically defined Riparian Reserves- - because they are not necessarily "riparian". The distinction was informally added on the Klamath NF to maintain protection of the entire Riparian Reserve land allocation and to highlight which areas were related to water and which were related to unstable lands.

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		features are then assessed on the ground as the team deems necessary. Where unstable lands are presently classified as suitable forest lands, the classification is changed to unsuitable forest lands. Unsuitable forest lands will not be harvested until they can be harvested without irreversible or unmitigable resource effects. If the team determines that current or prospective logging methods would result in irreversible or unmitigable watershed effects, then the line officer should reclassify the area to unsuitable forest land and defer harvesting.	

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#18909-78	The Westside DEIS fails to consider floodplain hazards and fails to mention if the Regional Forester has evaluated the potential effects of the proposed treatments in the seventy-five sup watersheds within the project analysis area. The R5 FSH 2509.22 - soil and water conservation handbook, 12.71 Exhibit 02, BMP 7.2 - Conduct Floodplain Hazard Analysis and Evaluation states: Objective: To avoid, where possible, the long- and short-term adverse impacts to water quality associated with the occupancy and modification of floodplains. Explanation: Floodplain analysis and evaluation are part of the environmental documentation process. Analysis must be performed prior to acquisition or exchange of land within floodplains and when sites within floodplains are being considered for structures or developments. Environmental quality, ecological effects, and individual safety and health must be considered as well as flood frequencies, watershed conditions, climatic and environmental factors associated with past flood events, flood flow quantities and specific flood boundaries. 1. Implementation: The Regional Forester will be responsible for ensuring consideration of floodplain hazards and values in all NEPA environmental analysis. a. Ensure that flood hazards, floodplain and wetland values, and all alternatives that affect floodplain or that involves new construction in wetlands are fully considered in the Forest Service planning and decision-making process. b. Coordinate activities and interchange of floodplain and wetlands information with other concerned Federal and State agencies. c. Ensure that cooperative technical and financial assistance programs include an evaluation of floodplain and wetland values. d. Ensure that all documents conveying interest in or authorizing use of floodplains and wetlands on NFS lands contain disclosure of and/or restrictions as warranted which will reduce the risk of loss and preserve the national and beneficial values served by floodplains and wetlands. 2. The Forest Supervisor, through use of earth scientists, will: a. Analyze proposed actions affecting floodplains or involving new construction in wetlands to access the specific flood hazards, quantify floodplain or wetland values of the areas; determine the impacts of the proposal on those hazards and values; formulate and evaluate land and resource management options; develop practicable alternative actions or locations for evaluation and decision making. b. In actions where an alternative affecting the floodplain or new construction in a wetland is not practicable, modify plans, activities, and designs to minimize impacts of the action and mitigate its effects on the national and beneficial values of the floodplain or wetland. c. Ensure that all practicable and necessary mitigation measures are incorporated in specifications for the proposed action, and that the implementation of the selected action is accomplished in a manner that to the extent practicable restores and preserves the d. natural and beneficial values served by the floodplains and preserves and enhances the natural and beneficial values of wetlands. e. Require flood hazard and wetland evaluations prior to issuing licenses, permits, loans, or grants-in-aid. Provide assistance to applicants in obtaining help to make such evaluations in their proposals. f. Ensure that design, construction or rehabilitation of Forest Service real property is in accordance with standards and criteria outlined in the National Flood Insurance Program (42 U.S.C. 4001 and following) using flood-proofing measures and structural elevation where practicable. g. Provide for the placement of appropriate signs to enhance public awareness and knowledge of flood hazards. h. Establish specific management standards and guidelines for floodplains and wetlands as part of forest planning actions. i. Cooperate with State and county governments in developing and implementing appropriate early flood warning and evacuation plans.	Floodplains are part of the Riparian Reserve Land allocation in the Forest Plan and are analyzed as part of aquatic conditions. See the Biological Assessment for Fish and MA 10-2 of the Klamath NF Forest Plan Standard and Guidelines regarding floodplains.) The project does not involve the construction of facilities. The Forest is coordinating with regulatory agencies such as the Water Quality Control Board for compliance. The Deciding Official for this project is the Forest Supervisor, as delegated by the Regional Forester.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#18909-79	Refugia are a cornerstone of most species conservation strategies. They are designated areas that either provide, or are expected to provide, high quality habitat. A system of Key Watersheds that serve as refugia is crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. NFP B-18 According to the DEIS, Key Watersheds in the project area include: Elk Creek, Grider Creek (in the Seiad Creek-Klamath River watershed), North Fork Salmon River, and South Fork Salmon River. Fires, fire suppression and multiple timber sales have greatly impacted each of these Key watersheds. Key Watersheds are defined by the NFP as, a system of large refugia comprising watersheds that are crucial to at-risk fish species and stocks and provide high quality water. They are the highest priority for watershed restoration. Yet, instead of restoring these Key Watersheds- as required in the Northwest Forest Plan Aquatic Conservation Strategy- logging large old trees and snags that are contributing critical elements of forest and riparian structure with ground-based, cable and helicopter yarding, road construction/reconstruction, landings, and skid trails on steep and erodible hillsides will degrade riparian values and watersheds at large. Key Watersheds Inside Roadless Areas: "Inside Roadless Areas - No new roads will be built in remaining unroaded portions of inventoried (RARE II) roadless areas." Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. Attachment A to the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl ("Standards and Guidelines"), at C-7. Grider Creek is identified in the DEIS as a Key Watershed (page 7) and as containing over 10,000 acres of Inventoried Roadless Area (page 300). Grider Creek is located in the Seiad Creek-Klamath River Watershed. The Aquatic Conservation Strategy Objective Report indicates that in the Seiad Creek-Klamath River Watershed, 13 miles of "Temp Road Access" would occur under Alternatives 2 and 3, and 2.1 miles of "Temp Road Access" would occur under Alternatives 4 and 5. This indicates that it is possible that new temporary road would be built in the unroaded portions of Grider Creek, which would violate the Aquatic Conservation Strategy. See Standards and Guidelines, at C-7. The Klamath National Forest should make clear whether any new temporary roads are proposed in roadless areas of the Grider Creek watershed.	Key Watersheds were defined for the Klamath NF as part of the Northwest Forest Plan and incorporated into the Klamath NF Forest Plan. The Grider Creek Key watershed is not within the Seiad-Klamath watershed, it is a 5th field watershed and Grider Creek is a tributary to the Klamath River. Before the Northwest Forest Plan and since the Klamath NF Forest Plan, watershed restoration has been a high priority for the Klamath NF, with millions of dollars spent on upslope and instream work throughout the Forest. The initial emphasis for restoration was to secure the best first - which meant prioritizing actions in Key Watersheds. The purpose and need for the Westside Fire Recovery Project was driven by the 2014 wildfires. As stated in the draft EIS, there is a need for worker and public safety and access, there is a need for safe conditions for firefighters performing fire suppression for community protection, there is a need for a project that is economically viable, meeting project objectives and benefiting our local communities, and there is a need for restored and fire-resilient forested ecosystems. To meet those objectives, opening decommissioned road has been proposed and evaluated through modeling, field review, and professional judgment. The hydrologist found that watershed effects from the action Alternatives would be indistinguishable from the effects of the wildfire, and in the long term, the proposed actions benefit watershed conditions and beneficial uses. The effects of taking No Action have documented negative effects to watershed conditions. The Klamath NF consulted with the National Marine Fisheries Service and agreed that the proposed actions, May Affect but will not Adversely Affect fish species listed under Endangered Species Act. The Klamath NF continues to implement a watershed restoration program in addition to other priorities on the Forest. Also see response to comment number 12364-1.
232.06 - Watershed Condition	#18909-82	The Hydrology Report and the Water Quality section of the DEIS look at project impacts to eight watersheds, while the Aquatic Species report looks at impacts to twelve watersheds. (Hydrology Report, page 5 & DEIS, page 199: "The spatial context for the hydrologic analysis is the project area that includes portions of the following eight 5th field watersheds: Beaver Creek; Humbug Creek-Klamath River; Horse Creek Klamath River; Seiad Creek-Klamath River; Lower Scott River; Thompson Creek-Klamath River; Elk Creek; and North Fork Salmon River. The 5th field watersheds are the analysis area for broad scale effects analysis. The 7th field watersheds are considered small scale for a project area of this size."; Aquatic Species Resources Report, page 11: "The Analysis Area is the following 5th-field watersheds (and their 7th-field subwatersheds or drainages) within three major burn areas that were affected by the 2014 fires and that have proposed activities: * Beaver Creek * Elk Creek * French-Scott River * Horse Creek-Klamath River * Humbug Creek-Klamath River * Indian Creek * Lower Scott River * North Fork Salmon River * Seiad Creek-Klamath River * South Fork Salmon * Thompson Creek-Klamath River * Ukonom Creek-Klamath River"). The Fish BA analyses impacts on eleven areas, which include the same watersheds as the Aquatic Resources Report, minus French-Scott River. Please explain and justify these differences in analysis areas. We are concerned about the completeness of the analysis in the Hydrology Report and Biological Assessment, as both left out watershed that the Aquatic Resources Report considered being within the analysis area.	Both the aquatic resources and hydrology analyses in Chapter 3 of the final EIS begin by considering all 5th field watersheds that were affected by the 2014 fires. Because several of these watersheds had no proposed actions within them, they discussed very little during the analysis of project effects. The 5th field watersheds that were affected by 2014 fires, but do not have proposed activities are: French-Scott River and Indian Creek. The 5th field watersheds where there are substantially less activities proposed, and less acres affected are: Humbug Creek-Klamath River, Ukonom Creek-Klamath River, and South Fork Salmon River. Both aquatic resources and hydrology analyses considered all 5th field watersheds potentially affected by the project. The project Aquatic Conservation Strategy analysis and report was prepared by both fisheries and hydrology specialists, and probably provides the best accounting of actions and effects in each 5th field watershed. The Aquatic Conservation Strategy Report addresses which specific 5th field watersheds are most relevant to the effects analysis and those where no or few activities are proposed.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#18912-5	I recently attended a presentation on the work of Matthew R. Cover from CSU Stanislaus, who has extensively studied post debris-flow ecosystems in the Klamath River drainage, and I hope you are familiar with his work. I also spoke with him about the WFRP. From my own interpretation about what he said and my prior knowledge of riparian-succession in the Klamath Mountains (I do not wish to portray these ideas as his, but am just stating that I am influenced by his words; obviously I cannot speak for anybody but myself), being aware of fire and logging's influence on the regularity and severity of debris flows is essential. Logging, but more specifically road cuts and stream crossings, are one of the major causes of these debris-flows. These features and their high use related to intensive cutting in these areas would be less maintained by vegetation and more vulnerable to causing a debris flow in these post-fire areas. According to Cover's work, it is apparent that riparian areas and the stream communities that have experienced a debris-flow take various amounts of time to be return to pre-flow conditions. These include the extirpation of amphibian species ten or more years after a flow, up to 100 years or more for biodiversity of riparian tree communities to return, and up to hundreds of years for streambed biomass and large woody debris to be recruited into these post-flow environments. As you know, these are all important factors in streams regarding species of concern.	Careful planning is required for logging and road construction. The Standards and Guidelines in the Forest Plan are incorporated from the Northwest Forest Plan that was designed to provide protection of riparian resources as well as provide for long term persistence of large and small fauna. The fish, earth, and water scientist conducted modeling, field work and used professional judgment to establish general and site specific Project Design Features (project design project design features) to protect water quality and beneficial uses while meeting the purpose and need for the project. The project design project design features prohibit salvage harvest, other than roadside hazard, in areas where ground disturbance may trigger debris flows including stream-side, wetlands, springs, active landslides, inner gorge and landslide toe zones. Even though salvage harvest may occur in steep, weathered granitic terrain (which are part of the Riparian Reserve land allocation), project design project design features prohibit the use of ground-based yarding and require full-suspension cable or helicopter yarding to minimize ground disturbance in these areas and reduce the potential for harvesting activities to trigger debris flows. Where the steep, weathered granitic terrain is overlain by stream course Riparian Reserve and inner gorges, there will not be salvage activities except for safety. And, even though roadside hazard salvage would occur in these areas, project design project design features restrict these operations below the road and limit the size of trees being removed which in turn results in less ground-disturbance. There are project design project design features for all new road construction to make sure they meet water quality, Endangered Species Act, and National Forest Management Act regulations. See Chapter 2 of the draft EIS for the full suite of project design project design features and the Aquatic Resources Report and Addendum for the assessment of impacts and protection of aquatic species.
232.06 - Watershed Condition	#18926-40	The DEIS claims that eventually the land will heal and the trend will be positive, except for "a slight downward dip in riparian function in watersheds with private land harvest due to the loss of shade in the stream channels."! ! While many of the watersheds would have increased high and moderate risk, the DEIS again discounts ! theses as insignificant and relies on the treatment of a fraction of legacy sites mainly in one watershed, Elk Creek, to offset effects to the activities in the entire project area. Reforestation is also noted as a positive, however, natural recovery would be more conducive with water quality.! ! Key Watersheds and the Aquatic Conservation Strategy! Refugia are a cornerstone of most species conservation strategies. They are designated areas that either provide, or are expected to provide, high quality habitat. A system of Key Watersheds that serve as refugia is crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species.! Northwest Forest Plan (NFP) B-18! ! Key watersheds in the project area include, Grider Creek in the Siead Creek Klamath River, South and North Fork Salmon River and Elk Creek. Fires, fire suppression and multiple timber sales have greatly impacted each of these Key watersheds.! ! Key Watersheds are also defined by the NFP as, a system of large refugia comprising watersheds that are crucial to at-risk fish species and stocks and provide high quality water. They are the highest priority for watershed restoration. Yet, instead of restoring these Key Watersheds- as required in the Northwest Forest Plan Aquatic Conservation Strategy- logging large old trees and snags that are contributing critical elements of forest and riparian structure with ground-based, cable and helicopter yarding, road construction/reconstruction, landings, and skid trails on steep and erodible hillsides will degrade riparian values and watersheds at large.! !	Comment misinterprets the findings from the fisheries biologist, geologist, and hydrologist. In general, the impacts from project activities are insignificant and not distinguishable from the effects of the 2014 wildfire. Legacy site treatments are proposed in Elk Creek to meet conditions of the water quality waiver with the State Water Board. The project does not intend that these would offset impacts due to the project, rather to meet conditions of the waiver for compliance with the Klamath Stream Temperature Total Maximum Daily Loads. Negotiations with the State Water Board regarding compliance with the conditions of the waiver for the Salmon and Scott River Total Maximum Daily Loads is ongoing. Project design features prohibit salvage harvest, other than roadside hazard, in most Riparian Reserves including stream-side, wetlands, springs, active landslides, inner gorge and landslide toe zones. Even though salvage harvest may occur in deeply weathered and dissected granitic terrain, project design features prohibit the use of ground-based yarding and require full-suspension cable or helicopter yarding to minimize ground disturbance in these areas. Most of the deeply weathered and dissected granitic terrain is overlain by a dense network of stream course Riparian Reserves and inner gorges that will not be harvested. Even though roadside hazard salvage would occur in these areas, project design features restrict these operations below the road and limit the size of trees being removed, which in turn results in less ground-disturbance. project design project design features apply to all road construction to prevent adverse impacts to aquatic beneficial uses. See response to comment 17403-1 that describes the development of Alternative 4 that reduces road construction and identifies some of the trade-offs and response to comment 18909-79 regarding restoration of Key Watersheds.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#18937-11	A wide variety of activities proposed in the Westside Project DEIS would adversely affect water quality in the rivers and streams within the project areas and within the Klamath River watershed. On page 194 of the DEIS, it claims, "Results of the analysis are used to verify that project alternatives adhere to existing law, regulation, and policy such as the Clean Water Act (specified by TMDL requirements for the Klamath, Salmon, and Scott Rivers) and Forest Plan requirements including those related to the Aquatic Conservation Strategy." Unfortunately, the results of this analysis grossly understate the impacts of past logging and road use within the project area, and do not guide responsible management practices for the project area. An unassuming reader of the DEIS could actually surmise that the impacts to water quality would be negligible even after thousands of acres of clear cut logging on steep slopes above creeks and rivers, construction of new "temporary" roads, and the installation of 14 new stream crossings. This extreme mischaracterization of reality is disingenuous by design and misleads the public to believe that the commercial logging project will benefit streams and rivers. As well, the misleading and understated impacts to water quality in the preferred alternative in the DEIS are inconsistent to the Aquatic Conservation Objectives outlined in the Forest Plan. Of special concern is the creation of conditions that will lead to major debris flows that that could contribute to habitat loss for species already impacted by existing challenges in the Klamath River and tributaries. On page 17 of the associated Aquatic Species Resource Report it states, "Decreased interception of rainfall as a result of wildfire as well as increased sediment and runoff delivered to streams, can lead to an increased debris flow probability in the affected watersheds compared to pre-fire conditions. Post-fire debris flow events can degrade or aggrade stream channels and remove riparian vegetation. BAER teams reported that the probability of aquatic habitat being damaged by debris flow is likely and there is a moderate risk of damage to the quality of habitat (for about the next 10-years)."	The comment states that the analysis in the draft EIS "grossly understates the impacts of past logging and road use within the project area". The Forest cumulative watershed effects analysis process considers effects of past logging and road construction/use in the context of three different models: 1) Equivalent Roaded Area (ERA), 2) universal soil loss equation, and 3) mass-wasting. The ERA model is an overall index of watershed disturbance and includes past logged acres (by yarding system; tractor, cable, helicopter) and includes logging on private acreage. The ERA model further considers forest road variables such as width, slope, surfacing, and maintenance, upgrade, and decommission in order to compare relative watershed disturbance and risk from roads. The universal soil loss equation model considers effects of logging and road construction/use on surface erosion while the mass wasting model considers effects of management disturbance landslide risk. The comment refers to "major debris flows that could contribute to habitat loss for species already impacted by existing challenges in the Klamath River and tributaries". Debris flows are a natural process in Klamath Mountain streams and the routing of sediment (including gravels) and large wood, and associated habitat functions depend on debris flow processes. Aquatic species in the Klamath Mountains have evolved with debris flows. Importantly, mass-wasting risk increases 5-10 years post-fire as transpiration and mechanical root strength provided by fire-killed trees is significantly reduced in this time frame. This increased mass-wasting risk is expected to produce a corresponding increase in debris flow risk. However, proposed salvage harvest treatments do not increase the risk of mass-wasting that exists post-fire. Based on the modeling, field review, and professional judgment of earth, water, and fish scientists that evaluated the effects of all Alternatives, the effects to watershed conditions are indistinguishable from the short and long term effects of the 2014 wildfire. These scientists are also recognize that the proposed actions, as modified, are better for watershed conditions and aquatic beneficial uses than the No Action Alternative.
232.06 - Watershed Condition	#18937-12	As the DEIS states on page 213, "many flows delivered large wood to mainstem channels in some areas (Elk Creek). Many riparian areas along the Middle Klamath and North Fork Salmn River remain partially barren as a result of historic placer and hydraulic mining activities, and lower hillslope road construction that disconnected the river from its floodplain." ' Unfortunately, the DEIS does not cover other habitat sweeps that were caused by steep-slope logging in the Project area. We also noted that we can see that removing large wood from streams causes dire consequences endured largely by local residents during a flood emergency and the fish that depend on habitat for regeneration. Please note the exhibit satellite photographs below, that illustrate how the BAER observers cited above understated the risk to habitat when they claimed a "moderate risk of damage to the quality of habitat" is a likely outcome to Westside salvage logging. In 1997, ten years after a large logging project was completed in the Walker Creek watershed, a massive debris flow changed the topography of the area, causing extreme damage to aquatic habitat in Walker creek and downstream.	It is unclear what is meant by "habitat sweeps" or which "Burned Area Emergency Reclamation observers". The comment is unclear in linking the removal of large wood from streams to consequences of flooding endured by local residents during a flood emergency. Comment expresses concern for removal of large wood from streams. No alternative proposes timber salvage in hydrologic Riparian Reserves. Project Design Features prohibit salvage harvest in areas where future coarse woody debris (snags) are most likely to contribute to watershed function including stream course Riparian Reserves, inner gorge, active landslides and landslide toe zones. Even though roadside hazard salvage would occur in these areas, project design features restrict these operations below the road and limit the size of trees being removed, which results in retention of larger size class coarse woody debris (>26" diameter at breast height) that persists in the environment much longer, providing longer lasting contributions to watershed function. Even though roadside hazard salvage would occur in these areas, project design features restrict these operations below the road and limit the size of trees being removed which results in less ground-disturbance. The biological Assessment for Fish and the Aquatic Report and Addendum in the final EIS details effects to aquatic habitat. Given these project designs it is not anticipated that the project will result in significant removal of large wood from streams. Comment references 1997 flood impacts along Walker Creek but does not provide details about the referenced prior logging project or otherwise make the link between that project and 1997 flood processes and/or effects. The Forest acknowledges the significant disturbance in Walker Creek during the 1997 flood. This disturbance was produced by very large landslides (and resulting debris flows) on naturally unstable lands that had roads constructed under antiquated design practices. Temporary road segments proposed for construction in the Westside Fire Recovery project will avoid inner gorges, active landslides, and toe zones of dormant landslides, and will be constructed to current specifications with regard to drainage structures, among other improvements.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#18937-13	Grider and Walker Creek Watersheds The majority of the proposed units I saw were located on extremely steep slopes, directly above the creeks that provide thermal refugia to the Klamath river fish downstream from the Scott River. Grider and Walker creek both provide these resources to the river fishery. Simply put, salmon would have to pass up refuge (cooling off points) in the mouths of these newly temperature and sediment impaired creeks en route to spawning habitat upstream, most of which is unavailable due to dewatering in the Scott River already. This effect has the potential to mark the end game for threatened Coho salmon over time, and more certainly negatively impact the fall run Klamath Chinook that depend on the refuges in late August. Another field observation I witnessed was marking for roadside hazard tree removal (salvage). Much of the area I traveled within the Whites and Happy Camp (Seiad Valley) fire areas already had blue paint indicating a mark. This seemed completed for essential byways that would benefit firefighters, recreationalists or workers. Neither me nor Klamath Riverkeeper are opposed to providing safe passage for forest workers by removing trees that could cause injury, or worse. That said, many important trees along existing roadways that are eligible for removal under the preferred alternative. I intend to cruise the remaining miles with a skilled timber cruiser in the coming months and will encourage my constituents to do so, also. We plan to continue sending KNF individual observations about road hazards and excessive marks in the coming months. To put it simply, much of the roadside mark I saw was below the road I was traveling on. Many of the targeted trees would observably provide profits to timber markets rather obstruct any traditional roadway in the Forest System. Also, many of the trees marked, especially in the Whites fire area, appeared "green" and large, and did not seem to pose a threat to passers by - especially in comparison to all of the other Forest System roads I travel on (with regularity). Much of the "roadside hazard" application seemed to promote logging of large trees in riparian zones as a way of rewarding timber companies with "receipts" instead of promoting fire resilient landscapes or local economic resilience. This logging would also create "stream side shade removal" that will almost certainly increase temperatures to 303d listed rivers included in the DEIS and could mean "game over" for Klamath salmon seeking thermal refugia at river mouths while running upstream in warm late summer months. In the Walker Creek watershed, I could only travel as far as the intersection of 46N64 and 46N62 on the way to Lake Mountain Lookout, where I thought I could get a view of many of the larger units slated for clear cut. My strong feeling after traveling to Grider and Walker Creeks in the Happy Camp fire area is that if most or all of the standing snags are removed the chance for debris flow (in addition to adverse conditions caused by increases in sediment) in this area is likely, and the impacts to habitat downstream could be extreme. In addition, I am concerned that local residents may not understand the hydrological impacts of clearcut logging in the watershed that provides drinking water to their families. I am concerned that ideological differences between constituents could impede local community education about threats to domestic water quality and quantity. Simply put, I am concerned that the local residents' future could be threatened if this project proceeds as proposed.	The June 19, 2015 addendum to the fish Biological Assessment states, "As part of the Project consultation, the Forest, National Marine Fisheries Service, and Karuk Tribe jointly developed a strategy to monitor implementation of Project elements that have the greatest likelihood of impacting SONCC Coho salmon and other salmonids. Pre Project, the group will monitor the hazard tree mark where it is proposed near SONCC Coho salmon CH; during the Project (especially June-Sept) all parties will share information about where Project water drafting is occurring, jointly monitor those water drafting actions, and help Forest Service Representatives decide where to shift Project water drafting so that impacts to SONCC Coho salmon and its CH are not adverse; also during the Project, the Forest Service and National Marine Fisheries Service level 1 team will coordinate in closer monitoring of the status of ground disturbing actions if/when operations are occurring outside of the Normal Operating Season (NOS) or within the NOS during wet weather - to ensure compliance with Forest Service Best Management Practices and Wet Weather Operations standards." The Forest appreciates the cooperative efforts of the Karuk Tribe and National Marine Fisheries Service. The Biological Assessment for Fish conducted an analysis for impacts to Coho and their habitat and it was determined, as agreed upon with National Marine Fisheries Service, that the proposed actions, May Affect but are Not Likely to Adversely Affect fish species listed under Endangered Species Act.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#19072-11	The water quality risk to channel morphology was evaluated in the Project DEIS using the ERA model. USLE and mass-wasting models were also used to assess cumulative impacts. These cumulative impact models rely on "risk ratio", which is the model results (ERA, USLE or mass-wasting) divided by the watershed threshold of concern (WTOC) (model results/WTOC). The threshold of concern for the risk ratio is 1.0. According to the DEIS, "The threshold of concern does not represent the exact point at which adverse cumulative impacts will occur. Rather it serves as a "yellow flag" indicating increasing susceptibility for adverse effects to beneficial uses in a watershed." For the DEIS, watersheds with risk ratios of less than 1.0 are considered to have a low risk of increased susceptibility for adverse effects to beneficial uses in a watershed. Watersheds with risk ratios between 1.0 and 1.5 have a moderate risk, and greater than 1.5 have a high risk. ·.... For ERA, the DEIS states, "A low risk to channel morphology means that there is not likely to be a measurable change to peak flows and the channel bed, banks and floodplain will undergo natural modifications that are proportional to the storm events. A moderate risk indicates that peak flows may be artificially increased by the actions taken. The increased peak flow is likely to leave the channel susceptible to modifications that are slightly more than would occur under natural conditions. The perturbation of the geomorphic process would be over the short term (about two to four years). "A high risk to channel morphology means that the increase in peak flows would lead to undesirable changes (such as channel straightening and loss of coarse wood) that ·would require long-term recovery (greater than 10 years)." From the Westside Fire Recovery Report - Hydrology Report analysis, it appears all eleven 7th field watershed ERA risk ratios are greater than 1.0 post-fire, no action, with two of the eleven having risk ratios >1.5. According to this report, risk ratios increase in most cases-when implementing the preferred Alternative 2, with three of the eleven 7th field watersheds having risk ratios >1.5 after implementing Alternative 2. For the mass-wasting analysis, all nineteen of the 7th field watershed have risk ratios are greater than 1.0 post-fire, no action, with five of the nineteen watersheds >1.5. Risk ratios increase in most cases when implementing the preferred Alternative 2, with six of the nineteen 7th field watersheds having risk ratios >1.5 after implementing Alternative 2. USLE modeling shows similar results. All eleven of the 7th field watershed have risk ratios greater than 1.0 post-fire, no action, with five of eleven being >1.5. Risk ratios increase in most cases when implementing the preferred Alternative 2, with six of the eleven 7th field watersheds having risk ratios >1.5 after implementing Alternative 2. Our staff analysis of Alternative 2 raises concerns that conducting salvage harvest and associated activities in watersheds already exhibiting elevated risks for cumulative impacts could result in significant impacts to water quality, especially in watersheds that have burned with a moderate or high intensity.	The Cumulative Watershed Effects modeling performed in support of the draft EIS used the project's GIS dataset without removing any areas protected by project design features such as stream course Riparian Reserves, inner gorge, active landslides or landslide toe zones. Therefore given that these areas account for at least 25% upwards to 40% of the proposed treatment areas, the cfs have been conservatively estimated as such. The final EIS includes a revised run of the cfs models on the preferred consultation Alternative to provide a closer approximation of actual cumulative watershed effects. Field review and development of the project design project design features are applied to avoid significant effects. The impacts to watershed conditions are expected to be undistinguishable from the impacts of the 2014 wildfire. And, there are benefits to watershed conditions from the proposed action Alternatives. A monitoring team has been set up; see response to comment 18937-13.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#19072-12	Regional Water Board staff have reviewed the fire burn severity maps. In general, the burn intensity in riparian zones within the fire area was generally low or very low. This is because in most instances the fire backed into the riparian zone and the fire intensity decreased as the fire approached the stream. In a few areas su.ch as the North Fork of the Salmon River and in White's Gulch, high winds caused the fire to burn with high intensity across the riparian corridor. In these areas, there is charred timber with bare mineral hydrophobic soil with very little surface cover. In some cases, there are steep slopes leading directly to perennial fish-bearing watercourses. Much of the tree branches, leaves, and needles were consumed in the fire. These areas wi11 be subject to elevated erosion rates and increased sediment delivery to the watercourses due to the steep slopes, hydrophobic soils, and lack of surface cover for erosion control. None of the alternatives evaluated in the DEIS of the KNF Westside Fire Recovery Project propose to treat riparian zones that burned in the fire with a moderate or high intensity. Treating these riparian areas, perhaps by falling some trees-and - leaving them on the ground, and/or spreading slash on bare soils, could help to break up the hydrophobic crust, provide temporary sediment storage, and increase infiltration rates. Treating the riparian areas that burned at a high intensity could provide significant benefits to water quality, but were not included in the proposed action. Additionally, the proposed Project lacks an approved plan to treat legacy sediment sites. The Regional Water Board provided scoping comments on the Westside Fire Recovery Project to KNF on December 5, 2014. Below are examples of our comments on the preparation of a legacy site treatment program for the Project. "[t is our understanding that some treatment of legacy sediment sites along the NFS roads within the project area is being accomplished as a part of the USFS Burned Area Emergency Rehabi1itation (BAER) program. The legacy- site treatment that is planned or accomplished under the BAER program may result in progress toward TMDL compliance but Regional Water Board staff cannot determine whether BAER activities a]one will be adequate for USFS Waiver Compliance without additional details of that work. Given the huge size of the Project area, treatment of all the legacy sites may not be a realistic goal. However, treatment of some of the high priority legacy sediment sites in the Project area may be necessary in order for the Project to be eligible for Waiver coverage. KNF must propose an. acceptable legacy site treatment program for the Project to comply with the Waiver and demonstrate reasonable progress towards TMDL compliance." The Regional Water Board received a draft legacy site treatment plan for the KNF Westside Fire Recovery Project on April 21, 2015, but has not yet had time to complete our review of the plan. An acceptable legacy site treatment program must be approved by the Executive Officer before Waiver coverage will be granted and Project activities can commence. Most of the comments above are responding specifically to Alternative 2, the preferred alternative. Alternative 4 of the DEIS was designed to reduce watershed disturbance and impacts to water quality and fisheries, relative to Alternative 2, while still meeting the purpose and need for action on the Project Alternative 4 addresses several of the above described water quality concerns, including not conducting roadside hazard tree removal and salvage logging on Maintenance Level 1roads, a:nd not constructing log landings within Riparian Reserves. It is possible that Alternative 4 could be modified to address the additional water. quality concerns and be eligible for Waiver coverage. However, a final determination regarding Waiver coverage cannot be made until the final EIS is prepared with the alternatives finalized and a Decision is issued.	Many members of the public want nothing done in Riparian Reserves. The proposed actions Alternative try to address that concern while still meeting the purpose and need for the project. It is possible that in the future additional treatments in Riparian Reserves can be planned. Riparian Reserves within the plantation site-preparation and planting units in the Whites Fire and Happy Camp Complex will be treated to achieve ground cover and allow for natural regeneration of vegetation. Treatment will be focused in areas of high and moderate vegetation mortality and where the overhead hazards can be mitigated without equipment entry into the Riparian Reserves. Treatment will include hand-work only (no ground-based equipment) and lop-and-scatter or other fuels reduction will be implemented if fuel loading is above seven tons per acre; fuels may be hand-piled or windrowed and burned. Alternative 4 also proposes only manual treatment for all salvage harvest treatments within Riparian Reserves, but the number of acres made safer for fire fighting, community protection, and fire resiliency is reduced by 900 acres and there is a reduction in social benefits such as income and jobs (Table 2-32, draft EIS). Manual or hand treatment will fall standing dead conifers up to 16 inches in diameter at breast height with a chainsaw or other cutting implement, then cut and scattered throughout the riparian area to achieve 70 percent soil cover in Riparian Reserves within salvage harvest units. On slopes greater than 35 percent, manual felling of standing dead conifers, hardwoods, and brush will be limited to material less than ten inches diameter at breast height because of concerns about safety and effectiveness of treating large, heavy material by hand on steep grounds. The goal is to promote more rapid soil recovery and natural regeneration without additional planting in these units. If fuel loading exceeds ten tons per acre (and/or greater than 70 percent soil cover), excess fuels can be piled and burned or broadcast burned. The action Alternatives have been adjusted since the draft EIS to meet interests expressed by the public, including tribes, and consulting agencies such as the Water Quality Control Board, NOAA-National Marine Fisheries, and the U.S. Fish and Wildlife Service. Treating Legacy Sites will be an ongoing component of the overall watershed restoration program of the Klamath NF that will require additional National Environmental Policy Act and funding.
232.06 - Watershed Condition	#19076-4	These three watersheds should be considered in a separate EIS because of their bedrock nature, their importance to salmon, their legacy sedime11t site status due to past management, and their lack of high intensity burt1from recent fire (3% in Thompson, 1.2% in Grider).	These watersheds were included because treatments within them met the purpose and need for the Project. Unique watershed characteristics were considered and addressed through the interdisciplinary process resulting in the most appropriate project design and minimization measures.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#5873-108	Salvage retards watershed and aquatic recovery In short, by adding another stressor to burned watersheds, postfire salvage logging worsens degraded aquatic conditions accumulated from a century of human activity (CWWR 1996,NRC 1996, 2002,McIntosh et al. 2000). The additional damage impedes the recovery and restoration of aquatic systems, lowers water quality, shrinks the distribution and abundance of native aquatic species, and compromises the flow of economic benefits to human communities that depend on aquatic resources (Beschta et al. 2004). Karr, J. R., J. J. Rhodes, G. W. Minshall, F. R. Hauer, R. L. Beschta, C. A. Frissell, and D. A. Perry. 2004. The effects of postfire salvage logging on aquatic ecosystems in the American West. BioScience 54:1029-1033. http://www.sierraforestlegacy.org/Resources/Conservation/FireForestEcology/SalvageLoggingScience/Salvage-Karr04.pdf citing Beschta, ,R.L., J. J. Rhodes, J. B. Kauffman, R. E. Gresswell, G. W. Minshall, J. R. Karr, D.A. Perry, F.R. Hauer, C. A. Frissell. 2004. Postfire Management on Forested Public Lands of the Western United States. Conservation Biology 18: 957–967. Downloadable at: https://www.researchgate.net/publication/227654964_Postfire_Management_on_Forested_Public_Lands_of_the_Western_United_States?ev=prf_pub	The comment includes citations of many studies regarding salvage logging. However, for this project the fish, earth, and water scientists conducted field work in this specific area and used standardized analytical procedures to determine the effects of doing nothing (Alternative 1) and four action Alternatives in this specific landscape as changed by the 2014 wildfires. The results of their site specific field work and modelling based on Klamath NF conditions and processes is the best information available. Their work allowed for the development of Project Design Features (project design project design features) that are specific to this project and prohibit salvage harvest to protect watershed and fish resources, including stream course Riparian Reserves, inner gorges, active landslides and landslide toe zones. Even though salvage harvest may occur in deeply weathered and dissected granitic terrain, project design project design features prohibit the use of ground-based yarding and require full-suspension cable or helicopter yarding to minimize ground disturbance in these areas. Most of the deeply weathered and dissected granitic terrain includes stream course Riparian Reserves and inner gorges where burned trees will not be salvaged. Even though roadside hazard salvage would occur in these areas, project design project design features restrict these operations below the road and limit the size of trees being removed which in turn results in less ground-disturbance. Also see response to comments 18832-48 and 12346-26.
232.06 - Watershed Condition	#5873-115	"In places where salvage logging occurs, the amount of snags that can be removed from the uplands without serious adverse effects on stream macroinvertebrate but ecosystem recovery is unknown and is likely to vary with forest type, geology, and topographical relief. However, it is know that virtually all forms of postfire logging can have various adverse effects on stream ecosystems (e.g., Mehahan, 1983; Smith et al., 1993a, b; Stout et al., 1993; Ketcheson and Megahan, 1996). Based on results from watersheds having various proportions of their areas burned by wildfire (e.g., Minshall et al., 1995, 2001b; Minshall, personal observation), it is probable that the amount of timber removed should not exceed about 25% of the merchantable timber (unless contradictory information is available). In addition, postfire removal should be appropriately spaced across the landscape and should be in proportion to the size classes (DBH) of trees present at the time of the fire (see also Beschta et al., 1995). This proportional harvesting is necessary because of the important graded inputs (Lyon, 1984) that a mix of such large woody debris contributes to streams over the extended recovery period (Minshall et al., 1989). In addition, fire lines should be obliterated prior to logging, and road construction or other major ground-disturbing activities should be avoided in order to prevent additional runoff and erosion. Salvage harvest yeilds responses (e.g., ground disturbance, woody debris removal, interruption of normal infiltration pathways, and acceleration of surface flows) that interact with the direct and indirect effects of fire to make these actions so potentially damaging. In addition, the negative effects extend many years beyond the actual time of salvage activities because of the harvest of snags that normally fall and become incorporated into stream channels and forest floors over several decades or more (Lyon, 1984). These wood inputs are important to create habitat, increase nutrients, and retard runoff and channel alteration during what is normally the most critical stage of stream and riparian vegetation recovery (Minshall et al., 1989; Lawrence and Minshall, 1994)."	Salvage is not occurring in hydrologic Riparian Reserves. Page V-27 in the Forest Ecosystem Management Assessment Team report shows that nearly 100% of coarse wood debris to streams come from one tree-height distance from a creek, usually 150 feet. Therefore, the proposed action Alternatives will not be preventing coarse wood contribution to streams. Additionally, Project Design Features prohibit salvage harvest in the inner gorge, active landslides and landslide toe zones. Although salvage harvest may occur in deeply weathered and dissected granitic terrain, most of these areas includes stream course Riparian Reserves and inner gorges that will not be harvested. Even though roadside hazard salvage would occur in these areas, project design features restrict these operations below the road and limit the size of trees being removed which in turn results in retention of larger size class of coarse woody debris (>26" diameter at breast height) that persists in the environment much longer, providing longer lasting contributions to watershed function. Alternative 2 proposed removal of burned trees on 11,700 acres and roadside hazard tree removal in coniferous forest on 16,600 acres (draft EIS page 15). These two actions are the most relevant to the comment, and involve 15.4% of the total burned area of 183,100 acres (draft EIS, page ii). Therefore, the project will retain more than 75% of the merchantable volume per watershed. Firelines were properly rehabilitated post-wildfire via fire suppression repair. Project design features limit the location and extent of road construction and other ground-disturbing actions to minimize erosion and sediment delivery.

Code	Comment Number	Comment Text	Response
232.06 - Watershed Condition	#5873-116	"In places where salvage logging occurs, the amount of snags that can be removed from the uplands without serious adverse effects on stream macroinvertebrate but ecosystem recovery is unknown and is likely to vary with forest type, geology, and topographical relief. However, it is know that virtually all forms of postfire logging can have various adverse effects on stream ecosystems (e.g., Mehahan, 1983; Smith et al., 1993a, b; Stout et al., 1993; Ketcheson and Megahan, 1996). Based on results from watersheds having various proportions of their areas burned by wildfire (e.g., Minshall et al., 1995, 2001b; Minshall, personal observation), it is probable that the amount of timber removed should not exceed about 25% of the merchantable timber (unless contradictory information is available). In addition, postfire removal should be appropriately spaced across the landscape and should be in proportion to the size classes (DBH) of trees present at the time of the fire (see also Beschta et al., 1995). This proportional harvesting is necessary because of the important graded inputs (Lyon, 1984) that a mix of such large woody debris contributes to streams over the extended recovery period (Minshall et al., 1989). In addition, fire lines should be obliterated prior to logging, and road construction or other major ground-disturbing activities should be avoided in order to prevent additional runoff and erosion. Salvage harvest yeilds responses (e.g., ground disturbance, woody debris removal, interruption of normal infiltration pathways, and acceleration of surface flows) that interact with the direct and indirect effects of fire to make these actions so potentially damaging. In addition, the negative effects extend many years beyond the actual time of salvage activities because of the harvest of snags that normally fall and become incorporated into stream channels and forest floors over several decades or more (Lyon, 1984). These wood inputs are important to create habitat, increase nutrients, and retard runoff and channel alteration during what is normally the most critical stage of stream and riparian vegetation recovery (Minshall et al., 1989; Lawrence and Minshall, 1994)."	See Response to comments number 5873-115
232.06 - Watershed Condition	#5873-124	Salvage: Watershed restoration. Salvage logging will adversely affect the ability of the land to absorb, store and release high quality water and the NEPA analysis fails to address these concerns. First, post-fire soils are fragile because the soil duff is often consumed by the fire and the carbon and other nutrients have been largely removed. Logging will further disturb the soils and litter and disrupt the natural soil recovery processes. Logging will also disturb and rearrange the soil protecting needle litter that will fall in the months after the fire. Second, large wood absorbs water and serves as a significant water reservoir that is especially critical during the dryer summer months. Logging removes the wood and so reduces the potential water reservoir. Recent research indicates that much water is stored in buried wood. This buried wood is likely to result of trees that have fallen on hillslopes and become buried in natural sediment moving downslope. Salvage will adversely affect the recruitment of future buried wood. The agency's snag retention guidelines are based on wildlife needs, but fail to consider or analyze the need to large snags and large down logs for soil, water storage, nutrient storage, or other purposes. Third, road construction, reconstruction, and road use all adversely affect the ability of the land to "distribute quality water."	Most of the trees removed by salvage logging will occur via helicopter or cable yarding systems, hence limiting the amount of soil cover disturbance post-harvest. Felling of trees will provide additional short-term soil cover due to the broken out tree tops and branches distributed through salvage units post-harvest. Project design features prescribe the amount of soil cover left to meet soil quality standards. The majority of the wood that would retain the most water would be left on site in the stream course Riparian Reserves. Coarse wood left on the ground or buried in upland areas provides a very small proportion of the moisture that could be retained during the hot summers of the Klamath Mountains. The project proposes between 4 and less than 1 mile of new temporary road construction and 9 to less than 1 mile of reopening decommissioned roads, depending on the Alternative. Where roads are would be constructed, reopening, or reconstructed project design features would require rehabilitation that will likely put these legacy roadbeds in a better condition than they were in the past, given that most of these legacy roads were built prior to Forest Service establishment of best management practices. Changes to the travel system is an issue that is outside of the scope of this analysis. The Forest Service incorporated concern about new road construction into relevant issue number 2 (draft EIS, Chapter 1) and developed Alternative 4, which responds to this issue. See draft EIS Chapter 2 for a description of Alternative 4. Project design features have been developed and modified since scoping to reduce or avoid negative effects on watershed conditions from temporary road access (Chapter 2). Proposed road access needed for implementation, including road maintenance, is described in Chapter 2 under each action Alternative. Additionally, legacy site treatments, including road improvement actions, are described under the proposed action and apply to all action Alternatives (Chapter 2). Effects of road access related action on watershed conditions are described in the hydrology section of Chapter 3.Also see response to comment number 12364-1. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
232.07 - ACS	#12346-13	The Project Will Violate the Aquatic Conservation Strategy (ACS) The March 2015 Aquatic Conservation Strategy Objective Report (ACSOR) indicates that the project will inhibit attainment of ACS objectives in numerous ways. Page 7 of the ACSOR reveals the Forest Service is aware that Caroline Creek, Walker Creek and West Grider/BittenBender are water quality impaired, subject to undesirable hillslope conditions and processes, and that "high road densities have contributed to impaired conditions." Hence the applicable Watershed Assessment directly recommends that the Forest Service "[d]ecommission roads contributing to the impairment of subwatersheds flowing a site specific analysis." In the Westside logging project the Forest Service is proposing to violate the ACS by ignoring the recommendation of its own Watershed Analysis. Rather than decreasing the impacts of the high road density in these water quality impaired water bodies, the Forest Service proposes increasing the cumulative negative watershed impacts through temporary road construction in riparian reserves, roadside logging in riparian reserves, and construction of log landings in riparian reserves. All of these actions will increase, as oppose to decrease, the impacts of the transportation system on hillslope processes, sediment production and aquatic health in opposition to the recommendations contained in the Forest Service Watershed Analysis.	The comment is referring to "management opportunities" summarized in Table 3 of the Aquatic Conservation Strategy Objective Report. This information was gleaned from the Thompson/Seiad/Grider Ecosystem Analysis published in 1999. The document identified high road densities in the Caroline Creek, Walker Creek, and West Grider Creek watersheds as contributing to water quality impairment and recommended road decommissioning. Since these 1999 recommendations road decommissioning, upgrade, and repair work has been ongoing across the west side of the Forest. In order for vegetation management (timber, fuels) projects to be implemented the Forest must apply for enrollment of the project under the North Coast Regional Water Quality Control Board's Waiver of Waste Discharge Requirements program. Primary components of the waiver are: 1) maintenance and restoration of Designated Riparian Zones pursuant to the Aquatic Conservation Strategy and Adaptive Management Strategy; 2) the timely implementation of watershed restoration plans that require inventories, prioritization and remediation of pre-existing sediment sources; and 3) for site-specific activities, the implementation of on-the-ground prescriptions to meet the Best Management Practice goals identified for the activities covered by this waiver (see page 9 of Water Board Order Number R1-2010-0029). Because the Forest is required to identify and remediate pre-existing sediment sources, which are most frequently associated with roads, road densities and related undesirable hillslope processes have been reduced. Based on equivalent roaded area model results presented in the Westside Fire Recovery Hydrology Report implementation of project Alternative 2 has minor to indiscernible effects on the watershed risk ratio of Walker Creek (moves from 1.0 to 1.1), Caroline Creek (0.5 to 0.6), and West Grider Creek (no change at 0.4). As Caroline and West Grider Creeks remain well below a risk ratio of 1.0 no adverse cumulative effects to hydrologic function or water quality are anticipated. Walker Creek marginally exceeds the watershed threshold of concern (risk ratio of 1.1) with implementation of Alternative 2 and thus has an elevated risk of adverse cumulative effects. However, project design features and best management practices are planned and implemented to protect against these adverse effects. Roadside vegetation treatments consist of fuels reduction and hazard tree removal, the effects of which are included in the equivalent roaded area model analysis, and not salvage logging. No new temporary road segments will be constructed in Riparian Reserves.
232.07 - ACS	#12346-16	Page 23 of the EA claims that "the only project action that could have any effect on the presence of trees near streams and down wood recruitment is hazard tree removal" in the Riparian Reserves. The ACSOR (page 24) then attempts to discount this impact to the first objective of the ACS by pointing out that snags greater than 26" DBH will be felled and left on site in the Riparian Reserves for fish bearing streams. No attempt is made to explain why removing 20"-26" DBH snags from Riparian Reserves is desirable or why non fish-bearing streams should not be managed to allow for large wood recruitment that benefits numerous aquatic species other than fish.	The comment is referring to the project EIS rather than an EA. Based on IDT field discussions on April 22 and 23. Project Design Features (project design project design features) have been revised such that all hazard trees greater than 26" diameter at breast height will be retained within the first site-tree distance from channels in all hydrologic Riparian Reserves (fish-bearing, permanently flowing nonfish-bearing, and seasonal or intermittent streams). The largest trees (> 26" diameter at breast height) provide the most benefit to riparian and aquatic systems in terms of sediment retention and metering, habitat, and nutrient cycling functions. We acknowledge that removal of hazard trees in the 20-126" diameter at breast height size class could reduce benefits from some of the aforementioned functions, however, we believe that the number of hazard trees identified in this size class (say on a per-acre basis) will be small.
232.07 - ACS	#12346-18	As acknowledged on page 30 of the ACSOR "temporary road crossings in Alternative 2 may have site level effects to aquatic habitat in several locations" which will inhibit attainment of ASCO 2. Similarly, page 30 also states that "[n]ew landings may have site level impacts to terrestrial habitat connectivity where large trees or snags are removed" thus impairing attainment of ACSO 2. In the Beaver Creek Watershed "hazard tree removal will occur on about 1,320 acres which will have a site scale effect on terrestrial wildlife connectivity where there was high/moderate fire severity because there will be a high density of hazard trees in those areas." (ACSOR 31). Presumably avoiding this violation of the ACS lead the agency to develop (but not propose) an action alternative that avoids these impacts to wildlife connectivity in the Beaver Creek Watershed. We agree with the Forest Service finding at page 31 of the ACSOR that "[l]andings may affect terrestrial wildlife connectivity at the site scale. We disagree with the Forest Service that the NWFP permits ACS violations that impact the ACS objectives at any scale smaller than the 5th field watershed. The impacts of proposed "temporary" road construction on ACS objectives are both significant and last for years. As acknowledged on page 31 of the ACSOR (but not disclosed in the DEIS) "[s]hort term sediment related impacts over about one mile of stream area expected during the time when the road is prepared for use, used, and then hydrologically stabilized. Effects may occur during storms throughout the first few years post-project as the road prism readjusts."	Fish, earth, and water scientists analyzed the effects of project activities and developed Project Design Features to protect riparian and aquatic resources. Effects at the site, 7th, and 5th field were analyzed and the short and long term effects were evaluated. Overall, the hydrologist determined, based on the modeling, field review, and professional judgment, that the effects to watershed conditions from any action Alternative will be indistinguishable from the effects of the wildfire. Also, there are negative effects from taking No Action. If no action is taken, the watersheds with a high risk of temperature regime alterations, without artificial regeneration that is proposed in the action Alternatives, will have an extended duration of elevated risk. Natural regeneration will occur, but in general it will be more than 80 years to get trees with 10 inch diameters at breast height in areas burned with high and moderate severity (draft EIS page 202-203). The benefit is meeting the Aquatic Conservation Strategy objectives. The proposed actions have beneficial effects to aquatic species, and to the connectivity of aquatic habitat, at the three sites that will have crossings upgraded with bottomless arches. These sites are in the lowest reaches of Twin Creeks and Malone Creek, just upstream of their confluence with Elk Creek (just upstream of confluence of Elk and East Fork Elk Creeks), and in upper East Fork Elk Creek (see project maps). These structures will allow for free movement of special status fish and amphibian species under these road crossings where passage has been blocked for many years during most or all flows. These benefits also meet Aquatic Conservation Strategy. See chapter 3 of the final EIS for an updated Aquatic Conservation Strategy analysis. Hazard trees need to be harvested to meet important safety goals. See wildlife and watershed project design features in chapter 2 of the final EIS for the mitigations for salvage harvest. In response to public comments, consultation, and our own concerns about wildlife connectivity in the Beaver Fire Area, salvage harvest was dropped from alternatives 5, alternative 3, and modified alternative 3 (the preferred alternative); see chapter 2 of the final EIS. The effects of hazard tree removal on connectivity is disclosed in chapter 3 of the final EIS.

Code	Comment Number	Comment Text	Response
232.07 - ACS	#12346-19	The proposed logging also will negatively impact terrestrial connectivity in the Horse Creek Watershed because "[h]azard tree removal will occur on about 1,390 acres which will have a site scale effect on terrestrial wildlife connectivity where there was high/moderate fire severity…" ACSOR at 31. Further, "[s]hort term sediment related impacts along about 1.5 miles of stream are expected" due to proposed road construction in the Horse Creek Watershed. ACSOR at 31. Additionally, the construction of 15 landings "may affect terrestrial wildlife at the site scale." ACSOR at 32. The NWFP does not permit actions that will inhibit the objectives of the ACS. Perhaps the most significant direct damage to the objectives of the ACS are proposed within the Seiad Creek Watershed in which the Forest Service intends to remove 4,570 acres of roadside habitat, construct 50 new landings and utilize "existing roads beds near the streams that currently have erosion problems." ACSOR at 32. "Short term site level effects related to sediment delivery to streams as a result of disturbance, especially at crossings, would be expected during and post project during storms for several years." ACSOR at 32. Similar violations of ACSO 2 are proposed for the Thompson Creek, Elk Creek and North Fork Salmon River Watersheds.	Hazard tree removal will result in select trees being felled and trees > 26" diameter at breast height within the first site tree distance of all defined stream channels being retained on-site. Comment references potential short-term sediment impacts to a 1.5 mile segment of creek. The Aquatic Conservation Strategy Objective Report does acknowledge this potential but also states that the stream is non-fish-bearing and that "long-term benefits to this drainage are expected because the condition of the roadbed will be improved post-project by out-sloping and pulling fills at crossings and appropriately treating the current legacy sediment site". Comment references proposed treatment of 4,570 acres in Seiad Creek. These are the maximum extent of roadside hazard treatments proposed in Alternative 2 (Modified Alternative 3 has less) that remove limited numbers of trees and so are not accurately characterized as a complete removal of habitat. The project does estimate 50 new landings for the watershed but the majority of these (45) are outside of Riparian Reserve areas and the remaining 5 site were approved for use only after field inspection by aquatics resource specialists found these actions would not remove shade over perennial streams or inhibit the function of aquatic habitat. These approvals were based on on-site assessment of risk of erosion and sedimentation. For example, two of the five deemed appropriate for use are sited uphill of a road and > 200' from a stream channel in the outer zone of the Riparian Reserves associated with Grider Creek. These proposed actions were evaluated and only landings that were considered low risk for sediment production (and other negative effects) to streams were approved for use. Further, all landings used by the project are subject to erosion control Best Management Practices during and after use; these landings will provide for reforestation actions that are likely to accelerate the re-generation of mature forests that are sustainable over time given the local fire regime.
232.07 - ACS	#12346-21	Numerous activities are proposed that will inhibit attainment of ACSO 3. Page 38 of the ACSOR indicates that "[a]lternative 2 proposes to temporarily re-open segments of decommissioned road in Gard and Cliff Valley creeks which involve several crossings in [the] Gard Creek area and one intermittent crossing of Cliff Valley Creek. The [stream] banks will likely show effects of temporary crossings for the long-term. As these roads have been appropriately decommissioned and stabilized, there is no potential long term benefit involved in opening and using them for the project."	Comment refers to Aquatic Conservation Strategy Objective number 3: Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations. The Forest acknowledges that reopened crossings will have longer-term, site-scale effects on the channel in the immediate vicinity of the crossing. However, project Best Management Practices are planned and implemented such that potential erosion and sedimentation associated with the crossings is controlled during road use to prevent adverse water quality effects, and crossings will be restored after project completion. Given that the number of re-opened crossings is limited, Best Management Practices, and that effects are expected to be manifest at the site-scale, these activities are not anticipated to prevent attainment of Aquatic Conservation Strategy Objective number 3. Further, the Forest expects positive watershed effects from any hazardous fuels treatments and site preparation and planting facilitated by the reopening of the road segments. Also see response to comment number 12364-1.
232.07 - ACS	#12346-29	The NEPA documents supporting the Westside Fire Salvage project fail to analyze or disclose the role of large down wood in moderating peak flows and maintaining in-stream flow during low flow conditions. Klamath National Forest BMPs that allow for up to 50% of streamflow to be diverted by water drafting would directly inhibit attainment of ACSO 6. ACSO 7 This objective of the ACS is not at issue in the Westside Project.	Action Alternatives 2 through 5 retain downed wood as specified earlier in Chapter 2 and through implementing project design features. It is unclear if the comment is referring to large wood on hillslopes or within channels. The Forest acknowledges the importance of large wood to watershed processes and aquatic functions. Project Design Features (project design feature) were developed such that no salvage harvest will occur in Riparian Reserves along fish-bearing, perennial nonfish-bearing, and intermittent stream channels. In addition, large roadside hazard trees (> 26" diameter at breast height) within one site tree distance of stream channels will be felled but left in place in Riparian Reserve areas. These design features will ensure that post-fire recruitment of large wood to Riparian Reserves and stream channels will not be adversely affected by project activities and will thus provide important functions to aquatic systems. Per Watershed-36 project design feature water drafting will not exceed 10% of the surface flow in channels designated as Coho salmon critical habitat. In fish-bearing channels outside of Coho critical habitat drafting will not exceed 20% of the surface flow and drafting will cease (or not begin at all) in channels where surface flow is less than 1.5 cubic feet per second (cfs). The June 19, 2015 addendum to the fish Biological Assessment states, "As part of the Project consultation, the Forest, National Marine Fisheries Service, and Karuk Tribe jointly developed a strategy to monitor implementation of Project elements that have the greatest likelihood of impacting SONCC Coho salmon and other salmonids. Pre Project, the group will monitor the hazard tree mark where it is proposed near SONCC Coho salmon CH; during the Project (especially June-Sept) all parties will share information about where Project water drafting is occurring, jointly monitor those water drafting actions, and help Forest Service Representatives decide where to shift Project water drafting so that impacts to SONCC Coho salmon and its CH are not adverse; also during the Project, the Forest Service and National Marine Fisheries Service level 1 team will coordinate in closer monitoring of the status of ground disturbing actions if/when operations are occurring outside of the Normal Operating Season or within the Normal Operating Season during wet weather - to ensure compliance with Forest Service Best Management Practices and Wet Weather Operations standards."

Code	Comment Number	Comment Text	Response
232.07 - ACS	#12346-42	The Forest Service is proposing thousands of acres of roadside logging in Reserve land use allocations. Page 35 of the DEIS indicates that the agency is proposing 2,062 acres of roadside logging in Riparian Reserves and 8,086 acres of roadside logging in Late 15 Successional Reserves. Only 2,255 acres of the proposed roadside logging is located in lands designated for timber productions (DEIS at 36). While the DEIS attempts to justify extensive roadside Reserve logging as related to the "safety" element of the project purpose and need, in fact the removal of roadside trees has nothing to do with public safety and is solely designed to accomplish the agency's economic preferences. Page 23 of the ACS Report indicates that the agency intends to retain snags >26" DBH located in the Riparian Reserve of fish-bearing streams that are felled as part of the roadside logging prescription in order to provide for down wood recruitment. No explanation is provided as to why large trees (greater than 26" DBH) are proposed for removal after being felled in the Riparian Reserves for non-fish bearing streams or in the LSRs. Down wood recruitment serves the management goals for these land use allocations by providing for wildlife habitat, nutrient cycling and needed legacy forest structure. Its removal serves only economic, rather than ecological, objectives. Please note that the KNF LMRP standards and guidelines for Riparian Reserves (MA 10- 58) direct the Forest Service to "fell" as opposed to "remove" trees where they pose a safety risk. Page 34 of the DEIS indicates that the Forest Service intends to remove (and in some cases clearcut) dead and live trees up to 250' feet below roads and that some snags and trees located further than 250' feet above roads will be removed due to "slope." This can be contrasted with the Riparian buffer for non-fish bearing streams which is considerably smaller than 250'. The agency offers no rational explanation for why trees may travel further downhill to reach roads than to reach streams or how snags that are 150' in height will jump up hill for several hundred feet to reach logging roads. When the Klamath National Forest signed the 2010 decision to log the Panther Salvage timber sale (a cumulative impact that is not fully disclosed and analyzed in the Westside DEIS) the KNF authorized removal of alleged "hazard" trees up to 200' feet above and below logging roads. See Panther EA page 24. The KNF 2014 decision to log the Salmon Salvage timber also authorized removal of roadside trees up to 200' feet above and below roads. No explanation is provided in the Westside DEIS of why KNF timber planners have now increased the size of post-fire roadside clearcuts by an additional 100' to a total of 250' feet above and 250' feet below roads in the Westside timber sale.1 Inexplicably the KNF will now create a 500' foot wide post-fire clearcut along some roads rather than the previous 400' wide swath. The Salmon Salvage and Panther decision documents are attached to these comments.	The comment refers to Table 2-4 of the draft EIS. This table displays acres of roadside hazard treatments by management area and fire area. It is not accurate to characterize these acres as roadside "logging" as the treatment is only applicable to trees that pose a hazard to the road. Standard and Guidelines MA10-58 says, Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees on-site when needed to meet Coarse Woody Debris objectives. It is anticipated that large areas within the roadside hazard acreage will remain predominantly unchanged by the treatment because they lack trees that pose a hazard to the road. Within Riparian Reserves large hazard trees (> 26" diameter at breast height) that are felled within the first site tree distance of fish-bearing, perennial nonfish-bearing, and intermittent stream channels will be left on site for the provision of hydrologic and aquatic functions. This inclusion of perennial nonfish-bearing and intermittent channels is a modification since the draft EIS was published. The comment appears to refer to the footnote on page 34 of the draft EIS that states "hazard tree removal is proposed within 250' on either side of selected roads". This does not apply to all roads in the project area and hazard tree removal is not accurately characterized as a "clearcut". For reference, Riparian Reserves widths are established at one site-potential tree slope distance along nonfish-bearing streams. The site tree distance is at least 150'. Cumulative watershed effects of the referenced Panther project have been analyzed in watershed models just as all past, present, and reasonably foreseeable future activities are. Hazard trees are identified for removal by engineering and Silviculture staff for removal based on their location and condition. When an economic gain is realized, these funds may be used for reforestation. Timber sale receipts will fund reforestation work that is critical for restoration of watershed conditions for fish habitat and the creation of future wildlife habitat for the federally-listed northern spotted owl and other important wildlife species. In addition, capturing the maximum economic value of the salvaged timber would benefit the local counties and communities' economies (draft EIS page 21). Note that the purposes of this project is: to address the needs for 1) worker and public safety and access; 2) safe conditions for firefighters performing fire suppression for community protection; 3) a project that is economically viable, meeting project objectives and benefiting our local communities; and 4) restored and fire-resilient forested ecosystems.
232.07 - ACS	#18878-63	Other specific comments which need to be addressed Please note that much of the analysis in the DEIS and ACSOR rely upon the existence of Riparian Reserves to mitigate and reduce sediment production from upland salvage logging activities. Yet the DEIS calls for logging in steep, unstable Geological Riparian Reserves and in moderately and high severity logging units above burned Hydrological Riparian Reserves in which "key riparian functions, including sediment retention capacity and streams shade, are assumed to be lost ... "ACSOR page 49. The Westside DEIS "Forest Plan Consistency checklist" contends that the project is "compliant" with Key Watershed road standards because allegedly "the project will not increase the amount of system roads in Key Watersheds" (emphasis in original). The word "system" (italicized or not) never appears in the LRMP Key Watershed standard 6- 24.	The Westside Fire Recovery project proposes no salvage harvest treatment in hydrologic Riparian Reserves--the reserves along fish-bearing, perennial nonfish-bearing, and intermittent stream channels. As such these Riparian Reserve areas will buffer potential upland salvage harvest to the extent naturally possible given variable effects of the 2014 wildfires in Riparian Reserves. Salvage harvest treatments are proposed for geological Riparian Reserves because these areas will benefit from hazardous fuels reduction and site preparation and planting in that risk of future high-severity wildfire will be reduced. Additionally, the areas will become re-forested more quickly (due to planting) thereby lowering the risk of sediment production from surface erosion and mass wasting processes. Table 2 in the Aquatic Conservation Strategy Report demonstrates that a relatively small percentage of Riparian Reserves in the project area experienced high soil burn severity in 2014. As such, Riparian Reserves will still provide key function of sediment retention and shading that is referenced in the comment. With regard to roads in key watersheds the Westside Fire Recovery project proposes treatment of existing legacy sediment site in the Elk Creek Key Watershed as a condition for enrollment of the project in the North Coast Regional Water Quality Control Board's waiver program. Treatment of these legacy sediment sites will reduce significantly risk of stream sedimentation and water quality impacts related to road system erosion.

Code	Comment Number	Comment Text	Response
232.07 - ACS	#18878-64	It does not appear that the Forest Service has met LRMP standard 6-29 in any Key Watershed within the Westside planning area. Instead of following the direction to "prioritize roads for relocation and restoration or closure, based on the impact to Forest resources" the agency is proposing to re-open previously closed and decommissioned roads in order to maximize timber harvest. While the DEIS attempts to justify extensive roadside Reserve logging as related to the "safety" element of the project purpose and need, in fact the removal of roadside trees has nothing to do with public safety and is solely designed to accomplish the agency's economic preferences. Page 23 of the ACS Report indicates that the agency intends to retain snags >26" DBH located in the Riparian Reserve of fish-bearing streams that are felled as part of the roadside logging prescription in order to provide for down wood recruitment. No explanation is provided as to why large trees (greater than 26" DBH) are proposed for removal after being felled in the Riparian Reserves for non-fish bearing streams or in the LSRs. Down wood recruitment serves the management goals for these land use allocations by providing for wildlife habitat, nutrient cycling and needed legacy forest structure. Its removal serves only economic, rather than ecological objectives. The combined effects salvage logging to facilitate future fire suppression, and the impacts of that fire suppression, must be analyzed together in a single NEPA document. Actions are connected when they "cannot or will not proceed unless other actions are taken previously or simultaneously" or when they are "interdependent parts of a larger action and depend on the larger action for their justification." 40 C.F.R §1508.25(a)(l)(ii, iii). Where one project will not proceed but for the completion of another, it is a connected action and NEPA mandates that both actions be analyzed in the same document. Thomas, 753 at 759.	The Westside Fire Recovery project proposes treatment of legacy sediment sites in the Elk Creek Key Watershed as part of any project action Alternative. These treatments will prioritize road restoration based on road impacts to forest resources as is stated in the comment. Importantly, the legacy sediment site treatments will reduce the risk of adverse effects to water quality from road-related erosion and sedimentation in Elk Creek. Additional road treatments have been planned and implemented across the project area as a result of post-2014 wildfire Burned Area Emergency Response efforts. This Burned Area Emergency Reclamation work has reduced the risk of road-related erosion and sedimentation. Within Riparian Reserves large hazard trees (> 26" diameter at breast height) that are felled within the first site tree distance of fish-bearing, perennial nonfish-bearing, and intermittent stream channels will be left on site for the provision of hydrologic and aquatic functions. This inclusion of perennial nonfish-bearing and intermittent channels is a modification since the draft EIS was published. The comment states that the effects of future fire suppression must be analyzed in the National Environmental Policy Act document as it is a connected action. The project proposes salvage harvest and hazardous fuels reduction to reduce the risk of high-severity wildfire in the future. Future wildfire and its associated suppression activities are unpredictable events with associated emergency actions at that time. It is uncertain the size, location, or year of the next fires. Therefore, fires and suppression are not reasonably foreseeable activities in the current analysis. Also see response to comment number 18909-79 regarding watershed restoration.
232.07 - ACS	#18912-2	In addition to warming water from drafting in a critical time, albedo affects from recently clear-cut and burned areas will be working simultaneously to warm these waters. The rush to begin cutting will exacerbate the warmth of these streams, before natural succession (or planting) has time to replenish riparian and hillside cover. To make matters even worse, many of the proposed stream crossings within the burn, as well as the new and re-commissioned roads are located at sediment legacy sites. While the proposal does mention that these sites tend to be outside of anadromy, anyone who has hiked in the Klamath Mountains knows that these streams flow from steep mountains and are high gradient. These streams have the capacity to carry sediment!	Project Design Feature (project design feature) Watershed-36 provides detailed standards for water drafting in Coho salmon critical habitat streams and other fish-bearing (non-Coho) streams. The implementation of these standards should prevent water warming directly related to drafting from occurring. The Forest acknowledges that fire-killed trees provide less shade to Riparian Reserves and streams, however, the extent of high-severity fire along streams in 2014 was modest (see Table 14 in the project Hydrology Report). As such, most Riparian Reserves in the project area are providing shade similar to what was produced before the 2014 wildfires. There are a limited number of stream crossings proposed by the project, and these will be constructed, used, and restored based on Best Management Practices to limit erosion and sedimentation and potential adverse effects to water quality. Additionally, where proposed temporary road segments and stream crossings encounter existing legacy sediment sites these sites will be prioritized for restoration so that long-term risk of erosion and sedimentation is reduced below pre-project risk.
232.07 - ACS	#19072-9	1. Aquatic Conservation Strategy Compliance . . The Northwest Forest Plan 'Aquatic Conservation Strategy Objectives Guidelines state that Forest Service and BLM-administered lands within the range of the northern spotted owl will be managed to maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. The Standards and guidelines for Riparian Reserves prohibit or regulate activities that retard or prevent attainment of Aquatic Conservation Strategy objectives. Alternative 2 proposes about 3,920 acres of salvage units (about 2,000 acres of salvage logging) on steep, weather granitic lands in Riparian Reserves. No salvage logging is proposed on inner gorges, active landslides or toe zones of dormant landslides. Also proposed is about 960 acres of site preparation and planting, 4,3-95 acres of roadside hazard tree removal, and 3,940 acres of fuels treatment on unstable lands considered to be Riparian Reserves. Alternative 2 also proposes construction of new log landings within aquatic Riparian Reserves and the reuse of existing log landings within Riparian Reserves. The number ·of pw and reused . Reserves may i:-esul t in significant impacts to water quality, and the draft EIS has not adequately proposed mitigation measures to reduce impacts to less than significant levels.	The Forest acknowledges the salvage harvest, site preparation and planting, hazard tree, and hazardous fuels treatments proposed for geologic Riparian Reserves. These geologic Riparian Reserves do not have active stream channels like hydrologic Riparian Reserves, and the treatments are proposed because it is anticipated that fuels reduction followed by planting will serve to reduce risk of future high-severity fire and sediment production from surface erosion and mass-wasting processes. A small number of log landings in Riparian Reserves were approved for use after field inspection by watershed staff. The landings deemed acceptable for use were approved because they were characterized by some or all of the following: 1) the landing was in the outer zone of the Riparian Reserves, 2) the landing was uphill or separated from the stream channel by an existing road, 3) the landing was not on an unstable landform, 4) the landing was not demonstrating active erosion, 5) the landing or landing edge was not vegetated with mature live trees that would need removed for landing use. Given these conditions, use of landings in Riparian Reserves is not expected to produce adverse effects to hydrologic function or water quality.

Code	Comment Number	Comment Text	Response
232.07 - ACS	#5873-110	Salvage logging will set back vegetative recovery that has already started and thereby retard attainment of riparian and aquatic management objectives. In research on post-fire logging on the Winema NF, Sexton (1998) found that salvage logged sites produced only about 38% of the understory biomass of that on the unlogged site; and one year later produced only about 27% of the understory biomass of that on the unlogged site. In fact, Sexton's (1998) study comparing salvaged and unsalvaged areas of a fire on the Winema NF one and two years after logging showed: Salvage Areas Unsalvaged Areas reduced vegetation biomass greater vegetation biomass reduced species diversity greater species diversity reduced species richness greater species richness reduced growth of planted seedlings greater growth of planted seedlings reduced survival of planted seedlings greater survival of planted seedlings Sexton, Timothy O. 1998. Ecological effects of post wildfire activities (salvage-logging and grass-seeding) on vegetation composition, diversity, biomass, and growth and survival of Pinus ponderosa and Purshia tridentata. MS Thesis Oregon State University. Corvallis, OR. 121p	The referenced citation studied effects on the Winema National Forest in Central Oregon. The Winema NF is an eastside (east of the Cascade Mountain crest) forest environment that is significantly different from forests in the Klamath Mountains and in the Westside Fire Recovery project area. Comment states that post-fire salvage resulted in reduced biomass, reduced species diversity, reduced species richness, and reduced survival and growth of planted seedlings relative to unsalvaged sites. Post-salvage biomass may not be a significant concern in the wetter Klamath Mountains. Additionally, a primary objective of the WFR project is to reduce forest fuels thereby reducing the intensity and subsequent direct, indirect, and cumulative adverse effects of future fires in the project area. The proposed salvage occur on just 11,700 acres of the 162,300 acres burned on national forest lands, with reforestation occurring on 7,900 acres. Overall, due to the mosaic nature of the proposed activities and the reforestation, biomass is not significantly affected.
232.07 - ACS	#5873-142	The proposed salvage activities are in fundamental conflict with the Northwest Forest Plan Aquatic Conservation Strategy objectives, especially because proposed logging, yarding, soil ripping, helicopter landings, safety zones, and road activities will— a) cause soil erosion and sedimentation. For instance, road use will cause sediment to enter streams, which will reduce aquatic insect abundance, which will adversely affect fish. b) Chronic lack of large woody debris does not support complex aquatic habitat structures, functions, and processes including: pools, gravel retention and storage, stream energy dissipation, side-channels, cover, winter refugia, and substrate and nutrients supporting organisms of all kinds. c) fires are a primary mechanism of large wood recruitment to streams. Removal of large quantities of large wood will limit recruitment of large woody to streams that are already severely degraded in terms of large wood and the aquatic habitat complexity it provides. If the large trees are retained they may some day be delivered to streams via landslides, but if the large snags are removed they will never reach streams. d) The NEPA analysis inappropriately relies on the filtering effect of riparian buffers that are severely affected by the fire and will very likely NOT filter sediment to the degree found in studies involving unburned riparian buffers. To be effective, riparian buffers need healthy vegetation, coarse woody debris, and adequate cover of litter and duff, all of which have been significantly reduced by the fire. e) Some riparian areas on private land located below BLM salvage areas will not function to filter sediment both because of fire effects and subsequent disturbance from private land salvage logging. f) Channel morphology and large woody debris recruitment will be adversely affected by logging in riparian reserves.	This comment largely reflects the opinion of the commenter and provides general descriptions of aquatic function and potential effects but does not provide information specific to the Westside Recovery Project, compliance or non-compliance with the Aquatic Conservation Strategy or the content of the draft EIS. We agree that logging, yarding, and landing and road construction and use have the potential to cause erosion and sedimentation but that doesn't mean those effects will occur. Extensive project design features have been incorporated into the project to prevent adverse impacts to water quality. Our analysis shows that the conditions created by the fire are driving watershed conditions now, and will continue to do so should the West Side Recovery Project be implemented. This was demonstrated by the recent debris flows from summer thunderstorms. It should be noted that our assessment predicted high likelihood of these events occurring whether the West Side Fire Recovery Project is implemented or not and that implementation will not increase the risk of debris flows or landslides (EIS Chapter 3 –Geology, Hydrology, Aquatic Resources, Aquatic Conservation Strategy Assessment). At most, there is some potential for site scale sediment impacts from project implementation that are minor compared to the effects of the fire (Chapter 3 – Hydrology). The cumulative watershed effects analysis presented in the Westside Fire Recovery project Hydrology Report incorporates these activities. Results of CWE analyses indicate that 9 of 10 project area 5th field watersheds remain below model thresholds of concern and thus are not expected to manifest adverse cumulative watershed effects to hydrologic function or water quality. Only the Beaver Creek 5th field watershed marginally exceeds the Threshold of Concern (risk ratio of 1.0) under alternative 2 with risk ratios of 1.1 and 1.2 for the mass-wasting and universal soil loss equation models, respectively. While risk ratios in excess of 1.0 are interpreted to mean an elevated risk of adverse cumulative effects Project Design Features and Best Management Practices are planned and implemented to prevent adverse effects. Items b) and c) of the comment concern the lack of existing large woody debris (or large wood) in streams and the potential for impacts to future large wood recruitment due to post-fire salvage operations. A fundamental Westside Fire Recovery project design feature was to remove all Riparian Reserves along stream channels from proposed salvage harvest in order to prevent impacts to hydrologic function and water quality. We agree that wildfire is a key mechanism by which large wood is recruited to streams, and the project is designed such that no timber salvage will occur in Riparian Reserves along streams, and the large hazard trees (> 26"" DBH) most beneficial to aquatic functions will be felled but retained within the first site tree distance along all defined streams (fish-bearing, perennial nonfish-bearing, and intermittent). We concur that riparian zones that experienced high-severity fire do not provide the same water quality buffering functions as unburned riparian zones the 2014 fires resulted in modest amounts of high-severity fire in Riparian Reserves in the project area. Table 14 in the Hydrology Report displays 2014 fire severity along intermittent and perennial streams in the project area. The highest value reported is 8% of intermittent streams in the Beaver Fire burned with high severity. Given these data we believe that the buffering capacity of channels in the project area is predominantly intact. Regarding point f) in the comment there is proposed hazard tree removal in Riparian Reserves but there will be no logging in Riparian Reserves along stream channels in the project. Snags in Riparian Reserves have been retained, and additional snag retention areas have been designated. An Aquatic Conservation Strategy assessment is provided in the final EIS. The Forest Supervisor will determine whether the project meets, or does not prevent attainment of Aquatic Conservation Strategy objectives. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
233.01 - Air Quality	#6-1	There are sizable asbestos containing rock formations in the fire area, including almost the whole Grider Creek Drainage. A map is attached. "In the past, EPA response actions were often taken when materials containing greater than 1 percent asbestos were present. However, asbestos in soils at and below 1% may still pose unacceptable health risks depending on site-specific conditions and land use (EPA 2004, EPA 2008). Current EPA policy recommends development of site-specific, risk-based action levels to determine if response actions should be taken when asbestos levels below 1 percent are found at a site (OSWER Directive, EPA 2004)."http://www.epa.gov/superfund/health/contaminants/asbestos/index.htm Here are tips from the Naturally Occuring Asbestos Fact Sheet for reducing your exposure to NOA: "-Be aware of windy conditions and avoid dusty conditions to reduce exposure -Limit dust generating activities, such as riding offroad vehicles, riding bicycles, running or hiking, riding horses or moving livestock, etc. -Avoid handling or disturbing loose asbestos containing rock types - Drive slowly over unpaved roads, with windows and vents closed, to minimize dust generation (California Air Resources Board recommends that vehicle speeds not exceed 15 miles per hour on unpaved roads where asbestos is present) -Avoid or minimize the tracking of dust into vehicles [and homes] -Do not use compressed air for cleaning your vehicles after your visit. Use a wet rag to clean the interior" and, as other sources suggest, a High Efficiency Particulate Air (HEPA) filter vacuum." And here's more from EPA: "Common work practices include limiting activities on NOA-containing areas, reducing driving speed on unpaved roads that may contain NOA, and cleaning vehicles driven over NOA. For example, during road construction or maintenance activities on unpaved areas where NOA is present, the As- bestos Airborne Toxics Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations of the California Air Resources Board (ARB) requires that vehicle speeds not exceed 15 miles per hour.1 Worker health and safety measures that include respiratory protection may be warranted. For information, consult with Occupational Safety and Health Administration Asbestos Standards for the General Industry and Asbestos Standards for the Construction Industry (http://www. osha.gov/SLTC/asbestos/hazards.html)."	Thank you for the information. How the existing regulations related to the potential for naturally occurring asbestos is discussed in the Section I of the Amendment to the Geology Report.
233.01 - Air Quality	19158-1	I finally was able to review more documentation regarding the project, and found the air quality resource report. Great to see you're the contact! First, Siskiyou County is currently in attainment for ozone. Nonetheless efforts to mitigate ozone precursors are encouraged. On page two the report has a bold type "Invalid source specified..", regarding organic aerosols. Should that be clarified or the referral to peaking aerosols be removed? Also on page two, under direct and indirect effects, it states: "So the emissions from the prescribed fire will be 8 per year." (That sounds really low). That snetence in particular is unclear in its conclusion and it may be help to state what units the "8" is referring to. It is 8 tons of emissions, combined total, NOx, PM, or? I have not reviewed all the documentation so please excuse my ignorance regarding the following. I read that the project entails over 16K acres total of Rx fire use. How many years does that cover? Is there any consideration to utilize smoke or particle monitors for the project? Road comments/questions include: If dust control or mitigation is required or has already been factored in, will there be water availible to wet roads under the current and forecast drought conditions? Is road grading or construction of roads, even tomporary, part of this project? Are there roads, existing or planned, in or through ultramafic rock locations? If so, California Air Toxic Control Measure(s) for the control of dust from naturally occuring asbestos may be applicable and should probably be addressed if not already so.	The "Invalid source specified" error was due to a formatting issues that was from converting the word document over to a .PDF. There should have been a link the website http://www.arb.ca.gov/app/emsinv/emssumcat.php. The only criteria pollutants analyzed for was nitrogen oxides due to the incorrect assumption that Siskiyou County was still in non-attainment for ozone. The amendment has updated this assumption to correctly identify Siskiyou County as in attainment for all criteria pollutants so Conformity is not required. The nitrogen oxide analysis was continued in the amendment to allow the reader to compare between the draft EIS and the final EIS only. There is no requirement for an analysis for particulate matter or dust (since the county is in attainment). However, a first order analysis was completed and is included in the Air Quality report amendment. There are mitigations in place that require water or chemical dust suppressant to reduce dust while hauling on dirt roads. There are an estimated 16,000 acres of prescribed burning. Only about 20% of that is assumed to be implemented in any given year (so 5 years total). FOFEM results show that there is about 5 lbs./acre of NOx emissions (see addendum to the AQ report) – so ((0.20x16,000)x5lb/acre)/2000)) = 8 tons/year of emissions of NOx (it was a typo to leave out the units). This is laid out a little better in my updated report. There is standard road maintenance associated with this project which will be completed with programmatic mitigations. An analysis regarding naturally occurring asbestos is in the Geology report amendment. Timber harvest is exempt from most of the regulation regarding naturally occurring asbestos with the exception of road construction on ultramafic rock. The project proposes temporary access roads on ultramafic rock but no new roads are being added to the system.
233.02 - Climate Change	#10501-1	You need to follow your own rules regarding logging protected forest preserves. Allowing extreme clearcutting is contrary to best practices for our environment. Especially now that California is experiencing severe drought conditions, tampering with natural recovery processes threatens watersheds and makes no sense whatsoever.	The Westside Fire Recovery project follows regional and national guidance and the standards and guideline in the Forest Plan including those related to salvage harvest, reforestation, roadside hazard treatments and fuel reduction as displayed on the summarized and referenced Forest Plan consistency checklist. Natural recovery processes will take place on between 65% to 100% of the area burned at moderate to high severity (depending on the project Alternative analyzed) as disclosed in the climate change section of Chapter 3 of the EIS. As noted in Chapter 2 of the EIS, natural recovery will take place on between 80% and 100% of the total project area.

Code	Comment Number	Comment Text	Response
233.02 - Climate Change	#13380-1	THE NW USA IS ALREADY A WAR ON OUR FORESTS AND RIVERS AND WILDLIFE FOR FAR TOO LONG!!! LOGGING INDUSTRY WE DEMAND CEASE AND DESIST IN DESTROYING OUR WATERSHEDS CLEARCUTTING FORESTS MUST BE BANNED IT JUST CAUSES DROUGHT THE MORE THE TREES GO DOWN THE LESS RAINFALL, THE LESS RAIN THE LESS FISH AND OTHER WILDLIFE SPECIES!!! CUTTING DOWN FORESTS IS VERY BAD WRONG AWFUL FOR CLIMATE CHANGE CRISES...OPPOSITE OF WHAT WE MUST BE DOING TO SAVE OUR PLANET AND BUILD HEALTHY COMMUNITIES FOR PERSONAL AND PLANETARY HEALING!!! THESE TREES ARE OLDER THAN PEOPLE AND CORPORATIONS EAGER TO RUIN EVERYTHING AND TURN ANCIENT TREES INTO TOILET PAPER THROWAWAY WASTE!! TIME TO MAKE PAPER AND MANY BUILDING MATERIALS OUT OF HEMP NOW!!! BAN CLIMATE CRIMES OF IMMORAL LOGGING WHEN OUR CLIMATE NEEDS PROTECTIONS FROM MORE RUTHLESS DESTRUCTIONS COMMITTING CRIMES AGAINST HUMANITY AND ALL LIVING THINGS!!!	The effects of project Alternatives on climate change are disclosed in the climate change section of Chapter 3 of the EIS.
233.02 - Climate Change	#13574-1	You have got to be kidding about cutting old growth forest during this time of record carbon emissions. Cutting old growth trees will help no-one. GO back to the drawing board and remember why taxpayers fund the Forest Service. It is not for silly temporary profit and large carbon emissions. You should be ashamed of yourself. Snap out of it and function in a respectful manner. You did study Biology? The mere suggestion of clear cutting old growth trees is an outrage.	The relationship between harvest of dead and dying trees and carbon storage is discussed in the climate change section of Chapter 3 of the EIS.
233.02 - Climate Change	#13702-1	Our forests are our planet's air & water conditioning systems. We need them in tact. I can't believe that in times of severe drought you are considering cutting a forest which sequesters water. It's nuts!! We cannot eat, drink or breathe money!!	The project Alternatives include cutting of live trees only if they are an immediate hazard to safety. See response to 12346-55.The effects of harvesting dead and dying trees are disclosed in the climate change section of Chapter 3 of the EIS.
233.02 - Climate Change	#14826-1	whsat will you do when all the trees, clean air and water are gone? buy clean water and air? you are creating your own slavery. the logging lifestyle is dying without the help of enviornmentalists. THERE IS A LIMITED AMOUT OF TREES, THEY CAN ONLY GROW SO FAST. you realize trees would help lessen the effects of global warming.....ya know fresh oxygen and what not	The project Alternatives include cutting of live trees only if they are an immediate hazard to safety. See response to 12346-55.The effects of harvesting dead and dying trees on water are disclosed in the air quality and water quality (hydrology) sections of Chapter 3 of the EIS.
233.02 - Climate Change	#15169-1	But, since the deaths of forests effect the air and climate of the entire planet, I felt I had to speak out. Although, I did not "personalize" the letter below. I feel that it already says what needs saying better than I could do. But please, I would ask you to give the below full consideration nonetheless, as it is of crucial importance!	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 3 of the final EIS for a disclosure of project's effects to air quality and climate.
233.02 - Climate Change	#15253-1	It is inexcusable that in the massive drought conditions that California is now facing and has been facing for so many years now but has become extreme, that any further thought of deforestation under any guise would be considered madness. To expose the land to further degradation, sun penetration, drying trends, siltation, etc. should be considered criminal at this point in history. Deforestation should be stopped globally particularly in evergreen forests, in order to cease climate change and absorb the massive buildup of CO2. What you are proposing should be banned and for your own sakes, you should voluntarily cease deforestation and be planting everything you can for any kind of future for your children and families now.	The project Alternative include the cutting of live trees only if they are an immediate hazard to safety and planting seedlings to recover conifer forest as described in Chapter 2 of the EIS. See response to 12346-55.The effects of harvesting dead and dying trees on water and climate change are disclosed in the water quality (hydrology) and climate change sections of Chapter 3 of the EIS.
233.02 - Climate Change	#17386-2	I attribute much of our current drought to the removal of millions of trees: each mature tree transpires 200 +/- gallons of water per day. That is hundreds of million of gallons of water every day that is not stabilizing our climate. (We humans also like to breathe their oxygen)	See the response to comment number 14826-1.

Code	Comment Number	Comment Text	Response
233.02 - Climate Change	#18872-12	The drought conditions, with far less water for all is not a mystery, the ocean currents are the key to our weather. Warm currents are seen farther North creating warmer water with warmer storms in the North.	We acknowledge that California is in a drought; however, this is beyond the scope of the project's analysis.
233.02 - Climate Change	#18883-13	Reforestation should utilize seedlings grown in a nursery from seeds taken from live trees in adjacent forests. These seedlings will be more adapted to local soil and water conditions and may be more resilient to climate change.	It is already the policy of the Klamath National Forest to utilize seedlings grown in a nursery from local seeds; when available, these seedlings even come from the same district where they are to be planted. Reforestation will plant seedlings appropriate to the climate of the project area as discussed in Chapter 2 of the EIS to insure these seedlings are adapted to local soil and water conditions; these seedlings may be more resilient to climate change as disclosed in the climate change section of Chapter 3 of the EIS.
233.02 - Climate Change	#18909-108	The ability of the Region's forestlands to sequester and store carbon has become a matter of national and international significance. Region 5 Ecological Restoration Implementation Plan The DEIS claims that our forests will benefit from fuels reduction designed to favor fire-resistant trees and reduce the risk of loss due to wildfire and will ultimately reduce carbon dioxide emissions from future fires. However as show from our comments we do not believe this assumption to be true. The DEIS fails to consider even the most rudimentary calculation of the carbon emissions involved in logging, yarding, hauling and processing. It does not consider: the rate of CO2 emissions from standing snags compared to snags that are taken off site, the role of down rotting logs on soil carbon levels or future stand development and CO2 capture, the role of forest soils on carbon sequestration, the impacts of increased fire hazard (via slash and plantation establishment) or the influence of the low surface to volume ratio of slash, sawdust and disposable wood products compared to the high surface to volume ratio of large snags and down wood on carbon sequestration. A recent Executive Order called for several agencies, including the Department of Agriculture to meet and create a plan to adapt their land- and water-related policies to protect watersheds and natural resources in the face of climate change. The DEIS does not consider or address the 2012 National Fish, Wildlife and Plants Climate Adoption Draft Strategy. Live tees, like the live trees targeted for removal in the Westside project, absorb carbon dioxide for use in photosynthesis, making them one of the most effective natural tools to remove the greenhouse gas from the atmosphere. It is imperative to retain dense stands and canopy on north and east facing slopes in regards to climate change, as these areas will provide the highest amount of refugia for plant and animal species. Further, the DEIS fails to analyze the fact that large old trees can store carbon for decades and even centuries. Preserving intact snag forest ecosystems and forests in this region is also a local solution to climate change. Further the DEIS does not consider the effects of climate change on weather, plants or wildlife. The agencies own scientific accounts19 show that these watersheds may continue to experience drought, decreased snow pack, rain events which increases the chance for flooding and possibly increased wind events which can influence fire behavior. 19 Butz, Ramona J. and Safford, Hugh. A summary of current trends and probable future trends in climate and climate-driven processes for the Klamath National Forest and surrounding lands. USDA Forest Service, Pacific Southwest Region.	The climate change section of Chapter 3 of the final EIS have been expanded to address carbon storage (sequestration). Department of Agriculture and Forest Service climate change adaptation guidance is followed. The information provided by Ramona Butz and Hugh Safford (Forest Service 2011) for the Klamath National Forest has been incorporated. As noted in responses to previous comments, live trees are not targeted for removal unless they are an immediate hazard to safety.

Code	Comment Number	Comment Text	Response
233.02 - Climate Change	#18926-31	The DEIS claims that our forests will benefit from fuels reduction designed to favor fire-resistant trees and reduce the risk of loss due to wildfire and will ultimately reduce carbon dioxide emissions from future fires. The DEIS fails to mention the effects of logging or include analysis regarding the carbon emissions involved in logging, yarding, hauling and processing. It does not consider: the rate of CO2 emissions from standing snags compared to snags that are taken off site, the role of down rotting logs on soil carbon levels or future stand development and CO2 capture, the role of forest soils on carbon sequestration, the impacts of increased fire hazard (via slash and plantation establishment) for the first 20 years after harvest on carbon sequestration should there be another stand replacing fire or the influence of the low surface to volume ratio of slash, sawdust and disposable wood products compared to the high surface to volume ratio of large snags and down wood on carbon sequestration.! ! A recent Executive Order called for several agencies, including the Department of Agriculture to meet and create a plan to adapt their land- and water-related policies to protect watersheds and natural resources in the face of climate change. The DEIS does not consider or address t	The commenters statements are inaccurate and claims are unsupported by evidence. The EIS analyzed the effects of logging throughout Chapter 3 of the EIS. Carbon emissions are discussed to the extent practical in the climate change section of Chapter 3. The purpose and need of the project includes the improvement of watersheds. See Chapter 2; the project incorporates watershed project design features and legacy site treatments. See Chapter 3 of the EIS for a disclosure watershed effects.
233.02 - Climate Change	#18926-32	Live tees, like the live trees targeted for removal in the Westside project, absorb carbon dioxide for use in photosynthesis, making them one of the most effective natural tools to remove the greenhouse gas from the atmosphere. It is imperative to retain dense stands and canopy on north and east facing slopes in regards to climate change as these areas will provide the highest amount of refugia for plant and animal species. Further, the DEIS fails to analyze the fact that large old trees can store carbon for decades and even centuries. Preserving intact snag forest ecosystems and forests in this region is also a local solution to climate change.! !	This project will only cut live trees that are of an immediate safety hazard as discussed in Chapter 2 of the EIS. See response to 12346-55.The expanded discussion in the climate change section of Chapter 3 of the final EIS acknowledges the storage capabilities of large old live trees and discloses the effects to carbon storage of removing dead and dying trees.
233.02 - Climate Change	#19079-10	Lie #1, the forest will become sequestered as lumber. Very little of the carbon in a forest will end up in a finished wood product. Over 60% of the carbon in a young growth redwood and fir forest is found in the leaves, branches, stump, roots and soil (Jandl 2007, Bonan 2008, Thomas and Martin 2012), all of which is left to decompose or be burned, releasing most of it's CO2 to the atmosphere in a short period of time. Of that which makes it to the mill, roughly half will end up in a finished product, the rest is mill waste to be burnt or put in a landfill where it is converted to methane.	The expanded climate change section of Chapter 3 of the EIS acknowledge the importance of forests, especially with healthy live trees, as carbon sinks (for carbon storage). Although they mention that some carbon is stored in finished wood products, these sections do not suggest that this is a major proportion of carbon storage. Carbon is stored in dead trees for a short time period but is released when these dead trees decay as disclosed in these sections of Chapter 3 of the EIS; this is reinforced in the citations provided in the comment.
233.02 - Climate Change	#19079-11	Lie #2, this lumber will remain sequestered for 100 years. Of the 20% that does become a wood product, most of this will be in use for less than 40 years (Smith 2006, Gower 2006, Ingerson 2009, Skog 2008). Of the 1% that does stay in use for 100 years, this is still not to be considered long term sequestration, as it only means that this carbon will enter the atmosphere when sequestration is most needed. The conservative IPCC states that by 2100 we need to be carbon neutral or carbon negative worldwide or expect the worst.	Nowhere in the EIS is it suggested that carbon requested in lumber or wood products is in use for more than 40 years. However, carbon in the dead or dying trees in the project are likely to release carbon much sooner than 40 years. The project will not affect the ability of the forest to be a carbon sink (store carbon) by 2100.
233.02 - Climate Change	#19079-12	Lie #3, a young forest takes in the lions share of carbon and not so much as it matures. As a tree matures it adds ever greater amounts of carbon to it's structure. If the biomass of a tree is 50% carbon, and that biomass is growing ever greater as the tree matures, then it's storage of carbon is also increasing as it matures, and not visa versa as the timber industry claims. This is especially true for conifer forests in Northern California. The following quotes from recent research highlight this fact; "The oldest tree we measured produced more heartwood in its main trunk over 651 years (351 m3) than contained in any tree we measured <1500 years old. Increasing wood production as trees age is a mechanism underlying the maintenance of biomass accumulation during forest development and the carbon-sink capacity of old-growth forests" (Sillett 2009). "Large, old trees do not act simply as senescent carbon reservoirs but actively fix large amounts of carbon compared to smaller trees; at the extreme, a single big tree can add the same amount of carbon to the forest within a year as is contained in an entire mid-sized tree" (Stephenson 2014).	Nowhere in the EIS is it suggested that young trees take in the lion's share of carbon and older trees take in less. It is suggested, in the expanded climate change and vegetation sections of Chapter 3 of the EIS that live trees are most important for carbon storage over time since dead or dying trees release carbon as they decay.

Code	Comment Number	Comment Text	Response
233.02 - Climate Change	#19079-2	Where in the document do you refer to "climate change?" The President has directives, Department of Interior and the USFS have directives when planning projects to consider the impacts of climate change.	The project is consistent with Presidential Executive Order on Sustainability, the draft Council on Environmental Quality recommendations on greenhouse house emissions, and the most recent Forest Service directives of 2009. The disclosure of effects of the project on climate change is provided in the expanded climate change section of Chapter 3 of the final EIS and in other referenced sections of the Chapter.
233.02 - Climate Change	#19079-4	No green growing trees should be cut. International research has deemed old growth trees sequester the most CO2 out of the atmosphere and deliver oxygen, more than second growth or third growth forest stands.	See the response to comment number 18926-32.
233.02 - Climate Change	#19079-9	As climate disruption accelerates, tipping points are reached and carbon levels soar, it is imperative that all of humanity work together to drastically cut emissions while removing excess carbon from the atmosphere, storing it long term as best we can. Or as Spock would say, "it's the only logical choice we have Jim." Yet we are given very few options, and in truth there is only one that can actually stem the tide. The last hope for mankind lives in a forest near you, and it's called a tree, natures greatest carbon storage bank. For many years we have heard about the importance of saving tropical forests, but equally important is the need to save temperate forests, both softwood and hardwood, and especially the redwood/fir forests of Northwestern California. They soak up carbon faster, and store it longer, than anything else on earth (Keith 2009, Sillett 2009). Recent research has shown that forests are the greatest carbon sink on the planet (Pan 2011). This is a quote from one of the lead researchers, Dr. Simon Lewis; "Humans are altering the world's forests in a number of ways.....Our research shows these changes are having globally important impacts, which highlights the critical role forests play in the global cycling of carbon and therefore the speed and severity of future climate change." The other types of carbon sequestration available to us on a large enough scale are the oceans and human induced geoengineering. Unfortunately the oceans can no longer handle large amounts of carbon sequestration without becoming highly acidic, killing ocean life, while all anthropogenic methods proposed are untested, dangerous for the environment and costly beyond anyone's dreams. That is why I say that the last hope for mankind resides in our forests, and, if left to grow, these same forests would heal the earth, provide habitat for species on the brink, clean our water and provide high quality unpolluted oxygen to breathe. It's the greatest no-brainer we've ever been faced with. That is, unless, you talk to someone who makes money from cutting those forests down. Then you run into a wall of obfuscation, a fantasy land where clearcutting a forest every 30 to 40 years becomes sustainable forestry and a solution to global warming instead of a crime against humanity. The obvious oxymoron of claiming clearcuts sequester carbon has been allowed to exist and shape regulatory policy because of the power of the timber industry. They have convinced regulators that turning a forest into lumber is a form of sequestration. Though hard to believe, the following from an industry website explains this rationale; "Did you know that carbon accounts for around 50% the dry weight of a tree? When trees are harvested and manufactured into products, this carbon remains stored for the life of the wood product.....One of the best ways to address climate change is to use more wood, as it is the most abundant, biodegradable and renewable material on our planet!" I can almost hear Orwell screaming from the grave.	The expanded climate change and vegetation (silviculture) sections of Chapter 3 of the EIS acknowledge the importance of forests, especially with healthy live trees, as carbon sinks (for carbon storage) as noted in the article cited by Keith (2009), Sillett (2010) and Pan (2011). The Westside project will not remove live trees unless they are an immediate safety hazard as noted in previous responses to comments; removing dead or dying trees will not have negative effects of leaving trees to grow and store carbon. Quotation from Dr. Simon Lewis is not provided in either or these citation. There is no evidence provided that this project will measurably decrease the carbon storage capability of the project area as addressed in Chapter 3 of the EIS.

Code	Comment Number	Comment Text	Response
233.02 - Climate Change	#5873-106	Salvage and Climate Change Climate change is expected to increase the magnitude and intensity of rain events which can cause significant erosion, especially after disturbances such as fire and logging. It would be wise to retain extra material on site after fire in order to intercept and absorb the energy of rain drops, absorb and store water, stabilize soil, capture and store mobile sediment, etc. Garbrecht, J. D., J. L. Steiner, and C. A. Cox (2007), Climate change impacts on soil and water conservation, Eos Trans. AGU, 88(11), 136. http://www.agu.org/eos_elec/2007/11-136_climate.html. The agency needs to ensure that the hydrology and erosion models used in the NEPA analysis accurately account for the expected increase in storm impacts due to climate change. Salvage will exacerbate peak flow effects The Effect of Mountain Pine Beetle Attack and Salvage Harvesting On Streamflows Special Investigation. FPB/SIR/16. March 2007. http://www.unbc.ca/assets/qrrc/the_impact_of_climate_change_and_harvest_of_mountain_pine_beetle_stands_on_streamflow_in_northern_british_columbia.pdf ("Salvage clearcut logging of grey-attack forest will affect peak flows and water yield significantly more than leaving the grey-attack forest standing. The grey-attack forest continues to play a role in snow interception, in reducing incoming solar radiation and reducing wind speed across the snowpack. As a result, the annual peak flows in the stream are delayed and of less magnitude than in clearcut watersheds. Leaving the MPB grey attack forest standing will result in lower peak flows than salvage harvesting the watershed.	The Garbrecht et al. citation is not a scientific study but an opinion piece that reiterates recommendations made by the Soil and Water Conservation Service for a national conservation watershed approach for the 21st century. These recommendations are beyond the scope of the project. The expanded water quality (hydrology), climate change and soils sections of Chapter 3 of the final EIS use the most recent information on expectations for extreme storm events in the project area to consider adaptation approaches that can be related to the activities proposed in the project. The effects of the proposed project on peak flows are disclosed in the expanded water quality (hydrology) section in Chapter 3 of the final EIS.
233.02 - Climate Change	#5873-15	Salvage logging will make climate change worse because logging accelerates the transfer of carbon from the forest to the atmosphere. Carbon in wood products is transferred to the atmosphere at about the same rate as carbon in fire killed trees. However, the DEIS fails to recognize that only a small fraction of the carbon removed from the forest via salvage logging ends up in wood products, and most of it is converted to slash, sawdust, milling waste, etc. and carbon in all of these pools is transferred to the atmosphere more rapidly than carbon in the dead trees. Each year that carbon can be retained in the forest and not in the atmosphere is a climate gain which the DEIS does not properly quantify. Salvage logging also delays revegetation, so the process of carbon uptake after the fire will be slower with salvage logging than without. 18. Diverse natural young forests are more resilient to climate change than simplified forests that result from salvage logging and replanting.	The contribution to carbon sequestration (storage) is disclosed in the vegetation (silviculture) section of Chapter 3 and referenced vegetation resource report. Managing forests for carbon sequestration has been a poorly understood science; some recent publications indicate that active forest management is believed to be an effective method of carbon sequestration for the future. Scientific evidence to support carbon storage is cited in the climate change section of Chapter 3 of the final EIS and in the expanded climate change section of that Chapter. This project retains all live trees except those that pose an immediate danger to safety so that carbon storage is continued in live trees.

Code	Comment Number	Comment Text	Response
233.02 - Climate Change	#5873-159	In the United Kingdom, which started estimating prices for carbon emissions several years ago, the government's latest calculation is a range of $41 – $124 per ton of CO2, with a central case of $83. An expanded calculation of carbon prices for the United States should at least explore prices in this range … Frank Ackerman, Elizabeth A. Stanton. 2010. The Social Cost of Carbon - A Report for the Economics for Equity and the Environment Network. April 1, 2010. http://www.e3network.org/papers/SocialCostOfCarbon_SEI_20100401.pdf. In recent work, Nordhaus (2010) ran a an updated version of the regional integrated model of climate and the economy (RICE model). The model also calculates the path of carbon prices necessary to keep the increase in global mean temperature to 2 °C or less in an efficient manner. The carbon price for 2010 associated with that goal is estimated to be $59 per ton (at 2005 prices) … William D. Nordhaus 2010. Economic aspects of global warming in a post-Copenhagen environment. PNAS June 29, 2010 vol. 107 no. 26 11721-11726. http://www.pnas.org/content/107/26/11721.full.pdf. The 2006 "Stern Review" from the UK Treasury concluded that each ton of carbon dioxide emitted will cause $85 worth of damage to the world's economy. http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm. According to the Congressional Research Service, capturing and storing most of the carbon from coal as it is combusted costs between $43-89/ton of CO2, and this price will likely increase after the many safety, environmental, and efficiency problems with CSS are fully accounted for. Parker, Folger & Stine. 2008. Capturing CO2 from Coal-Fired Power Plants: Challenges for a Comprehensive Strategy. CRS Report for Congress. http://www.fas.org/sgp/crs/misc/RL34621.pdf citing S. Julio Friedmann, Carbon Capture and Sequestration As a Major Greenhouse Gas Abatement Option (November 2007), p. 11. That's another good indication of the value of a storing a ton of carbon in forests. Howard, P. 2014. OMITTED DAMAGES: What's Missing From the Social Cost of Carbon. http://costofcarbon.org/files/Omitted_Damages_Whats_Missing_From_the_Social_Cost_of_Carbon.pdf ("ABSTRACT: The 2013 Interagency Working Group on the Social Cost of Carbon (IWG) updated the U.S. social cost of carbon (SCC) for 2015 from a central value of $24 to $37 using three integrated assessment models (IAMs): DICE-2010, FUND 3.8, and PAGE09. The SCC is the additional economic damage caused by one ton of carbon dioxide. While some have questioned the increase in the SCC as too high, a thorough examination of the latest scientific and economic research shows that $37 should be viewed as a lower bound. This is because the studies available to estimate the SCC omit many climate impacts—effectively valuing them at zero. Where estimates are available for a given type of impact, they tend to include only a portion of potential harms. This paper represents the first attempt to systematically examine and document these omissions for the latest versions of the three IAMs used by the IWG, as well as earlier versions when they are used in calibrating the updated models. … [H]ot spot damages include[e] increases in forced migration, social and political conflict, and violence; weather variability and extreme weather events; and declining growth rates. A better accounting of catastrophic damages is also needed, as well as many other impacts.") Laurie T. Johnson & Chris Hope, 2012. The social cost of carbon in U.S. regulatory impact analyses: an introduction and critique, J Environ Stud Sci. DOI 10.1007/s13412-012-0087-7. http://www.springerlink.com/content/863287021p06m441/fulltext.pdf?MUD=MP ("We reestimate the values from the models (1) using a range of discount rates and methodologies considered more appropriate for the very long time horizons associated with climate change and (2) using a methodology that assigns "equity weights" to damages based upon relative income levels between regions—i.e., a dollar's worth of damages occurring in a poor region is given more weight than one occurring in a wealthy region. Under our alternative discount rate specifications, we find an SCC [social cost of carbon] 2.6 to over 12 times larger than the Working Group's central estimate of $21"…) If the agency chooses to disclose the economic and other benefits of logging, they must also disclose the social costs. See Sierra Club v. Sigler, 695 F.2d 957, 979 (5th Cir. 1983), Hughes River Watershed Conservancy v. Glickman, 81 F.3d 437, 448 (4th Cir. 1996); Columbia Basin Land Prot. Assn v. Schlesinger, 643 F.2d 585, 594 (9th Cir. 1981).	The carbon dioxide emissions projected to occur due to the project activities are disclosed in the air quality section of Chapter 3 of the final EIS. The future benefits to carbon storage of reforestation and recovery are disclosed in the climate change section of Chapter 3 of the EIS.

Code	Comment Number	Comment Text	Response
233.02 - Climate Change	#5873-160	The DIS says “active forest management is believed to be an effective method of carbon sequestration.” This is not a well-supported statement because virtually every type of logging, including salvage logging and fuel reduction will transfer carbon form the forest to the atmosphere, increase GHG emissions, and make climate change worse. See Mitchell, Harmon, O’Connell. 2009. Forest fuel reduction alters fire severity and long-term carbon storage in three Pacific Northwest ecosystems. Ecological Applications. 19(3), 2009, pp. 643–655 http://www.fs.fed.us/pnw/pubs/journals/pnw_2009_mitchell001.pdf; Heiken, D. Myths & Facts on Forest, Carbon and Global Warming slide show clarifying many misconceptions about forests, logging, and carbon: http://www.slideshare.net/dougoh/forest-carbon-climate-myths-presentation/; Heiken, D. “The Straight Facts on Forests, Carbon, and Global Warming” provides a more detailed foot-noted report: https://dl.dropboxusercontent.com/u/47741/Oregon%20Wild%20Report%20on%20forests%2C%20carbon%2C%20and%20global%20warming%2C%20ver.%201.4.pdf Avoid “before-and-after” carbon accounting Some NEPA analyses say that logging is carbon neutral because the forest captures and stores the same pre-harvest amount of carbon after a period of regrowth. This is highly misleading. The proper analysis requires comparison of the amount of carbon with the project and without the project, not before and after logging. This is not only required to accurately determine the effect of vegetation removal on forest carbon storage but it is also consistent with NEPA requirements to compare action and no action alternatives. The only way to properly evaluate the net carbon impacts of energy from forest biomass [or any vegetation management] is to estimate … net change in atmospheric CO2 levels over time with and without the harvest of wood biomass for energy. …[I]t is necessary to construct a baseline, or control, scenario (that is no biomass harvest). … Once a baseline is established, one can assess how switching to wood biomass would change atmospheric carbon levels. … [T]he information provided by only comparing forest carbon stocks before and after biomass harvest could be a very misleading indicator of the impact of biomass energy on the atmosphere. Carellichio, P., Walker, T. 2010. Commentary: The Manomet Study Got the Biomass Carbon Accounting Right. The Forestry Source. 4 Nov 2010. http://www.nxtbook.com/nxtbooks/saf/forestrysource_201011/index.php#/4. The Carbon Value of Wood Products Substitution is Over-estimated. The agency should avoid arguments that support logging and the alleged climate benefit of storing carbon in wood products or using wood as a substitute for alternative building materials. There may be some slight benefit from wood as a substitute but most of the analysis that tout this effect are produced and advocated by the timber industry with unreasonable assumptions that don’t stand up to scrutiny. • Only a small fraction of the carbon in a forest ends up in long-term storage in wood products. Most of the carbon in a logged forest is transferred to the atmosphere in an accelerated fashion. For every ton of carbon stored in wood products, there are several times more carbon from the forest prematurely transferred to the atmosphere. • Substitution is speculative because the alleged benefits are in the distant future, and it takes more than a century to off-set the carbon emissions caused by logging forests. • Also, carbon benefits from substitution are typically realized in the distant future and must be discounted. • Many analyses start with bare ground instead of an existing forest, which biases the analysis because the carbon loss from logging are not accounted for. • Many analyses forget that wood already dominates the building material markets, and climate benefits would only be realized to the extent wood actually displaces other building materials, which is very difficult to show. People have a strong preference for wood houses, so less logging does not necessarily translate into more steel and cement houses. It’s virtually impossible to verify that a given wood product from a given harvest activity actually being used to substitute for steel and concrete. • Using wood may delay, but does not prevent, fossil fuel use. • Carbon credits require “additionality.” Credit can only be given if the market share of wood increases relative to steel and concrete. This is unlikely. • A credible analysis of substitution must account for the time it takes to reabsorb the carbon after forests are logged, differences in the useful lifespan of different building materials, the improving carbon efficiency of the energy input used to make alternative building materials, the possibility of demand-side policies such as recycling and “demand reduction.”	Powers, E., Marshal, J., Zhang, J., and Wei, L. 2013. Post-fire management regimes affect carbon sequestration and storage in a Sierra Nevada mixed conifer forest. Forest Ecology and Management. Vallant, N, Reiner, A., Wright, E. 2013. Prescribed fire effects on field-derived and simulated forest carbon stocks over time. Forest Ecology and Management. Zhang, J., Powers, R., and Skinner, C. 2010. To manage or not to manage: The role of silviculture in sequestering carbon in the specter of climate change. Forest Service Proceedings RMRS-P-61. Hurteau, M. and North, M. 2010. Carbon recovery rates following different wildfire risk mitigation treatments. Forest Ecology and Management. North, M. and Hurteau, M. 2011. High-severity wildfire effects on carbon stocks and emissions in fuels treatments and untreated forest. Forest Ecology and Management. Powers et al (2013) found that while areas without salvage retained higher stored carbon (due the snags left on the landscape) they had the lowest carbon sequestration rates compared to treated areas. Valliant et al (2010) showed that after 8 years after treatment the stored carbon removed via fuels reduction was nearly equal to areas with no treatment, but the areas with no treatments had a potential for 45% more carbon emissions under wildfire conditions. Zhang et al (2010) and Hurteau and North (2010) both reported benefits to carbon sequestration as a result of forest management activities including fuels reduction and timber harvest. North and Hurteau (2011) found that areas with post-fire treatments have a greater initial loss of stored carbon but long-term the areas may benefit from a lower rate of decomposition (releasing less carbon) and increased carbon sequestration rates. Harmon and O'Connell (2009) found that fuels treatments removed more carbon than was estimated to be lost during a wildfire. North and Hurteau (2011) and Powers et al (2010) report similar findings - that there is an overall immediate loss of stored carbon if vegetation is removed. However, they also reported increases in overall sequestration and chronic loss of stored carbon from decomposition of dead material. Heiken (2011) is a opinion article and is not peer reviewed. It does provide recommendations for improving carbon storage which includes protecting and promoting old growth forests. The project is designed to restore and move toward a fire-resilient ecosystem (see Purpose and Need in Chapter 1 of the final EIS). This is in line with Mr. Heiken's recommendations as how the Alternatives meet this need is summarized in the comparison of Alternatives section of the final EIS.

Code	Comment Number	Comment Text	Response
233.02 - Climate Change	#5873-161	The agency should avoid bringing unsupported information into the NEPA process. The agency must give fair treatment to the merits of the competing ideas by disclosing the flaws and caveats associated with the substitution argument. Shafer et al (2011) state: An alternative to increasing carbon stores within the forest is to harvest wood and store some of this carbon within wood products (Perez-Garcia et al., 2005). Under current manufacturing, use, and disposal practices this alternative is unlikely to increase the overall carbon store of the forest sector, which includes the forest and wood products derived from the forest (Harmon et al., 2009). Manufacturing, use, and disposal of harvested wood all entail significant carbon losses that are either as large as or larger than those in the forest itself (Krankina and Harmon, 2007). Wood products carbon offsets associated with biofuels and substitution of wood for more energy intensive building materials, such as steel and concrete, can theoretically increase the carbon "stores" of wood products beyond that stored in the forest itself (Perez-Garcia et al., 2005; Lippke et al. 2010). However, several issues need to be recognized regarding these offsets. First, most analyses have presented theoretical maximum product substitution offsets and ignored the effects of additionality (i.e., degree to which practices differ from business as usual or statutory requirements), permanence and replacement of existing wood products, and enduser preferences for building materials. If these factors are included, then substitution effects are substantially lower than the theoretical maximum and unlikely to surpass carbon stores in forests for many centuries if at all. Second, depending on the starting condition of the forest, both product substitution and forest-related biofuels can create carbon debts that delay carbon benefits. For example, biofuels harvested from existing forests could offset fossil fuel releases of carbon, but recent studies have indicated that carbon debts associated with the energy used during biofuel harvests, decreased carbon stores in forests, and differences in carbon to energy ratios could persist for decades to centuries, implying a significant temporal lag in net carbon uptake (Fargione et al., 2008; Searchinger et al., 2009). Third, being offsets, the effectiveness of both biofuel and product substitution will vary with the duration of the offset; the longer the delay in releasing fossil fuel carbon, the more effective offsets become: An offset with a 1 year delay would have little impact on atmospheric CO2 concentrations, whereas an offset of hundreds of years would have a much greater impact. Unfortunately, the duration of offsets is not well understood at this point, but it is unlikely to be infinite as tacitly assumed in many current analyses. Finally, while offsets are often counted as carbon stores, they are difficult to directly inventory because they are not physically in an identifiable location, whereas carbon stored in forests can be more directly inventoried and quantified. Sarah L. Shafer, Mark E. Harmon, Ronald P. Neilson, Rupert Seidl, Brad St. Clair, Andrew Yost 2011. Oregon Climate Assessment Report (OCAR) http://occri.net/ocar Chapter 5. The Potential Effects of Climate Change on Oregon's Vegetation. http://occri.net/wp-content/uploads/2011/04/chapter5ocar.pdf	The Oregon Climate Assessment Report (Shafer et al 2011) is not directly applicable to the Westside project area; for the Westside project, information from the California climate assessment has been used. The offsets of carbon stored in harvested wood products is mentioned in the climate change section of Chapter 3 of the final EIS but is not used as an offset or mitigation to the amount of carbon storage removed by salvage of dead or dying trees. Carbon storage in wood products is just one of the factors considered in the environment effects of the project to carbon storage. See response to previous comments for additional information.

Code	Comment Number	Comment Text	Response
233.02 - Climate Change	#5873-162	Complex native forests are more resilient to climate change than simplified plantations. ... [R]educing emissions from deforestation and degradation may also yield co-benefits for adaptation by maintaining biodiversity and other ecosystem goods and services, while plantations, if they reduce biological diversity may diminish adaptive capacity to climate change (e.g., (Chum et al., 2011). Primary forests tend to be more resilient to climate change and other human-induced environmental changes than secondary forests and plantations (Thompson et al., 2009). The impact of plantations on the carbon balance is dependent on the land-use system they replace, while plantation forests are often monospecies stands, they may be more vulnerable to climatic change (see IPCC WGII Chapter 4) ... Adaptation measures in return may help maintain the mitigation potential of land-use systems. For example, projects that prevent fires and restore degraded forest ecosystems also prevent release of GHGs and enhance carbon stocks (CBD and GiZ, 2011). ... Forest and biodiversity conservation, protected area formation, and mixed-species forestry-based afforestation are practices that can help to maintain or enhance carbon stocks, while also providing adaptation options to enhance resilience of forest ecosystems to climate change (Ravindranath, 2007) ... IPCC AR5, Working Group III, Mitigation of Climate Change, Chapter 11 Agriculture, Forestry and Other Land Use (AFOLU) (Final Draft 2014) pp 46-47. http://report.mitigation2014.org/drafts/final-draft-postplenary/ipcc_wg3_ar5_final-draft_postplenary_chapter11.pdf Cumulative Impacts of GHG Emissions Must not be Minimized The DEIS says "… effects of ongoing or reasonably foreseeable future actions in the project area is expected to provide minimal cumulative effects …" (DEIS p 243). This analysis is flawed. Since the atmosphere is well-mixed globally, the cumulative effects analysis cannot be limited to "the project area." The DEIS also say "… these emissions are expected to be minimal and are expected to be minimal and able to disperse readily..." The dispersal of GHG emissions here will contribute to cumulative impacts in the rest of the world, and vice versa; cumulative emissions in the rest of the world will have impacts here. The Westside DEIS fails to take a hard look at the effects of salvage logging and other planned activities. A proper consideration of cumulative impacts of GHG on global climate change will increase the chances that the decision-maker will choose the no action alternative, or consider and choose an alternatives such as removing only small trees and leaving the large trees that store the most carbon in the forest where they will store carbon the longest.	The first half of this comment (until the citation for the IPCC AR5) is a direct quote from the IPCC AR5. There is no project specific comment associated with this text. The second half of this comment related to the cumulative effects of greenhouse gases is responded to in comment number 5873-163.

Code	Comment Number	Comment Text	Response
233.02 - Climate Change	#5873-163	The NEPA analysis must avoid minimizing this project's contribution to carbon emissions and global warming by saying the effects of this project would be negligible on a global scale. This is not an appropriate framework. Global climate change and ocean acidification are the result of the cumulative effects on the global carbon cycle which is spatially distributed. There is no single culprit, nor is there a silver bullet solution. All emissions are part of the problem, and all land management decisions must be part of the solution. Since the global carbon cycle is spatially distributed, carbon storage and carbon emissions will always we spread out around the globe, and the carbon flux at any given place and time may appear small, but cumulatively they help determine the temperature of our climate and the pH of our oceans. Given the current carbon overload in the atmosphere and oceans, the carbon consequences of every project must be carefully considered (rather than dismissed as negligible). The agency may argue that logging a few small patches of forest won't make a difference in the global scheme of the climate problem, but as Voltaire said, "No snowflake in an avalanche ever feels responsible." The NEPA analysis must recognize that global warming will not be solved by one miraculous technological fix or by changing one behavior or one economic activity. The whole global carbon cycle must be managed to reduce carbon emissions and increase carbon uptake. Recent evidence supports the conclusions that all net emissions of greenhouse gases are adverse to the climate. None can be considered de minimus. "We show first that a single pulse of carbon released into the atmosphere increases globally averaged surface temperature by an amount that remains approximately constant for several centuries, even in the absence of additional emissions. We then show that to hold climate constant at a given global temperature requires near- zero future carbon emissions. Our results suggest that future anthropogenic emissions would need to be eliminated in order to stabilize global-mean temperatures. As a consequence, any future anthropogenic emissions will commit the climate system to warming that is essentially irreversible on centennial timescales." H. Damon Matthews and Ken Caldeira. 2009. Stabilizing climate requires near-zero emissions. Nature Vol 455 | 18 September 2008 | doi:10.1038/nature07296. Former D.C. Circuit Judge Wald wrote in a 1990 dissenting opinion, which was recently quoted with unanimous approval by the Ninth Circuit in Center for Biological Diversity v. NHTSA: [W]e cannot afford to ignore even modest contributions to global warming. If global warming is the result of the cumulative contributions of myriad sources, any one modest in itself, is there not a danger of losing the forest by closing our eyes to the felling of the individual trees? 538 F.3d at 1217. Similarly, the U.S. Supreme Court's decision in Massachusetts v. EPA noted that one cannot avoid responsibility to reduce and mitigate the climate problem by attempting to minimize the scale of one's contribution to the problem. ("While it may be true that regulating motor-vehicle emissions will not by itself reverse global warming, it by no means follows that we lack jurisdiction to decide whether EPA has a duty to take steps to slow or reduce it.... In sum, … [t]he risk of catastrophic harm, though remote, is nevertheless real. That risk would be reduced to some extent if petitioners received the relief they seek." 127 S.Ct. 1438, 1455 (2007) http://web.archive.org/web/20080610172128/http://www.supremecourtus.gov/opinions/06pdf/05-1120.pdf)	Updates to the Air Quality Report's cumulative effects have been made in the Report Amendment per this comment. The greenhouse gas emissions from this project are less than 0.005% of the global annual greenhouse gas emissions (See Amendment to Air Quality Report - Methods Section and Environmental Consequences Section and the Air Quality Methods Section and Environmental Consequences Section of Chapter 3 of the final EIS). The US Forest Service Climate Change Considerations in Project-Level National Environmental Policy Act Analysis guidance document (2009) stresses that "It is not possible to determine the cumulative impacts on global climate change from emissions associated with any number of particular projects". It does go on to say that for large projects the cumulative analysis may include quantified emission in the context of other (Regional, National, or Global) emissions sources. And that there may be a qualitative description of the effect on climate change. The draft EIS and the Air Quality Report (incorporated by reference into the draft EIS) quantified the emissions but did not put it into context of other sources or describe the qualitative effects. These were updated in the Amendment to the Air Quality Report and the Air Quality Section of the final EIS (See Amendment to Air Quality Report - Methods Section and Environmental Consequences Section and the Air Quality Methods Section and Environmental Consequences Section of Chapter 3 of the final EIS).

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233.02 - Climate Change	#5873-164	CEQ draft guidance on NEPA and climate change recognizes that disclosure of the incremental nature of GHG emissions attributable to any given project is merely a restatement of the nature of the climate problem itself and and does not allow agencies ot avoid disclosure and consideration of alternatives and mitigation. CEQ recognizes that many agency NEPA analyses to date have concluded that GHG emissions from an individual agency action will have small, if any climate change effects. Government action occurs incrementally, program-by-program and step-by-step, and climate impacts are not attributable to any single action, but are exacerbated by a series of smaller decisions, including decisions made by the government. Therefore, the statement that emissions from a government action or approval represent only a small fraction of global emissions is more a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether to consider climate impacts under NEPA. Moreover, these comparisons are not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations. This approach does not reveal anything beyond the nature of the climate change challenge itself: The fact that diverse individual sources of emissions each make relatively small additions to global atmospheric GHG concentrations that collectively have huge impact. 77 Fed. Reg. 77802, 77825. (Dec. 24, 2014).	This is a quote from the CEQ Revised Draft Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (2014). The project considered the CEQ guidance in its assessment within the sideboards of the Service Climate Change Considerations in Project-Level National Environmental Policy Act Analysis guidance document (2009).
233.02 - Climate Change	#5873-165	NEPA Analysis of Climate Change The Forest Service is now on record in the New York Times stating that carbon consequences of forest management are relevant to project-level decision-making. … occasionally, when tour groups come through, someone will ask what role the trees might play as the nation addresses global warming. After all, forests soak up carbon dioxide as they grow. “We've always said that's outside the scope of this project,” said Michael Keown,... “But those days have come and gone.” WILLIAM YARDLEY 2009. Protecting the Forests, and Hoping for Payback. The New York Times November 29, 2009. http://www.nytimes.com/2009/11/29/science/earth/29trees.html. The Forest Service's Dave Cleaves said “Forests serve an important role in sequestering or removing carbon dioxide from the atmosphere and today, their role is even more important because of climate change. … Forests are the solution to absorbing carbon dioxide from the atmosphere and regulating temperatures. We must take an active role in keeping, planting and respecting forests for all they provide for us such as carbon, wood, flood control, wildlife habitat, and all the rest.” [FS newsletter] Engaging a Climate Ready Agency from Dave Cleaves, Forest Service Climate Change Advisor. April 30, 2013. http://www.fs.fed.us/climatechange/updates/April%202013%20Climate%20Update%20.pdf. What does adequate NEPA analysis look like? http://web.law.columbia.edu/climate-change/resources/nepa-and-state-nepa-eis-resource-center#Federal Guidelines. The Forest Service has started to answer that question … “In recognizing agency responsibility to consider climate change, the responsible official can cite the Forest Service mission to ‘sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations' and state how their decision considered climate change issues. … Climate change effects include the effects of agency action on global climate change and the effects of climate change on a proposed project. … Scoping is useful to determine if climate change issues are specifically related to the proposed action. Refrain from prematurely dismissing climate change issues as “outside the scope” of the analysis and use the interdisciplinary team and other sources to identify potential cause-effect relationships (if they exist) between the proposal and climate change. … Alternatives may include mitigation measures to reduce GHG emissions, affect carbon cycling, or enhance adaptive capacity. … Many proposed projects and programs will emit greenhouse gases (direct effect) and, thus, contribute to the global concentration of greenhouse gases that affect climate (indirect effect). Quantifying greenhouse gases emitted and/or sequestered may help choose between alternatives based on relative direct effects trade-offs. Forest Service decisions having the potential to emit or sequester more greenhouse gases; … may be best informed by quantitative analyses. … Qualitative effects disclosure for a project's impacts on GHG emissions and carbon sequestration should be couched in the ecosystem's role in the carbon cycle. … Forests play a	The project record does not dispute the statements made by Micheal Keown or Dave Cleaves (as cited by the commenter). The effects of climate change on the project and effects of the project on climate change were disclosed in the draft EIS and now in the final EIS in the Climate Change Section with the Vegetation, Fire and Fuels and Air Quality reports incorporated by reference. The project includes fuels reduction which is intended to meet the purpose and need of restoration and promoting a fire-resilient ecosystem and reforestation of areas that were deforested by the wildfire will increase the speed at which conifer forest is re-established on the landscape (Environmental Consequences Section of the Vegetation Report as incorporated by reference into the final EIS).

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		major role in the carbon cycle. … It may be appropriate for the decision document rationale to include some indication of how climate change considerations (if any) were weighed during decisionmaking. These statements should reference relevant NEPA documents, assessments, and science to substantiate findings. … [W]hen responding to comments about climate change [the agency may] 1. Modify alternatives including the proposed action. 2. Develop and evaluate alternatives not previously given serious consideration by the Agency. 3. Supplement, improve, or modify the analysis. 4. Make factual corrections. 5. Explain why the comments do not warrant further agency response …" USDA Forest Service. 2009. Climate Change Considerations in Project Level NEPA Analysis. January 13, 2009. http://www.fs.fed.us/emc/nepa/climate_change/includes/cc_nepa_guidance.pdf. http://www.fs.fed.us/emc/nepa/climate_change/includes/cc_cover_letter.pdf. Note this document has some serious shortcomings. It completely misses the contribution of logging to GHG emissions and it fails to recognize the useful role of NEPA's requirement for cumulative impacts analysis to address the programmatic effects of the agencies' forest management programs. The project-level effects of logging must be linked to the cumulative global effects of climate change through a credible cumulative effects analysis. The FS' assertion that "Because the context of individual projects and their effects cannot be meaningfully evaluated globally to inform individual project decisions, it is not possible and it is not expected that climate change effects can be found to be 'significant' under NEPA and therefore require EIS preparation." Is absurd and erroneous. Recognizing the significant global impact of collective project-level actions, it is clear that a programmatic EIS is needed and a project-level FONSIs are inappropriate until one is done.	
233.02 - Climate Change	#5873-189	The following is an excerpt from Ron Bass's presentation, "NEPA and Climate Change: What Constitutes a Hard Look?" The recommended 10-step approach takes into consideration the existing provisions of the NEPA regulations, recent court decisions, and various state programs. The steps conform to the main elements of a NEPA document. Affected Environment Step 1 – Describe the existing global context in which climate change impacts are occurring and are expected to continue to occur in the future. Step 2 – Summarize any relevant state laws that address climate change. Step 3 – Describe any relevant national, statewide, and regional GHG inventories to which the project will contribute. Environmental Consequences Step 4 – Quantify the project's direct and indirect GHG emissions. Step 5 – Convert the GHG emissions into carbon equivalents using an established "carbon calculator." Step 6 – Discuss whether the project would enhance or impede the attainment of applicable state GHG reduction. Step 7 – Describe the cumulative global climate change impacts to which the proposed action would contribute, i.e., the impacts of the project on climate change. (This may use the same information as in Step 1.) Step 8 – Describe how the impacts of global climate change could manifest themselves in the geographic area in which the project is proposed, and therefore potentially affect the project, i.e., the impacts of climate change on the project (e.g., sea level rise could affect a coastal project). Alternatives Step 9 – Include alternatives that would meet the project objectives but would also reduce GHG emissions.	The Air Quality report as summarized and incorporated by reference into the final EIS include the components recommended by Bass's "National Environmental Policy Act and Climate Change: What constitutes a Hard Look?" There is no explicit climate change Alternative because it was not determined to be a relevant issue during scoping comment disposition (See Issues section of Chapter 1 of the final EIS). However, the Alternatives have varying levels of treatments and the Air Quality analysis reports emissions for all alternatives including no action for comparison. There are no project design features specifically to mitigate greenhouse gas emissions for this project. The second piece of literature cited in this comment is a newsletter summarizing discussions regarding the Department of Energy's climate change policy. This is not relevant to this project. The US Forest Service has issued guidance for dealing with climate change for US Forest service land management activities (Climate Change Considerations in Project-Level National Environmental Policy Act Analysis guidance document, 2009).

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233.02 - Climate Change	#5873-190	Mitigation Measures Step 10 – Identify mitigation measures that would reduce GHG emissions, including both project design or operational changes and potential compensatory mitigation (e.g., carbon offsets). DOE 2009. NEPA and Climate Change: "Don't Do Nothing" NEPA Lessons Learned - Quarterly Report. June 1, 2009. http://energy.gov/sites/prod/files/LLQR-2009-Q2.pdf citing Ron Bass 2008. Evaluating Greenhouse Gases and Climate Change Impacts Under NEPA: Ten Steps to Taking a Hard Look. ICF/Jones & Stokes. Impact Report Nov. 2008. http://www.icfi.com/insights/white-papers/2008/evaluating-greenhouse-gases-and-climate-change-impacts-under-nepa-ten-steps-to-taking-a-hard-look. NEPA's requirement to take a "hard look" requires the agency to consider the effects of logging-related GHG emissions. This includes: • Disclose whether the cumulative effects of logging-related GHG emissions are consistent with emissions reduction goals established by state or federal government or international agreements. In 2007, the Oregon legislature passed HB 3543 that codifies Governor Kulongoski's greenhouse gas reduction goals: namely, by 2010 to begin to reduce greenhouse gas emissions, by 2020 to achieve greenhouse gas levels 10% less than 1990 levels and by 2050 to achieve greenhouse gas levels 75% below 1990 levels. ORS § 468A.205. The agency should also strive to harmonize with State of Oregon statewide land-use planning goals (adopted in administrative rules) that prohibit land use activities that exceed the "carrying capacity" of air and water resources. OAR 660-015-0000(5) - (6). The Department of Land Conservation and Development (DLCD) defines "carrying capacity" as a "Level of use which can be accommodated and continued without irreversible impairment of natural resources productivity, the ecosystem and the quality of air, land, and water resources." There is a large body of science indicating that we are already beyond the level of CO2 in our atmosphere that can be described as safe or reversible. "In November 2014, in a historic joint announcement with China, President Obama laid out an ambitious but achievable target to reduce greenhouse gas emissions in the United States in the range of 26 to 28 percent below 2005 levels by 2025." https://www.whitehouse.gov/climate-change; https://www.whitehouse.gov/the-press-office/2014/11/11/fact-sheet-us-china-joint-announcement-climate-change-and-clean-energy-c On June 25, 2013, President Obama released his Climate Action Plan which includes forest conservation among the "first pillar" of efforts to reduce emissions, saying: "Preserving the Role of Forests in Mitigating Climate Change: America's forests play a critical role in addressing carbon pollution, removing nearly 12 percent of total U.S. greenhouse gas emissions each year. … Conservation and sustainable management can help to ensure our forests continue to remove carbon from the atmosphere … " http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf "[A]dvancing efforts to protect our forests" is also mentioned in the 6th U.S. Climate Action Report under the United Nations Framework Convention on Climate Change (UNFCCC). The agency should advance this national climate goal by conserving public forests. Carbon emissions from logging public lands directly conflict with this important national goal and indicate potential significant impacts requiring an EIS. Logging related GHG emissions (and forgone opportunities for increased storage of carbon in forests) will conflict with these state, federal and international GHG reduction goals. • Disclose the social cost of carbon as a proxy for the impacts of GHG emissions. GHG emissions from logging (and other land management activities) impose significant costs on society, such as the cost of damage caused by climate change and the costs of adapting to climate change and the cost of sequestering carbon to mitigate emissions. CEQ's draft guidance on NEPA and Climate Change recognizes that the social cost of carbon ("SCC") is a "harmonized, interagency metric that can provide decisionmakers and the public with some context for meaningful NEPA review." 79 Fed. Reg. 77802, 77827. "The SCC estimates the benefit to be achieved, expressed in monetary value, by avoiding the damage caused by each additional metric ton (tonne) of carbon dioxide (CO2) put into the atmosphere. Ruth Greenspan and Dianne Callan, World Resources Institute, More than Meets the Eye: The Social Cost of Carbon in U.S Climate Policy, in Plain English (July 2011) at 1. The NEPA analysis should carefully disclose these social costs. The express purpose of SCC analysis is to provide an apples-to-apples basis for comparing a project's economic benefits with GHG pollution impacts (costs). Where SCC is not completed, these impacts (costs) are hidden from the public and, in fact, often "paid for" by the broader environment and public in the	The mitigation measures step 10 portion of this comment and the "Don't Do Nothing" citation go with comment number 5873-189 and is addressed in that response. The SCC is intended to be used to evaluate the cost benefit of restrictions on carbon emissions (Greenspan, 2011). Greenspan (2011) takes "no direct position on the merits" of SCC. The article is intended to inform the reader on how SCC values were derived and how they are intended to be used. SCC is intended to inform Federal policy and is not calibrated for the project-level. This caveat needs to be kept in mind when using it at the project level. The EPA's SCC numbers range from $12/tonne to $116/tonne. The middle value is $39/tonne and is what is used in this demonstration. The greenhouse gas emissions are about 45,000 tonnes per year ove 5 years. Assuming that the SCC is $39/tonne this comes to about $8.8 million which is mainly from hazardous fuels reduction (aka prescribed fire). The Association for Fire Ecology, the International Association of Wildland Fire and the Nature Conservancy discuss the total cost of wildfires in "Reducing Wildfire Risk: or we'll continue to pay more for fire disasters" (2015) (http://wildfiretoday.com/documents/AFE-IAWF-PositionPaper.PDF). They are including not just the suppression but the cost of training needed for fire suppression personnel, real estate devaluation, emergency services, loss of forest commodities, and long-term rehabilitation. The total cost of the Old Grand Prix wildfire in 2003 is estimated to be about $1.2 billion. The total cost of the Rim fire in 2013 is estimate to be $1.8 billion. When weighing the cost benefit the $8.8 million of SCC for hazardous fuels reduction with the total potential cost of wildfires like the Grande Old Prix and the Rim the benefits of fuels reduction outweighs the SCC of greenhouse gas emissions from the project.

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		form of degraded ecological resiliency, public health impacts, and more. The agency must recognize that the federal estimate of SCC likely underestimates—perhaps significantly—the climate impacts of GHG pollution. As the U.S. Environmental Protection Agency has concluded: given current modeling and data limitations, [the federal SCC values] do[] not include all important damages. As noted by the IPCC Fourth Assessment Report, it is "very likely that [SCC] underestimates" the damages. The models used to develop SCC estimates, known as integrated assessment models, do not currently include all of the important physical, ecological, and economic impacts of climate change recognized in the climate change literature because of a lack of precise information on the nature of damages and because the science incorporated into these models naturally lags behind the most recent research. EPA, The Social Cost of Carbon, http://www.epa.gov/climatechange/EPAactivities/economics/scc.html. Agencies seeking to incorporate climate change considerations in rules and regulations often rely on a cost-benefit analysis, weighing the cost of curbing emissions against the expected damages from every ton of carbon dioxide (CO2) that goes into the atmosphere — a value known as the "social cost of carbon" (SCC). … While no definite SCC has been set so far, an interagency working group has endorsed a "central" estimate of $21 per ton of CO2 in 2010, or roughly 20 cents per gallon of gasoline — far too small a price incentive to prompt substantive mitigation measures.	

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234 - Soils	#12346-56	Soils The Forest Service may not propose and authorize activities that will inhibit attainment of the standards and guidelines of its Land Resource Management Plan. Please note that page 231 of the DEIS indicates that: 23 For alternative 2, 2,800 acres would not meet desired conditions for soil stability, 825 would not meet surface organic matter, 2,214 acres for SOM, and 1,255 for soil structure. The KNF offers no explanation for why it intends to conduct actions that will result in undesirable soil conditions that violate forest plan standards across thousands of acres. Please note that the KNF FY12 Monitoring and Evaluation Report (page 8 and 9) discusses impacts of post-fire tractor yarding in the Panther Salvage timber and states: The majority of areas that did not meet desired [post project] conditions were located on primary skid trails and landings. Due to a lack of protective duff mat on the soil surface, and increased amount of disturbance was noted on secondary skid trails compared to green timber sales. Recommended changes to planning tractor yarding for salvage timbers sales is to reduce the extent of soil displacement and compaction by limiting slope steepness where skidding can occur or limiting the total area in the unit in primary and secondary skid trails. Alternatively, planners can reduce soil disturbance in fire salvage units by changing logging systems from tractor yarding to cable or helicopter yarding. The monitoring information above, developed by the Klamath National Forest, indicates that BMPs and PDFs are not sufficient to protect soils during KNF post-fire logging operations. KNF post-fire timber practices are not sufficient to meet Forest Plan soil standard 3-2. Page 231 of the Westside DEIS indicates that "[p]ost fire accelerated erosion due to ground based salvage logging could result in a 6 to 1,000 fold increase in sediment production." In contrast, were the KNF to allow for natural recovery of burned sites the "natural falling of dead needles, branches and eventually tree boles would continue to assist in recovery of soil stability." DEIS page 230. Page 5 of the Soil Resources Report acknowledges that: Ground-based harvest would be expected to delay vegetation recovery on up to 30 percent of a units area, and ground based harvest of roadside hazard could impact 30 to 60 percent. Vegetation began to recover almost immediately following the fires and will continue to add soil cover and increase soil stability where undisturbed. Page 20 of the Soil Resources Report concludes that "[t]he proposed action is likely to result in less than 30 percent cover and the soil stability indicator would not be met on approximately 30 percent of proposed ground based units…" The result being that "[a]dding the effects of alternative 2 to the effects of past, present, and reasonably 24 foreseeable future actions could have substantial negative effects on soil desired conditions." This result is inconsistent with the NWRP, the KNF LRMP and NFMA. The KNF practice of defining the "project area" to exceed the actual harvest units in order to mask site-level Forest Plan violations is arbitrary and capricious. Forest Plan S&Gs 3-1 and 3-2 will not be met on "about 4,000 acres" under the current logging proposal. See Soil Resources Report at 8. Pages 30-31 of the Soils Resources Report directly acknowledges that the proposed logging will violate KNF LRMP soil protection requirements. Standard 3-1 necessitates that the KNF "[p]lan and implement land management activities to maintain or enhance soil productivity and stability." 3-1 will not be met "on approximately 2,000 acres for Alternative 2, and 1,500 acres for alternative 3 through 5." Standard 3-2 necessitates maintaining certain percentages of soil cover based on slope and soil type. 3-2 will not be met "on approximately 2,000 acres for Alternative 2, and 1,500 acres for alternative 3 through 5." Standard 3-3 necessitates that timber planners "[m]aintain soil productivity by retaining organic material on the soil surface and by retaining organic material in the soil profile." 3-3 would not be met "on approximately 2,000 acres for Alternative 2, and 1,500 acres for alternative 3 through 5." Standard 3-5 requires the KNF to "[m]aintain a minimum of 85% of the existing soil organic matter in the top 12 inches of the soil profile to allow for nutrient cycling and maintain soil productivity." This standard would be violated "on approximately 2,000 acres for Alternative 2, and 1,500 acres for alternative 3 through 5." Please note that while the DEIS is replete with numerous conclusory statements regarding the efficacy of "decommissioning" temporary roads that will be (re)constructed to facilitate logging, page 20 of the Soil Resources Report acknowledges that "soil stability would remain impacted over the long term on existing or previously decommissioned temporary roads, and exiting landings." Westside timber planners have made no effort to comply with KNF LRMP Forest-wide standard 1-2 which requires the agency to "identify areas of unacceptable soil erosion during project planning of project	Project design features have been revised to effectively meet Forest Plan Standard and Guidelines 3-2 for soil cover and 6-16 for Coarse Woody Debris. Tractor harvest could result in temporarily not meeting soil cover standards, yet for any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Additional mitigations designed to meet Standard and Guideline 3-2 include limiting skidding equipment to slopes less than 35 percent, and site preparation is designed to maintain adequate soil cover by not reducing the sum of 1, 10, and 100 hour fuels to less than less than 7 tons per acre. Also during site preparation, manual felling of small diameter trees could also be accomplished to add soil cover on ground based harvest units. To meet the surface organic matter Forest Plan Standard and Guideline 3-6, the watershed-36 project design feature would require retention of 5 to 20 pieces of Coarse Woody Debris per acre. Areas that would not meet the soil organic matter indicator and soil structure indicator are limited to skid trails, temporary roads, and landings. Because these areas are small and scattered, soil productivity is unlikely to be impacted on a unit scale and Forest Plan Standard and Guideline 3-1 would be met. Text has been added to Chapter 3 – Soil to clarify Project Design Features and project impacts. Also see response to comment number 12364-1.

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		implementation so project plans for restoration and improvement can be developed." Watersheds throughout the planning area are suffering from unacceptable soil erosion associated with legacy sites that the KNF has refused to identify or address. The only watershed in which unacceptable soil erosion is acknowledged and addressed in the Westside DEIS is Elk Creek where the Water Board has required that legacy sites be addressed. No other portion of the planning area complies with Forest Plan standard 1-2.	

Code	Comment Number	Comment Text	Response
234 - Soils	#12346-67	The Westside salvage DEIS does not disclose and analyze the impacts, location, acreage or science surrounding the significant direct and cumulative impacts associated with proposed machine piling activities. 34 Please note that recently your colleagues in the Six Rivers National Forest concluded: "Machine piling/burn piles would increase ground disturbance and soil displacement when the machine turns." -Little Doe and Low Gulch Timber Sale DEIS p 110. No similar analysis or disclosure is present in the Westside DEIS. Indeed, the amount, location and impacts of machine piling are simply ignored. Mechanical piling is universally recognized as an outdated practice that has disproportionately harmful significant impacts on watershed and soil resources. Please see: Evelyn Bull et al. Trees and Logs Important to Wildlife in the Interior Columbia River Basin PNW-GTR-391 (1977). BLM, USGS, Biological Soil Crusts: Ecology and Management (Technical Reference 1730-2 (2001) (Available from BLM Publication Management Distribution Service, Bldg 41, E-16 (BC-650B) Denver, CO 80255 We further encourage the agency to examine the soil compaction monitoring reports from 1985 through 1997 on the Payette National Forest. While the Payette contains different ecotypes and soil types than does the Westside project area, the monitoring reports clearly show long-lasting and significant soil damage from tractor piling activities. Similar monitoring in the Idaho Panhandle (Jerry Niehoff) and the Kootenai National Forest (Lou Kuennen) demonstrate significant impacts to soils. We also encourage the agency to review the findings of Geppert, R.R., Lorenz, C.W., and Larson, A.G., 1984. Cumulative Effects of Forest Practices on the Environment: A State of the Knowledge. Wash. For. Practices Board Proj. No. 0130, Dept. of Natural Resources, Olympia, Wash. Manual piling or underburning is far preferable to tractor piling. Manual piling and underburning have none of the negative impacts to soils associated with tractor piling, and they provide an increased opportunity for local employment while significantly reducing long-term damage to soil health and productivity. Hence manual piling or underburning would better achieve the stated purpose and need for the project. Given that these practices can reduce fuels without the negative impacts associated with machine piling, they are reasonable to implement and reasonable to consider and analyze as an action alternative. Heavy machine use in timber sale units causes soil compaction and displacement. Soil compaction is an increase in bulk density with a corresponding decrease in soil porosity. Compaction reduces soil productivity through a reduction in root growth, tree height, and 35 timber volume (Greacen and Sands 19804; Froehlich and McNabb 19845) and may be produced by a single pass of logging equipment across a site (Wronski 19846). Productivity losses have been documented for whole sites (West and Thomas 19817) and for individual trees (Froehlich 19798, Helms and Hipkin 19869). Decreases in important microbial populations have also been observed in compacted soils (Amaranthus et al. 1996.)10 Soil compaction may also increase surface runoff because of reducing infiltration (Graecen and Sands 1980.)11 Soil displacement from ground-based machine use occurs when the tracked equipment turns on its skids pushing the soil into small piles, or berms, along the skid trails. This displacement of the topsoil removes the organic litter layer and exposes mineral soil. Removal of the loose, organic surface materials promotes surface sealing and crusting that decreases infiltration capacity and may increase erosion (Child et. Al. 1989.)12 Soil displacement also results in a loss of important soil biota, such as mycorrhizal fungi, which facilitates nutrient uptake by plants (Amaranthus et al. 1989 and 1996.)13 Please note how the Medford BLM recently responded to requests from the timber industry to authorize machine piling on federal lands:	The effects of mechanical piling were considered in the Soils section, Chapter 3, of the EIS: “Site preparation or fuels management zones could result in impacts to soil cover, soil organic matter and soil structure, especially if mechanical equipment is used. A project design feature would require site preparation treatments to be designed to meet the Forest Plan soil management direction. Site preparation and tree planting could benefit soil stability and SOM if brush fields, which are less effective soil cover, would otherwise dominate the site over the long term. In addition, Watershed Project Design Features for mechanical site preparation are described in detail in Chapter 2 of the EIS.Chapter 3 of the EIS has been revised to analyze impacts of machine piling where it overlaps with proposed harvest. Site preparation is designed to not reduce fine fuels to less than 7 tons per acre. The soils report for this project analyzed the impacts of machine piling to soil indicators, but did not account for the overlapping of the two treatments. Tractor piling has been proposed where there is a need to remove larger material that otherwise would not be feasible using hand piling. The soil organic matter indicator is used to analyze impacts to soil biota. When soil organic matter is displaced, soil biota, such as mycorrhizal fungi are impacted thereby decreasing overall soil productivity. Effects to soil organic matter are described in the soils report for the project and summarized in Chapter 2 of the EIS. Soil organic matter could be removed due to displacement from mechanical equipment or could occur gradually over time due to accelerated erosion. Accelerated erosion would be expected to decrease soil organic matter where the soil stability indicator is not met as described above. Therefore, mitigations to maintain soil stability would also maintain soil organic matter. With the application of soil stability measures described above, it is expected Forest Plan standard and guideline 3-3 would be met within the proposed activity areas.
234 - Soils	#12354-1	Salvage logging inhibits forest succession - or inhibits natural successional species. While microbial communities are more changed by fire tha n by clear-cut (1-yr.* 5- yr., and 60-yr. all show differences), the phoenicoid fungi and other microbes increasing in post-fire soils (Staddon et al. 1998) may assist in successional regeneration. "[L]ogging differs from fire, for instance, in its effects on soil nutrients (Weber 1987), carabid assemblages (Beaud ry et al. 1 997), and surface vegetation (Whittle et al. 1997). " · (Radeloff et al. 2000) Staddon, W. J., L. C. Duchesne, and J. T. Trevors. 1998. Impact of clear-cutting and prescribed burning on microbial diversity and community structure in a Jack pine (Pinus banksiana Lamb.) clear-cut using Biolog Gram negative microplates. World Journal of M icrobiology & Biotechnology 14:119-123.	Soil organic matter refers to the upper soil horizon and is expected to contain the highest amount of soil microbes including fungi. Therefore, the soil organic matter indicator has been used to analyze impacts to overall soil productivity due to changes in microbial communities. Where the soil organic matter indicator is not met, microbial communities have the potential of being been impacted. Impacts to Soils are discussed in the soils report and summarized in Chapter 3 of the final EIS. In the soils report, impacts to soil microbes and soil nutrients have been analyzed using the soil organic matter indicator. Impacts to soil cover have been analyzed using the soil stability indicator. Chapter 3 of the final EIS summarizes these impacts.

Code	Comment Number	Comment Text	Response
234 - Soils	#14557-1	During this drought, the last thing you want to do is to clear-cut trees that hold the soil. While the soil it is dry, it will blow away. And when the rains come - and they will - there will be landslides. Respect the life on earth, such as the trees, and protect the ecosystem for us all.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the final EIS for a description of proposed treatments; no clear-cutting is proposed with this project. The soils report for the project quantifies impacts to soil stability due to proposed activities including harvest. The final EIS summarizes these impacts. Landslide risk is assessed in the Geology report as amended and in the Geology Environmental Consequences Section of the final EIS. The wildfire effects did increase the landslide risk. However, the analysis shows that none of the project Alternatives increase the risk in any watershed.
234 - Soils	#15125-1	At a time of extreme drought, when the soil requires vegetation to assist with holding its integrity, you plan on adopting a "scorched earth" policy. This makes absolutely no sense.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The soil report for this project describes impacts to soil stability and surface organic matter indicators. Chapter 3 of the final EIS summarizes the soils effects analysis. When the soil stability indicator is not met, ground cover is likely to be insufficient for erosion control. Project Design Feature Watershed-30 would require additions of mulch to provide for erosion control on approximately 40 acres.
234 - Soils	#16695-3	Moreover, this project would damage the fragile soils that need to be left alone to regenerate, not subject to mechanical shear and friction from heavy machinery in their unclothed condition, not buffered from physical stress as is soil with normal vegetative detritus.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The soil report for this project describes impacts to soil indicators. Chapter 3 of the final EIS summarizes the soils effects analysis.
234 - Soils	#17460-10	It is disappointing that the recommendations of the 1995 Beschta Report, dismissed under Alternative A, were not given full scientific consideration. Many of the recommendations were simply dismissed as having been minimized by "project design features," such as the recommendation in table 2-36, Row 1 (a-f), which addressed areas having sensitive soil conditions. Yet this conclusion is not supported by the March 2015 "Soils Report" prepared for the Westside Project, which concluded that, under Alternative 2, page 5: "Adding the effects of alternative 2 to the effects of past, present, and reasonably foreseeable future actions could have substantial negative effects on soil desired 6 conditions. "	Negative effects to soils desired conditions could occur even with implementation of project design project design features. When averaged between the 3 fire areas, soil desired conditions would not be met on less than 10 percent of the fire analysis areas. Therefore, forest soils standard and guidelines would be met. The highest soils impacts would occur under Alternative 2 within the Beaver fire area. Alternatives have been proposed which would reduce the area not meeting the soil desired conditions. Soils derived from Schist, Granite, or Serpentine parent material are most sensitive to disturbance by mechanical equipment. Ground based harvest could have the highest potential to impact these soils. Project Design Feature Watershed-8 would restrict all ground based harvest equipment to less than 35 percent slopes. In site preparation units (where no salvage will occur) felling and skidding equipment will be restricted to slopes less than 35% on granitic and schist soil types. The soils report analyzes the cumulative impacts to desired conditions from the 2014 fires and proposed project activities.
234 - Soils	#17910-6	GEOLOGY: A report on salvage logging by Pacific Rivers Council in 1995 states that “Salvage logging by any method must be prohibited on sensitive sites, including: in severely burned areas (areas with litter destruction), on erosive sites, on fragile soils, in roadless areas, in riparian areas, on steep slopes, any site where accelerated erosion is possible, and watersheds with existing serious sedimentation problems.” (A report on salvage logging by Pacific Rivers Council in 1995) Is there ANY ground in the footprint of the KNF 2014 fires that does not fit in one of these categories? The potential for mass wasting, erosion and sedimentation from salvage logging “temporary” roads must be addressed in depth.	The Pacific Rivers Council Paper (Beschta et al 1995) is focused on soil productivity and soil erosion concerns in the post-fire environment. There are project design features incorporated into the Alternatives to mitigate impacts to soil resources. The estimated effectiveness of the project design features, the soil types, and the effects of the project on soil resources can be found in the Environmental Consequences in the Soil Section of Chapter 3 of the final EIS and the Soils report as amended. There is no salvage logging in hydrologic Riparian Reserves (Chapter 2 of the final EIS). The Hydrology section of the final EIS discusses the 303(d) listing under the Clean Water Act of all the watersheds in the project area. The watersheds are listed for excessive sediment and/or temperature. The effectiveness of the project design features and effects to sediment delivery to streams is summarized in the Hydrology Environmental Consequences section of Chapter 3 of the final EIS. Soil erosion processes are different than those governing mass-wasting. The Environmental Consequences in the Geology Section in Chapter 3 of the final EIS provide the estimated acres of unstable lands (as defined in the Forest Plan) in each type of proposed treatment by Alternative. The Landslide Risk assessment for the Westside Fire Recovery Project takes a holistic approach. It does not analyze the effects of each action separately, however the effects of temporary roads is incorporated into the Landslide Risk assessment. They are considered a high level of disturbance and are included in the acres of high and moderate disturbance used to estimate landslide risk. A discussion of temporary road actions and the potential effects at the site scale is in the Environmental Consequences section of the Geology report as amended.

Code	Comment Number	Comment Text	Response
234 - Soils	#18852-21	3) Disturbance to soils, soil chemistry / fertility, erosion and mass wasting is not adequately addressed.	Impacts to soil erosion have been analyzed using the soil stability indicator. Areas not meeting desired conditions for soil stability would have high erosion hazard ratings. The soil organic matter indicator analyzes impacts to the upper soil horizon where most plant available nutrients exist and soil chemistry could be most impacted. The soils report for the project analyzes these impacts which are also summarized in the EIS. Mass wasting is assessed as Landslide Risk in the Geology Report and is summarized in the EIS.
234 - Soils	#18852-47	31) Consider an upper limit for slope % for acceptable timber harvest. Slopes over 40% should not be considered for timber harvest activities, nor on unstable geologic parent materials. Increased erosion, sedimentation, slope failures, mass wasting etc. are not acceptable results of forest management and salvage logging.	Impacts to soil erosion have been analyzed using the soil stability indicator. Areas not meeting desired conditions for soil stability would have high erosion hazard ratings. The soil organic matter indicator analyzes impacts to the upper soil horizon where most plant available nutrients exist and soil chemistry could be most impacted. The soils report for the project analyzes these impacts which are also summarized in the EIS. The Forest Plan defines unstable lands as Riparian Reserves. The landforms the Forest Plan defines as unstable lands are active landslides (including earth flows), toe zones of dormant landslides, inner gorges and steep, weathered granitic lands. There is salvage harvest on these landforms. As described in the Methods section of the Geology report and summarized in the Geology section of Chapter 3 of the final EIS, root support plays the primary role in slope stability post-fire. Fire killed trees cease to provide slope stabilizing root strength after about 10 years regardless of whether the tree is left standing or is cut down. So the removal of dead trees does not affect landslide risk. The current landslide risks are elevated due to the large areas of fire killed trees. The infrastructure needed to harvest the trees does have an effect (see response to number 17910-6 on the effects of temporary road access on landslide risk). The effect is acute at the site scale but is small over a 7th field watershed scale because of the small number of acres required for landings and temporary road access. There is an indirect benefit of salvage harvest on unstable lands – post-salvage reforestation will decrease the duration of the elevated landslide risk. The landslide risk will begin to go down as there are trees large enough to provide enough root strength to reduce landslide potential (about 10 inches in diameter). The Geology Environmental Consequences Section of the final EIS and the Geology report as amended discloses the effects of salvage logging
234 - Soils	#18857-6	No salvage logging on sensitive soils, active landslides, dormant landslides, toe zones of dormant landslides, earth flows and other erosive soil types. * No salvage units on decomposed granite.	See response to comment 18852-47 regarding unstable lands. Soils derived from Schist, Granite, or Serpentine parent material are most sensitive to disturbance by mechanical equipment. Ground based harvest could have the highest potential to impact these soils. Project Design Feature Watershed-8 would restrict all ground based harvest equipment to less than 35 percent slopes. In site preparation units (where no salvage will occur) felling and skidding equipment will be restricted to slopes less than 35% on granitic and schist soil types.
234 - Soils	#18878-56	DEIS: 2,800 acres would not meet desired conditions for soil stability, 825 would not meet surface organic matter, 2,214 acres for SOM, and 1,255 for soil structure (Pg. 231) Comment: The Forest Service offers no explanation for why it intends to conduct actions that will result in undesirable soil conditions that violate forest plan standards across thousands of acres.	Ground based harvest equipment would result in the highest rates of accelerated erosion and this would have the greatest potential impact to long term soil impairment. Impacts were predicted to be highest within the Beaver Fire area, and the modified Alternative 3 only proposes ground based harvest on some of the roadside hazard treatments within this fire area. For all Alternatives and fire areas, project design project design features have been revised so that all new temporary roads would be decompacted. This would occur to a depth based on soil type and slope to promote the return of vegetation, improve soil stability, and decrease potential impacts from subsoiling. It is not our intent to conduct activities that would result in undesirable soils conditions. Therefore, an erosion control plan has been developed and by following the plan, erosion and sedimentation can be controlled or prevented.
234 - Soils	#18878-57	DEIS: Post fire accelerated erosion due to ground based salvage logging could result in a 6 to 1,000 fold increase in sediment production. (Pg. 231) Comment: The ACS and the CW A do not permit Forest Service logging actions that will result in a 6 fold increase in sediment production let alone those that will result in a 1,000 fold increase. Ground based harvest equipment would result in the highest rates of accelerated erosion. Impacts to soil stability were predicted to be highest within the Beaver Fire area, and the modified Alternative 3 only proposes ground based harvest on some of the roadside hazard treatments within this fire area.	Tractor harvest could result in temporarily not meeting soil cover standards, yet for any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Additional mitigations designed to meet Standard and Guideline 3-2 include limiting skidding equipment to slopes less than 35 percent, and site preparation is designed to maintain adequate soil cover by not reducing the sum of 1, 10, and 100 hour fuels to less than less than 7 tons per acre. Also during site preparation, manual felling of small diameter trees could also be accomplished to add soil cover on ground based harvest units. For all Alternatives and fire areas, project design project design features have been revised so that all new temporary roads would be decompacted. In addition, This would occur to a depth based on soil type and slope to promote the return of vegetation, improve soil stability, and decrease potential impacts from subsoiling. It is not our intent to conduct activities that would result in undesirable soils conditions. Therefore, an erosion control plan has been developed and by following the plan, erosion and sedimentation can be controlled or prevented. The project is consistent with Aquatic Conservation Strategy objectives, as stated in the Forest Plan; see a summary of the Aquatic Conservation Strategy review in Chapter 3 of the EIS and the full report in the project record.

Code	Comment Number	Comment Text	Response
234 - Soils	#18878-79	Finally, in terms of post-fire salvage activities the Karuk Tribe is especially concerned with any planned ground disturbing activities in inner gorges, previously active landslides and older landslide deposits. These concerns are based upon a 1998 report of general findings by USFS Geologists which states that "Watersheds devegetated by a combination of wildfire and timber harvest experienced high rates of landslides and debris flows, particularly on devegetated sensitive geomorphic terranes." (de la Fuente, et al 1997) Depending on the timing, location and severity resulting landslides and debris flows can and do endanger significant cultural resources, public and personnel safety, private property, and infrastructure.	Project Design Features prohibit salvage harvest in most sensitive areas to watershed disturbance including stream course Riparian Reserves, inner gorge, active landslides and landslide toe zones. Even though roadside hazard salvage would occur in these areas, project design features restrict these operations below the road and limit the size of trees being removed which in turn results in less ground-disturbance. Two of the purposes of the proposed actions are: 1) worker and public safety and access, 2) safe conditions for firefighters performing fire suppression for community protection. Timber harvest as used in de la Fuente (1997) is referring to green tree removal or live trees. See response to number 18852-47 for summary of reasoning for treatments on unstable lands. The Geology Report as amended and summarized in the final EIS acknowledges the effects of wildfire on landslide risk in the Affected Environment Section.
234 - Soils	#18883-8	No helicopter logging should be allowed because these areas are intrinsically steep and the disturbance of fallers and workers cutting trees and the movement of logs on the ground will accelerate erosion over the already high erosion that is occurring due to fire-loss of ground cover.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Helicopter logging and other logging techniques are proposed, consistent with the Forest Plan and law, regulation and policy. The soils report describes impacts to soil indicators. Chapter 3 of the EIS summarizes the soils effects analysis. The soils report for the project analyzes the impacts to accelerated erosion due to helicopter logging using the soil stability indicator. The no action Alternative analyzes these impacts if no helicopter logging occurred.
234 - Soils	#18883-9	Skyline logging is extremely damaging to the forest floor. This activity will tremendously increase the already bare soil mobility. Climate change is already demonstrating that increased intensity of precipitation is occurring and predictions are that it will occur in the future. These high intensity storms will increase soil particle mobilization of bare soils and skyline logging techniques will exacerbate the already fragile surface soil and cause deep gully erosion in steep areas.	General comment, opinion, or position statement; see response to Comment number 16695-4.The soils report for the project has estimated that skyline logging could increase areas with high erosion hazard ratings by approximately 10 percent. These impacts have been analyzed using the soil stability indicator. Chapter 3 of the EIS summarizes this analysis. The winter following the fire was warmer and generally resulted in higher rates of erosion due to higher intensity precipitation over the project area, most of which was rain rather than snow. See the climate change section of Chapter 3 of the EIS for a discussion of how that has been considered.
234 - Soils	#18909-94	"The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health, age into youth, death into life. Without proper care for it we can have no community, because without proper care for it we can have no life." ? Wendell Berry, The Unsettling of America: Culture and Agriculture According to the KNF LRMP the maintenance of soil productivity, permeability and fertility is a National issue of high intensity and a requirement. Soil is a critical component to nearly every ecosystem in the world, sustaining life in a variety of ways-from production of biomass to filtering, buffering and transformation of water and nutrients. Natural processes can take more than 500 years to form one inch of topsoil. According to the DEIS, 4,236 acres would not meet desired conditions for soil stability; 900 acres would not be met for surface organic matter, 2,214 acres for soil organic matter and 1,255 acres for soil structure.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. When averaged between the 3 fire areas, all desired soils conditions would not be met on less than 10 percent of the fire analysis areas. Therefore, forest soils standard and guidelines would be met. The highest soils impacts would occur under Alternative 2 within the Beaver fire area, where the soil stability indicator would not be met on approximately 29 percent of the fire analysis area. Alternatives have been proposed which would reduce the area not meeting the soil stability indicator to between 15 and 20 percent. It is not our intent to conduct activities that would result in undesirable soils conditions. Therefore, an erosion control plan has been developed and by following the plan, erosion and sedimentation can be controlled or prevented.
234 - Soils	#18909-95	Soil Stability: Soils Report page 16, "Prior to proposed activities approximately 490 acres of the project area are not meeting desired conditions for soil stability. The areas that are not meeting the desired condition have high EHRs, or less than 30 percent soil cover due to recent wildfires which combusted organic matter on top of the soil surface. Generally, existing EHRs are high on slopes greater than 30 percent and moderate on slopes less than 20 percent. Soil disturbance has the potential to increase the erosion hazard because soil cover is reduced on portions of units." Page 17, "Immediately following the fire, EHRs were high on approximately 57 percent of the project area." An estimated 4,236 acres of the project area would not meet desired conditions for soil stability because soil cover would be less than 30 percent. Construction of temporary roads, associated with ground based harvest, would have the highest impact to soil stability and sedimentation. Post fire accelerated erosion due to ground based salvage logging could result in a 6 to 1,000 fold increase in sediment production.	See response to 18909-94.

Code	Comment Number	Comment Text	Response
234 - Soils	#18909-96	Surface Organic Matter: Approximately 900 acres may not meet the desired condition for surface organic matter due to insufficient retention of large woody material. Post-fire woody debris constitutes a valuable natural element as a potential source of nutrients. Charred wood represents a considerable pool of nutrients including Nitrogen and micronutrients Sodium, Manganese, Iron, Zinc, and Copper.	The surface organic matter indicator would not be met on less than 10 percent of each of the fire analysis areas. As described in the soil resource report, a scarcity of large wood may not necessarily translate to reduced soil productivity, for a couple of reasons. First, heavily charred wood decays much more slowly; lots of smaller diameter material would be expected to remain longer. Second, coarse wood doesn't contribute that much to soil fertility – it's carbon rich and nutrient poor, so it contributes some carbon for soil organic matter (SOM), but most of the carbon goes off as carbon dioxide from microbial respiration as it decays (Spears, 2003). Also, formation of SOM is a much longer term process than the period of wood scarcity, and soil carbon has a huge buffering capacity because it is such a large source of carbon. For these reasons, it's expected that LMP soils standards and guidelines would be met for the surface organic matter indicator.
234 - Soils	#18909-97	Soil Organic Matter: Currently 660 acres do not meet standards for soil organic matter. It is anticipated that 2,214 acres for soil organic matter would not meet desired conditions. Less soil organic matter would decrease soils ability to hold moisture, with implications for soil biota, and plant growth. An adequate level of soil cover is needed to maintain soil stability and prevent accelerated erosion. The most severe displacement is expected to occur during temporary road construction, landings and skid trails. Displacement caused by new skid trails and temporary road construction will be considered a long-term disturbance as no mitigations to replace displaced soil organic matter are planned. A Non-Native Invasive Plant project design feature would require removal of the top few inches soil on approximately 24 landings. This would result in major decreases to soil organic matter on landings.	The soil organic matter (SOM) indicator would not be met on less than 10 percent of each of the fire analysis areas and therefore, it's expected LMP soils standards and guidelines would be met for the soil organic matter indicator . See soils section of Chapter 3 of the final EIS for details. Project design features have been revised to more effective decompact new temporary roads to promote the return of vegetation and improve soil stability. Effectively maintaining soil cover and decompacting temporary roads would maintain soil organic matter on site. So although displaced, it's likely soil organic matter would not be lost to soil erosion and LMP soils standards and guidelines would be met. Although the Non-Native Invasive Plant (NNIP) project design feature would result in localized, major decreases to soil organic matter on landings, this could prevent NNIP infestations within units that could out compete native plants and result in long term decreases to SOM.
234 - Soils	#18909-98	Soil Structure: Currently 815 acres are not meeting standards for soil structure. Soil structure could have substantial negative effects and would not meet desired conditions on approximately 1,255 acres. Soil structure conditions are not met when areas have reduced infiltration and permeability capacity. Reduced infiltration and permeability capacity is expected due to the use of mechanical equipment on landings, skid trails, and temporary roads. Construction of new landings, and temporary roads would reduce infiltration to near zero. Changes in porosity occur both by the reduction of soil pore space by force applied to the soil surface (compaction) and the filling of pores by soil and ash material (soil sealing). The DEIS claims, "[s]ince this is less than 10% of the project area, Forest Plan standards will be met on the project area as a whole." However, the KNF Forest Plan standards state that planned activities are to maintain or enhance soil productivity and stability and to maintain soil productivity by retaining organic material on the soil surface and by retaining organic material in the soil profile. Further, the 10% is meant for treatment acres not the entire project areas. The Westside DEIS proposed project area is 218,600 acres, however the treatment acres are less than 55,000. The DEIS fails to appropriately and adequately analyze and disclose the effects of the project and the irreversible impacts to soils. R5 FSH 2509.22 - Soil And Water Conservation Handbook, Chapter 10 - Water Quality Management Handbook, 12.11 Exhibit 03, BMP 1.3 - Determining Surface Erosion Hazard For Timber Harvest Unit Design, " Where the harvest impacts cannot be reduced to a low or moderate level with treatments, then the harvest units should be avoided or harvest methods modified, or both (see also BMP 1.6). All action alternatives in the DEIS fail to meet soil standards and guidelines. The KNF LRMP at page 4-21, "3-6 Refer to the Coarse Woody Debris (CWD) section of Biological Diversity under Biological Environment for coarse woody debris standards and guidelines designed to maintain soil fertility and provide for species needs." Alternative 2 fails to meet CWD retention requirements for soil fertility and the needs of species.	The draft EIS was revised to compare the acres not meeting soil desired conditions to the project analysis area where treatments are proposed. When averaged between the 3 fire areas, all desired soils conditions would not be met on less than 10 percent of the fire analysis areas. Therefore, forest soils standard and guidelines would be met. Project design features have been revised to more effective decompact new temporary roads to promote the return of vegetation and improve soil stability. Alternatives have been proposed which would reduce the area not meeting the soil desired conditions. It is not our intent to conduct activities that would result in undesirable soils conditions. Therefore, an erosion control plan has been developed and by following the plan, erosion and sedimentation can be controlled or prevented.

Code	Comment Number	Comment Text	Response
234 - Soils	#18926-26	SOILS ! According to the KNF forest plan the maintenance of soil productivity, permeability and fertility is a National issue of high intensity. Soil is a critical component to nearly every ecosystem in the world, sustaining life in a variety of ways-from production of biomass to filtering, buffering and transformation of water and nutrients. ! ! The dominant soils within the analysis area are mostly sandy loams or loams with gravelly to extremely gravelly texture modifiers, indicating high natural infiltration rates, and high rock content in many areas. According to the DEIS, 4,236 acres would not meet desired conditions for soil stability; 900 acres would not be met for surface organic matter, 2,214 acres for soil organic matter and 1,255 acres for soil structure.! ! Soil Stability! An estimated 4,236 acres of the project area would not meet desired conditions for soil stability because soil cover would be less than 30 percent. Construction of temporary roads, associated with ground based harvest, would have the highest impact to soil stability and sedimentation. Post fire accelerated erosion due to ground based salvage logging could result in a 6 to 1,000 fold increase in sediment production.! ! Soil Structure! Soil structure could have substantial negative effects and would not meet desired conditions on approximately 1,255 acres. Soil structure conditions are not met when areas have reduced infiltration and permeability capacity. Reduced infiltration and permeability capacity is expected due to the use of mechanical equipment on landings, skid trails, and temporary roads. Construction of new landings, and temporary roads would reduce infiltration to near zero. Changes in porosity occur both by the reduction of soil pore space by force applied to the soil surface (compaction) and the filling of pores by soil and ash material (soil sealing).! The DEIS claims, "Since this is less than 10% of the project area, Forest Plan standards will be met on the project area as a whole." However, the KNF Forest Plan standards state that planned activities are to maintain or enhance soil productivity and stability and to maintain soil productivity by retaining organic material on the soil surface and by retaining organic material in the soil profile.! !	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to 18909-94.The Forest Service acknowledges the benefits of soil resources.
234 - Soils	#19076-13	ome removal of hazard trees along public roads and strategic fuels treatments are needed to protect: local communities, but the compaction of soil due to logging and road building proposed is too harmful to such a cfitica1 a.1:ea, especially the 3 watersheds mentioned above	It is not clear which 3 watersheds are being referenced in the comment. No project action Alternative proposes timber salvage in hydrologic Riparian Reserves. See Chapter 2 of the EIS for a description of proposed actions. Further, the extent of reopened decommissioned roads and new temporary road construction is limited to 0.2 and 0.3 miles, respectively, within hydrologic Riparian Reserves under Alternative 2. This number is reduced for the preferred Alternative in the final EIS--modified Alternative 3. Given that these ground disturbing activities are very limited along waterways, adverse effects to hydrologic function and water quality are not anticipated. In addition Project Design Features (project design feature) and Best Management Practices are designed and implemented to prevent adverse effects to water quality and project activities such as planting and legacy sediment site treatments are anticipated to produce positive effects to water quality over the mid- and long-term. Project design features have been revised to effectively meet Forest Plan Standard and Guidelines 3-2 for soil cover and 6-16 for Coarse Woody Debris. Tractor harvest could result in temporarily not meeting soil cover standards, yet for any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Additional mitigations designed to meet Standard and Guideline 3-2 include limiting skidding equipment to slopes less than 35 percent, and site preparation is designed to maintain adequate soil cover by not reducing the sum of 1, 10, and 100 hour fuels to less than less than 7 tons per acre. Also during site preparation, manual felling of small diameter trees could also be accomplished to add soil cover on ground based harvest units. To meet the surface organic matter Forest Plan Standard and Guideline 3-6, the watershed-36 project design feature would require retention of 5 to 20 pieces of Coarse Woody Debris per acre. Areas that would not meet the soil organic matter indicator and soil structure indicator are limited to skid trails, temporary roads, and landings. Because these areas are small and scattered, soil productivity is unlikely to be impacted on a unit scale and Forest Plan Standard and Guideline 3-1 would be met. Text has been added to Chapter 3 – Soil to clarify Project Design Features and project impacts. Effects to watersheds and soils from project activities are discussed in the EIS, Chapter 3, Water Quality and Soils sections. See response number 19076-13. Also see response to comment number 12364-1.

Code	Comment Number	Comment Text	Response
234 - Soils	#19076-4	These three watersheds should be considered in a separate EIS because of their bedrock nature, their importance to salmon, their legacy sedime11t site status due to past management, and their lack of high intensity burt1from recent fire (3% in Thompson, 1.2% in Grider).	The project boundary is up to the discretion of the Responsible Official. The fire areas were used, as described in Chapter 1 of the EIS. Effects of treatments are considered by fire area and watershed; see Chapter 3 of the EIS under hydrology or the associated report for more information. These watersheds were included because treatments within them met the purpose and need for the Project. Unique watershed characteristics were considered and addressed through the interdisciplinary process resulting in the most appropriate project design and minimization measures.
234 - Soils	#3678-25	Soils – No Action direct and indirect effects "Under alternative 1, large surface organic matter could reach sufficient levels within approximately five years and contribute to the recovery of soil productivity. It is possible that the surface organic matter indicator would not be met if material greater than 12 inch diameter exceeds 800 cubic feet. If a wildfire occurs during the next 10 to 15 years, soils would burn with a high SBS directly beneath this large woody debris. This could occur on approximately 2,500 acres of the project area and it's estimated large wood could cover 5 to 10 percent of this area."	The removal of large woody debris, greater than 12 inches in diameter, could reduce the area that burns with high soil burn severity in a future fire. This potential benefit has been clarified in the EIS Chapter 3. As described by Brown, 2003 this benefit occur if wildfire occurs 10 to 15 years from now, through areas with greater than 35 tons per acre large woody debris. The soils report analyzed areas greater than 35 tons per acre, yet incorrectly converted 35 tons per acre to 800 cubic feet per acre. This number has been revised to 2,500 cubic feet per acre to correctly correlate to research by Brown 2003. A wildfire 10 to 15 years from now is an unpredictable event, and therefore areas with greater than 35 tons per acre large woody debris are not factored into acres not meeting desired conditions for any of the Alternatives. Under the No Action Alternative, high soil burn severity could occur on approximately 2,609 acres if a wildfire burns 10 to 15 years from now. Proposed harvest under Alternative 2 could reduce this amount by 283 acres, 123 acres for Alternative 3, 253 acres for Alternative 4, 187 acres for Alternative 5, 177 acres for the modified Alternative 2, and 173 acres for the modified Alternative 3.
234 - Soils	#5873-109	The quantity, quality, and rate of revegetation has a direct contribution to controlling erosion and sedimentation. USGS has described the role of vegetation in slope stability and erosion as follows: In a watershed, vegetation provides five major physical functions that help control soil erosion during rainfall events (Spittler, in press): • Interception of rainfall, which extends the time for water to reach the ground surface and absorbs raindrop impact energy. • Mulching of the ground surface to provide temporary water storage and slow release, slope roughness, and energy absorption. • Structural support of loose, surficial material. • Reinforcement of the deeper soil by roots, which increases the natural slope stability. • Maintains conditions necessary for soil micro-organisms that provide soil structure. http://web.archive.org/web/20040218052053/http://landslides.usgs.gov/html_files/ofr95-508/skrep2.html citing Spittler, T.E., in press, Fire and the debris-flow potential of winter storms, in, Proceedings of the Symposium on Brush Fires in California Wildlands: Ecology and Resource Management: International Association of Wildland Fire. Wagenbrenner et al (2015) found that - • Post-fire salvage logging increased soil compaction and decreased vegetative cover. • Salvage logging greatly increased sediment production from more disturbed plots. ("Sediment production from the skidder plots was 10–100 times the value from the controls.") • Salvage logging delayed post-fire recovery of vegetation and sediment production. ("The relative differences in sediment production between the disturbed plots and the controls tended to increase over time as the controls exhibited more rapid regrowth." Data were taken 2-8 years post-harvest.) Joseph W. Wagenbrenner, Lee H. MacDonald, , Robert N. Coats, Peter R. Robichaud, Robert E. Brown. 2015. Effects of post-fire salvage logging and a skid trail treatment on ground cover, soils, and sediment production in the interior western United States. Forest Ecology and Management. Volume 335, 1 January 2015, Pages 176–193. http://www.nrel.colostate.edu/assets/nrel_files/labs/macdonald-lab/pubs/Salvage-logging-Wagenbrenner%20et%20al-ForEcolMgmt-2015.pdf	The soils report for the project considers the findings of Wagenbrenner et al (2015) as well as the contribution of vegetation in controlling erosion. Vegetation would provide for the five major physical functions described. A loss of vegetation would result in areas that partially meet the soil structure indicator, and areas that do not meet the soil structure and soil organic matter indicators. The five major physical functions have not been discussed in the soils report, but the impacts have been analyzed using the soil indicators. Impacts to soils are summarized in Chapter 3 of the EIS.

Code	Comment Number	Comment Text	Response
234 - Soils	#5873-114	Salvage logging and associated activities such as site prep, fuel treatment, and planting kills understory vegetation which will significantly reduce site productivity. Salvage logging will increase soil erosion and sedimentation through the following mechanisms, each or which must be addressed in detail in the NEPA analysis: 1. Soil disturbance, 2. damage to live and dead roots, 3. removal of organic material, 4. delay of revegetation, 5. construction of roads and landings, 6. increased channel erosion from peak flow caused by a. loss of large logs that help anchor snowpacks, b. mobilization of fine soil particles that seal the soil surface and increase c. loss of dead tree canopy; See McNabb and Swanson, "Effects of Fire on Soil Erosion," Chapter 14 in Natural and Prescribed Fire in Pacific Northwest Forests, Walstad, Radosevich, and Sandberg, editors, OSU Press. Since the recovery of understory groundcover is the primary recovery mechanism for post fire recovery of erosion and runoff, and consequent downstream sediment-related effects, this indicates that post-fire logging seriously impedes recovery of sediment regimes after fire. Kattleman (1996) noted that "If post fire treatments of salvage logging and site preparation prevent rapid reestablishment of low vegetation, resulting erosion can be greater than that directly produced by the fire."	We agree in general that logging can cause soil erosion however we don't believe the described impacts will occur on the Westside Fire Recovery Project Area because of the design of the proposed actions. This comment provides general literature citations however the citations are not specific to the effects of the proposed Westside Fire recovery Project. Literature citations that assert an impact may happen are not the same as a site specific analysis that demonstrates probable impacts. There are extensive project design features to minimize soil erosion in the Westside Fire Recovery Project. Between draft and final, project design features have been added to ensure that Forest Plan standards for soil cover and coarse woody debris are met. These standards are designed to ensure that the impacts described do not occur. The comment asserts that proposed activities would "kill understory vegetation which will significantly reduce site productivity." No information is provided to support that assertion and that has not been our experience. Sites are rapidly reoccupied by manzanita, ceanothus, snowbrush and other species on the Klamath under just about any circumstance after a fire, so it is unlikely that we would return to a post fire erosion environment particularly since coarse woody debris and ground cover (which currently don't exist in much of the project area) would be generated by proposed salvage and site preparation activities. Impacts due to salvage logging and associated activities have been described in the soils report for the project and summarized in Chapter 3 of the EIS. Removal of organic matter is analyzed using the soil organic matter indicator for below ground, and the surface organic matter indicator for above ground material. In the soils report for the project, damage to live and dead roots was not specifically mentioned, yet it was considered in the overall impacts to vegetation and soil cover as described in the impacts to soil stability. It is also likely that future repeated high severity fire from untreated fuels (no action, as suggested by the comment) would negatively impact soils (EIS Chapter 3 – Fuels, Soil).
234 - Soils	#5873-118	Undisturbed litterfall after wildfire reduces soil erosion caused by both rain and overland-flow. By disturbing needle cover and effectively reducing the soil coverage, logging and yarding will cause increased in erosion compared to not logging. Pannkuk, C. D., and P. R. Robichaud. 2003. Effectiveness of needle cast at reducing erosion after forest fires, Water Resources Research, Vol. 39, No. 11, doi:10.1029/2003WR002318, 2003. http://www.agu.org/pubs/crossref/2003/2003WR002318.shtml They found that a 50 percent ground cover of Douglas fir needles reduced water flow erosion by 20 percent and rain-induced erosion by 80 percent. A 50 percent ground cover of ponderosa pine needles reduced water flow erosion by 40 percent and rain-induced erosion by 60 percent.	The Forest Service acknowledges that post-fire litterfall reduces soil erosion. However, the reference cited is primarily a comparison of effects of two needle types (ponderosa pine and Douglas Fir) on surface erosion rates. The publication does not explicitly use the terms "salvage", "harvest", or "logging" for example. Project Design Features (Watershed-10 project design feature) specify that unit site preparation will retain as close to 7 tons of surface fuels per acre as possible. In addition, the project proposes lop-and-scatter treatments in plantation units within Riparian Reserves in the Whites and Happy Camp Complex Fire areas. Retention and production of surface material will reduce risk of surface erosion. The potential for proposed activities to remove existing soil cover, including litterfall has been analyzed using the soils stability indicator in the soils report for the project and summarized in Chapter 3 of the EIS. Salvage harvest would remove soil cover and result in higher erosion rates compared to the no action Alternative. This would mostly occur during ground based harvest on approximately 30 to 40 percent of a units area. In addition, machine piling to complete site preparation would remove soil cover.
234 - Soils	#5873-175	Post-fire logging inevitably involves increases in road use, which increases erosion and sedimentation, especially at road crossings (Reid and Dunne, 1984; Roni et al., 2001). Roni et al. (2001) identified reductions in road traffic as a component of watershed restoration, indicating that increased road traffic works in opposition to watershed and stream restoration. Beschta et al. (1995) noted that even relatively low impact logging systems such as helicopter yarding should be avoided where sedimentation is already a major problem for salmonids or other sensitive aquatic species, because any activity that disturbs litter layers of soil surface horizons, either pre- or post-fire can accelerate soil erosion and sediment delivery to aquatic systems. The USFS and USBLM (1997a; c) conceded that logging generally increases erosion and, consequently, sedimentation, regardless of how carefully it is implemented. Megahan et al. (1992) came to similar conclusions. Elevated erosion and sedimentation persist for several years after logging disturbance (USFS and USBLM, p. 1101, 1997a). BMPs do not eliminate the persistent erosional impacts of post-fire logging. USFS and USBLM (p. 446, 1997c) concluded that although BMPs can reduce sediment yields compared to historical practices, risks of increased sedimentation will continue to occur if road building or timber harvest occur, damaging aquatic habitats. Ziemer and Lisle (1993) stated that there are no reliable data indicating that BMPs are cumulatively effective in protecting aquatic resources from the adverse effects of logging and associated impacts. Espinosa et al. (1997) provided evidence from watershed case histories that BMPs thoroughly failed to cumulatively protect salmonid habitats and streams from severe damage from roads and logging. Logging effects on soils and vegetation increase erosion and sedimentation in the post-fire environment. Logging causes soil compaction which causes loss of soil productivity and increased erosion. The latter is essentially permanent (Beschta et al., 1995) and is the most severe source of reductions in long-term soil productivity (USFS and USBLM, 1997a; b). Soil compaction persists for at 50-80 years (USFS	The soils report for the project describes impacts to soil erosion and soil compaction due to post fire logging as analyzed using the soil stability and soil structure indicators. Impacts are summarized in Chapter 3 of the EIS. The soils report discusses that if soil cover is not available, soil stability and SOM could be impacted over the long term. Wagenbrenner, 2015 concludes that the reduction in vegetative regrowth can persist over time. The soils report also discusses that subsoiling would promote the recovery of soil stability, soil organic matter, and soil structure, yet soil productivity would remain impacted over the long term on compacted surfaces that are not subsoiled. Compaction and reduced soil productivity are only analyzed within the proposed treatment areas for this project and the soils cumulative effects analysis does not consider impacts on public lands on regional scales.

Code	Comment Number	Comment Text	Response
		and USBLM, 1997a). Compaction and reduced soil productivity are already major concerns on public lands on regional scales (USFS and USBLM, 1997a; CWWR, 1996).	

Code	Comment Number	Comment Text	Response
234 - Soils	#5873-176	Logging also reduces soil productivity by removing trees which are major sources of the coarse woody debris (CWD) and organic matter critical to soil productivity (USFS and USBLM, 1997a). Even the removal of slash consisting of tops and branches negatively affects soil productivity by negatively affecting nutrient and organic matter levels; burning these materials in place (as occurs with wildland fire) causes much less negative impacts on soils (USFS and USBLM,1997a). USFS and USBLM (p. 466, 1997a) found that losses in soil productivity were correlated with logging and roads within the ICBEMP project area. USFS and USBLM (p. 206, 1997a) and Kattleman (1996) state that the prevention of soil damage and loss of productivity is easier and more effective than attempts to restore it after damage has occurred. A primary approach to restoring soil productivity is to restore organic matter and coarse woody debris levels by leaving areas undisturbed until organic matter levels have recovered (USFS and USBLM, p. 206, 1997a, emph. is mine). Avoidance of increased erosion is key to restoring soil productivity (Beschta et al., 1995; USFS and USBLM, p. 206, 1997a). The most effective means of controlling erosion is to avoid activities that disrupt/damage soils and vegetation, as is exceedingly well-documented in the literature. Due to the manifold negative effects of logging on soil productivity, erosion, and sedimentation, USFS and USBLM (1997b) concluded that logging had greater negative effects on ecosystem functions than the baring of soils by fire. The USFS and USBLM (Ch. 4, pp. 12-13, 1997b) notes that although fire may reduce soil productivity, it typically does not reduce it as much as from soil compaction and whole tree removal (e.g. logging), except in the rare cases where fire consumes all organic material. It states: "Because of the mosaic pattern that wildfire produces, and the residual wood that is left on site...wildfire usually has fewer implications for loss of soil productivity and function than disturbances which remove oil organic matter and [increase] bulk density as well." Logging effects on soil properties are usually more severe and more persistent than those of fire (USFS and USBLM, Ch. 4, pp. 13, 1997b). These multiple impacts on soil productivity are probably why salvage-logging retards post-fire vegetative recovery. Sexton (1998) documented that post-fire salvage logging over snow reduced regrowth of ponderosa pine and other species relative to adjacent burned, but unlogged, areas. Naturally regenerating groundcover in unlogged areas also had greater survival and growth than plantings on areas that had been salvaged logged after fire. Notably, these adverse effects of logging on regrowth were from over-snow logging (Sexton, 1998). It is highly likely that ground-based logging without snowcover retards regrowth to a greater extent due to its greater negative effects on soils. Kattleman (1996) noted that “If postfire treatments of salvage logging and site preparation prevent rapid reestablishment of low vegetation, resulting erosion can be greater than that directly produced by the fire.” Coupled with Sexton’s work and the known effects of logging on soil productivity and concomitant effects on revegetation, it appears that post-fire logging creates more erosion and sedimentation than fires	Beschta et. al, 1995 concludes that ground based logging and soil disruption are not likely to be consistent with ecological restoration. See the end of Chapter 2 for how an Alternative based on the Beschta suggestions was considered. The soils report for the project describes impacts to soil productivity due to logging and whole tree removal. The EIS summarizes the relative importance of soil erosion and soil compaction to overall soil productivity. The no action Alternative analyzes impacts to soil productivity by leaving areas undisturbed. Post-fire logging over snow has not been proposed for this project. Project Design Features (project design project design features) have been developed to decrease the potential of accelerated erosion and would require mulching up to 40 acres of skid trails where accelerated erosion is predicted to be highest, limiting skidding equipment to slopes less than 35 percent, and retaining material greater than 8 inches in diameter unless needed to reduce 1,000 hour fuel loading to seven tons per acre. A project design feature requires decompacting new temporary roads to varying depths based on slope and soil type to promote the return of vegetation while avoiding additional impacts to soil stability; see Chapter 2 of the final EIS under watershed project design project design features in the project design feature table.

Code	Comment Number	Comment Text	Response
234 - Soils	12346-12	DEIS: Post fire accelerated erosion due to ground based salvage logging could result in a 6 to 1,000 fold increase in sediment production. (Pg. 231) Comment: The ACS and the CW A do not permit Forest Service logging actions that will result in a 6 fold increase in sediment production let alone those that will result in a 1,000 fold increase.	The reference to a 6 to 1,000 fold increase in sediment from ground-based skidding is a literature citation to Wagenbrenner - 2015. It is not an analysis of the effects that would necessarily occur in the Westside Fire Recovery Project. Wagenbrenner (2015) also noted that "Adding slash to skid trails increased total ground cover by 20-30% and reduced sediment yields by 5 to 50 times over untreated areas. Project Design Feature Watershed 30 states "Where skidding occurs through units with less than 50 percent soil cover, mulch skid trails of greater than 15 percent slope, to achieve at least 50 percent effective soil cover on skid trails (approximately 40 acres across the project area may require this). Effective soil cover could include plant litter, woody material in contact with the soil, living vegetation, and rock fragments with a diameter of ½ to 3 inches. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient. This action is expected to significantly reduce potential erosion from skid trails as noted by Wagenbrenner (2015). Soil organic matter is currently limited in severely burned areas but will recover as dead trees fall and leaf litter from early seral plant communities accumulates.Ground based harvest equipment would result in the highest rates of accelerated erosion. Impacts to soil stability were predicted to be highest within the Beaver Fire area, and the modified Alternative 3 only proposes ground based harvest on some of the roadside hazard treatments within this fire area. Tractor harvest could result in temporarily not meeting soil cover standards, yet for any tractor harvest unit that does not meet the soil cover standards in table 4-2 of the Forest Plan upon completion of treatments, areas where soil cover is deficient will be mulched so that soil cover standards are met. Additional mitigations designed to meet Standard and Guideline 3-2 include limiting skidding equipment to slopes less than 35 percent, and site preparation is designed to maintain adequate soil cover by not reducing the sum of 1, 10, and 100 hour fuels to less than less than 7 tons per acre. Also during site preparation, manual felling of small diameter trees could also be accomplished to add soil cover on ground based harvest units. For all Alternatives and fire areas, project design project design features have been revised so that all new temporary roads would be decompacted. In addition, This would occur to a depth based on soil type and slope to promote the return of vegetation, improve soil stability, and decrease potential impacts from subsoiling. It is not our intent to conduct activities that would result in undesirable soils conditions. Therefore, an erosion control plan has been developed and by following the plan, erosion and sedimentation can be controlled or prevented. Elements in the ECP include effectively constructing waterbars on skid trails, confining tractors and feller-bunchers to approved skid trails and equipment routes, and implementing appropriate road watering to maintain road fines on site. Text has been added to the final EIS to clarify these requirements and effects. The project is consistent with Aquatic Conservation Strategy objectives, as stated in the Forest Plan; see a summary of the Aquatic Conservation Strategy review in Chapter 3 of the EIS and the full report in the project record.

Code	Comment Number	Comment Text	Response
235 - Minerals & Geol. Resources	#18909-103	There are about 3,920 acres of proposed salvage units on steep, weathered granitic lands designated as Riparian Reserves, about 960 acres of site prep and plant, 4,395 acres of roadside hazard tree removal and 3,940 acres of fuels treatments on unstable lands, Riparian Reserves. The watersheds with a high landslide risk that will have a reduced duration of elevated risk are Upper Grider Creek, Cliff Valley, Lower Grider Creek, O'Neil Creek, Walker Creek, and Caroline Creek. The reduction in duration of elevated risk will benefit natural resources and infrastructure in the long-term. Middle Creek, Horse Creek, and Upper Elk Creek have a moderate landslide risk and will have a duration of elevated risk of 30 years in this alternative. Lower Grider and Walker Creek have very high landslide risk due to the potential to impact private land - so the reduction of elevated risk from more than 80 years to 30 years is of great benefit for protecting human safety and private property in these two watersheds. Rancheria Creek, which also has a very high landslide risk, will continue to have a greater than 80-year duration of elevated risk because there is less than 25 percent of the high and moderate vegetation burn severity areas being planted. All other watersheds will have a greater than 80 year duration of elevated risk. The DEIS fails to meet the KNF LRMP Standards and Guidelines, Geology 4-5: "Promote slope stability and maintain soil productivity on geologically unstable lands." The KNF LRMP page 4-18 states, "2-1 Manage vegetation on geologically unstable lands (including active landslides, all inner gorges, margins and toe zones of dormant landslides and severely weathered and dissected granitic lands) to maintain or enhance slope stability and soil productivity according to Riparian Reserves standards and guidelines." The DEIS states that the project does not change the landslide risk for any watershed. However, there is a change in the risk ratio or the percent of watersheds with high or moderate disturbance for twenty-eight watersheds due to treatments. Then the DEIS claims that there is a reduction in the duration of elevated risk due to planting for nine watersheds compared to no action, but science shows that natural regeneration would take place and would not disturb the geologic structure. Please also see the Treatment in Riparian Reserve section of these comments, page 31. The KNF LRMP at page 4-19 states, "2-3: A geologic evaluation will be conducted for all projects involving ground- or vegetation-disturbing activities on potentially unstable land. Such land includes, at a minimum, all of the geologically sensitive land identified in the geologic layer of the Forest Plan database. These investigations will include geologic hazards and resource assessments, development of management requirements and mitigation measures, and documentation. All such investigations will review for accuracy the geologically unsuitable lands, which are identified in the project area on the geologic layer of the Forest Plan database, and other potentially unstable lands. Recommendations for inclusion of more land into this category and/or exclusion of other lands will be provided. These geologic investigations will be conducted in a way consistent with the generally accepted standards of the profession. Documentation will include: a summary or abstract, observations, analysis, conclusions, recommendations and references, and be in a format compatible with NEPA requirements." Data collection will include all information needed to adequately address the geologic questions at hand. Minimum data necessary for projects involving ground- or vegetation-disturbing activities in areas containing geologically sensitive lands are as follows: a) Distribution of rock types and relevant structural features within the project area, b) Distribution of geomorphic terranes with unique landslide potential, c) Distribution of all previously identified unsuitable land (due to instability), and d) Distribution of known geologic SIAs, caves, groundwater developments, and rock material quarries. The DEIS and Geology Report fail to disclose this information.	The acres of unstable lands with treatments has been updated in the Geology Environmental Consequence section of Chapter 3 of the final EIS and the Geology report as amended. The duration of elevated landslide risk indicator is intended to illustrate compliance with Standard and Guidelines 2-1 and the Forest Program Emphasis "Promote slope stability and maintain soil productivity on geologically unstable lands". See response to number 18852-47 for summary of effects to landslide risk and the indirect benefits of reforestation. A geologic evaluation per Standard and Guideline 2-3 was completed and is documented in the Geologic report as amended and incorporated by reference into the final EIS in Chapter 3. Recommendations for mitigation are captured in the watershed project design features in Chapter 2 of the final EIS. The information includes bedrock geology maps, geologic terrane maps with previously identified unstable lands. The report as amended now includes explicit information on the distribution of SIAs.The Federal Cave Resource Protection Act (1988) prohibits the disclosure of cave locations. However, A map of the limestone bedrock (the most likely to contain caves in the project area) was added to the Geology report amendment. A discussion of groundwater effects was added as well. There is no proposal to develop or use Forest Service rock quarries so they are not discussed in the report or final EIS.

Code	Comment Number	Comment Text	Response
235 - Minerals & Geol. Resources	#18926-27	The DEIS states that the project does not change the landslide risk for any watershed. However, there is a change in the risk ratio or the percent of watersheds with high or moderate disturbance for twenty-eight watersheds due to treatments. Then the DEIS claims that there is a reduction in the duration of elevated risk due to planting for nine watersheds compared to no action, but science shows that natural regeneration would take place. ! !	It is difficult to directly measure slope stability so the analysis uses landslide risk as a proxy for slope stability. Landslide risk is a combination of the likelihood a landslide event may occur and the consequences of such an event. The likelihood of a landslide uses a combination of the risk ratio of the GEO model, percent unstable lands and percent high and moderate disturbance in the watershed. The final EIS and the Geology report as amended report the incremental changes in measures such as GEO model risk ratios and percent watershed with high and moderate disturbance. The landslide risk categories are based on professional judgment of the Forest Geologist and are intended to better illustrate the effects to slope stability of the project rather than simply displaying the incremental changes in the measures. See the response to comment number 18852-47 for a summary of how the project affects landslide processes. Only the construction of new landings and temporary roads is considered high or moderate disturbance. The removal of fire killed trees (aka salvage or site preparation) is included in the model but does not affect the GEO model risk ratio (Methods section of the Geology report as amended). All other actions do have an effect and are illustrated in the increase or decrease (in the case of road stormproofing) GEO model risk ratio. The changes, however, were not enough to move any watersheds from one risk category to another. The duration of elevated risk is related to the speed at which the areas burned with high and moderate severity fire are reforested with 10 inch trees (See Section I of the Geology Amendment). The effects analysis does account for natural reforestation. However, the Silviculture report shows that areas that have site preparation (including salvage) and planting will have conifer forest re-established faster than relying on natural regeneration. The duration of elevated risk is reduced in watersheds where at least 25% of the high and moderate severity burn is replanted.
236 - Fire, Fire Risk	#17387-6	Support reducing fuels/fire hazard along primary access roads and roads with high potential to be used for managing planned and unplanned ignitions	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The suggestion of the commenter is already incorporated into project design; see Chapter 2 of the EIS for details. Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
236 - Fire, Fire Risk	#18878-34	Fire and Fuels Methodology Overview of Methodology DEIS: A combination of field-collected data, geospatial data, fire modeling, professional judgment, and literature review was used to provide a landscape level picture of potential fire behavior and analyze environmental consequences of the project to fire and fuels. (Pg. 118) Comment: It is unclear at what point fire return was analyzed for the alternatives. Depending on where, when and why fire is re-introduced should change the fuel conditions on the ground.	We agree that depending on where, when and why fire is re-introduced would change fuels conditions on the ground. For modeling purposes, it was assumed that initial fuels treatments would be done in the short-term defined in the Fire and Fuels Report as one to five years. Maintenance of fuels treatments is described in the Fire and Fuels Report and therefore, it is assumed that fuels treatments would stay effective over the long-term as defined in the Fire and Fuels Report.
236 - Fire, Fire Risk	#18878-36	DEIS: Few forested regions have historically experienced fires as frequently and with such high variability in fire severity as the Klamath Mountains Bioregion (Taylor & Skinner, 1998) which includes the project area.(Pg. 119) Comment: It should be noted this high variability of fire severity has contributed to the diversity for which this region is known, and integral to Karuk management practices which foster the cultural resources found in the project area. What also is not discussed in this section is how suppression policy has aggravated fire severity. To quote Taylor & Skinner (1998), "As the time since the last fire lengthens in these fire-prone forests, surface fuels and live ladder fuels will accumulate. Accordingly, the probability of large, severe fires will likely increase as has been the case throughout the western United States (e.g., Mutch and Cook, 1996). The use of fire will likely be an integral component of management plans that 9 of22 successfully provide long-term, late-successional conditions in the newly established latesuccessional reserves of the Klamath Mountains." Unfortunately, the use of fire is not an integral component of management plans and regulated to the periphery of the refined proposed action with the exception of the Whites Fire perimeter. Karuk philosophy, the Karuk ECRMP, and the Karuk Alternative all consistently note that fire is an integral component of management plans.	Within the Fire and Fuels Report "Fire History" section and "Pre-fire Condition" section it describes the history of fire in the project area. Similar conclusions are drawn from the Fire and Fuels Report compared to this comment in terms of high variability of fire severity, diversity, and how fire suppression has aggravated fire severity. It is noted in the Fire and Fuels Report that "decades of fire exclusion lead to an increased accumulation in all fuel profiles across the landscape. Before fire suppression, fires had higher spatial complexity created openings of variable size within a matrix of forest that was generally open comparatively to today." Fire is an integral part of the Klamath Land and Resource Management Plan and part of the EIS. Strategic hazardous fuels treatments are proposed in all action Alternatives and are proposed to treat within the WUI and road and ridge systems to implement prescribed fire activity and other fuel treatment activities. Further descriptions of the use of fire can be found in the Fire and Fuels Report or Chapter 3 of the EIS.

Code	Comment Number	Comment Text	Response
236 - Fire, Fire Risk	#18878-42	DEIS: The Fire and Fuels resource report displays projected surface fuel loads predicted over a 50-year period, based on completion of implementation actions. (Pg. 124) Comment: It is unclear why the 50 year period of fuel build up is being stressed. The median fire return interval of 8-38 years over that 50 year timeframe. If fire would be used as a management tool as in the Karuk Alternative then the surface fuel loading should be reduced to acceptable levels.	The Forest Plan recommends using 50 years for an analysis period. The Fire and Fuels Report for the Westside Fire Recovery Project (Chapter 3 of the EIS) uses short term (one to five years) and long-term (20 years and greater) to display modeled outputs (see methodology sections). The break up in years for the analysis period helps compare Alternatives for different time frames. This helps account for comparing measurement indicators and other analysis for the different range of fire return intervals experienced within the project area. For analysis, it was assumed that fuels treatments would occur in the short-term with maintenance fuels treatments to follow. This allows a comparison of fuels treatments proposed in the Westside Fire Recovery Project to no action.
236 - Fire, Fire Risk	#18909-27	FIRE AND FUELS The temporal analysis for the Fire and Fuels section of the DEIS fails to consider years 6-19. The Direct and Indirect Effects analysis section of the DEIS page 121: "Since lightning is the predominate cause of ignition in the project area, there is a future concern that small fires will be difficult to control and will have a high probability of requiring large quantities of suppression resources." This statement accentuates the need for a long-term fire strategy which the DEIS fails to consider. The Cumulative Effects section for Alternative 1 page 122 states: "As a result of the operations expected on privately owned lands these lands are expected to be relatively fire safe." Why is this assumed? How much slash was left on the ground in the Beaver Fire area? How did the plantations in this fire area affect fire behavior? The DEIS does not analyze or disclose the high severity fire behavior in the Beaver Fire area caused by industrial plantation forestry. The assumption that private lands logging creates a relatively fire safe condition is far from reality as seen in the 2014 Beaver Fire. Alternative 2, as stated in the DEIS page 122: "Steeper slopes (greater than 40 percent) would be anticipated to require hand piling and or broadcast burning to achieve desired surface fuel loadings of less than 10 tons/acre. Compared to ground-based and cable units, within helicopter units or those areas on steep slopes, larger diameter (greater than 3" diameter) fuels may have increased loads as these fuels can be difficult to pile by hand." In fact, helicopter logging, nearly 50% of the project area, can create such a deep bed of flammable fuels that the agency may not be able to manual pile or broadcast burn. For example, the Salmon Salvage project, where the agency is considering torching these deep fuel beds on steep slopes from a helicopter. Further as noted above, the DEIS analysis seems to rely on the assumption that all activity fuels treatments and other fuels reduction would take place on 100% of the project area. There is no guarantee that fuels reduction would take place, especially given that only 32% of the funding would be provided from timber sale receipts.	This comment has a number of discrete points, each of which is addressed individually below:1. Though the temporal analysis of fire modeling in Chapter 3 of the Final EIS gives discrete years for specific outputs, such as potential flame length and fireline intensity, these outputs are representative samples of the continuum of change expected over time. Vegetation does not grow and change at a rate that will be detected by fire models on a year to year basis, largely due to the nature of fire behavior modeling and representative fuel models used as proxies for the actual vegetation. The concept becomes that of a punctuated equilibrium, where vegetation that is represented by a static values, is in fact growing and changing, and, eventually, reaches a threshold at which it is more appropriately represented by changed values. The points in time chosen by the fuels specialists who compiled the Fire and Fuels section o final EIS Chapter 3 used professional judgement and experience with the vegetation types within the project area, informed by vegetation growth simulation, to determine, to determine what the likely pathways for vegetation parameters, given either a treatment Alternative or no action, given the starting vegetation condition. In this way, the modeling captures time periods with discrete changes happening as opposed to a continual modeling process that attempts to capture minute changes on a daily or yearly basis.2. A long term fire management strategy is not the goal of this project or the EIS. The long term fire management strategy for the forest is defined through the Klamath National Forest Fire Management Plan, which draws its direction from the Forest Plan. This project is a site specific plan for management of post fire activities, and is limited to actions analyzed in the EIS and within the project area until conditions change sufficiently to warrant new analysis through the National Environmental Policy Act process. 3. In response to concerns regarding the Beaver fire and high severity, the goal of the final EIS is not to disclose, discuss or determine the cause for fire severity patterns that happened during the 2014 fire season. The purpose of this EIS is to disclose environmental effects of the proposed actions with the project area defined for the Westside Fire Recovery. The Fire and Fuels section of Chapter 3 of the final EIS states “As a result of the operations expected on privately owned lands these lands are expected to be relatively fire safe”, with the additional statement of “This is primarily due to the removal or reduction of most of the dead and dying trees on these lands. When added to the 1,765 acres already meeting desired condition there will be 11,665 acres meeting desired condition over the next 10 years”. This statement clarifies the comment quote, by determining that these lands are expected to be relatively fire safe over the next 10 years. The condition of these lands past 10 years cannot be readily determined by the forest service because of uncertainty in actions on private land that are wholly outside the control of the US Forest Service. The condition of these plantations during the Beaver Fire can be assumed to be well over 10 years of age, given that they are composed of trees that have commercial value, and therefore are not a reasonable comparison to the likely condition of these stands for the next 10 years.4. Regarding fuel loading on steep slopes, yes, helicopter logging may result in concentrations of slash too thick to Handpile or machine pile. This is why the proposed Alternatives, Chapter 2 of the EIS, allow for broadcast burning of such material as part of fuel reduction in site preparation units. The environmental effects of this type of post-logging slash treatment are disclosed in the resource reports and Chapter 3 of the final EIS. In addition, Helicopter logging is not proposed for 50% of the project area, and in fact, composes less than 50% of acres proposed for harvest, with less than 10% of federal land in the project area proposed for harvest operations.5. See comment number 18878-16 for a discussion funding for slash treatments.

Code	Comment Number	Comment Text	Response
236 - Fire, Fire Risk	#18926-18	Plantations and Site Preparation! Site preparation with conifer tree planting can be problematic especially in drier times. Many conifers will not survive in drier times as we are experiencing. Conifers, particularly pine species, can burn up and not sprout after a fire. In these times which tend to be drier, conifers particularly in plantations can pose a more significant fire risk in many areas. This has been experienced in several of the more intensive and severe burns and fires over the past 40 years. ! ! Since tree plantations are known to have increased fire behavior, increased fire risk would result reestablishment of highly flammable tree plantations. This would result in greater risks to forest and watershed values - and greater risks for future firefighters - for many years to come. ! !	See response to number 18926-7. Appendices C and D in the Silviculture report address the reforestation prescriptions and stand evaluation process which identifies the areas within the project boundary where optimal reforestation could occur. Specifics regarding precipitation are not addressed, but wider spacing, microsite planting, and release tactics can ameliorate the potential effects of climate change, particularly drier seasons, on stand development. Research has shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less severity and intensity or not at all (Thompson, Spies and Ganio, 2007; Weatherspoon and Skinner, 1995). The Westside Fire Recovery Project is treating slash/fuel loading in plantations. In the Fire and Fuels Report; Direct and Indirect Effect section it states "Fuel treatment is an essential component of sustainable reforestation in the Klamath Province (Peterson et al. 2014). Research has shown that the quickest way to reestablsih a coniferous forest after stand replacement fire is by active reforestation (Zhang et. al 2008). We agree that effective fuels reduction treatments to address activity fuels will be necessary to prevent future fire events from becoming stand-replacing fires that destroy planted seedlings. Research has shown fuel treatments increase the likelihood of the planted trees surviving future fires (Weatherspoon and Skinner 1995, Omi and Kalabokidis 1991). Heavy residual fuels need to be reduced substantially to help assure sustainability of plantations. Follow-up reforestation surveys will be completed to assure that the reforestation objectives are achieved." Fuels reduction actions are further described in the Fire and Fuels Report.
236 - Fire, Fire Risk	#18926-7	Tree Plantations - Increased fire risk would result reestablishment of highly flammable tree plantations. This would result in greater risks to forest and watershed values, greater risks for future firefighters and managers, for many years to come. ! !	Research has shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less severity and intensity or not at all (Thompson, Spies and Ganio, 2007; Weatherspoon and Skinner, 1995). The Westside Fire Recovery Project is treating slash/fuel loading in plantations. In the Fire and Fuels Report; Direct and Indirect Effect section it states "Fuel treatment is an essential component of sustainable reforestation in the Klamath Province (Peterson et al. 2014). Research has shown that the quickest way to reestablsih a coniferous forest after stand replacement fire is by active reforestation (Zhang 2008). We agree that effective fuels reduction treatments to address activity fuels will be necessary to prevent future fire events from becoming stand-replacing fires that destroy planted seedlings. Research has shown fuel treatments increase the likelihood of the planted trees surviving future fires (Weatherspoon and Skinner 1995, Omi and Kalabokidis 1991). Heavy residual fuels need to be reduced substantially to help assure sustainability of plantations. Follow-up reforestation surveys will be completed to assure that the reforestation objectives are achieved." Fuels reduction actions are further described in the Fire and Fuels Report.
236 - Fire, Fire Risk	#18934-6	The Karuk Alternative is the only proposed alternative that addresses restoration of fire resilient forests through scientifically valid concepts referenced in Dr. Franklin's comments. The DEIS summary states that the 6,700 acres of salvage logging in moderate to high severity burn areas will reduce future fire risk and severity. What data is this statement based on? In our experience, and based on the research papers cited in comments from Dr. Franklin, whether or not an area was salvaged logged appears to have far less effect on risk and severity than whether or not the activity fuels were treated or when the next wildfire occurred.	Thank you for your comments on the Westside Fire Recovery Project. See Chapter 2 of the EIS for a discussion of how the Karuk Alternative was considered and incorporated into modified Alternative 3 (preferred Alternative in the final EIS). A combination of field-collected data, geospatial data, fire modeling, professional judgment and literature review is used to provide a landscape level picture of potential fire behavior and analyze environmental consequences of the project to fire and fuels. This all helped draw conclusions on fuels treatment effectiveness on the landscape. In addition, all salvage units will have site preparation done as a fuels treatment to reduce fire hazard, risk, and severity in the future. Methodology and the analysis of proposed actions is further described in the Fire and Fuels Report and within Chapter 3 of the EIS. The primary reason that salvage harvest is proposed is to reduce future heavy fuel accumulations that will result from fire killed trees and thus reduce the risk of future high severity fire that would delay the development of late successional stand conditions, as consistent with the purpose and need of the project from Chapter 1 of the EIS.

Code	Comment Number	Comment Text	Response
236.01 - Wildland/ Urban Interface Cond.	#17349-7	Wild/and/Urban Interface areas-The WUI zone of a number of communities was burned over during the fires. Effected communities include Happy Camp, Seiad Valley, Hamberg, etc. In these situations the fuel complex in the WUI will be less hazardous for 4-7 years following the fire but beyond this period the fuel complex will rapidly become more hazardous as the dead material decays and falls to the ground and the sprouting vegetation matures. The Recovery plan needs to address this problem by sclieduling treatments to prevent an escalation of hazard and risk in the burned WUI areas.	We agree that the fuel complex in the WUI will be less hazardous for 4-7 years following the fire but beyond this period the fuel complex will rapidly become more hazardous as the dead material decays and falls to the ground and the sprouting vegetation matures. The action Alternatives all implement multiple types of activities to reduce snag densities and surface fuel loading, including within the WUI. The Fire and Fuels Report states "Units proposed for treatment occur both within the WUI and strategic road and ridge systems in which fire suppression resources utilized historically to control unplanned fires and implement prescribed fire activities. Any hazardous fuels treatment not meeting desired conditions can be maintained with future treatment." The maintenance of these treatments will address future escalation of hazard and risk both within and outside the WUI. Fuel treatments within the Wildland Urban Interface promote safer firefighting actions and public evacuation, should a future large fire occur within the project area. Eliminating high snag densities and treating surface fuels within the WUI has an indirect effect on reducing sources for embers, spotting, and receptive fuel beds. These indirect effects are a benefit in Alternative 2 (and other action Alternatives), when compared to Alternative 1, where no action is taken to reduce future available material. Additionally, increased spotting and radiation would make structures more difficult to defend from crown fire, as opposed to surface fire. (Cohen & Butler, 1996) (Scott & Reinhardt, 2001). Identified treatments in the WUI modify fire behavior such that fires are anticipated to spread slower, with flame lengths less than four feet, allowing responding resources to take direct action to control fires. These direct actions are effective due to the change in composition and structure of fuels, which promotes low resistance to control when compared to Alternative 1. Further description of the fuels strategy and how WUI treatments are applied on the ground can be viewed in the Fire and Fuels Report -- "Hazardous Fuels Treatment" section.
236.01 - Wildland/ Urban Interface Cond.	#17481-19	There are issues regarding the 10-acre size limitation of treatment. Intensity maps show burned out areas adjacent and to the south of Happy Camp that are not included is treatments. Must focus on the WUI areas. WUI areas must be defined.	Forest Plan standards and guides within Late-Successional Reserves land allocation provides direction to not salvage harvest in patch sizes less than 10 acres. Forest Plan Management Area 5-30, "Guidelines for Salvage: 1. The potential for benefit to species associated with late-successional forest conditions from salvage is greatest when stand-replacing events are involved. Salvage in disturbed sites of less than 10 acres is not appropriate because small forest openings are an important component of old-growth forests. In addition, salvage should occur only in stands where disturbance has reduced canopy closure to less than 40%, because stands with more closure are likely to provide some value for species associated with these forests." The project is consistent with this Management Area 5-30 (1) for the reasons stated. WUI treatments are defined within the Fire and Fuels Report and hazardous fuels treatments are identified to protect communities in all action Alternatives. Fuels treatments identified for WUI treatment include small diameter thinning, mastication, site preparation, fuel management zones, ridgetop fuel breaks, underburning, as described in Chapter 2 of the final EIS are not limited by patch size. These prescriptions are aimed at reducing the threat to communities in both the short and long-term. Additionally, other recent past, ongoing, and future foreseeable projects, mentioned in the cumulative effects section, also address fuel conditions in the WUI.

Code	Comment Number	Comment Text	Response
236.01 - Wildland/ Urban Interface Cond.	#17481-4	I like the salvage plan with rehab of burned plantations and fuels treatment. Seems like the max alternative is somewhat restrictive by not considering patches less than 10 acres, especially in the WUI. Also proposed fuels treatments seem a bit fragmented and disconnected, especially in the WUI. Seems like prescribed burning could be expanded to include the east side of ridge in Happy Camp and east side of Grider Creek. Some properties appear well protected and others have no proposed protection. This is evident in both Happy Camp and Seiad Valley as well as along Scott River Road. There appears to be less protection proposed for Hamburg even though that area was very challenging during fire and where it spotted across the river.	Many communities along the Klamath River, including Happy Camp, Seiad Valley and Hamburg currently have contracts awarded to do WUI treatments. Therefore, many of these areas were not identified in the Westside Fire Recovery Project for treatment because similar treatments and objectives would be met. See a list of actions considered for cumulative impacts in the Appendix of the EIS. WUI treatments did not include a patch size limitations.
236.01 - Wildland/ Urban Interface Cond.	#18883-22	The Forest Service should not be treating the Wildland Urban Interface to protect private property. Private property owners are responsible for protection of their property and not the Forest Service. Many communities have expanded with roads and many buildings into areas that used to be dense forest. If the private property owners want to do fire protection, then they can do it on their own in accordance with the laws that regulate fire and logging on their private property. This project should not be justified to protect these sprawling home sites and structures.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. To clarify, treatments proposed in WUIs are proposed on National Forest System lands adjacent but not including private property. Treatments near communities on National Forest System lands are proposed with the project, as consistent with the purpose and need of the project in Chapter 1 of the EIS.
236.02 - Fuel Load	#14-11	new research document has recently been published highlighting the long-term positive fuel reduction effects that are created by dead tree removal. I have included this document as part of the comments. We ask that it be incorporated into the record in support of your efforts.	The comment doesn't cite any particular research to review or reference. We will review the literature and incorporate the best available science into the EIS or project record, as appropriate See response to number 17111-5
236.02 - Fuel Load	#17910-3	Several factors associated with fire-proofing operations may actually enhance the frequency and intensity of fires. If the canopy provided by big trees is reduced, the understory will dry out earlier in the fire season. And disruption and damage to soils from heavy equipment can reduce soil moisture retention, also creating drier conditions during fire season. (Harvey et. Al. 1994)	This article referenced by the commenter does not seem applicable to post-fire salvage harvest conditions of this project for the following reasons. The article is discussing the affects of green-tree fuel reduction activity, not post-fire conditions. These areas burned at such intensities that they no longer offer adequate canopy cover to provide the shade, moisture, humidity, and temperature characteristics. Salvage units and roadside hazard treatments are removing dead trees that no longer provide the benefits of canopy cover. Hazardous fuels treatments primarily remove understory vegetation and have little effect on canopy. No salvage harvest is proposed in streamside Riparian Reserves, so there is no impact to shade or soil moisture to streams. The project incorporates project design features for streamside Riparian Reserves shade protection, as described in the watershed project design features in Chapter 2 of the final EIS related to roadside hazard treatment, landings, and fuel treatments. Changes to shade, and consequently changes to soil moisture, are anticipated to be discountable as a result of proposed actions.
236.02 - Fuel Load	#17910-4	Also, the fine fuels produced by logging slash actually contribute more to the spread of fires than large fuel classes that are difficult to ignite and contribute mainly to fire intensity. Logs also absorb moisture and slowly release critical nutrients into the ecosystem, and they are important microsites for mycorrhizal and other biological activity, particularly during the dry season. (Harvey et. Al. 1978)	See response to comment number 5873-98
236.02 - Fuel Load	#18914-1	Regarding Fuel Management Zones, the Draft EIS places too much emphasis on conifers for overstory tree retention. The importance of hardwoods on these FMZs is not discussed or are the proposed actions sufficient to assure a strong hardwood presence on these FMZs. I am assuming that most of these strategic ridge FMZs will be shaded fuel breaks. The diameter limit for brushing/removal is slated at 12 inches DBH. Where spacing objectives are met, I would like to see the diameter for conifers lowered to 8" DBH. A 8" DBH conifer tree is well on it's way to achieving resilience to fire; limbing up the bole should be sufficient.	As described in Chapter 2 under the proposed action, "Treatments in these zones aim to maintain existing control lines by removing all dead vegetation and live brush greater than two feet tall, and by thinning live conifer trees less than 12 inches in diameter at breast height to approximately 20-foot spacing. Hardwoods would be retained." In Alternative 2 Modified, 8 inch diameter at breast height live trees are identified as the maximum for roadside fuels treatments and Fuel Management Zones.

Code	Comment Number	Comment Text	Response
236.02 - Fuel Load	#18935-7	2) The DEIS discounts persistence of highly flammable slash fuel on steep slopes where post-logging fuel treatments are unlikely to occur in any action alternative. Post-fire logging creates enormous quantities of highly flammable activity-created fuel ("slash"). Duncan (2002) reported that woody fuels on the ground surface increased 1.2 to 5.3 tons per acre after post-fire logging. Donato and others (2006) compared fire hazard in the Siskiyou National Forest of Oregon burned by wildfires in 1987 and 2002, and concluded that post-fire logging significantly increased the likelihood of catastrophic "reburn" compared to sites that were left to naturally recover without management due to the density and volume of fine woody fuels created by post-fire logging activities. Thompson and others (2007) reported similar results. The Forest Service admits that the project will significantly increase fine fuel load on the forest floor by relocating unburned biomass (i.e., tree tops, limbs, needles) from the forest canopy to the ground surface. See DEIS at 124; USDA (2015b: 6) ("Under alternative 2, activity generated slash will be piled and burned reducing surface fuels to levels consistent with low severity fire effects"). As discussed above, post-logging fuel treatments must follow salvage logging activities where the objective of logging is to minimize "reburn" hazard (Donato 2006, Dunn and Bailey 2015). However, the Forest Service supplies no assurance that post-logging fuel treatments will occur in most of the project area. See DEIS at 30-33 (no requirement of fuel treatment after "salvage harvest" on ~6,800 acres); compare 36 ("activity created slash will be piled and burned" in "wildland urban interface" settings (~2,200 acres)); 37 ("Mechanical or mastication equipment may be used to pile activity slash within [fuel management areas (~4,800 acres)] in addition to, or in lieu of, hand work"). According to the DEIS, Harvesting of trees are planned utilizing ground based, cable and helicopter logging. It is anticipated that there will be a delay between harvesting activities and associated fuel reduction activities. During this time frame, greater accumulation of surface fuels due to logging activities would be anticipated especially within cable and helicopter units where whole tree yarding is not planned. The short term effect of logging is an elevated surface fuel loading from broken tops and branch wood. The greatest fuel loadings post-harvest is expected to occur within helicopter units, followed by cable and ground based units. However, post logging activity breaks the structure and composition of the fuel bed. Upon completion of fuel reduction activities, ground based units would be expected to reduce the greatest amounts of surface fuels due to the ease of facilitating piling and other fuels reduction activities on gentler slopes. Steeper slopes (greater than 40 percent) would be anticipated to require hand piling and or broadcast burning to achieve desired surface fuel loadings of less than 10 tons/acre. Compared to ground-based and cable units, within helicopter units or those areas on steep slopes, larger diameter (greater than 3" diameter) fuels may have increased loads as these fuels can be difficult to pile by hand. DEIS at 122 [emphasis added]. Slash fuel concentrations are likely to occur on steep slopes where post-logging pile-and-burn fuel treatments present the greatest logistical difficulty. The area to be logged by helicopter systems indicates the degree to which fire hazard will increase as a result of salvage logging with little or no post-activity fuel treatment. See DEIS at 31 (Table 2-1: harvest treatment by logging system).	Removing large trees by salvage alone is not a sufficient fuels treatments as pointed out by many of these studies. The Westside Fire Recovery Project proposes follow-up fuels treatments after salvage logging to reduce fuel loading and fire hazard. The Westside Fire Recovery Project reduces future accumulations of fuel loading as trees fall to the forest floor through salvage logging and treats surface fuels upon completion of cutting activities. The Fire and Fuels Report sites many findings that support short to long-term benefits from fuels reduction and is summarized in Chapter 3 of the EIS.See response to comment number 18878-16 about project funding for implementation.
236.02 - Fuel Load	#19-3	The preferred alternative 2 proposes to treat the most acres and is the most aggressive alternative analyzed. However, it is certainly a long way from meeting the need for restored and fire-resilient forested ecosystems. As detailed in the DEIS, only approximately 6,800 acres are proposed for salvage logging, this represents less than 4% of the total burned acres, and only 14% of the 46,635 acres that burned at high severity, (stand replacing). This means that 86% or 41,835 acres that burned at high severity will not be restored or become fire-resilient ecosystems if Alternative 2 is not implemented, and even less would be treated if any of the other alternatives are selected. The DEIS specifically states: "Following a high severity wildfire, heavy fuel loadings predisposes an area to higher intensity and higher severity wildfires in the future. Such fires inhibit forest stand regeneration and result in stand type changes to brush or other non-forested vegetation types, delaying these lands from reaching the desired conditions of the Forest Plan or providing for future forested wildlife habitat per Forest Plan goals and direction. High intensity fires also put remaining wildlife habitat at risk or future loss."	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The proposed actions were designed to meet the purpose and need of Chapter 1 of the EIS to varying degrees within the constraints of law, regulation, and policy. Some restrictions apply to proposed treatments in order to be consistent with Forest Plan direction and other law, regulation, and policy. The Alternatives were developed within those sidebars, as described Chapter 1 and 2 of the EIS. Due to some of these restrictions, large areas of high severity fire will not be able to be considered for treatment. The Fire and Fuels Report and EIS disclose that large patches of high severity fire that do not receive proposed treatments would reduce the effectiveness in meeting the purpose and need and desired condition.

Code	Comment Number	Comment Text	Response
236.02 - Fuel Load	#5873-14	Salvage logging will not meaningfully reduce fire hazard. Salvage logging removes the large logs (which are least hazardous, and most valuable to wildlife) while moving small fuels (which are most hazardous) to the ground where they are more available for combustion. Activity fuel treatments are only partially effective and will retard desired vegetation/watershed recovery. Replanting conifers will likely exacerbate fuel hazard by creating a dense, homogenous fuel structure in the decades to come. 16. The purpose and need to conduct salvage logging and replanting to restore resilient forests needs to be reconsidered. The proposed action will do the exact opposite of the intended outcome. The best available science shows that salvage logging and replanting will retard complex forest recovery and make the forest less resilient and increase fire hazard.	Salvage logging will remove some large logs and site preparation treatments will remove small fuels, reducing fire hazard. Project design features within the Westside Fire Recovery Project protect watershed and resource values. The Fire and Fuels Report describes fuel treatments for the Westside Fire Recovery Project and how they will reduce fire hazard. Research has shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less severity and intensity or not at all (Thompson, Spies and Ganio, 2007; Weatherspoon and Skinner, 1995). The Westside Fire Recovery Project is treating slash/fuel loading in plantations. In the Fire and Fuels Report; Direct and Indirect Effect section it states "Fuel treatment is an essential component of sustainable reforestation in the Klamath Province (Peterson et al. 2014). Research has shown that the quickest way to reestablsih a coniferous forest after stand replacement fire is by active reforestation (Zhang et. al 2008). Aggressive reduction of residual fuels will be necessary to prevent future fire events from becoming stand-replacing fires that destroy planted seedlings. Research has shown fuel treatments increase the likelihood of the planted trees surviving future fires (Weatherspoon and Skinner 1995, Omi and Kalabokidis 1991). Heavy residual fuels need to be reduced substantially to help assure sustainability of plantations. Follow-up reforestation surveys will be completed to assure that the reforestation objectives are achieved." Fuels reduction actions are further described in the Fire and Fuels Report. As per the Fire and Fuels Environmental Consequences section of the EIS: "Post treatment activities under Alternative 2 are expected to significantly reduce large surface fuel accumulations in the future compared to Alternative 1. The Fire and Fuels resource report displays projected surface fuel loads predicted over a 50-year period, based on completion of implementation actions. While modeling predicts an expected increase in surface fuels less than 3 inches diameter at breast height as compared to the Alternative 1, after implementation of proposed activities, modeling results predict that within ten years, Alternative 2 will continue to promote low accumulations of surface fuel loadings. Comparatively, taking no action significantly elevates surface fuels for decades. Salvage logging and treatment of activity fuels significantly reduces future fuel loading, particularly in fuels greater than 3inches in diameter."
236.02 - Fuel Load	#5873-173	Salvage accompanied by fuel treatment lowered CWD into the optimum range (fig. 9). The simulations for salvage of all dead merchantable trees without fuel treatment and 50 percent salvage accompanied by fuel treatment produced nearly the same amount of CWD … [T]he level of salvage affected snag density significantly … In planning for retention of a given amount of CWD, treatment of fuel that reduces small-sized CWD (trees up to 6 inches d.b.h.) makes it possible to retain more large-diameter dead snags. Brown, James K.; Reinhardt, Elizabeth D.; Kramer, Kylie A. 2003. Coarse woody debris: managing benefits and fire hazard in the recovering forest. Gen. Tech. Rep. RMRSGTR-105. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 16 p. http://www.fs.fed.us/rm/pubs/rmrs_gtr105.html (This paper reveals a scientific controversy about how much wood and of what size to leave after a fire and this issue needs to be fully analyzed in an EIS.) "There's no science that demonstrates re-burn potential in areas where there is downed wood or decayed wood." Craig Bobzien, Bitterroot NF Acting Supervisor (Missoula Independent, July 19, 2001) "We found no studies documenting a reduction in fire intensity in a stand that had previously burned and then been logged." Environmental Effects of Postfire Logging (USDA Forest Service, 2000) "[We] are aware of no evidence supporting the contention that leaving large dead wood material significantly increases the probability of reburn." Wildfire and Salvage Logging (Beschta, et al., Oregon State University, 1995) "The removal of large, merchantable trees from forests does not reduce fire risk and may, in fact, increase such risk." Dept. of Agriculture and Interior, Report to the President (September 2000) Bitterroot NF Burned Area Recovery DEIS, p.3-12: "The slash created by the harvest and fuels treatments that is left on the ground for site protection and future site productivity, would create a short term (zero - eight years) fire hazard. The fuel-bed created by these treatments would be, in large part, comprised of material in the smaller size classes. These fuels would contribute to the flammability and continuity of fuels on a local level, as well as across the landscape. Under good burning conditions, fires burning in these slash fuel types have the potential to spread rapidly and extensively."	Salvage logging does create additional activity fuels that, if untreated, can increase long-term fire risk The commenter cites several papers alluding to increased fire risk in post fire salvage conditions from untreated logging slash. Those conditions are not anticipated in the Westside Project because treatment of activity fuels is a part of all of the action Alternatives (final EIS Chapter 3). The effects of treatment of activity fuels by various methods are shown in the model outputs in the Fuels Report. The Fuels Report also clearly shows the long-term effect of fuel accumulation from fire-killed trees if no salvage harvest occurs. Model results in the Fuels Report are consistent with findings reported in Peterson (2014) that showed heavy fuels from fire-killed trees can persist for as many as 40 years, and that significant reductions in fuel loading can be accomplished by salvage logging. Knapp (2015) states "consumption of both standing snags and Coarse Woody Debris increases fire-line intensity, contributing to extreme fire behavior and more severe fire effects (Page et al., 2013). With Coarse Woody Debris, Brown et al. (2003) speculated that an optimum quantity for warm and dry ponderosa pine and Douglas fir forest types of the western U.S. that would provide for wildlife, nutrients and other ecological benefits, without contributing to excessive risk of an uncharacteristically severe wildfire, would fall within the range of 11.2–44.8 Mg ha-1 (5–20 tons ac-1), with the higher fuel loading acceptable if the Coarse Woody Debris was comprised of larger pieces." These are the target residual fuel levels anticipated in the Westside Project. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

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236.02 - Fuel Load	#5873-174	A recent fuels modeling project for the Cerro Grande Fire area (Greenlee 2000) found that, without fuels treatment, fire risk in ponderosa pine stands bordering Los Alamos generally would be: 1) lower than the pre-fire risk during the first five years after the Cerro Grande Fire, 2) equal to the pre-fire risk during succession years six through twelve, and 3) lower than the pre-fire risk during succession years 13 through 23. Specifically, WUI fire risk would increase markedly by succession year six due to heavy fuel accretion in the moderately- to severely burned stands. Such fuel accretion occurs as a result of numerous fallen snags intermingled with the newly developing understory of grasses, shrubs, and trees. Greenlee, Dawn. 2000. Predicted changes in fire danger in the Los Alamos Wildland-Urban Interface as a result of the Cerro Grande wildfire. Unpub. final rept. FEMA-1329-DR-NM, on file at Fire Research Institute, Missoula MT. The agency often alleges that leaving large snags and logs will increase “resistance-to-control” during future fire fighting. Any discussion of “resistance to control” needs to be limited to areas where direct attack fire-fighting is likely to occur. Improving resistance to control does not justify salvage logging in areas that are not likely to be subject to direct attack, such as topographic chimneys, or steep mid-slope areas. Resistance to control is defined as— the relative difficulty of constructing and holding a fire control line as affected by resistance to line construction and fire behavior. Resistance to line construction is the relative difficulty of constructing control lines as determined by the fuel, topography, and soil. National Wildfire Coordinating Group. 1998. page G-16. While future fire in the next 50 years is by no means a certainty, large logs may increase the time and effort needed to construct fire lines in the event of a future fire. However, this is only a concern in specific locations where fire lines are likely to be built, not all across the landscape. The only place it makes sense to remove large wood to reduce resistance-to-control is in areas where the agency anticipates building fire lines, such as “shaded fuel breaks.” Furthermore, fire lines are often built along ridgelines, so the interest in reducing resistance-to-control must be balanced against the significant impacts of removing large snag and logs other ecological values associated with ridgetop locations. These unique ridgetop values include rare plants and bats roosts. Large logs do not always have lengthy burn-out times or cause severe soil effects as sometimes assumed. Large logs in fact do not burn well. … in most situations the consumption of large woody detritus is linked to consumption of the forest floor. The reason appears to be related to the extremely loose packing of woody detritus. To burn there must be a positive feedback of energy between pieces; and given the distance between large pieces of wood, this feedback is very low. Therefore, for coarse wood this positive feedback is with the underlying forest. This is important because it means that without deep forest floor layers, large pieces of woody detritus will not be completely consumed even when the moisture content is extremely low (similar to attempting to burn a single dry log in a fire place without another log or finer fuels). Harmon, Mark E. Moving towards a New Paradigm for Woody Detritus Management. http://www.fs.fed.us/psw/publications/documents/gtr-181/071_Harm.pdf in William F. Laudenslayer, Jr., Patrick J. Shea, Bradley E. Valentine, C. Phillip Weatherspoon, and Thomas E. Lisle Technical Coordinators. Proceedings of the Symposium on the Ecology and Management of Dead Wood in Western Forests. PSW-GTR-181. http://www.fs.fed.us/psw/publications/documents/gtr-181/. Logging after fire increases future fire risks. The Biscuit Fire in southern Oregon was the largest fire in Oregon’s history in terms of acreage. A large part of this fire area had burned 15 years earlier in 1987. Researchers found that areas that had been logged after the Silver Fire burned with much higher severity than those that were unlogged. While only 28% of the unlogged portions of the Silver Fire burned with high severity in the Biscuit Fire, 68% of the logged portion burned severe. The unlogged portion of the Silver Fire area experienced relatively equal amounts of land burning as high, moderate, low and unburned. The vegetation mortality in the logged units stands out in sharp contrast to the conditions in the unlogged land that was also affected by the 1987 Silver Fire. (Harma and Morrison 2003	Resistance to control and WUI fire risk are analyzed for the Westside Fire Recovery Project in the Fire and Fuels Report and summarized in the EIS, Chapter 3. Findings in the Fire and Fuels Report show that all action Alternatives will reduce fire risk to communities within the project area and improve resistance to control. Removing large trees by salvage alone is not a sufficient fuels treatments as pointed out by many studies. The Westside Fire Recovery Project proposes follow-up fuels treatments after salvage logging to reduce fuel loading and fire hazard. The Westside Fire Recovery Project reduces future accumulations of fuel loading as trees fall to the forest floor through salvage logging and treats surface fuels upon completion of cutting activities. The Fire and Fuels Report sites many findings that support long-term benefits from fuels reduction and can be found in Chapter 3 of the EIS.

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236.02 - Fuel Load	#5873-92	Modeling done by the University of Washington scientists shows that post-fire landscapes are by far the least hazardous fuel profiles not just in the short-term but for several decades after wildfire. If the agency is following the National Fore Plan they will prioritize fuel reduction in areas that are suffering from fire suppression, not areas that have just burned. C. Larry Mason, Kevin Ceder, Heather Rogers, Thomas Bloxton, Jeffrey Comnick, Bruce Lippke, James McCarter, Kevin Zobrist, Investigation of Alternative Strategies for Design, Layout and Administration of Fuel Removal Projects; Rural Technology Initiative; July 2003; http://www.ruraltech.org/pubs/reports/fuel_removal/. See especially Appendix B, pages 13 and 14.	The research provided by the commenter (Mason et al. 2003) is primarily related to risk reduction prior to a fire rather than a post-fire environment. The conditions described for the Fremont National Forest are not necessarily the conditions that exist in the Klamath Province of northern California with respect to fire severity and cycling of dead wood. See Response 5873-72. The fuels reduction activities proposed in the Westside Fire Recovery project are projected to reduce future fire severity in the short-term and long-term compared to the no action Alternative. See Chapter 1 of the EIS and Chapter 3 of the Fire and Fuels Report for further information.See also:Knapp, E. J. 2015. Long-term dead wood changes in a Sierra Nevada mixed conifer forest: Habitat and fire hazard implications. Forest Ecology and Management 339 (2015) 87–95Ritchie M.W. , E. E. Knapp, C. N. Skinner.2012. Snag longevity and surface fuel accumulation following post-fire logging in a ponderosa pine dominated forest. Forest Ecology and Management 287 (2013) 113–122Peterson , D. W., E. K. Dodson and R. J. Harrod. 2003. Post-fire logging reduces surface woody fuels up to four decades following wildfire Erich K. Forest Ecology and Management 338 (2015) 84–91Skinner, C. N. 2002. Influence of fire on the dynamics of dead woody material in forests of California and Southwestern Oregon. Pages 445-454 in Symposium on the ecology and management of dead wood in western forests, November 2-4, 1999, Reno, Nevada.Skinner, C. N., A. H. Taylor, and J. K. Agee. 2006. Klamath Mountains bioregion. Pages 170-194 in N. G. Sugihara, J. W. van Wagtendonk, K. E. Shaffer, J. Fites-Kaufman, and A. E. Thode, editors. Fire in California's Ecosystems. University of California Press, Berkeley and Los Angeles, CA.Taylor, A. H., and C. N. Skinner. 1997. Fire regimes and management of old-growth Douglas fir forests in the Klamath Mountains of Northwestern California. Pages 203-208 in Fire Effects on Threatened and Endangered Species and Habitats. International Association of Wildland Fire, Fairfield, WA, Coeur d'Alene, ID.Taylor, A. H., and C. N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111:285-301.
236.02 - Fuel Load	#5873-93	Salvage increases fire hazard. Faulty analysis of reburn potential. Prevention of reburn must not be used as a justification for post-fire logging, without carefully documenting the rationale and providing references to published scientific studies (not just hypotheses and speculation and anecdotes). Also, the Forest Service must explain whether logging will increase or decrease the risk of reburn in terms of fuels profiles over various time horizons, ignition sources, etc. Salvage logging increases fine and mid-size fuels in the short-term by leaving treetops, branches, and needles on site. Fine and mid-size surface fuels also occur in unsalvaged areas, but accumulate gradually over time. It is unlikely that fuels in an unsalvaged area would reach the same magnitude as in the post-salvage scenario because decomposition breaks down new material accumulates. As noted by scientists interviewed by the Oregonian, “There would be less risk by leaving dead trees standing where they gradually would decay while keeping their tinder above the reach of flames.” Michael Milstein. “Scorched forests best left alone, study finds.” The Oregonian, Jan 6, 2006.	See response to comment number 5873-14. The Oregonian is not a peer reviewed literature source that requires review.
236.02 - Fuel Load	#5873-95	A study of the portions of the Biscuit fire that were previously burned by wildfire, reveals that salvage logging did not reduce the severity of subsequent fires, and in fact salvage logging appeared to increase the severity of subsequent wildfires. See Jonathan R. Thompson, Thomas A. Spies, and Lisa M. Ganio. 2007. Reburn severity in managed and unmanaged vegetation in a large wildfire. Proceedings of the National Academy of Sciences. PNAS published online Jun 11, 2007. http://www.fs.fed.us/pnw/pubs/journals/pnw_2007_thompson001.pdf (“In places that burned with high severity in the Silver Fire, areas that were salvage-logged and planted burned with even higher severity than comparable unmanaged areas.”) http://www.fs.fed.us/pnw/research/PNAS_Biscuit_Author_Comments_PNW.doc. This represents significant new information about salvage logging. (“Some, including forest scientists, would have expected fire severity to be lower in the logged and planted sites, where large wood was removed, broadcast burning done to reduce fine surface fuels, and some vegetation management conducted possibly reducing the cover of flammable shrubs. That our findings were the opposite of this expectation indicates that the large diameter wood is not a major factor in flammability …”). A recent scientific study scientific study of post-fire logging (McIver and Ottmar 2007) showed that salvage logging causes a four-fold increase in fine fuels and that increase can last for 15 years. Fine fuels tend to cause wildfires to rapidly spread which is more likely to kill young trees and set back forest recovery. Unlogged fire areas (the controls) had lower levels of fine fuels but had higher levels of large fuels. Large fuels do not tend to exacerbate the spread of fire but they can heat the soil. However, soil heating is a patchy phenomena that forests have evolved with and can tolerate. Retaining the large wood is also important for wildlife habitat and soil conservation. The scientific consensus in the fuel	The Biscuit Fire project's analysis is outside the scope of this analysis. Removing large trees by salvage alone is not a sufficient fuels treatment as pointed out by many of these studies. The Westside Fire Recovery Project proposes follow-up fuels treatments after salvage logging to reduce fuel loading and fire hazard. The Westside Fire Recovery Project reduces future accumulations of fuel loading as trees fall to the forest floor through salvage logging and treats surface fuels upon completion of cutting activities. The Fire and Fuels Report sites many findings that support long-term benefits from fuels reduction and is summarized in Chapter 3 of the EIS.

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		management literature is that it is more important to control small fuels. J.D. McIver, and R. Ottmar. 2007. Fuel mass and stand structure after post-fire logging of a severely burned ponderosa pine forest in northeastern Oregon. Forest Ecology and Management. Volume 238, Issues 1-3 , 30 January 2007, Pages 268-279. http://www.sierraforestlegacy.org/Resources/Conservation/FireForestEcology/SalvageLoggingScience/Salvage-McIver07.pdf Donato looked at the effects of salvage logging after the Biscuit fire and found that— Postfire logging significantly increased both fine and coarse downed woody fuel loads (Fig. 1B). This pulse was comprised of unmerchantable material (e.g., branches), and far exceeded expectations for postfire logging-generated fuel loads (5, 6). In terms of short-term fire risk, a reburn in logged stands would likely exhibit elevated rates of fire spread, fireline intensity and soil heating impacts (7). Postfire logging alone was notably incongruent with fuel reduction goals. Fuel reduction treatments (prescribed burning or mechanical removal) are frequently intended following postfire logging, including in the Biscuit plan, but resources are often not allocated to complete them (8). Our study underscores that, after logging, mitigation of short-term fire risk is not possible without subsequent fuel reduction treatments. D. C. Donato, J. B. Fontaine, J. L. Campbell, W. D. Robinson, J. B. Kauffman, B. E. Law. Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk. www.sciencexpress.org. 5 January 2006. The 1987 Bland Mountain fire burned east of Canyonville and was heavily salvage logged. The same area then reburned in 2004 with high fire intensity. Salvage logging did not appear to save these plantations from intense fire, in fact, the removal of large logs and dense replanting may have made the fire more intense. One fact is unquestionable, that is that fire hazard is high in young plantations even when they are salvaged. Salvage logging does nothing to address this fact, and may in fact lead to increased density of conifer vegetation types that are more flammable than the mixed conifer-broadleaf vegetation types that may be less flammable. The NEPA analysis asserts that leaving large numbers of snags is unsafe and the NEPA document describes an undesirable scenario with respect to the no action and restoration alternatives, but the NEPA document must acknowledge the fire risks associated with salvage logging including: (a) salvage logging will remove most of the largest logs that least prone to burn (because large logs hold the most water the longest and they have relatively high ratios of volume to surface area), (b) salvage logging leave behind almost all of the smallest material which is most prone to drying and burning (e.g., relatively low ratio of volume to surface area), (c) the proposed action may lop and scatter the tops of large trees that are too big for the ground-based harvest machinery, (d) salvage logging equipment and workers could start fires, (e) increased human access increases the risk of human caused ignition, (f) the replanting will create a fuel load that is dense, uniform, extensive, volatile, and close to the ground (During an extreme weather conditions this is one of the most extreme fire hazards in the forest). There is little empirical support for the idea that salvage logging reduces the intensity or severity of subsequent fire. Recent data show an actual increase in fire severity where post-fire logging had occurred. McIver, James D.; Starr, Lynn; [Technical Editors] 2000. Environmental effects of postfire logging: literature review and annotated bibliography Gen. Tech. Rep. PNW-GTR-486. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 72 p. http://www.fs.fed.us/pnw/pubs/gtr486.pdf. Harma K., and P. Morrison. 2002. Analysis of Vegetation Mortality and Prior Landscape Condition, 2002 Biscuit Fire Complex. Pacific Biodiversity Institute. http://web.archive.org/web/20060518211529/http://www.siskiyou.org/issues/pbivegetative.pdf Dennis C. Odion, Evan J. Frost, James R. Strittholt, Hong Jiang, Dominick A. Dellasala§, And Max A. Moritz. 2004. Patterns of Fire Severity and Forest Conditions in the Western Klamath Mountains, California. Conservation Biology. Volume 18 Issue 4 Page 927 - August 2004. http://www.blackwell-synergy.com/links/doi/10.1111/j.1523-1739.2004.00493.x.	

Code	Comment Number	Comment Text	Response
236.02 - Fuel Load	#5873-96	The agency also over-states the risk of leaving standing snags. Where large numbers of standing snags were present in bug killed areas burned by the Hayman fire in Colorado, fire was generally less severe compared to other areas where large numbers of dead trees were absent. In addition to wildfires, the Hayman Fire burned over another type of natural fuel modification: an area affected by a spruce budworm outbreak. Most Douglas-fir in the area between points 47 and 48 on figure 63 were killed by spruce budworm in the early 1990s with subsequent mortality in remaining trees from Douglas-fir beetle. Surface fuel loads were not excessive, since most of the Douglas-fir snags remained standing. The only live trees remaining prior to the Hayman fire were scattered ponderosa pine and the reduction in crown cover due to insect mortality seemed to affect fire behavior. The fire spread towards the southeast through this area during the relatively inactive period between the runs of June 9 and 17. The fire burned mostly as a surface fire on both sides of Westcreek, with small patches of crown fire activity. From the air, the burn appeared less severe than in areas outside the budworm affected area (fig. 70). Graham, Russell. 2003. Hayman Fire Case Study. Rocky Mountain Research Station Report RMRS-GTR-114. p 144. http://www.fs.fed.us/rm/pubs/rmrs_gtr114.html.	The commenter fails to provide a clear indication of where or how the risk of leaving snags is overstated in the draft EIS. The pre-fire conditions and the fire effects of the Hayman Fire are not comparable to this project's conditions and outside the scope of this analysis. It is in a different fire regime, with different climate variables than the Klamath Province. The risk of leaving snags in terms of fuels conditions for this project are analyzed in the EIS and is site specific for the Westside Fire Recovery Project (fuels section of chapter 3 of the final EIS). We are proposing to retain many snags both across the landscape outside of treatments units and within treatment units, as described in the wildlife project design features and the description of actions in the preferred alternatives (modified alternative 3) in chapter 2 of the final EIS. See pie charts and bar graphs within the chapter for comparative information. See response to comment # 18935-5 for more information. Also see responsible opposing points of view at the beginning of chapter 3 of the final EIS.
236.02 - Fuel Load	#5873-98	Salvage typically removes the largest logs that act as water “reservoirs” and are least prone to drying. See Amaranthus, M.P.; Parrish, D.S.; and D.A. Perry. 1989. Decaying Logs as Moisture Reservoirs After Drought and Wildfire. In: Alexander, E.B. (ed.) Proceedings of Watershed '89: Conference on the Stewardship of Soil, Air, and Water Resources. USDA-FS Alaska Region. RIO-MB-77. p. 191-194. This study found that large down logs in a post-fire landscape contain 25 times more moisture than the surrounding soil. While the authors recommended preventing large accumulations of "woody residue" (which the author described as very small diameter material--branches, twigs, etc.), they also recommended leaving down logs after fires to PREVENT future fire severity. They concluded that, "When forest managers are analyzing for fire risk, they should take into account the high water content of fallen logs during the period in which wildfire potential is greatest... Fallen trees, in a range of decay classes, therefore provide a long-term reservoir of moisture. A continuous supply of woody material left on the forest floor, not only protects the productive potential of the forest soil, but also provides a sanctuary for ectomycorrhizae and a significant source of moisture in the event of prolonged drought or wildfire." The study was conducted in the Klamath region in an area with roughly 40 inches of annual rainfall. It was published in 1989 in Proceedings of Watershed '89: a conference on the stewardship of soil, air and water resources. USDA Forest Service, Alaska Region: pp. 191-194 (1989).	Benefits of leaving large woody material are incorporated into the Westside Fire Recovery Project. The Westside Fire Recovery Project proposes to reduce fuel loading to reduce fire hazard while leaving areas of woody material to meet Land and Resource Management Plan goals and objectives (project design features Wildlife-11 through Wildlife 13, Wildlife-15). Effects analysis within the EIS, Chapter 3, take into account woody material. Removal of down logs would reduce the productive potential of the soil by impacting microorganisms and decreasing soil moisture. Areas deficient in large logs would not meet the surface organic matter indicator and these impacts are summarized in Chapter 3 of the EIS.
236.03 - Community Protection	#13-3	Adopting the FS preferred alternative would also promote conflict in our communities and render the Forest Service more susceptible to lawsuits if homes are destroyed because KNF managers chose to create greater future fire risks via salvage logging rather than choosing the Karuk or another alternative which offers more community protection, creates ridge top shaded fuelbreaks capable of stopping a future fire and which results in less fire risk over time.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Fire and Fuels Report and EIS show all action Alternatives have a reduction of hazard to communities and in areas where fuels are being treated. See Chapter 2 for a discussion of the Karuk Alternative, how it was considered, and what components of it were or were not incorporated into the preferred Alternative (modified Alternative 3). Fuel breaks are part of the proposed actions, some as originally proposed and some as incorporated from the Karuk Alternative.
236.03 - Community Protection	#17481-24	I would like to see full recovery treatment adjacent to small towns and settlements. This should include removal of Snags, dead and dying trees, and development of shaded fuel breaks.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. All action Alternatives include treatment adjacent to communities/WUI and remove snags, dead and dying trees and development of ridge-top fuel treatments.

Code	Comment Number	Comment Text	Response
236.03 - Community Protection	#17764-5	I do not believe the Westside project promotes recovery or that it would protect communities- it would actually hinder natural recovery and increase the fire risk.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The Fire and Fuels Report suggests that fuels treatments would protect communities and decrease fire hazard. The action Alternatives all implement multiple types of activities to reduce snag densities and surface fuel loading, including within the WUI. The Fire and Fuels Report states "Units proposed for treatment occur both within the WUI and strategic road and ridge systems in which fire suppression resources utilized historically to control unplanned fires and implement prescribed fire activities. Any hazardous fuels treatment not meeting desired conditions can be maintained with future treatment." The maintenance of these treatments will address future escalation of hazard and risk both within and outside the WUI. Fuel treatments within the WUI promote safer firefighting actions and public evacuation, should a future large fire occur within the project area. Eliminating high snag densities and treating surface fuels within the WUI has an indirect effect on reducing sources for embers, spotting, and receptive fuel beds. These indirect effects are a benefit in the action Alternatives, when compared to Alternative 1, where no action is taken to reduce future available material. Additionally, increased spotting and radiation would make structures more difficult to defend from crown fire, as opposed to surface fire. (Cohen & Butler, 1996; Scott & Reinhardt, 2001). Further descriptions of WUI treatments can be viewed in the Fire and Fuels Report.
236.03 - Community Protection	#18849-4	Given the chronic neglect of forest conditions over the past three decades, emergency treatments must proceed to protect communities such as Happy Camp and Scott Bar from future fires that will be aggravated by dead wood.	Comments about past forest management are outside the scope of this project. Conditions of the post-fire environment are addressed throughout Chapter 3 in the affected environment. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. The Fire and Fuels Report analyzes and describes actions of treatments that would protect communities, including the removal of fire killed trees. A full description of WUI treatments can be viewed in the Fire and Fuels Report.
236.03 - Community Protection	#18859-11	Given the chronic neglect of forest conditions over the past three decades, emergency treatments must proceed to protect communities such as Happy Camp and Scott Bar from future fires that will be aggravated by dead wood.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
236.03 - Community Protection	#18859-2	The Westside Recovery Project proposed by the Klamath National Forest is urgently needed to address the priority needs resulting from the 2014 wildfire season. The lack of active management, a prolonged drought, and a century of fire suppression has left our forests, our communities and our county as a whole under a constant threat of large, uncharacteristic, catastrophic wildfires.	Comments about past forest management are outside the scope of this project. Conditions of the post-fire environment are addressed throughout Chapter 3 in the affected environment. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. Identified treatments in the WUI modify fire behavior such that fires are anticipated to spread slower, with flame lengths less than four feet, allowing responding resources to take direct action to control fires. These direct actions are effective due to the change in composition and structure of fuels, which promotes low resistance to control when compared to Alternative 1.
236.03 - Community Protection	#18872-3	We, The Shasta Nation, A Sovereign and the public that resides in our Unextinguished Land Titled Indian Lands, and throughout the California Republic are in fact being terrorized by these catastrophic forest fires. FEMA Fire prevention monies should be available for communities and homes in the fire off season to areas of imminent danger. Many communities within the West side fires that were on evacuation notice with existing sub level fire conditions exist with the current fire threat until the next fire event. . . All communities with appropriate agencies need to prepare for fire in the spring and fall,as if a fire is likely to occur in the summer months, money spent now will save money later. Fire safe councils, State and Federal fire crews need to do this preparatory readiness when conditions are suitable. They are after all public servants.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The statement is outside the scope of this project because this project is a fire recovery project. The Westside Fire Recovery Project does propose WUI treatments to reduce fire hazard.
236.03 - Community Protection	#18872-8	A priority of projects around communities and homes	All action Alternatives propose treatments around communities. These treatments would be prioritized to protect communities and homes.

Code	Comment Number	Comment Text	Response
236.04 - Fire Supression	#12346-50	Future Wildfire Suppression Actions Please note that the Westside DEIS indicates that part of the purpose of the project is to provide conditions to facilitate future fire suppression/exclusion. Hence continued fire suppression constitutes a "connected action" to the proposed salvage logging. As connected action, the impacts and consequences of fire suppression activities (such as fireline construction, use of retardant, and backburns/burnouts) must be disclosed in the NEPA document for this project. Yet here the Forest Service has refused to disclose even the site-specific and cumulative impacts of fire suppression activities (including dozer line construction in Riparian Reserves) associated with the 2014 Westside fires, let alone the cumulative impacts of the future fire suppression that the agency hopes to facilitate via additional logging. Throughout the DEIS the Forest Service states part of the objective of the roadside salvage logging is to provide ingress and egress for firefighters and that part of the objective of unit salvage is to affect fire behavior and the ability to suppress future fires. Given that safety is one of the purposes of the project, and that fire suppression effectiveness was used as a measure of achievement of that purpose, there is no doubt that fire suppression is a connected and cumulative action to the authorized logging activities.	Although wildfire is a regular occurrence in the Klamath Province, when, where, and how big the next fire will be is unknown. Given the unpredictable nature of wildfire, it is unreasonable for the Forest Service to consider and analyze the site specific activities associated with suppression of wildfire as either a connected action or cumulative action.
236.04 - Fire Supression	#12346-54	The ecological impacts of wildland fire-suppression activities can be significant and may surpass the impacts of the fire itself. A recent paradigm shift from fire control to fire management has resulted in increased attention to minimizing the negative effects of suppression. While the philosophy behind minimum-impact suppression tactics has provided a good first step in this direction, increased attention to the ecological effects of suppression is needed, especially in the management of public lands. We reviewed the potential impacts of suppression on land, air and water resources and the impacts of using fire to help control fire. Effects on land resources include erosion, which is exacerbated by the construction of fire lines, temporary roads, and helicopter pads, and some postfire rehabilitation activities. Although the fire itself is the most obvious source of air pollution, the vehicles used in suppression activities contribute to this problem and to noise pollution. Water resources, including aquatic flora and fauna, may be seriously affected by suppression activities that can increase erosion, sedimentation, turbidity, and chemical contamination. Finally, the use of backburns and burnout operations contributes to the risk of soil and water contamination, increases the total area burned, and promotes more intense fires or more homogenous burned areas. Although no fire-management strategy should be applied uniformly, some general techniques such as use of natural clearings, natural barriers, and appropriately sized fire lines, "leave no-trace" camping, and careful application of fuels and retardants can be employed to minimize the impacts of suppression. 21 Because part of the purpose of the Westside Fire Salvage project is to facilitate additional fire suppression, the cumulative and connected impacts of such suppression must be disclosed and analyzed.	See response to comment number 12346-50. Fire suppression activities have been accounted for in the existing conditions.
236.04 - Fire Supression	#17111-24	Issues associated with fire suppression could be addressed by creating snag-free corridors or narrow FMZs. Some limited tree planti ng may be justified to provide seed sources for tree species otherwise likely to be absent or under-represented but the plantings should be carried out in low numbers and at variable density. Establishment of large areas of plantations, even at low density, is inappropriate within the LSRs or on sites characterized by Fire Regimes I and II. Finally, current knowledge regarding the ecology and recovery of the NSO should be considered during revision of the DEIS.	Please see the response to comment number 17111-4. Please see the updated Terrestrial Wildlife Biological Assessment for a review of current knowledge regarding the ecology and recovery of northern spotted owl. Fire suppression activities are outside the scope of this project and its analysis. While silvicultural practices are not always viewed as ecologically sound, recent studies have shown that there is a need to create stands with late successional characteristics to support species populations that rely on this type of stand. Silvicultural treatments can increase stand structural variability, move stands toward multi-level canopies and increase residual tree growth, primarily in the form of thinning (Dodson, Ares, and Puettmann 2012). Through artificial reforestation, conifers are given a head start at re-establishment, and subsequent thinning treatments can move stands towards a condition more ecologically suitable for wildlife in a shorter time frame than if left to establish naturally. Forest wide standards and guidelines encourage restocking of lands left understocked after wildfire. Tree planting prescriptions are based on historic unit conditions and will be planted in clusters and at a lower density than in the past (EIS, Chapter 2, Alternative 2, Reforestation and Release). Current knowledge regarding the northern spotted owl has been considered in the EIS (Chapter 3, Terrestrial Wildlife). Best available science is referenced throughout the final EIS, biological assessment, and other supporting documents.

Code	Comment Number	Comment Text	Response
236.04 - Fire Supression	#18747-2	The treatment of ridge tops is especially important to slow or stop Forest Fires and all of the above adds a great measure towards the safety of personnel and vehicles in the fire areas and escape routes.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Numerous ridgetop treatments are proposed in all action Alternatives within the Westside Fire Recovery Project. See Chapter 2 for a description of proposed actions. See the fuels section for a discussion of effects.
236.04 - Fire Supression	#18878-25	DEIS: High severity areas are characterized by total or near-total conifer crown consumption.Within areas of moderate burn intensity, some crown consumption has occurred as a result of the fire but these areas are characterized by total or near-total crown scorch. The vast majority of crown-scorched trees have been killed by the fire or damaged beyond their ability to survive. (pg 111) Comment: Please provide literature which concludes, "The vast majority of crownscorched trees have been killed by the fire or damaged beyond their ability to survive" a 6 of 22 moderate burn intensity. In addition please define "vast majority" and what percentage of crown scorching was documented.	As described in Chapter 3 of the EIS, "Site visits to the project area by foresters and a silviculturist were conducted between October 2014 and December 2014. Remotely sensed data on vegetation burn severity were field-validated and potential treatment areas were identified. Stand data were collected using ocular estimates and plot data collection, as needed." The fire-injured tree marking guidelines for the Westside Fire Recovery Project are based on published models from the Hood et al. 2010 study (Hood, Sharon M.; Smith, Sheri L.; Cluck, Daniel R. 2010. Predicting mortality for five California conifers following a wildfire. Forest Ecology and Management. 260: 750-762). The guidelines are based on probabilities and the Forest chose to only mark trees with a high probability of mortality thus minimizing the chance that large numbers of green trees that might otherwise live will be removed. In addition, many of the trees that will not be marked for removal because they do not meet this high threshold will ultimately die, providing for snag habitat, etc. See response to comment number 12346-55. The Westside Proposed Action focuses on high severity patches that consist of dead trees, the number of trees marked for removal with some level of green crown (i.e. the ones that will utilize the guidelines) will be minimal; and even fewer of these marked green trees would have ultimately survived based on the high Pm chosen for the project. The fire-injured tree marking guidelines for the Westside Fire Recovery Project are based on published models from the Hood et al. 2010 study (Hood, Sharon M.; Smith, Sheri L.; Cluck, Daniel R. 2010. Predicting mortality for five California conifers following a wildfire. Forest Ecology and Management. 260: 750-762). These well established guidelines are based on the best available science documenting post-fire conifer mortality in California and their use has contributed to the success of many post-fire salvage and restoration projects. The Hood et al. 2010 publication that the marking guidelines are based on compares their models to other models in the scientific literature and describes the similarities and differences in tree mortality predictions. Differences exist between different studies due to a variety of factors including the geographic locations where the models were developed, whether the data was collected from prescribed fires or wildland fires, the methods used to evaluate fire-injuries and the size and number of fire-injured trees in the respective datasets. The Hood et al. 2010 study is based on the most comprehensive dataset for wildland fire-injured conifers in California, and the guidelines developed from this publication are the most appropriate for the Westside Fire Recovery Project.
236.04 - Fire Supression	#18878-36	DEIS: Few forested regions have historically experienced fires as frequently and with such high variability in fire severity as the Klamath Mountains Bioregion (Taylor & Skinner, 1998) which includes the project area.(Pg. 119) Comment: It should be noted this high variability of fire severity has contributed to the diversity for which this region is known, and integral to Karuk management practices which foster the cultural resources found in the project area. What also is not discussed in this section is how suppression policy has aggravated fire severity. To quote Taylor & Skinner (1998), "As the time since the last fire lengthens in these fire-prone forests, surface fuels and live ladder fuels will accumulate. Accordingly, the probability of large, severe fires will likely increase as has been the case throughout the western United States (e.g., Mutch and Cook, 1996). The use of fire will likely be an integral component of management plans that successfully provide long-term, late-successional conditions in the newly established latesuccessional reserves of the Klamath Mountains." Unfortunately, the use of fire is not an integral component of management plans and regulated to the periphery of the refined proposed action with the exception of the Whites Fire perimeter. Karuk philosophy, the Karuk ECRMP, and the Karuk Alternative all consistently note that fire is an integral component of management plans.	Several elements of the Karuk Alternative overlap with the Preferred Alternative. See Chapter 2 for a discussion of how the Karuk Alternative was considered.

Code	Comment Number	Comment Text	Response
236.04 - Fire Supression	#18878-45	DEIS: Resources, including aircraft, heavy equipment and personnel were safely able to drop water and retardant in open areas and construct line with minimal large woody debris. (Pg. 127) Comment: Earlier in the document on Page 125 it states "Effectively produce fire behavior such that persons using hand tools can generally attack fires at the head or flanks and handline is sufficient to hold the fire." We are concerned that there seem to be conflicting and potentially misleading statements throughout the DEIS.	On Page 125 of the draft EIS under the "Fire Behavior Synopsis" section, the document is referring to predicted fire behavior under Alternative 2. On page 127, under the "Fire Suppression Capability" section, the document is referring to an example of the Kyburz Fire. We see no indication of misleading or conflicting statements in this example.
236.04 - Fire Supression	#18935-5	he Forest Service acknowledged that the Center discussed in its scoping comment the information cited above, but did not respond to it (USDA 2015a: 97, 106) (acknowledging information with no response). The DEIS contains no specific information to support its projection of snag fall rates or its statement that large woody fuel will feed uncontrollable wildfire in the project area. See DEIS at 120 ("Over the course of time, it is anticipated that fireline intensities from stored standing material that fall and accumulate on the surface will exceed intensities of 6,000 British Thermal Units per foot per second (btu/ft/sec) … Re-burn within these locations will have a high probability of burning at high severity again due to the fire intensity and duration as larger fuels are consumed after the flaming front has passed"). To reach this statement, the Forest Service says that it modeled snag-fall rates in the project area. Id. 118 ("Post-fire stand data were collected," and "these data were used to enter into a snag-fall and decay model that quantifies potential surface fuel loads overtime as snags weaken, break and/or fall over"). However, the analysis does not describe the "snag-fall and decay model," assumptions of the model, inputs to the model, or any information about quality control to ensure that model outputs accurately reflect facts in the project area. NEPA requires disclosure of factual information used by agencies to support assumptions and conclusions about environmental effects of proposed actions. The "snag-fall and decay model" applied in this case epitomizes the black box lacking explanation and repeatability that is barred by Ninth Circuit case law. It fails to meet basic standards of professional and scientific integrity. The lack of information is significant because relevant scientific information cited above indicates that snags may remain standing for many decades, and much longer than the 20-year time horizon applied by the DEIS to compare effects of alternatives. See id. 119 ("Short-term analysis is considered at one to five years post-fire; long-term analysis extends out to greater than 20 years to model the potential effects of standing snags, downed wood and subsequent surface fuel loading over time"). Moreover, failure to quantify decomposition (decay) of woody fuels contributes to gross overestimation of available fuel load and predicted fire intensity over time (USDA 2015b: 41-48). The black box "snag-fall and decay model" applied by the Forest Service in this project overlooks scientific information that is directly on point and exposes a key flaw in the DEIS regarding decomposition of woody fuels over time. Dunn and Bailey (2015) modeled temporal fuel dynamics after wildfire controlling for effects of salvage logging in forests dominated by ponderosa pine and Douglas-fir. That research states that coarse woody fuel (>3 inches diameter) decomposed at a rate of 22-60 percent by the time such fuels class peaked in volume ~30 years after wildfire. Salvage logging increased coarse fuel density for 7 years compared to a no-logging scenario, after which coarse fuels were less abundant than without logging. Salvage also increased fine fuel density (most flammable) for 22 years compared to a no-logging scenario. Dunn and Bailey (2015) state that while fuels increase over time in the absence of salvage logging, decomposition also occurs, and fuel accumulation is not constant over time. In contrast, the Forest Service assumes in its analysis of fire resistance-to-control and wildfire behavior that fuels will accumulate over time, but fails to account for woody fuel decomposition. See DEIS at 120 ("Over the course of a 50-year period, surface fuel accumulation is expected to occur from two sources: (1) new vegetation that establishes and grows over time, and (2) accumulations from snags as they fall"); compare id. 230-231 (large snags that fall to the ground decompose over time to promote soil development and post-fire ecological recovery).	Combined response with comment number 18935-6. As mentioned in the Fire and Fuels Report under the " Fire Modeling" section, fuels plot information was used to provide information into the 'Snag-fall and decay" model using methods from Wilson 1999. Furthermore, the Fire and Fuels report states that a review of the calculations (from Wilson 1999) demonstrates that similar snag fall and decay rates can be expected for the Klamath Mountains. Snag fall and decay rates where analyzed over a 50 year period for the analysis. Decay rates are part of the calculation described in this modeling exercise. Dunn and Bailey 2015 state "Total surface fine woody fuel loadings peaked 17–18 years post-fire (6.76–9.92 Mg ha_1) in unmanipulated stands; thereafter decay losses exceeded input rates and loadings decreased. Salvage logging immediately increased surface fine woody fuel loadings by 160–237% above maximum loadings observed in unmanipulated stands, and were higher during the initial 18–22 years post-fire." We agree with the commenter that fuels increase overtime in the absence of salvage logging, that decomposition rates occur, and fuel accumulation does not occur constantly through time. These concepts, including findings from Dunn and Bailey 2015, are accounted for in the Fire and Fuel Report and summarized in Chapter 3 of the EIS. Furthermore, the Westside Fire Recovery Project proposes to reduce fuel loading post-salvage harvest through site preparation fuels treatments. Removing large trees by salvage alone is not a sufficient fuels treatment as pointed out by many of these studies. The Westside Fire Recovery Project proposes follow-up fuels treatments after salvage logging to reduce fuel loading and fire hazard. The Westside Fire Recovery Project reduces future accumulations of fuel loading as trees fall to the forest floor through salvage logging and treats surface fuels upon completion of cutting activities. The Fire and Fuels Report sites many findings that support long-term benefits from fuels reduction and can be found in Chapter 3 of the EIS. Project design features are also in place to provide resource protection measures in meeting the Forest Plan. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
236.04 - Fire Supression	#18935-6	Moreover, Dunn and Bailey (2015: 104-107) observe that absence of salvage logging 18 years after wildfire did not result in coarse wood input to forests meriting application of the "high" fire hazard metric cited by the Forest Service in this project (Brown et al. 2003). In fact, salvage logging increased density and volume of fine woody fuels (slash) to a degree that fire hazard was "high" ~20 years after wildfire irrespective of coarse wood input to surface fuel load by snag fall. Management implications of the NecroDynamics temporal fuel model developed by Dunn and Bailey (2015: 106-107), never addressed by the Forest Service in the DEIS, are highly relevant to this project: Although salvage logging reduces coarse woody fuel loadings, alone it does not mitigate re-burn hazard because it increases fine woody fuel loadings and has little direct effect on reestablishing vegetation. Spatial fidelity of high-severity fire has been observed and may result from shrub crown combustion (Thompson and Spies, 2009), or combustion of heavy fuel loadings that release large amounts of heat (Odion et al., 2004). Therefore, additional hazardous fuels treatments are required to reduce fine woody fuel loadings (McIver and Ottmar, 2007) and the abundance of the highly-combustible shrub fuel layer (Weatherspoon and Skinner, 1995). Shrub control would reduce woody vegetation biomass but may increase herbaceous (i.e. grass and forbs) fuel loadings in the near term (McGinnis et al., 2010), which can be a significant fuel layer as it cures and becomes a combustible, continuous fuelbed (McIver and Ottmar, 2007). Additionally, intensive reforestation typically substitutes conifer biomass for shrub biomass, limiting hazardous fuels reduction unless additional efforts are employed to reduce and maintain crown continuity and surface fuel loadings (Lyons-Tinsley and Peterson, 2012). Intensive postfire hazardous fuels treatments that influence all hazardous fuel layers could have negative consequences on ecosystem function, making them an undesirable mitigation strategy. Long-term management strategies promoting fire resilient ecosystems should maintain the ecological functions supported by early seral habitats and coarse woody detritus, while mitigating their contribution to fire hazard (Brown et al., 2003). Salvage logging to enhance ecosystem resilience may not be appropriate if multiple ecosystem functions and resources are considered, including; coarse wood use by wildlife (Cahall and Hayes, 2009; Hutto, 1995; Fontaine et al., 2009; Saab et al., 2005), functional attributes of early seral vegetation (Swanson et al., 2010), compounding effects on soil and nutrient pools (Brais et al., 2000; Triska and Cromack, 1980) and reduced water and carbon storage (Harmon et al., 1986). Salvage logging intensity can be reduced to maintain the ecological benefits of early seral habitats and coarse woody detritus, but less intensive salvage logging retains more fine and coarse woody fuels potentially limiting any re-burn hazard reduction (Donato et al., 2013; Ritchie et al., 2013). Those research findings of Dunn and Bailey (2015) agree with Donato and others (2006) that additional fuel treatment is necessary to avoid significant increase of fire hazard and undesirable fire effects after salvage logging. They also agree with conclusions of Beschta and others (2004), Lindenmayer and others (2008), Lindenmayer and Noss (2006) and Noss and others (2006) that, on balance, salvage logging intended to minimize "reburn" hazard is incompatible with management objectives for national forest lands including conservation of soil productivity and biological diversity.	See response to comment number 18935-5.
236.04 - Fire Supression	#5873-12	Since the location and timing of future fires cannot be predicted, creating safe space for firefighters should be limited to the structure ignition zone and limited areas that are highly likely to be used as future fire control lines. If makes no sense to sacrifice ecological restoration goals in order to facilitate highly speculative future fire-fighting.	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The proposed treatments shown in the Fire and Fuels Reports are largely based on strategic locations where firefighters will likely be in the future for planned and unplanned ignitions. Many of these locations will likely be used as control lines for future wildfire suppression as well as implementation of future prescribed fire.
236.06 - Fire Adapted Ecosystem	#17359-3	As a former resident of southwest Oregon, I wish to see the Forest Service accept fire as a normal component of nutrient cycling and succession, and I continue to do so, starting with its response to the 2014 fire season.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
236.06 - Fire Adapted Ecosystem	#17450-2	Second, I have recently hiked through many of the areas burned in the 2014 fire and have observed them to be recovering nicely. New growth is occurring, wildlife is resuming its place in the order of things and there are no significant erosion or safety issues.	Statement that is outside the scope of this project.
236.06 - Fire Adapted Ecosystem	#17481-21	Fire is a landscape process and an acre-by-acre treatment is decoupling safety in the WUI, habitat and other functional needs are not acre-by-acre.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
236.06 - Fire Adapted Ecosystem	#18852-30	12) The role of re-introducing or "allowing" fire into the project area in order to assist with treatment of fuel loading and fire risk over time, and the return to functional ecological processes within a "post-suppression" fire regime is not adequately addressed. Based on maps for Alternatives #2-5, there is not an adequate plan for prescriptive or wild land fire return to these fire effected landscapes. 13) The role of future fire suppression efforts in landscapes effected by the Beaver, Happy Camp Complex and Whites fire should be considered within a "let-burn" context, in order to treat fuel loading and assist with ecological processes. Prescribed fire within these landscapes should be encouraged. (Please see the Karuk alternative for mapping of intended prescriptive fire allowance).	See response to comment number 12346-50. Prescribed fire is a component of all action Alternatives.
236.06 - Fire Adapted Ecosystem	#18852-5	We have fundamentally made an enemy of fire which is an inherent and essential component of our forested ecosystem. This enemization (i.e. fire suppression) has created forest fuel loading and forest structures which is highly susceptible to catastrophic wildfire over large contiguous acreage, as evidenced in the burn severity maps included in the project documents. The "Westside Recovery" project dialogue also emphasizes the risks if fuels are left untreated, however it does not adequately take into account the natural process of incremental fuels treatments if our fire regime (6-12 year intervals) are allowed to proceed unmolested.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We acknowledge the importance of fire in a fire-adapted ecosystem, as referenced throughout the final EIS. Where fire has or will be desired conditions in the Forest Plan and the purpose and need of the project, no treatments are proposed. Treatments are proposed where they are needed to meet project purposes, including reducing future fire risk and improvements to long-term wildlife habitat and watershed conditions. Evidence of this includes that this project proposed prescribed underburning as needed to meet project objectives. See response to comment number 18935-7 for planned follow-up fuels treatments. See the No Action for effects of no treatment.
236.06 - Fire Adapted Ecosystem	#18878-28	DEIS: Light-seeded, prolific, early successional weed and grass species, having survived the fire in unburned pockets and perimeter areas, will rapidly reinvade burned areas. Well established perennial root or rhizome species will likely re-sprout from existing root systems. Brush species, such as manzanita, snowbrush, deerbrush and whitethorn, are well-adapted ecologically to the fire-impacted ecosystems. Assuming fire intensity and duration at less than lethal levels, these species are capable of root collar sprouting. Brush seed, which may retain viability for 40-150 years in the duff layer, will germinate in potentially large numbers for 2-3 years after fire-scarification. Fire top-killed hardwood tree species, such as black oak, tanoak, madrone, and live oak are also capable of root-collar sprouting. These species are able to take immediate advantage of a well-established root system, giving them the inherent capability to grow rapidly for early site dominance. (Pg 112) Comment: Once again the author is using terminology such as "fire-impacted ecosystems" and "rapidly reinvade" as a semantic tool eliciting a negative emotional response to what is being described. The accepted terminology for the Klamath Province in terms of fire is fireadapted ecosystem. Without a balanced discussion in regards to our fire-adapted ecosystem and ecosystem responses, the reviewer is left with an incomplete view, much less a basic understanding, of the role fire has played in shaping the landscape.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
236.06 - Fire Adapted Ecosystem	#18878-9	Fire will continue to be a presence on the Klamath Mountain landscape and shape future vegetation, fuel loadings, and fire severity patterns" (Pg 2) 2 of 22 Comment: The above statement is partially correct. Yes, fire will continue to be a presence on the landscape shaping future vegetation and fuel loading. Yet it is critical to point out, "More area is burning at high intensity, and this is related, in part, to higher quantities and more homogeneous fuels caused by accumulation during the firesuppression period" (Taylor, Skinner, and Agee, 2006). These conditions are a direct result of past, current, and, it appears from the DEIS, proposed future KNF management actions such as the Refined Proposed Action. We are at a critical management decision point where we can re-establish the traditional role that fire played on the landscape. Emergency Triggering Event	We acknowledge that fire will continue to be present in the Klamath Province, as discussed throughout the final EIS. We agree with the reference by Taylor, Skinner, and Agee and that some of the existing fuels conditions are a result of past management, including past fire suppression activities. However, past fire actions are outside the scope of this project (other than as considered under affected environment analysis in Chapter 3 of the final EIS). We disagree that this project in contributing to homogenous fuels conditions, since the opposite is true. Salvage harvest and fuels treatments are proposed to reduce the amount and continuity of future fuels across the landscape. See the purpose and need in chapter 1 and the proposed actions, which described intention, in chapter 2 of the final EIS. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. See Chapter 3 under fuels for a discussion of the effects of this project on fuels conditions. We agree with the importance of fire on the landscape, as evidenced by the fact that our proposed includes prescribed underburning (see Chapter 2). Where fire achieved desired conditions of the Forest Plan and already meets the purpose and need of the project, no treatment is planned.
236.06 - Fire Adapted Ecosystem	#18935-3	(1) The DEIS fails to reliably state temporal rates of snag fall and wood decomposition affecting projections of fuel density and fire hazard over time. The Center noted in scoping comment that time required for fire-killed trees ("snags") to fall to the ground and become available fuel for combustion by wildfire is proportional to their size and varies by species. For example, 20 years may pass before fire-killed ponderosa pine snags of relatively small size (i.e., 6-9 inches diameter) break or topple, and Forest Service research states that larger stems of fire-killed ponderosa pine and Douglas-fir may remain standing for up to 80 years (Harrod et al. 1998). Russell and others (2006) studied temporal dynamics of woody fuel after wildfire affected mixed conifer forest with a significant component of Douglas fir, similar to conditions in the project area. They distinguished longevity of Douglas fir snags from ponderosa pine snags, and reported that stems of the former species remained standing longer due to relative heartwood density and rate of decay. More than 80 percent of Douglas fir snags stood 10 years after wildfire compared to approximately 30 percent of ponderosa pine snags (Russell et al. 2006: 183 - Fig. 1). Similar to in Chambers and Mast (2005), large snags (>20-inches diameter) and snags occurring in high densities persisted much longer than smaller snags and others that were not clumped (Russell et al. 2006: 184). Post-fire logging increased the rate of snag fall and shortened the period in which snags provided habitat for cavity-nesting bird species (Russell et al. 2006: 186). Citing this information, we commented that the project is likely to accelerate snag loss and recruitment of large woody fuels compared to a scenario in which no logging occurs.	See response to comment number 18935-5. Harrod et al. 1998 state "some recent data collected in the Leavenworth Ranger District, Wenatchee National Forest, suggests that some snags may last up to 80 years." This is based on personal communications, and not published data. The literature shows that most large trees do not stay upright nearly this long as pointed out the commenter. Harrod et al. 1998 summarize the snag longevity data and state that fall down rates have only been studied for up to 15 years, so anything beyond that would be based on extrapolation and not actual data. In their snag fall model, harrod et al. 1998 choose 45 years as the time when all snags have fallen, which they term "generous." The literature summarized in Harrod et al. 1998 shows most snags, even the large ones" do not last more that 20-25 years (Keen 1929, Keen 1955, Bull 1983). Knapp et al. 2015 did not see an increasing rate of snag fall after salvage logging and saw "no effect of increasing levels of retention on the percent of material coming down" (Ritchie et al. 2013. The Russell 2006 study reported shorter snag longevity in salvaged logged plots compared to unsalvaged log plots, which the authors attribute to the fact that salvage removed the largest trees. Because the salvaged areas contains more small snags and smaller trees fall quicker than larger trees, the average for the salvaged areas was lower. Salvage itself did not cause snags to fall more quickly.
236.06 - Fire Adapted Ecosystem	#5873-105	LSOG FIRE BEHAVIOR: "The multi-layered, mixed-conifer stands in age classes greater than 120 years with more open stand structure have lower surface fuels and higher canopy heights. These stands would likely have single or group tree torching with low rates of spread and short flame lengths. A fire started within these stands would likely be easily suppressed." Butte Falls Blowdown Salvage Environmental Assessment. Butte Falls Resource Area. Medford BLM. Department of the Interior. 2008. http://www.blm.gov/or/districts/medford/plans/files/EAOR1150802.pdf pages 56-57.	Statement that is outside the scope of this project.

Code	Comment Number	Comment Text	Response
236.07 - Fire Behavior Plantations	#17460-12	Throughout the DEIS and accompanying reports, many references to fire safety are made as a justification for this project: some have merit, like roadside hazard treatments and fuels treatments in the WUis; at the same time, deeper in the documents, the specifics of the concerns within the LSRs and away from roads and WUis state that increased fire potential will not exist there for 10-15 years: that's an emergency that doesn't really exist yet. If fire safety is the driving concern, are there higher priority projects that are being ignored, due to all the attention given to the Westside Project? After dozens of visits to the Happy Camp Complex area following the fires, and comparing those areas that burned most severely to historical imagery through Google Earth, one pattern became very clear: overstocked, young (20-40 year old) plantations that had not received thinning and fuels treatments consistently burned with nearly 100% tree mortality. Here is a short, but not exhaustive, list of such plantations, as identified by units on the Alternative 2 maps proposed for plant-and-release treatments: P300, P301, P302, P303, P353 (Cougar Creek Watershed); P198, P199; P038, P042 (South of Tyler Meadows); P146, P147, P148 (Blue Mountain). Given the already high fire danger of 2015, a higher priority should be given to thinning and fuels reduction in overstocked, young plantations that have NOT burned. That would truly reduce the threat of high severity fires in the shortterm, and the potential for even more loss of timbered lands within the National Forest. There is plenty of time to complete fuels hazard treatments and replant in the plantations affected by the 2014 fires, without having to resort to an ESD in those areas. In light of these facts, I oppose any such Emergency Situation Determination.	See response to comment number 17501-2 about the emergency situation determination. Supporting documentation provided with the emergency situation determination submittal describe that in order to address long-term goals for fire risk reduction and habitat improvement that the project implementation needs to be expedited due to the need to have a viable project for implementation. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. There are other project objectives within the Westside Fire Recovery outside of fire safety. In addition, standing snags are described as a safety concern for future firefighting efforts with examples provided in the Fire and Fuels Report. Prioritization of this project compared to others is outside the scope of this project analysis.
236.07 - Fire Behavior Plantations	#17471-1	I believe the sale of the timber that was burned last fall will have far and long standing implications. I believe the sale of this recovery will only serve to reinforce the idea behind fire suppression. After the sale takes place, more tree stands will be replanted in sectioned lots that will again, after several years time, be ripe for a wildfire to quickly rip through the forest costing thousands of dollars in man power, human lives and tax payers money. As the trees will all be of the same maturity and without thinning or prescribed burning, the incidence of wild fires will only continue as our climate changes and the continuation of drought throughout the state occurs.	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
236.07 - Fire Behavior Plantations	#18852-28	10) Site preparation and planting will likely assist with a transition away from ecological restoration to one of managed forest plantations, with resultant overstocking, homogeneity and future fire susceptibility, this is particularly out of alignment with LSR designation. This "investment" in timber stand improvement will also negatively effect future flexibility to reinstitute wild land and prescriptive fire to these landscapes.	Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Responses number 18926-18 and number 17111-24.
236.07 - Fire Behavior Plantations	#18878-26	DEIS: Within areas of light vegetative burn severity, the impacts on conifers were often severe, especially to the smaller size and lower crown classes. Within the fire-burned area, approximately 70 percent of all the existing plantations survived the extreme fire conditions of the 2014 Fires. (Pg 111) Comment: Please provide further documentation on how areas of light vegetative burn severity were often severe, yet 70 percent of all existing plantations survived the "extreme" fire conditions of the 2014 Fires. The use of "extreme" is subjective. Does this statement mean to say 70% of plantations survived high fire severity? If so, further documentation should be provided.	Light vegetative burn severity refers to the classification of change derived from the Rapid Assessment of Vegetation Condition after Wildfire (RAVG) data. Although considered low severity, conifers were killed in these areas, primarily understory and smaller diameter trees, which indicated a change in stand structure that is not reflected in the severity classification. This statement is a brief assessment of the current condition not discussed in great detail elsewhere, primarily because management actions are focusing on high severity areas. Within the entire project area, numerous plantations existed prior to the fire. Seventy percent of them survived the 2014 Fires in spite of drought conditions, high temperatures and low relative humidity or what was called "extreme" fire conditions. “Extreme” implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action (National Wildfire Coordination Group (NWCG) glossary of wildland fire terminology (NWCG, n.d.). One or more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

Code	Comment Number	Comment Text	Response
236.07 - Fire Behavior Plantations	#18878-27	DEIS: Understory vegetation has been totally consumed or top-killed throughout much of the project area; the degree of mortality is primarily a function of fire intensity. On areas burned at moderate to high intensity levels, mortality is essentially complete. On areas burned at lowintensity levels, if the fire was hot enough to consume the organic layer then understory vegetation, including conifer seedlings and saplings, were also killed. (Pg. 111) Comment: Understory vegetation in the project area consists of various species of post fire sprouting and non sprouting trees and shrubs. The use of subjective phrases such as "mortality is essentially complete" and "understory vegetation, including conifer seedlings and saplings, were also killed" is vague, un-informative and can be construed as utilizing language techniques to draw the reviewer to a pre-determined conclusion.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
236.07 - Fire Behavior Plantations	#5873-104	PLANTATION FIRE BEHAVIOR: "Stands 10 to 60 years old which have been modified by past harvest include the mixed-conifer plantations found throughout the Fire and Fuels analysis area. These stands show potential for very high intensity fires with the likelihood of higher mortality of the existing stand following a wildfire event; this is likely due to the large amount of fine fuels, such as grasses and needle cast, as well as a high shrub components." "The current expected fire behavior of these stands would make suppression of a fire by initial attack resources very difficult. Hand attack would not be feasible. Containment of a fire at a smaller size would be unlikely; the ladder fuel component found in these stands would carry fire into the canopies very quickly, creating the high flame lengths and intensitiesŠ"	See response to comment number 18926-7.
240.01 - Ecosystem, Habitat Health	#17481-25	Use a Mosaic approach of having all Seral stages available within a given geographical area. Should include strategies to return stands to historic conditions	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The project will result in a mix of seral stages, where salvage harvest and site preparation, planting, and release are proposed, the intention is to return the area to its historic conditions. See Chapter 2 of the final EIS for a description of these proposed actions. See the vegetation section of Chapter 3 of the EIS for a description of effects to vegetation.
240.01 - Ecosystem, Habitat Health	#18852-3	As an ecologist and student of the Klamath Mountains, I wish to see the ecological values of our region appreciated and the use of best management practices that are in accord with the long term application of ecosystem management principles.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We have used best available science in project design and analysis, as described throughout the final EIS and supporting documents. Also see the beginning of Chapter 3 of the EIS for a discussion of responsible opposing points of view.

Code	Comment Number	Comment Text	Response
240.01 - Ecosystem, Habitat Health	#5873-48	The agency should carefully review the post-fire science summary prepared by the World Wildlife Fund in 2006. In general traditional forestry has viewed fire as bad and dead trees as a waste. These views have skewed public policies about post-fire logging. However, current scientific understanding recognizes that disturbance and dead trees are in fact critical to forest health. Of the approximately thirty scientific papers on post-fire logging and additional government reports published to date, not a single one indicates that logging provides benefits to ecosystems regenerating post-disturbance. In general, post-fire logging impedes regeneration when it compacts soils, removes "biological legacies" (e.g., large dead standing and downed trees), introduces or spreads invasive species, causes soil erosion when logs are dragged across steep slopes, and delivers sediment to streams from logging roads. Further, a large body of science on disturbance ecology (e.g., recent books on Mt. St Helens and studies in the Yellowstone Ecosystem and elsewhere) indicate that when natural disturbance events are preceded and/or followed by land management activities they often impair the recovery of forest ecosystems. Dominick A. DellaSala 2006. POST-FIRE LOGGING SUMMARY OF KEY STUDIES AND FINDINGS. World Wildlife Fund, February 2006. ftp://frap.cdf.ca.gov/pub/incoming/IMMP/Post%20Fire%20Salvage%20Logging%20Papers/Post%20Fire%20Logging%20Review%202006.pdf	The analysis for the Westside project does not make the argument that treatments are designed to improve the forest by logging. Logging is a tool for meeting the purpose and need for the project. Treatments are designed to mitigate fuel loading in an area that has not burned in a substantial period of time by a human-caused fire. By removing these fuels in strategic areas, fire effects would be moderated in later fires, improving the likelihood that a fire burning in this area in the future may not be stand replacing over such a large, contiguous area and create more of a mosaic across this landscape. Within these constraints, fire is accepted as an important driver of forest health and biodiversity in the Klamath Mountains.
240.01 - Ecosystem, Habitat Health	#5873-52	Karr, James. 2005 Nature doesn't benefit from logging fire-damaged lands | The News Tribune, Tacoma, WA. ftp://ftp2.fs.fed.us/incoming/r5/Klamath/Mt.HebronRestoration/MountHebron.Records/MtHebronRestoration.ProjectRecord/D.%20ScopingComments.Analysis/ArtleyAttachment9.FullArticles/Pub10.Karr2005.Tribune.pdf	Similar to Beschta et al. (2004), Karr et al. (2004) presents a list of recommendations to avoid damage from salvage logging. The Westside analysis is cognizant of these recommendations and has planned and designed the proposed action such that significant old/large trees are retained on slopes and in Riparian Reserves, soils are protected by limiting ground-based skidding and implementing extensive soil and water Best Management Practices, and ecologically sensitive areas such as Riparian Reserves are protected. No new system roads will be constructed for the project and temporary roads needed for the project will be ripped, and closed. In addition, no instream structures are proposed for the project and stream monitoring sites have been established to monitor potential fire and project effects. Properly done salvage logging can lessen the time for ecosystems to recover by getting needed burned overstory on to the ground to provide soil cover, increase soil roughness to reduce erosion and break up water repellant layers, return of nutrients to the soil, and replant burned trees. Soil design features and resource protection measures will be employed to insure erosion levels are low and within forest plan thresholds. All available cover material (less than 3 inches in diameter) from salvage will be utilized to provide erosion protection and return readily available woody material (tree tops, branches, twigs, needles) to the soil. Also, increasing soil roughness through tractor and cable operations will slow surface erosion creating microsites to trap any erosion (Powers 2003).
240.01 - Ecosystem, Habitat Health	#5873-53	[I]n the absence of research specifically addressing the impact of large-scale salvage, I believe there is sufficient evidence to suggest that the risk to nontimber values decreases as the amount of retention increases at either the stand or landscape level (or in some cases both). Jim Snetsinger, Chief Forester. Guidance on Landscape- and Stand-level Structural Retention in Large-Scale Mountain Pine Beetle Salvage Operations. December 2005. http://www.for.gov.bc.ca/hfp/mountain_pine_beetle/stewardship/cf_retention_guidance_dec2005.pdf.	We are uncertain how or why large-scale mountain pine beetle salvage operations in lodge pole stands in Canada relate to the proposed actions or its effects of the Westside Recovery Project, as suggested by the commenter. We acknowledge that non-timber values would be impacted in sufficient snags were not retained; however, this project meets or exceeds snag retention requirements for other potentially affected resources. See a discussion of responsible opposing points of view at the beginning of Chapter 3 of the final EIS. Much of the project is not being harvested for snags; see salvage harvest and roadside hazard treatment acres in Chapter 2 of the final EIS and related pie charts and bar graphs for relative numbers and percentages. Also see the wildlife project design features in Chapter 2 of the final EIS for snag retention. Compared to the other action Alternatives, additional snag retention is also proposed for the final EIS preferred Alternative, Modified Alternative 3. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

Code	Comment Number	Comment Text	Response
240.01 - Ecosystem, Habitat Health	#5873-88	Recognize the effects of compound disturbances such as fire and fire suppression followed by logging and treatment of activity fuels. Compound disturbances have the potential to fundamentally alter an ecosystem structure and function. This study examines the effects of a natural disturbance and a compounded natural and anthropogenic disturbance on soil properties, biogeochemical cycles, and ecosystem reorganization in a windblown and salvage-logged ecosystem in northwestern Colorado. Areas of intact forest are used as a control to compare the disturbance effects. Results indicate that soils in the salvage-logged areas are drier, significantly warmer, denser, and contain less organic matter than soils in blowdown or control areas. Significant amounts of erosion occurred in the salvage-logged areas to produce these results. Furthermore, net nitrogen mineralization rates are lower in soils from salvage-logged areas than in blowdown areas. By contrast, net nitrogen mineralization rates are twice as high in blowdown areas than in control areas. Seedling density, herbaceous cover, and plant species diversity are greatest in blowdown areas, and least in salvaged-logged areas. The results of this four-year study indicate that the mitigation effects of salvage logging significantly alter ecosystem functions and retard the rate of recovery when compared to unlogged blowdown areas. Cristina M. Rumbaitis-Del Rio and Carol A. Wessman. Impact of compound disturbances on N-cycling and forest reorganization in a wind-disturbed and logged forest. Paper presented to the 86th Annual Meeting of the Ecological Society of America, August 6 – 10, 2001. http://abstracts.co.allenpress.com/pweb/esa2001/document/28519.	The cited study is in Colorado. The conditions in Colorado, particularly the fire regime and cycling of dead wood are not the same as the Klamath Province of northern California. See response 5873-72. See also:Knapp, E. J. 2015. Long-term dead wood changes in a Sierra Nevada mixed conifer forest: Habitat and fire hazard implications. Forest Ecology and Management 339 (2015) 87–95Ritchie M.W. , E. E. Knapp, C. N. Skinner.2012. Snag longevity and surface fuel accumulation following post-fire logging in a ponderosa pine dominated forest. Forest Ecology and Management 287 (2013) 113–122Peterson , D. W., E. K. Dodson and R. J. Harrod. 2003. Post-fire logging reduces surface woody fuels up to four decades following wildfire Erich K. Forest Ecology and Management 338 (2015) 84–91Skinner, C. N. 2002. Influence of fire on the dynamics of dead woody material in forests of California and Southwestern Oregon. Pages 445-454 in Symposium on the ecology and management of dead wood in western forests, November 2-4, 1999, Reno, Nevada.Skinner, C. N., A. H. Taylor, and J. K. Agee. 2006. Klamath Mountains bioregion. Pages 170-194 in N. G. Sugihara, J. W. van Wagtendonk, K. E. Shaffer, J. Fites-Kaufman, and A. E. Thode, editors. Fire in California's Ecosystems. University of California Press, Berkeley and Los Angeles, CA.Taylor, A. H., and C. N. Skinner. 1997. Fire regimes and management of old-growth Douglas fir forests in the Klamath Mountains of Northwestern California. Pages 203-208 in Fire Effects on Threatened and Endangered Species and Habitats. International Association of Wildland Fire, Fairfield, WA, Coeur d'Alene, ID.Taylor, A. H., and C. N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111:285-301.
240.01 - Ecosystem, Habitat Health	#5873-89	Studying the effects of wildfire and salvage logging on boreal forest insects and nutrient dynamics, Tyler Cobb found that “disturbance combinations … should be avoided whenever possible…” While many studies have examined the effects of single disturbances on biodiversity (e.g., Hunter 1999; Stelfox 1995), there is a growing awareness that independent consideration of disturbances may be insufficient from a sustainable forest management perspective (Lindenmayer and Noss, 2006). Today, forest ecosystems face multiple, often simultaneous, natural and anthropogenic environmental stressors. Disturbance regimes in most forest ecosystems now include environmental stress associated with increasing natural resource extraction (e.g., timber, natural gas, oil, minerals, etc.) (Kennedy 2002; Schneider 2002), pollution (Perry 1994) and global climate change (Flannigan et al., 1998; Li et al. 2000; Overpeck et al., 1990). Thus, forest management models based on emulating natural disturbances like wildfire (Attiwill 1994; Hunter 1993) may be overly simplistic and fail dramatically in application on many landscapes. … Research presented here suggests that combining wildfire and forestry-related disturbances in boreal ecosystems may not only impact beetle diversity, but has significant potential to also impact decomposition and nutrient cycling processes. These effects, in turn, may well affect successional pathways and have broad effects on regeneration Thus, the ecological integrity of these ecosystems may depend, at least in part, on organisms we consider to be either economic “pests” or of no economic significance. …	The cited papers are either general in nature or not applicable to the circumstances of the Westside Fire Recovery Project. The conditions of the boreal forest of Canada are not necessarily the conditions of the Klamath Province of northern California particularly as related to fire regimes and cycling of dead wood.. See Response 5873-72. See also: Knapp, E. J. 2015. Long-term dead wood changes in a Sierra Nevada mixed conifer forest: Habitat and fire hazard implications. Forest Ecology and Management 339 (2015) 87–95 Ritchie M.W. , E. E. Knapp, C. N. Skinner.2012. Snag longevity and surface fuel accumulation following post-fire logging in a ponderosa pine dominated forest. Forest Ecology and Management 287 (2013) 113–122 Peterson , D. W., E. K. Dodson and R. J. Harrod. 2003. Post-fire logging reduces surface woody fuels up to four decades following wildfire Erich K. Forest Ecology and Management 338 (2015) 84–91 Skinner, C. N. 2002. Influence of fire on the dynamics of dead woody material in forests of California and Southwestern Oregon. Pages 445-454 in Symposium on the ecology and management of dead wood in western forests, November 2-4, 1999, Reno, Nevada. Skinner, C. N., A. H. Taylor, and J. K. Agee. 2006. Klamath Mountains bioregion. Pages 170-194 in N. G. Sugihara, J. W. van Wagtendonk, K. E. Shaffer, J. Fites-Kaufman, and A. E. Thode, editors. Fire in California's Ecosystems. University of California Press, Berkeley and Los Angeles, CA. Taylor, A. H., and C. N. Skinner. 1997. Fire regimes and management of old-growth Douglas fir forests in the Klamath Mountains of Northwestern California. Pages 203-208 in Fire Effects on Threatened and Endangered Species and Habitats. International Association of Wildland Fire, Fairfield, WA, Coeur d'Alene, ID. Taylor, A. H., and C. N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111:285-301.

Code	Comment Number	Comment Text	Response
240.01 - Ecosystem, Habitat Health	#5873-90	For saproxylic [dead wood dependent] beetle assemblages, the combination of wildfire and forest harvesting (postfire salvage logging) reduced species richness and altered species composition to a greater extent that either disturbance alone. Postfire salvage logging also altered the trophic structure of the saproxylic beetle assemblage and was particularly detrimental for wood- and barkboring species. Through a series of experiments, the abundance of one such species, Monochamus scutellatus scutellatus, was linked to decomposition processes in burned forests. Together, the results of these studies suggest that disturbance combinations should be avoided whenever possible because they may impact not only beetle diversity, but also decomposition processes in forests recovering from wildfire. … Broadly, my results showed that removal of dead wood from burned forests by postfire salvage logging has the potential to alter naturally occurring links between wood-feeding insects and nutrient dynamics in forests recovering from wildfire. … By feeding on burned dead wood, M. s. scutellatus larvae help to begin the process of gradually returning organic materials from standing burned coniferous trees to the soil. My data show that this feeding activity is linked to changes in soil microbial activity, N availability, and the germination and growth of colonizing plants in early postfire ecosystems. … [T]he fact that the development time for M. s. scutellatus is 1 or 2 years (Rose, 1957; Wilson, 1962) suggests that organic nutrient inputs in the frass of this species are somewhat gradual, which may also reduce leaching of N from burned stands. … While M. s. scutellatus and other wood-feeding beetle species may be considered "pests" that rapidly reduce the economic value of salvaged timber (Ross, 1960; Sessions et al., 2004), their role in nutrient cycling and food web dynamics (Hoyt & Hannon, 2002) in burned forests should not be overlooked in the development of guidelines for postfire management. By removing fire-killed trees, postfire salvage logging in boreal ecosystems may be as damaging to saproxylic insect diversity as have intensive forestry and fire suppression in Europe (Grove, 2002; Siitonen, 2001). In addition to biodiversity consequences, the results of this study indicate that postfire salvage logging may also influence nutrient dynamics and succession in regenerating burned forests. Therefore, the long-term persistence of boreal ecosystem function may require the retention of some burned timber. Tyler Cobb. 2007. Boreal Mixed-wood Beetles and the Cumulative Ecological Consequences of Disturbance. PhD dissertation. University of Alberta. Spring 2007.	The cited papers are either general in nature or not applicable to the circumstances of the Westside Fire Recovery Project. The conditions of the boreal forest of Canada are not necessarily the conditions of the Klamath Province of northern California particularly as related to fire regimes and cycling of dead wood. Dead wood in the Klamath Province rarely lasted long enough to decompose (Taylor and Skinner (1997) and Skinner (2002)), . See Response 5873-72. See also:Knapp, E. J. 2015. Long-term dead wood changes in a Sierra Nevada mixed conifer forest: Habitat and fire hazard implications. Forest Ecology and Management 339 (2015) 87–95Ritchie M.W. , E. E. Knapp, C. N. Skinner.2012. Snag longevity and surface fuel accumulation following post-fire logging in a ponderosa pine dominated forest. Forest Ecology and Management 287 (2013) 113–122Peterson , D. W., E. K. Dodson and R. J. Harrod. 2003. Post-fire logging reduces surface woody fuels up to four decades following wildfire Erich K. Forest Ecology and Management 338 (2015) 84–91Skinner, C. N. 2002. Influence of fire on the dynamics of dead woody material in forests of California and Southwestern Oregon. Pages 445-454 in Symposium on the ecology and management of dead wood in western forests, November 2-4, 1999, Reno, Nevada.Skinner, C. N., A. H. Taylor, and J. K. Agee. 2006. Klamath Mountains bioregion. Pages 170-194 in N. G. Sugihara, J. W. van Wagtendonk, K. E. Shaffer, J. Fites-Kaufman, and A. E. Thode, editors. Fire in California's Ecosystems. University of California Press, Berkeley and Los Angeles, CA.Taylor, A. H., and C. N. Skinner. 1997. Fire regimes and management of old-growth Douglas fir forests in the Klamath Mountains of Northwestern California. Pages 203-208 in Fire Effects on Threatened and Endangered Species and Habitats. International Association of Wildland Fire, Fairfield, WA, Coeur d'Alene, ID.Taylor, A. H., and C. N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111:285-301.
240.0101 - Disturbance Regimes	#5873-42	A recent article from respected scientists in one of the world's leading science journals said: … [N]atural disturbances are key ecosystem processes rather than ecological disasters that require human repair. Recent ecological paradigms emphasize the dynamic, nonequilibrial nature of ecological systems in which disturbance is a normal feature and how natural disturbance regimes and the maintenance of biodiversity and productivity are interrelated … Salvage harvesting activities undermine many of the ecosystem benefits of major disturbances. … [R]emoval of large quantities of biological legacies can have negative impacts on many taxa. For example, salvage harvesting removes critical habitat for species, such as cavity-nesting mammals, [and] woodpeckers, … Large-scale salvage harvesting is often begun soon after a wildfire, when resource managers make decisions rapidly, with longlasting ecological consequences…. Lindenmayer, Franklin, Hunter, Noss, et al., ECOLOGY: Salvage Harvesting Policies After Natural Disturbance, Science 2004 303: 1303. http://www.eebweb.arizona.edu/courses/ecol406r_506r/lindenmayer&noss-2005-effectslogging4.pdf	The agency acknowledges the role of fire in the ecosystem; however existing and near future post-fire conditions in much of the project area have deviated from the goals of the Forest Plan and require management. The project is designed to meet the goals of the Forest Plan and the purpose and need of the project. Review Chapter 2 of the EIS for the proposed actions; salvage harvest is not proposed within the majority of the project area, but it is proposed where it has been determined to promote forested conditions, decrease fire risk, improve safety conditions, and address other resource needs, including the improvement of wildlife habitat and watershed conditions. See Chapter 1 of the EIS for a discussion about salvage harvest in Late Successional Reserves. See Chapter 2 for a discussion of the project design features, including the retention of snags, course woody debris, and legacy components for the protection of various resources, including soils and wildlife. Chapter 3 of the EIS discloses both the beneficial and adverse effects of salvage harvesting.

Code	Comment Number	Comment Text	Response
240.0102 - Fragmentation, Connectivity	#18909-111	The Wildlife section of the DEIS touches upon habitat connectivity for fishers, martens and wolverine but fails to provide specific information or names of the watersheds considered. There is no information on two of the four the most important KNF wildlife corridor areas for wildlife, Grider Creek and northern portion of the Whites Fire/Snoozer Roadless area. Grider is well known as an important north to south biological corridor, yet the NEPA analysis fails to take a hard look at the proposed actions on Grider Creek connectivity or the northern area of the Whites Fire. The KNF LRMP at 4-22: Biological Diversity: 6-6 Coordinate proposed management actions within the Klamath bio-region to develop a coordinated management approach for species that move across Forest boundaries. Assure that the most recent scientific information is available for use in project planning. 6-7 Manage for a distribution and abundance of plant and animal populations that contribute to healthy, viable populations of all existing native and desirable non-native species. Maintain populations throughout their historic range. Develop strategies to determine the response of Sensitive species proposed for Endangered or Threatened listing by the United States Fish and Wildlife Service (USFWS) or by the National Marine Fisheries Service as well as indicator species to management activities. The agency is required to look at the bioregion as a whole and to manage for species viability. Protecting a diverse group of different populations of a species is what guarantees both biological diversity and the long-term viability of a species. Many wildlife populations are under incredible threat, and losing them one after another erodes the survivability of the species to which they belong. Small-localized populations of rare species are located throughout the project area and are in critical need of protection. The Westside DEIS did not consider the effects of impacts to localized populations from the proposed treatments on species viability.	Thanks for pointing out this information. It's true the original Wildlife BE did not identify all the watersheds in the connectivity analysis. It only identified the watersheds with connectivity issues and watersheds that changed connectivity status. If no change in connectivity status occurred it was not included. The pacific fisher, marten and wolverine are Forest Service sensitive species. Connectivity and effects to habitat are summarized and disclosed in more detail see the "amendment to the wildlife reports" under the section called "corrections and clarifications to methods". The Forest Plan Standard and Guideline that recommends the collection of information on Sensitive Species is 8-19; this is forest-wide, not project-specific direction.
240.0102 - Fragmentation, Connectivity	#18909-121	On page 52 or the Review of Publically Provided Literature from Scoping, in response to Olsen et al. 201221 the agency states that the project isn't proposing green tree management and implies that the study refers to green trees. 21 Olson, David, DellaSala, Dominick A., Noss, Reed F., Strittholt, James R., Kass, Jamie, Koopman, Marni E. and Allnutt, Thomas F. Climate Change Refugia for Biodiversity in the Klamath-Siskiyou Ecoregion. Natural Areas Journal, 32(1):65-74. 2012. This response is not adequate and did not consider the true meaning of the study, which highlights the importance of an immediate protection of a network of climate change microrefugia. The proposed project would eliminate intact complex forest structure and would increase habitat fragmentation across seventy-five watersheds. Further the agency is proposing to extract live green trees throughout larger units and throughout entire road systems. The DEIS fails to respond to the substantive implications of the Olsen et al. study as emphasized below: Abstract: The Klamath-Siskiyou Ecoregion has been a refuge for species during past climate change events, but current anthropogenic stressors are likely compromising its effectiveness as a refugium for this century's projected changes. Reducing non-climate stressors and securing protection for large, complex landscapes are important long-term actions to alleviate climate change impacts on biodiversity. Equally important is the immediate protection of a network of climate change microrefugia, particularly old growth and intact forests on north-facing slopes and in canyon bottoms, lower- and middle-elevations, wetter coastal mountains, and along elevational gradients. Such areas provide local opportunities for vulnerable species to persist within the ecoregion. We identify a provisional set of 22 highest-priority and 40 high-priority microrefugia that occur mostly outside of existing protected areas and along wetter and lower elevations of the ecoregion. Proposed reserve designs, if fully implemented, would capture most of the recommended microrefugia, although we found 11 important gaps. Most of the region's biodiversity, endemic species, and species vulnerable to climate change are invertebrates, non-vascular plants, and fungi that are largely restricted to persistently cool and moist late-successional forests. Opportunities for climate change response for vulnerable taxa will necessarily be local due to a limited capacity of many species to move to new habitat, even over relatively small distances where land use practices create inhospitable conditions. The ecoregion's distinctive and endemic serpentine-substrate flora also is at risk and possible refugia are sites that will retain wet soil conditions, such as seeps and bogs. At page 65, The Klamath-Siskyou Ecoregion (KSE) contains globally important biodiversity- only five	This comment reflects the opinion of the author related to a journal article, not the content of the EIS. No information other than a general journal article is provided to support the argument that the Westside Fire Recovery Project would eliminate intact complex forest structure or increase fragmentation other than a general comment. The comment expresses a concern that green trees are marked for removal. Most of the trees in the marked for salvage in the Westside Project are dead. The only green trees that would be cut are fire-damaged trees that are likely to die. Trees are marked for retention in proposed salvage units if they have 30% or more chance of survival. Approximately 8,500 "green" trees and legacy trees have been marked for retention throughout the Project. Within roadside hazard treatment areas, fire-damaged trees are retained if they have a 40% or greater chance of survival, except for trees over 45 inches in diameter, which must have only a 5% chance of survival to be retained (EIS Chapter 2). Additional information has been added to the text of the EIS to address actions in Late-Successional Reserves, which serve as refugia on the Klamath National Forest. Appendix E provides an assessment of the fire area within the Late-Successional Reserve land allocation. All table references are to Appendix E. Within the Late-Successional Reserves, about 28,700 acres had moderate - high severity fire of which about 3,870 acres are proposed for salvage in Alternative 3 modified. This represents about 5% of the area within the Late-Successional Reserve fire perimeter These measures would meet short term Late-Successional Reserve objectives because very little of the Westside Fire Recovery Project area is actually in salvage units (Figures 8, 9, 10, 11, and 12) and because snags and coarse woody debris are maintained in sufficient amounts to meet Late-Successional Reserve standards described in the Late-Successional Reserve Assessment (Table 6) and the Forest Plan (Table 7 and 8) where salvage does occur. Figure 12 shows that of the 29,600 acres of stands dominated by trees greater than 24 inches in diameter in the Late Successional Reserves, in all burn severities, 1,750 acres (6% of the size class) would be removed by the Westside Fire Recovery project in salvage harvest units. An estimated additional 240 acres of trees greater than 24 inches in diameter would be removed in moderate - high severity patches of roadside hazard cleanup (Table 3). With salvage units and roadside hazard combined, approximately 2,000 acres of trees greater than 24 inches in diameter in moderate – high burn severity areas would be removed from within the Eddy Gulch and Seiad Late Successional Reserves. Of trees greater than 24 inches in diameter, this represents about 23 percent of the 8,650 acres moderate to high severity burn acres in that diameter class and about 7% of the large tree diameter class in all burn severities in the Late Successional Reserves. Of the trees greater than 24 inches in diameter that are in moderate to high severity burn patches, 77 percent would be retained. Overall, over 90 percent of the trees greater than 24 inches in the Seiad and Eddy Gulch Late Successional Reserves would be retained (Figure 12). Components of late-successional forests (legacy trees, snags, down wood) are retained

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		other temperate forests regions are as diverse or home to as many endemic species and ancient lineages. However, cumulative land use impacts combined with projected climate change could have a profound impact on the ecoregion's species and ecosystems. In the KSE, over a century of land use activities (e.g., logging, mining, livestock grazing, damming of rivers, mining, and human-caused alterations of fire) have resulted in loss or degradation of mesic habitats (DellaSala et al. 1999) that may have previously functioned as refugia over millennia. Impacts include loss of contiguous habitat along intact elevational and other environmental gradients that may facilitate climate-related shifts in natural communities and loss and degradation of most of the mature and old-growth forests (e.g., only about 28% of the historic old-growth forests remain; Strittholt et al. 2006), particularly mesic lowland and mid- elevation habitats (Staus et al. 2002). Increasing prevalence of invasive plants and pathogens facilitated by road building and land use practices poses an additional threat to native species and communities (DellaSala et al. 1999).	within harvest areas in amounts specified in the Forest Plan. Long term Late-Successional Reserve objectives would be met in salvage units because legacy trees, green trees (to the degree they exist) that can provide future snags and coarse wood and larger trees in hydrologic Riparian Reserves, would be retained. Risk-reduction salvage in concert with ridgetop FMZs would increase the probability that snags and Coarse Woody Debris retained would persist within treatment units because it would reduce the amount of surface fuels, and thus reduce future fire severity (Figure 7). In the wildfires that occurred in the 2014 Westside Fire Recovery project area (Beaver, Whites, and Happy Camp fires) over 7,000 acres of functioning nesting-roosting habitat and 9,600 acres of foraging habitat were lost to stand-replacement (i.e. high severity) fire. Thus, it is well established that stand-replacing, high intensity wildfire negatively affects northern spotted owl habitat within the Klamath Province and that the potential for future habitat losses in the Klamath Province is high. Given probable climate change scenarios, the rate of habitat loss from stand-replacement fire is likely to increase. From this, it follows that land managers should consider opportunities to reduce the probability of future large stand-replacement fires. That is the objective of risk-reduction salvage harvest in the Westside Fire Recovery project. See Chapter 3 of the EIS for a discussion of the impacts of this project and this project's consideration of climate change. See Chapter 1 of the EIS for a discussion of salvage harvest in Late Successional Reserves. See Chapter 2 for a description of the proposed actions, including project design features, for the protection of Late Successional Reserves and their constituent elements. The establishment of a network of climate change microrefugia is beyond the scope of this project. The Klamath National Forest has established a wide variety of protected, specialized habitats for species that may be vulnerable to climate change in the network of Research Natural Areas and Special Interest Botanical Areas that for the most part were unaffected by the fires of 2014, and will not be affected by any treatment units in the Westside Recovery Project. The effects of the proposed actions in Late-Successional Reserves, that act as refugia for a wide variety of organisms, has been addressed in detail above in this response, and in the EIS in Chapter 3.See response to comment number 12346-55.
240.0102 - Fragmentation, Connectivity	#18909-122	At page 66, Fundamental to the development of a robust conservation design are three core-planning elements: (1) reduction of non-climate stressors; (2) protection of complex landscapes; and (3) protection of climate change microrefugia. Taken together, they are the foundation for guiding reserve design and conservation implementation in the KSE. Reducing non-climate stressors across the landscape, such as curtailing or greatly reducing logging and road building, is the single most important action that land managers can take to help the regional biota and ecosystems persist in the face of a changing climate. The release from stressors should be strategically targeted to critical core habitats, old-growth forest microrefugia, and adaptation corridors along environmental gradients. Securing a high level of protection and undertaking ecologically based restoration in degraded areas is important, as well as protection of large, complex landscapes with diverse terrains, soils, microclimates and other environmental gradients. Page 67, In order to maintain pockets of habitat for climate-vulnerable species, conservation attention should be aimed at securing microrefugia that may uniquely provide opportunities for many species to persist and are particularly threatened due to ongoing habitat degradation and rapid warming. Because of the rapid speed of climate change (Loarie et al. 2008, 2009), including warmer temperatures (Koopman et al. 2009) and diminishment of fog (Johnstone and Dawson 2010) in the KSE, opportunities for long-term persistence for many species will be local, likely within a scale of a few kilometers, from the location of present populations. Many species will be unable to shift rapidly enough to areas with more favorable conditions. Moreover, most of KSE's species, distinctive (endemic) species, and those vulnerable to climate change are mesophilic, old-growth forest specialists, largely lesser known taxa (by the public) such as invertebrates, fungi, bryophytes, and other non-vascular plants (Olson 1992; Lattin 1993; Olson 2010; Vicente 2010). The majority of these taxa cannot cross even small distances of terrain with unfavorable conditions (e.g., light, hot, and dry; Frest and Johannes 1993; Niwa and Peck 2002). Thus, protection and restoration of microrefugia around extant populations is essential for the long-term perpetuation of the vast majority of the KSE biota. The ecoregion's endemic serpentine flora (Kruckeberg 1984; Harrison et al. 2006; Sawyer 2007) is also highly vulnerable to projected increases in temperature and drying (Damschen et al. 2010) and some taxa may only persist within persistently wet pockets and seeps surrounded by late seral forests (collectively mature and old growth) that can act as climatic buffers. North-South corridors of contiguous natural vegetation are important for many reasons, such as	This comment provides general literature citations but does not provide any information how those apply to the Project area nor does it provide information specific to the environmental consequences of the proposed action or Alternatives.

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		dispersing vertebrates, but a swiftly changing climate will likely limit the ability of most slowly dispersing organisms to move long distances northwards over generations. Page 68, Areas with concentrations of restricted range (i.e., local endemic) species or relict taxa dependent on cool and moist habitats were also evaluated to refine candidate mesorefugia locations and boundaries (i.e., where multiple species boundaries overlap). These include the distribution of Brewer spruce (Picea breweriana), Engelmann spruce (Picea engelmanni), foxtail pine (Pinus balfouriana) (Sawyer 2007), Plethodon and Dicamptodon salamander species and subgoups (Bury 1973; Mead et al. 2005; Steele and Storfer 2006), and numerous other plants (Sawyer 2007) and invertebrates (Olson 1992), such as harvestman (Briggs 1969, 1971ab), millipedes (Gardner and Shelley 1989; Olson 1992), trapdoor spiders (Cokendolopher et al. 2005), and land snails (Frest and Johannes 1993). Page 72, Identifying and protecting microrefugia complements ongoing modeling of range shifts for vulnerable species and natural communities (e.g., Pearson and Dawson 2003; Loarie et al. 2008; Carroll et al. 2010; Damschen et al. 2010; Harrison et al. 2010), studies of climate sensitivity of species, analyses of how a changing climate will affect wide-ranging species, and assessing the cost and cost-effectiveness of alternative conservation actions. Without large natural landscapes in relatively good condition, many of the remaining pockets of old-growth forest may not persist or function well as microrefugia. However, for ensuring a robust reserve design that is responsive to climate change, it is prudent to secure priority old- growth forest microrefugia as swiftly as possible while the more time-consuming and uncertain task of conserving larger landscapes continues. Waiting decades for formal "gazettement" of large protected areas without securing microrefugia now may allow continued degradation of these critical refuges.	
240.0102 - Fragmentation, Connectivity	#3679-5	My comments refer mainly to the Beaver Fire as I live within its boundaries. I am especially concerned about issues of "habitat fragmentation" and "connectivity" because there is so much private land within the fire boundaries. The private lands are already being logged and it is quite a mess up there. However I do I think that the USFS should be able to do a salvage harvest but it needs to be done with the utmost care	Under the preferred Alternative in the final EIS (modified Alternative 3) there would be no salvage harvest in the Beaver Fire area and that Alternative has been designed to reduce effects to northern spotted owl habitat and connectivity. This project has been designed with specific project design features and best management practices to minimize effects to resources from salvage harvest and other project activities. he Forest Service is required to consider the cumulative effects of this project when added to the other actions or projects within the analysis area. The agency reviewed and considered the impacts of the private land actions within the Beaver Fire Area, as described in the "Actions Considered for Cumulative Effects" Appendix of the EIS and throughout Chapter 3 of the EIS (under Cumulative Effects) by resource. As a result of considering these other actions and their impacts during consultation and conferencing with the U.S. Fish and Wildlife Service among other agencies, the Forest Service dropped salvage harvest in the Beaver Fire from the new preferred Alternative (modified Alternative 3, see Chapter 2 for details).
240.0104 - Nutrient Cycling	#5873-56	Part of the natural post-fire recovery process is that beetles eat some trees parts and excrete nutrient-rich frass which enhances the growth of surviving and newly established plants. New science indicates that salvage should be avoided or delayed and snags must be retained well-distributed in order to realize the nutrient-cycling benefits of beetle frass. Beetle droppings—known in the scientific world as frass—are crucial to forests recovering from fire. The tiny piles of droppings, found at the bases of trees, resemble cones of sawdust, and they help nourish the forest floor by increasing microbial activity in the soil. This process can also determine which kinds of trees grow back. "This means that rather than being considered a pest or a nuisance, these beetles are in fact very important to helping burned forests recover," Cobb said. He is concerned, though, because salvage logging is taking the beetles out of the forest before they can do their job; the insects lay their eggs in the dead trees, and the larvae are subsequently destroyed when the wood is processed at sawmills. "That population is being removed from the salvage site and that takes away the mechanism by which the nutrients are returned to the soil." Salvage logging should be delayed after a fire to allow the beetles to complete their life cycle, Cobb said. Betkowski, Bev. 2007. Beetle dung helps forests recover from fire. University of Alberta. Public release date: 3-Dec-2007. http://www.uofaweb.ualberta.ca/rso/news.cfm?story=69803 citing Tyler Cobb. 2007. Boreal Mixed-wood Beetles and the Cumulative Ecological Consequences of Disturbance. PhD Dissertation. University of Alberta. Spring 2007.	This comment is from a study in Alberta, Canada. No evidence is provided as to why this should apply to the conditions of the Klamath Province. We agree that any material over time would serve an ecological function for the simple reason that there is no “excess” in nature. Retention however, of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current Late-Successional Reserve land allocation (EIS Chapter 3 – Fuels). We do not agree that all fire killed trees, or all large fire killed trees must be retained. Snags and down logs are being left in amounts that are consistent with the Klamath's Forest Plan and are deemed sufficient to maintain soil fertility and species needs (Forest Plan 4-20). The article referenced in this comment suggests that delaying logging or leaving 10-25 percent of the burned timber would allow for nutrients to be returned to the soil by beetles. This project is only proposing salvage harvest on about 4 and percent of the total burned area and just over 10% of the severely burned areas (EIS Chapter 2), so would provide more than the 10-25 percent suggested. Additionally as noted above, Forest Plan guidelines for coarse woody debris will be met on every acre where salvage does occur. In the soils report, the surface organic matter indicator analyzes the impacts of removing coarse wood and is met when sufficient organic matter is available for long term soil productivity. Coarse wood can improve soil productivity by increasing macroorganisms such as dung beetles, which therefore improve soil organic matter. Chapter 3 of the EIS summarizes this information.

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240.02 - Diversity, Extinctions	#15-1	Grider Creek is only one of two wilderness corridors between the Salmon Mountains and the Siskiyous, but the Forest Service seems to have an ongoing program to close up these corridors, both of which are becoming skinny. The Ukonom Creek corridor that the Forest Service recognizes is only a few feet wide along Ukonom Creek. So, really, the Grider Creek corridor is the best available way for biodiversity to be shared between mountain ranges. And you want to close that corridor. People who deminish the importance of these wild corridors puzzle me. Here's a quote from a USFS document from 2001: "First, planners and scientists have been at work for over 2 decades trying to assess biological diversity and species viability. In fact, the agency currently has a process underway looking for a logical option under the existing 1982 regulations and in response to current case law (Schwalbach & Barone 2000). This work has always been fraught with inconsistency and lack of consensus on what is sufficient to comply with laws such as ESA and NFMA. Salwasser points out that the very nature of biodiversity itself creates some of the difficulty because 1) biodiversity is inherently complex, 2) we have incomplete knowledge of most species let alone all the processes through which they function together, 3) inventories are incomplete and inconsistent, 4) models are unrealistic and, 5) population futures are dynamic, uncertain and influenced by more than just the habitats that national forest and grassland managers affect. He concludes that after 2 decades of experience, the problem of addressing biodiversity conservation in a comprehensive and quantitative analytical way may not be technical or analytical in nature but it "may be a foundational problem that rests on our incomplete and inconsistent knowledge about the degree to which habitat conditions affect population conditions of any native plants or animals" (2001). Relevant ecological requirements and population dynamics are largely unknown for many species and will remain so for some time. Animals and plants of commercial value, or those that have pest potential, receive primary attention and research focus rather than the range of biological species in natural areas. Knowledge is "non-existent for the majority of biological diversity" (Salwasser 2001)." So please, just keep it simple and stay out of the Grider Creek drainage all together. You have admitted that you have NO IDEA how important this drainage is in the scheme of things. Just stay out of it, completely.	The level of scientific controversy and uncertainty surrounding the effects of a project are two of the significance factors laid out by the Council of Environmental Quality to determine whether an EIS needs to be prepared for any given project. This project is pursued through the development of an EIS to facilitate the 'hard look' at the project Alternatives in light of the competing scientific views and incomplete information. It is recognized there this is incomplete knowledge or competing scientific views that create scientific uncertainty of the environmental consequences of ecologic and habitat function. In such cases, the Forest Service may proceed in the absence of information so long as it relies on the best available scientific information. A discussion of the competing scientific views identified by Forest Staff and the public is addressed in the beginning of Chapter 3 and in the resource reports available on the project webpage or in the project record upon request. The comment does not disclose how the commenter believes the project will impact Grider Creek and wilderness corridors. In the absence of specific concerns, it can generally be stated that all action Alternatives were designed to protect and promote critical wildlife and fisheries habitat by implementation of wildlife and watershed project design features and compliance with the Forest Plan. The Forest Plan identifies several goals to promote biological diversity throughout the Forest (Forest Plan page 4-6). One of those Forest-wide goals is to “manage for desired compositional, structural, and functional attributes of biologically diverse forest…ecosystems…” The action Alternatives in the Westside Fire Recovery project would create a more biologically diverse ecosystem by promoting regeneration of the forest and reducing future fire risk and severity (see the Fuels section of Chapter 3 of the draft EIS). For example, Alternative 2 would retain biodiversity by both promoting a restored fire-resilient forested ecosystem and retaining the mosaic effect of the fires by treating less than four percent of the burned area (see Figure 2-1 of the EIS). The environmental consequences of taking no action (Alternative 1) in analyzed in detail and displayed by resource in Chapter 3.
240.02 - Diversity, Extinctions	#18851-2	Biological Diversity is the foundation for many forest resources and benefits (including Scenery). There appears to be no tracking of how this project benefits, or impairs KNF westside biodiversity overall.	While it is true that biodiversity is not analyzed as a stand-alone issue at the project level, the extensive analyses in Chapter 3 for vegetation, fire and fuels, terrestrial wildlife, botany and non-native invasive species, range, water quality, aquatic resources, soil, geology, air quality, cultural resources, the social and economic environment, scenery, recreation, wild and scenic rivers, inventoried Roadless Areas, climate change, and short-term uses and long-term productivity all describe the existing condition of biodiversity on the Forest and the expected impacts to that biodiversity. Project components such as matching treatments to specific management areas, leaving small gaps untreated, and leaving snag trees and down wood all support the forest-wide goals of the Forest Plan to incorporate biodiversity into general management. Please see Chapter 3 and individual resource reports for more specific information on effects, and the Forest Plan, page 4-6 for forest-wide biodiversity goals.

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240.02 - Diversity, Extinctions	#5873-46	Salvage logging and replanting will convert a structurally complex landscape into a simplified and biologically depraved landscape. Unsalvaged, naturally regenerated, young stands are one of the rarest forest types in the Pacific northwest, and their biodiversity rivals that of old-growth forests. Indeed, naturally developed early-successional forest habitats, with their rich array of snags and logs and nonarborescent vegetation, are probably the scarcest habitat in the current regional [Pacific Northwest] landscape. Lindenmayer, David B. and Jerry F. Franklin. 2002. Conserving Forest Biodiversity: A Comprehensive Multiscale Approach. Island Press. Washington, DC: 69. See also, DellaSala, D.A., J.E. Williams, C. Deacon-Williams, and J.F. Franklin. Beyond smoke and mirrors: a synthesis of fire policy and science. In review - Conservation Biology	While this comment may be applicable in the context of the Pacific Northwest at a regional scale, the commenter provides no evidence that the Westside Fire Recovery Project area will have a shortage of early seral plant communities. In the Westside Fire Recovery Project Area, about 52,000 acres burned with moderate to high severity where more than 50% of the trees present were killed (EIS Chapter 2). Considerable secondary mortality in fire damaged trees has occurred since the fire because of drought stress and insect attack. Salvage harvest is proposed on about 5,760 acres, with site preparation and planting proposed on an additional 7,130 acres in Alternative 3 Modified. A total of about 12,900 acres (25%) of the 52,000 acres of moderate to high intensity burn would be replanted; about 39,000 acres of areas where most of the trees were killed would remain untreated and would go unimpeded through the long early seral plant community described by the commenter. This includes smaller mosaic burned areas, and all high mortality burn patches that are less than 20 acres in size. This maximizes the heterogeneity that benefits northern spotted owls described by Franklin (2002). Areas that would not be planted also include multiple large patches ranging in size from a few hundred acres to well in excess of 1000 acres of fire-killed older trees in the Grider Creek Inventoried Roadless Area. No fuel reduction treatments will occur in areas that are not site prepped and planted. In the future, as snags fall and become surface fuels, it is probable that many of these untreated areas will reburn multiple times because of high surface fuel loads from dead trees (final EIS Chapter 3-Fuels; final EIS Appendix E, Figure 7). As a result, large areas that are not site prepped and planted will likely remain in an early seral plant community dominated by brushfields for multiple decades. The probability of reestablishing late successional coniferous forests on these landscapes will remain low until surface fuels created by the 2014 fires and subsequent reburns has been consumed. Because Late Successional Reserves have been established to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions (Northwest Forest Plan C-14; Late-Successional Reserve Assessment 1-24). Research has shown that the quickest way to reestablish a coniferous forest after stand replacement fire is by active reforestation (Zhang et. al 2008). Research has also shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less severity and intensity or not at all (Thompson, Spies and Ganio, 2007; Weatherspoon and Skinner, 1995; Omi and Kalabokidis 1991). Forest Vegetation Simulation (FVS) modeling (Appendix E, Attachment 1) shows that reforestation will establish forested conditions more rapidly by treating surface fuels and planting trees than by natural succession. It also shows that where surface fuels have been treated by salvage logging and site preparation, the ensuing stand is more resilient to fire than untreated areas. If surface fuels are treated, the risk of future stand replacement fires would be reduced, increasing the probability that planted conifers can persist into the future. In the FVS model, planted stands where fuels had been reduced began to show late-successional stand conditions typical of the Klamath Province with 40% canopy closure and 18 inch diameter at breast height trees in 90 years compared to over 200 years for untreated stands to reach the same stage. Without planting, trees will slowly become reestablished over a period of 10-50 years in severely burned areas, but the probability of a late-successional coniferous forest becoming established is low. It is probable that areas where fuels are not treated will go through several cycles of stand replacement fire until surface fuels have been reduced to the point that a low to moderate fire severity regime has been reestablished. This would maintain areas where fuels have not been reduced in semi-permanent brush fields for decades rather than accelerating the development of late-successional stand conditions. The planted trees in areas where fuels have been successfully reduced are expected to provide “islands” of coniferous forest in a sea of brushfields perpetuated by reburns where fuels have not been reduced. This would provide a measure of vegetative diversity that would not otherwise be present on the landscape. These planted stands have a much higher probability of achieving and sustaining the desired late successional stand condition for the Late-Successional Reserve than do unplanted areas as shown in the FVS modeling.

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240.23 - CWD	#17111-1	Stand-replacement fires provide large pulses of coarse woody debris (CWD) i ncl uding snags and logs, which l ifeboat dependent species and processes u nti l the regenerating forest begins to prod uce large and decay-resistant dead wood structures, which is typically not for a century or more. Since this pulse provides all of the large CWD that is going to be avai lable to the ecosystem for at least the nex t 100 to 150 years, it is not appropriate to use the levels of CWD found in mat ure and old stands of a particular Plant Association Group (PAG) as a guide to levels of CWD that should be retai ned after salvage. Effecti vel y none of the large snags and logs of decay-resistant species can be viewed as being in excess of what is needed to assist in natural recovery to late-successional forest conditions and, hence, appropriate for salvage on land allocations where ecological objectives are pri mary, such as LSRs. Retention of large snags and logs are specificall y relevant to Northern Spotted Owl (NSO) since these structures provide the habi tat that sustai n most of the owl 's forest-based prey species.	We agree that retention of large structures is beneficial for northern spotted owls and many other species, and that any material over time would serve an ecological function for the simple reason that there is no “excess” in nature. We also agree that we should strive to maintain large structures that would persist until the next stand is capable of producing large material. That is a requirement of the Forest Plan (4-87; MA 5-30). Retention however, of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current Late-Successional Reserve land allocation (EIS Chapter 3 – Fuels). We do not agree that all fire killed trees, or all large fire killed trees must be retained. To determine how much dead wood should be retained on the landscape, we use the Guidelines provided by the Forest Plan for snags (4-30, Table 4-4) and coarse woody debris (4-23). The Late-Successional Reserve Assessment (1-5, Table 1-1) also provided metrics for snags and coarse woody debris that closely match the metrics in the Forest Plan. These metric were developed from studies of late successional and old-growth forests. Since the Forest Plan was developed in 1995, new research has shown that even the amounts of snags and coarse wood debris noted in the Forest Plan may be excessive for the Klamath Province when compared to historical norms. Skinner et al. (2006) observed that: "Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve." - Skinner et al. (2006).This suggests that even the levels of snag and coarse woody debris retention described in the Forest Plan, which are far lower than the post-fire conditions of current landscape would increase the risk of future stand replacement fire above historical levels. As previously noted, retaining all of the fire-killed snags, is likely to create fuel loading that would actually increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; Appendix E Figure 7; EIS Chapter 3 - fuels). Because of fire frequency in the Klamath Province it is highly unlikely that any dead wood could persist for 80-100 years until the next stand is capable of producing large wood (Taylor and Skinner 2007; Skinner 2002) without effective reduction of surface fuels. The Westside Fire Recovery Project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by• Retaining large “legacy” trees wherever they occur. By virtue of their location and / or inherent resistance to fire, these trees are most likely to persist until the next stand can develop large structures.• Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less intensity. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in association with Riparian Reserves (see map packet) or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity.• Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Figure 7). • Treating small fuels in Riparian Reserves by broadcast burning at the time that activity fuels are treated. This reduces the small surface fuels that readily ignite and carry fire.See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

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240.23 - CWD	#17460-19	The project design feature throughout the DEIS for fuel loading is stated to be 7- 10 tons per acre, and the "Fire and Fuels Resource Report" published with the DEIS frequently mentions that figure, but most of the discussion in that report specifies that it applied to small diameter woody material less than 3 inches in diameter. Without explanations or justification, the DEIS applies the 7-10 tons per acre figure to all fuels within the project, including larger diameter snags and course woody debris greater than 3" in diameter. While there are a few mentions of coarse woody debris in the DEIS, those occurrences only highlighted the potential for increased fire severity, without any discussion of the benefits and desirability of CWD in late successional areas. The management goals within the LS Rs make frequent mention of the desire for sufficient CWD and standing snags for habitat and wildlife, yet there is no discussion of the optimal amount of CWD to leave behind, nor discussion of balancing an optimal amount of snags and CWD versus future fire concerns outside of the LSRs. Removal of snags and CWD within the LS Rs at this rate destroys that last significant characteristic of the LSRs remaining after the 2014 fires. Left to regenerate naturally, in 50 years, the high fire severity areas within the LSRs will still have significant CWD and snags remaining along with new growth, including both brush and new trees. Under the salvage guidelines, it will be at least 80-100 years before larger snags and CWD begin to accumulate. The USDA's Forest Service publication, "Coarse Woody Debris: Managing Benefits and Fire Hazard in the Recovering Forest," dated July 2003, cited studies 4 recommending between 25-50 large diameter snags (<9" dbh) as being optimal for various woodpecker species that occur within the Klamath National Forest, and another study recommending 40 snags per acre (<15" dbh) both standing and down for all wildlife. These translate into 5-25 tons per acre of CWD for ponderosa pine. Another major point highlighted by this publication is that the larger diameter the CWD, the more tons per acre can safely remain on the landscape without increasing overall fire intensity: "Higher loadings of CWD are acceptable where larger piece sizes predominate, for example in accumulated falldown of old growth trees. Larger piece sizes also are desirable because, faced with decomposition and fire, they persist longer to benefit wildlife and soil productivity. " The tables in the "Fire and Fuels Resource Report" published with the DEIS do not appear to reflect that; the other shortcoming with the tables and analysis in that report is it only analyzes two extremes: no treatment versus (intense) treatment (through timber salvage followed by fuels treatment). Table 23 in the fuels report shows several entries having CWD close to 20 tons per acre having low and moderate resistance to control, so long as the small diameter surface fuels remain at low levels. This is an opportunity for a different approach to optimal recovery with the LSRs, without using salvage logging in the LSRs, by employing periodic fuels treatments of small woody debris, yet the benefits of retaining the CWD would remain. It also allows for a greater retention of snags throughout the project for wildlife habitat.	Larger pieces of large woody debris would persist longer to benefit soil productivity. See Chapter 1 for a discussion of salvage in Late Successional Reserves. See Chapter 2 for a description of watershed project design features that apply to this project. See the beginning of Chapter 3 for a discussion of responsible opposing points of view. See chapter 3 for effects analysis.
240.23 - CWD	#17460-7	The project design feature throughout the DEIS for fuel loading is stated to be 7- 10 tons per acre, and the "Fire and Fuels Resource Report" published with the DEIS frequently mentions that figure, but most of the discussion in that report specifies that it applied to small diameter woody material less than 3 inches in diameter. Without explanations or justification, the DEIS applies the 7-10 tons per acre figure to all fuels within the project, including larger diameter snags and course woody debris greater than 3" in diameter. While there are a few mentions of coarse woody debris in the DEIS, those occurrences only highlighted the potential for increased fire severity, without any discussion of the benefits and desirability of CWD in late successional areas. The management goals within the LS Rs make frequent mention of the desire for sufficient CWD and standing snags for habitat and wildlife, yet there is no discussion of the optimal amount of CWD to leave behind, nor discussion of balancing an optimal amount of snags and CWD versus future fire concerns outside of the LSRs. Removal of snags and CWD within the LS Rs at this rate destroys that last significant characteristic of the LSRs remaining after the 2014 fires. Left to regenerate naturally, in 50 years, the high fire severity areas within the LSRs will still have significant CWD and snags remaining along with new growth, including both brush and new trees. Under the salvage guidelines, it will be at least 80-100 years before larger snags and CWD begin to accumulate. The USDA's Forest Service publication, "Coarse Woody Debris: Managing Benefits and Fire Hazard in the Recovering Forest," dated July 2003, cited studies 4 recommending between 25-50 large diameter snags (<9" dbh) as being	This comment is correct that the 7-10 tons / acre for the desired post-project fuel loading applies to the material that less than 3 inches in diameter. This is the material that most readily carries fire and most readily contributes to fire hazard. A 7- 10 tons / acre fuel loading of 3 inch and smaller material was the level identified in the modeling that would accomplish the Project objectives. We also agree that higher fuel loads can be carried if the material is in larger size classes, however large coarse woody debris is not without risk in terms of fire severity. Larger material burns slower, but causes significant resistance to control. The long burnout time and amount of heat released from combustion in large woody fuels can lead to torching and crown fire. Large numbers of snags and down logs are an issue for management or control of fire and safety of firefighting personnel working in proximity. Heay down fuels can also have a negative effect on soil resources when excessive amounts of Coarse Woody Debris are burned. We agree that retention of large structures is beneficial for northern spotted owls and many other species, and that any material over time would serve an ecological function for the simple reason that there is no “excess” in nature. We also agree that we should strive to maintain large structures that would persist until the next stand is capable of producing large material. That is a requirement of the Forest Plan (4-87; MA 5-30). Retention however, of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current Late-Successional Reserve land allocation (EIS Chapter 3 – Fuels). We do not agree that all fire killed trees, or all large fire killed trees must be retained. This comment appears to equate the snag and down wood trajectories of the fire regime of the Klamath Province with that of more mesic areas of the Northwest Forest Plan. That is not correct (See Background, EIS Chapter 1; Appendix E). The fire regime of old-growth Douglas fir dominated forests of the Klamath Mountains differs

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		optimal for various woodpecker species that occur within the Klamath National Forest, and another study recommending 40 snags per acre (<15" dbh) both standing and down for all wildlife. These translate into 5-25 tons per acre of CWD for ponderosa pine. Another major point highlighted by this publication is that the larger diameter the CWD, the more tons per acre can safely remain on the landscape without increasing overall fire intensity: "Higher loadings of CWD are acceptable where larger piece sizes predominate, for example in accumulated falldown of old growth trees. Larger piece sizes also are desirable because, faced with decomposition and fire, they persist longer to benefit wildlife and soil productivity. " The tables in the "Fire and Fuels Resource Report" published with the DEIS do not appear to reflect that; the other shortcoming with the tables and analysis in that report is it only analyzes two extremes: no treatment versus (intense) treatment (through timber salvage followed by fuels treatment). Table 23 in the fuels report shows several entries having CWD close to 20 tons per acre having low and moderate resistance to control, so long as the small diameter surface fuels remain at low levels. This is an opportunity for a different approach to optimal recovery with the LSRs, without using salvage logging in the LSRs, by employing periodic fuels treatments of small woody debris, yet the benefits of retaining the CWD would remain. It also allows for a greater retention of snags throughout the project for wildlife habitat.	from more mesic old-growth Douglas fir forests of Oregon and Washington (described in Franklin et al. (1981)) in fire frequency, fire severity, and structural attributes such as amount and persistence of snags and coarse woody debris (Taylor and Skinner 1997). The characteristic fire regime of the Klamath Mountains is actually one of frequent low to moderate intensity fire with low to moderate severity effects (Skinner et al. 2006), not “stand-replacement or mixed” that is typical in the Coast Range and western Oregon and Washington Cascades. With frequent fire, surface fuels are maintained at low levels – too low for intensity sufficient to produce much stand-replacement fire, except under unusual circumstances. Also, as noted by Taylor and Skinner (1997) and Skinner (2002), dead wood in the Klamath province rarely lasted long enough, even in a low to moderate fire severity environment, to actually decompose because snags and down logs are receptive to embers, and once partially rotted, are easily consumed by fire. In a fire regime dominated by low to moderate severity effects, tree mortality with wildfire is by definition generally low. In the Klamath Mountains, patches of moderate to high severity fire, when they did occur historically, were more likely on upper slope positions and on south and west-facing aspects (Skinner et al. 2006). Patches of high severity would produce a pulse of snags and then eventually down logs, until those logs were consumed by subsequent fires. Because frequent low-moderate severity fires consume wood, it is unlikely that coarse woody debris accumulated to levels seen in more mesic old-growth Douglas fir forests of Oregon and Washington (Taylor and Skinner 1997). In the Klamath Mountains snags and logs were likely clustered in time and space, with long intervals and large areas where dead wood was sparse (Skinner 2002). To determine how much dead wood should be retained on the landscape, we use the Guidelines provided by the Forest Plan for snags (4-30, Table 4-4) and coarse woody debris (4-23). The Late-Successional Reserve Assessment (1-5, Table 1-1) also provided metrics for snags and coarse woody debris that closely match the metrics in the Forest Plan. These metric were developed from studies of late successional and old-growth forests. Since the Forest Plan was developed in 1995, new research has shown that even the amounts of snags and coarse wood debris noted in the Forest Plan may be excessive for the Klamath Province when compared to historical norms. Skinner et al. (2006) observed that: "Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve." - Skinner et al. (2006).This suggests that even the levels of snag and coarse woody debris retention described in the Forest Plan, which are far lower than the post-fire conditions of current landscape would increase the risk of future stand replacement fire above historical levels. As previously noted, retaining all of the fire-killed snags, is likely to create fuel loading that would actually increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; Appendix E Figure 7; EIS Chapter 3 - fuels). Because of fire frequency in the Klamath Province it is highly unlikely that any dead wood could persist for 80-100 years until the next stand is capable of producing large wood (Taylor and Skinner 2007; Skinner 2002) without effective reduction of surface fuels. The Westside Fire Recovery Project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by• Retaining large “legacy” trees wherever they occur. By virtue of their location and / or inherent resistance to fire, these trees are most likely to persist until the next stand can develop large structures.• Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less intensity. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in association with Riparian Reserves (see map packet) or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity.• Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Figure 7). • Treating small fuels in Riparian Reserves in Riparian Reserves by hand piling and burning. This reduces the small surface fuels that readily ignite and carry fire.Peterson et al. (2015) observed that:“post-fire logging can serve as an effective tool for managing fuel loadings in forests regenerating after high severity wildfires. By strategically applying and varying post-fire logging treatments within landscapes, post-fire logging could reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects. If applied using best management practices and with consideration for possible environmental impacts and meeting other management objectives, post-fire logging could serve as an effective option – along with mechanical thinning, prescribed fire, and managed low to mixed severity wildfires – for reducing fuels and restoring low and mixed severity fire regimes in dry coniferous forests of western North America and other fire-prone forest types.”See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.

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240.23 - CWD	#18909-131	Coarse Woody Debris (CWD) as described in the KNF LRMP 4-23 &24: 6-16 A renewable supply of large down logs is critical for maintaining populations of fungi, arthropods, bryophytes, and various other organisms that use this habitat structure. Provision of CWD is also a key standard and guideline for American marten, fisher, 2 amphibians, and 2 species of vascular plants. The objective is to provide CWD well-distributed across the landscape in a manner which meets the needs of species and provides for ecological functions. Standards and guidelines would provide for appropriate CWD quantity, quality (such as species, decay stage, and size) and groups of plant associations and stand types, which can be used as a baseline for managers to develop prescriptions for landscape management. An important factor is to provide the CWD within a forest patch so that the appropriate microclimate for various organisms that use this substrate is available. a) Manage to provide a renewable supply of large down logs well distributed across the matrix landscape in a manner that meets the needs of species and provides for ecological functions. Develop models for groups of plant associations and stand types that can be used as a baseline for developing prescriptions. b) Until standards are developed as described above, the following guidelines apply in areas of regeneration harvests and other vegetation manipulation: Maintain 5 to 20 pieces of CWD per acre in various states of decay. The specific amount of materials specified for retention on individual projects shall be determined by the project ID team. At a minimum, the ID team should consider the amount of materials existing on site, the amount of material needed to provide for nutrient cycling and site productivity, the denning needs of wildlife species, and the fire risk as a result of fuel material on site. Attempt to maintain these levels of CWD on site throughout the life of the project or throughout the rotation (if timber harvest is planned.) Leave large logs, conifer and hardwood, sound and cull of at least 20 inches in diameter and about 40 cubic feet in volume when they are available. Most of the logs should be in Decay Class 3, 4 and 5 (defined in the USDA Handbook 553, page 80) with at least 2 logs per acre in decay Class 1 or 2. Do not count logs less than 12 inches in diameter or stumps as CWD. This guideline may be waived in strategic fuelbreak areas or for documented safety reasons. Down logs should reflect the species mix of the original stand. In areas of partial harvest, the same basic guidelines should be applied, but they should be modified to reflect the timing of stand development cycles where partial harvesting is practiced. c) CWD already on the ground should be retained and protected to the greatest extent possible form disturbance during treatment (e.g., slash burning and yarding) which might otherwise destroy the integrity of the substrate. LRMP-4-4, " Carefully conserve resources that cannot be replaced. Cultural resources, soil, species and genetic diversity require special management due to their irreplaceable nature." LRMP 4-39, "Retain snags with the largest DBH as they tend to last longer and make the best wildlife habitat." LRMP 4-100, "LSR - Desired Future Condition - Snags are common and fallen trees visible on the ground, providing for adequate prey species." "Although overstory trees are smaller and less dense, important structural elements such as snags and nesting platforms are present."	Through interdisciplinary discussion, including soils, wildlife and fuels, the project was designed to be consistent with Forest Plan standards and guidelines for Coarse Woody Debris; see Chapter 2 of the EIS under wildlife and watershed project design features. The surface organic matter indicator analyzes the impacts of removing coarse wood and is met when sufficient organic matter is available for long term soil productivity. Coarse wood can improve soil productivity by increasing soil moisture, soil nutrients, soil micro and macroorganisms and organic matter. In addition, coarse wood can increase the survival of vegetation which in addition to coarse wood, provides soil cover and increases soil stability. See Chapter 3 under soil and wildlife of the EIS for a discussion of the effects of this project on course woody debris and related effects. See the Forest Plan consistency checklist for a review of applicable standards and guidelines.

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240.23 - CWD	#18909-132	LRMP 4-105, "Following a stand-replacing disturbance, management should retain adequate CWD quantities in the new stand so that in the future it will still contain amounts similar to naturally regenerated stands." "Snags are key habitat for numerous species. They provide forage, cavities for nesting and protection, perch sites, and den sites. Snag characteristics such as state of decay, density size, and species influence their use by wildlife. Snags are also an important structural component of a forest and large snags are considered to be one of the distinctive features of an old-growth forest.-Happy Watershed Analysis, Klamath Nation Forest at page 8. DEIS page 165, no Action alternative: "In the long term, the abundant source of snags will provide a source of woody debris (an important habitat component for the species, especially for the blue-gray tail dropper) for many years. Large woody debris in conjunction with regenerating trees may provide micro-site conditions for these species in the long term (20 years) but the regeneration of habitat will take much more time (beyond the long-term time span for this analysis)." It is not clear in the DEIS how much CWD is proposed for retention. The DIES did not consider how CWD contributes to seedling survival, natural regeneration of manually planted20. All that is shared about CWD retention is that Alternatives 3 and 4 would provide for Threatened and Endangered, Sensitive and Survey and Manage Species. Given the critical importance of CWD on soils, plants and wildlife the DEIS fails to analyze, disclose and take a "hard look" at CWD retention and fails to provide the public with clear information. 20 Castro, Jorge, Allen, Craig D., Molina-Morales, Mercedes, Sara, Maranon-Jimenez, Sanchez-Miranda, Angela and Zamora Regino.Salvage Logging Versus the Use of Burnt Wood as a Nurse Object to Promote Post-Fire Tree Seedling Establishment. JULY 2011. Restoration Ecology Vol. 19, No. 4, pp. 537-544	The soils report for the project analyzes impacts of coarse woody debris removal to soil productivity using the surface Organic Matter indicator. This analysis is summarized in Chapter 3 of the EIS. Coarse woody debris could also indirectly benefit soil productivity if it promotes post fire tree seedling establishment as described in the Restoration Ecology research.We agree that retention of large structures is beneficial for northern spotted owls and many other species, and that any material over time would serve an ecological function for the simple reason that there is no “excess” in nature. We also agree that we should strive to maintain large structures that would persist until the next stand is capable of producing large material. That is a requirement of the Forest Plan (4-87; MA 5-30). Retention however, of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current Late-Successional Reserve land allocation (EIS Chapter 3 – Fuels). We do not agree that all fire killed trees, or all large fire killed trees must be retained. To determine how much dead wood should be retained on the landscape, we use the Guidelines provided by the Forest Plan for snags (4-30, Table 4-4) and coarse woody debris (4-23). The Late-Successional Reserve Assessment (1-5, Table 1-1) also provided metrics for snags and coarse woody debris that closely match the metrics in the Forest Plan. These metric were developed from studies of late successional and old-growth forests. Since the Forest Plan was developed in 1995, new research has shown that even the amounts of snags and coarse wood debris noted in the Forest Plan may be excessive for the Klamath Province when compared to historical norms. Skinner et al. (2006) observed that: "Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve." - Skinner et al. (2006).This suggests that even the levels of snag and coarse woody debris retention described in the Forest Plan, which are far lower than the post-fire conditions of current landscape would increase the risk of future stand replacement fire above historical levels. As previously noted, retaining all of the fire-killed snags, is likely to create fuel loading that would actually increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; Appendix E Figure 7; EIS Chapter 3 - fuels). Because of fire frequency in the Klamath Province it is highly unlikely that any dead wood could persist for 80-100 years until the next stand is capable of producing large wood (Taylor and Skinner 2007; Skinner 2002) without effective reduction of surface fuels. The Westside Fire Recovery Project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by• Retaining large “legacy” trees wherever they occur. By virtue of their location and / or inherent resistance to fire, these trees are most likely to persist until the next stand can develop large structures.• Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less intensity. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in association with Riparian Reserves (see map packet) or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity.• Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Figure 7). • Treating small fuels in Riparian Reserves in Riparian Reserves broadcast burning at the time that activity fuels are treated. This reduces the small surface fuels that readily ignite and carry fire but is unlikely to harm most larger snags because they will not yet have developed the punky surface that is receptive to embers..Peterson et al. (2015) observed that:“post-fire logging can serve as an effective tool for managing fuel loadings in forests regenerating after high severity wildfires. By strategically applying and varying post-fire logging treatments within landscapes, post-fire logging could reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects. If applied using best management practices and with consideration for possible environmental impacts and meeting other management objectives, post-fire logging could serve as an effective option – along with mechanical thinning, prescribed fire, and managed low to mixed severity wildfires – for reducing fuels

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240.23 - CWD	#5873-100	The agencies' NEPA analysis too often lumps all sizes of woody material together for purposes of estimating fire hazard. This leads to arbitrary and capricious decision-making because the availability of fuel to combustion is inversely related to size. Small fuels are hazardous, while large fuels pose little or no hazard. Fuel models do not generally consider fuels larger than 8" in diameter. Commercial salvage logging removes primarily (sometimes exclusively) wood that does not contribute to fire hazard. Large amounts of fuels >8" that can be retained on a given site without detrimental effect. Lumping fuel sizes together prevents the decision-maker from accurately understanding the actual magnitude of the risk from logging or not logging. If fuels must be removed, the agency should remove the smaller fuels that are most hazardous and leave the largest logs that are least flammable and most valuable for habitat and other ecological services. The Forest Service own research shows that pound-for-pound small fuels are far more hazardous than large fuels, and that if the agency would remove more small fuels they could safely leave more large logs that are beneficial to wildlife: Small and large downed woody fuels contribute differently to the various elements of fire hazard. … Large woody fuels have little influence on spread and intensity of the initiating surface fire in current fire behavior models… [T]he spatial distribution of snags was highly variable... … For cavity-nesting birds, up to 25 tons per acre may be desirable depending on species …. For small mammals, more than 30 tons per acre is best. … To summarize the negative values, fire hazard including resistance-to-control and fire behavior reach high ratings when large fuels exceed about 25 to 30 tons per acre in combination with small woody fuels of 5 tons per acre or less. Excessive soil heating is likely at approximately 40 tons per acre and higher. Thus, generally high to extreme fire hazard potential exists when downed CWD exceeds 30 to 40 tons per acre. Consideration of these positive and negative aspects indicates that the optimum quantity of CWD is about 5 to 20 tons per acre for warm dry ponderosa pine and Douglas-fir types and 10 to 30 tons per acre for cool Douglas-fir and lodgepole pine types and lower subalpine fir types. The recommended optimum ranges of CWD quantities (fig. 2) should be modified by consideration of other factors such as quantity of small woody fuel, diameter of CWD, landscape level needs, and ecosystem restoration objectives. … Higher loadings of CWD are acceptable where larger piece sizes predominate, for example in accumulated falldown of old growth trees. Larger piece sizes also are desirable because, faced with decomposition and fire, they persist longer to benefit wildlife and soil productivity. Unfortunately, the relationship between quantity and size of CWD and the various measures of fire hazard is largely undefined. Thus, it is a matter of judgment to consider that the larger the diameter of downed CWD the greater the loading that could be allowed without undesirable fire effects. … surface area.... This suggests that where CWD comprises predominately 3- to 6-inch material, the optimum quantity is less, perhaps by 5 tons per acre or more, than for larger sized material.... … The probability of a reburn occurrence, which is small for a particular site but high over a large area … … [S]ome general statements about the effects of a reburn during high to extreme burning conditions with low fuel moistures can be made: 0 to 10 Years After First Fire—High severity fire is unlikely because duff and downed woody fuels that support prolonged burning would be absent. Large woody fuels would still be accumulating through falldown, and they would not have decayed enough to support smoldering combustion, which can extend the period of downward heating. If salvage operations leave concentrations of small woody fuels, high severity burning could occur where the fuels are concentrated. … … … The time interval chosen for predicting CWD should be long enough for a new immature or mature forest to develop.	The comment is referencing findings in the previous paragraph that didn't get included in this comment. Here is the study. Amaranthus, M.P.; Parrish, D.S.; and D.A. Perry. 1989. Decaying Logs as Moisture Reservoirs After Drought and Wildfire. In: Alexander, E.B. (ed.) Proceedings of Watershed '89: Conference on the Stewardship of Soil, Air, and Water Resources. USDA-Forest Service Alaska Region. RIO-MB-77. p. 191-194. The Fire and Fuels Report breaks out woody material by size class. This was done to help analyze effects by measurement indicator. We agree that small size classes (material less than 3") contributes to fire spread, fire risk and fire hazard. Large woody material (material greater than 3") can lead to a decrease if fire suppression capability and increase the intensity and severity of future wildfires. It is anticipated that 5 to 20 tons per acre will occur after salvage logging and associated fuel treatments -- with the higher end of 20 tons per acre in areas where larger trees and downed wood are present on the landscape. The intent of the fuels treatments are to reduce the excessive amounts of fuel loading while leaving some of the large woody material to mitigate concerns of other resources such as soils and wildlife. The reduction in fuel loading is anticipated to still meet the desired conditions of the Fire and Fuels Resource. An analysis of fuel loading and associated effects are summarized in the EIS (Chapter 3, Fire and Fuels) and further information on this can be found in the Fire and Fuels Report.

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240.23 - CWD	#5873-24	"Removal of legacies is most profound long-term impact" because of the "Importance of Coarse Wood: • Habitat for species • Organic seedbeds (nurse logs) • Modification of microclimate • Protection of plants from ungulates • Sediment traps • Sources of energy & nutrients • Sites of N-fixation • Special source of soil organic matter • Structural elements of aquatic ecosystems"	It is recognized that coarse wood can improve soil productivity by increasing soil moisture, soil nutrients, soil micro and macroorganisms and organic matter. Course wood also traps hillslope sediment, and increases the survival of vegetation which provides soil cover and increases soil stability. Field observations of large down woody material within the proposed treatment units indicate that approximately 10 percent of large down logs, greater than 8 inch diameter, are providing erosion control and trapping sediment. As logs decay and more trees fall, this number could increase. The soils report for the project analyzes the impacts to surface organic matter and is summarized in Chapter 3 of the EIS. To clarify, no salvage harvest is proposed within Riparian Reserves. However, other treatments, including site preparation and planting are proposed within Riparian Reserves, as developed by the interdisciplinary team for the benefit of Riparian Reserves. Roadside hazard treatments are proposed within Riparian Reserves to address safety and access needs; however, project design features, such as Botany-4, Watershed-12 & 13, are incorporated into the proposed action and its Alternatives, which leaves felled hazard trees within Riparian Reserves for large woody debris recruitment and the protection of soil. For more information on how the project addresses concerns related to the structural aquatic habitat see the Aquatic Resources section of Chapter 3 and the Aquatic Conservation Report, Aquatic Conservation Strategy objectives 1 through 9.
240.23 - CWD	#5873-39	"Many natural young and mature stands have some of the attributes of old-growth stands that may not be present in young, managed stands. Perhaps the greatest difference between natural and managed stands is the lower number and volume of large snags and logs in managed plantations (Spies and Cline 1988). Many young natural forests less than 80 years old have high amounts of carry-over of woody debris..." Thomas A. Spies and Jerry F. Franklin 1991. The Structure of Natural Young, Mature, and Old-Growth Douglas-Fir Forests in Oregon and Washington in Leonard F. Ruggiero, Keith B. Aubry, Andrew B. Carey, and Mark H. Huff, technical editors 1991. Wildlife and Vegetation of Unmanaged Douglas-Fir Forests. General Technical Report PNW-GTR-285. http://www.fs.fed.us/pnw/pubs/gtr285/	The agency acknowledges the need to retain legacy components within an Late-Successional Reserve. See Chapter 1 for a discussion of salvage harvest in Late Successional Reserves. See Chapter 2 for a description of soils and wildlife project design features related to snag retention and coarse and large woody debris retention. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.Spies and Cline 1988 "...compares effects of green tree harvest with no post treatment on wildfire. The Westside Proposed Action does not propose the harvest of "green" trees. See response to comment number 12346-55. In proposed salvage harvest units, Project Design Features provide for the retention of snags and down wood to meet ecosystem needs.

Code	Comment Number	Comment Text	Response
240.23 - CWD	#5873-69	The agency cannot take a hard look at the issues of snag habitat and complex young forests without considering the dynamics of snags and dead wood. Spies et al. (1988) reported that amounts of CWD were high in the youngest successional stages, were lowest in 60-80-year-old forests, and were high in old stands (< 500 years). After 500 years CWD amounts declined to an intermediate level. Spies and Franklin (1988) reported that CWD input may be low in young stands because of the small size of dead and dying stems. Volumes in these stands are often high, however, due to residual CWD from the previous stand. Lofroth, Eric. 1998. The dead wood cycle. In: Conservation biology principles for forested landscapes. Edited by J. Voller and S. Harrison. UBC Press, Vancouver, B.C. pp. 185-214. 243 p. http://www.for.gov.bc.ca/hre/deadwood/DTrol.htm.	We agree that the EIS must consider the dynamics of snags and down wood. That discussion needs to be site-specific and consider the conditions of the local and regional environments. These topics are addressed at length in the fuels, wildlife and soils sections of Chapter 3. The comment as written provides no information specific to the circumstances the Westside Fire Recovery Project. Most of the area of the Northwest Forest Plan lies in the Oregon and Washington Cascades and Coast Ranges. The Mediterranean climate dry forests of the Klamath Province in northern California are not the same as the mesic forests of western Oregon and Washington. There is often a mistaken presumption (suggested by the author's reference to 500 year Coarse Woody Debris cycles) that the conditions described for those forests apply to forests of the Klamath Province as well. Key old-growth structural attributes of the Coast Range and Oregon and Washington Cascades include large live old trees, a large number of snags-of various ages, a multilayered canopy, and moderate to high accumulations of logs or coarse woody debris on the forest floor (Franklin, 1981). The fire regime of old-growth Douglas fir dominated forests of the Klamath Mountains differs from more mesic old-growth Douglas fir forests of Oregon and Washington (described in Franklin et al. (1981)) in fire frequency, fire severity, and structural attributes such as amount and persistence of coarse woody debris (Taylor and Skinner 1997). The characteristic fire regime of the Klamath Mountains is actually one of frequent low to moderate intensity fire with low to moderate severity effects (Skinner et al. 2006). In a fire regime dominated by low to moderate severity effects, tree mortality with wildfire is by definition generally low. In the Klamath Mountains, patches of moderate to high severity fire, when they did occur historically, were more likely on upper slope positions and on south and west-facing aspects (Skinner et al. 2006). Patches of high severity would produce a pulse of snags and then eventually down logs, until those logs were consumed by subsequent fires. Because frequent low-moderate severity fires consume wood, it is unlikely that coarse woody debris accumulated to levels seen in more mesic old-growth Douglas fir forests of Oregon and Washington (Taylor and Skinner 1997). In the Klamath Mountains snags and logs were likely clustered in time and space, with long intervals and large areas where dead wood was sparse (Skinner 2002). Because of fire frequency in the Klamath Province it is unlikely that dead wood could persist for 80-100 years until the next stand is capable of producing large wood (Taylor and Skinner 2007; Skinner 2002) without effective reduction of surface fuels.

Code	Comment Number	Comment Text	Response
240.23 - CWD	#5873-70	The agency cannot take a hard look at the issues of snag habitat and complex young forests without considering the dynamics of snags and dead wood. Spies et al. (1988) reported that amounts of CWD were high in the youngest successional stages, were lowest in 60-80-year-old forests, and were high in old stands (< 500 years). After 500 years CWD amounts declined to an intermediate level. Spies and Franklin (1988) reported that CWD input may be low in young stands because of the small size of dead and dying stems. Volumes in these stands are often high, however, due to residual CWD from the previous stand. Lofroth, Eric. 1998. The dead wood cycle. In: Conservation biology principles for forested landscapes. Edited by J. Voller and S. Harrison. UBC Press, Vancouver, B.C. pp. 185-214. 243 p. http://www.for.gov.bc.ca/hre/deadwood/DTrol.htm.	To determine how much dead wood should be retained on the landscape, we use the Guidelines provided by the Forest Plan for snags (4-30, Table 4-4) and coarse woody debris (4-23). The Late-Successional Reserve Assessment (Tables 3-1, 3-2, 3-3) also provided metrics for snags and coarse woody debris that closely match the metrics in the Forest Plan. These metrics were developed from studies of late successional and old-growth forests. Since the Forest Plan was developed in 1995, new research has shown that even the amounts of snags and coarse wood debris noted in the Forest Plan may be excessive for the Klamath Province when compared to historical norms. "Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve." - Skinner et al. (2006).This suggests that even the levels of snag and coarse woody debris retention described in the Forest Plan, which are far lower than the post-fire conditions of current landscape, would increase the risk of future stand replacement fire above historical levels. As previously noted, retaining all of the fire-killed trees and snags is likely to create fuel loading that would actually increase the probability of future high-severity fire that would consume snags and down wood (Skinner et al. 2006; Figure 7 of Appendix E; Fuels section of this Chapter of the final EIS). Because of fire frequency in the Klamath Province, it is highly unlikely that any dead wood could persist for 80 to 100 years until the next stand is capable of producing large wood (Taylor and Skinner 2007; Skinner 2002) without effective reduction of surface fuels. The Westside Fire Recovery project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by:• Retaining large “legacy” green trees wherever they occur. By virtue of their location and/or inherent resistance to fire, large green trees are most likely to persist until the next stand can develop large structures.• Retaining snags in Riparian Reserves. This has the effect of retaining the larger trees, on average, on the landscape in locations that historically burned with less intensity. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in association with Riparian Reserves or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity.• Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity-fuel treatment. By reducing surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Figure 7 of Appendix E). • Treating small fuels in Riparian Reserves by broadcast burning at the time that activity fuels are treated. This reduces the small surface fuels that readily ignite and carry fire but is unlikely to harm most of the larger snags because they will not yet have developed the surface that is receptive to embers.Peterson et al. (2015) observed that: “…post-fire logging can serve as an effective tool for managing fuel loadings in forests regenerating after high severity wildfires. By strategically applying and varying post-fire logging treatments within landscapes, post-fire logging could reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects. If applied using best management practices and with consideration for possible environmental impacts and meeting other management objectives, post-fire logging could serve as an effective option – along with mechanical thinning, prescribed fire, and managed low to mixed severity wildfires – for reducing fuels and restoring low and mixed severity fire regimes in dry coniferous forests of western North America and other fire-prone forest types.”Leaving all of the dead wood created by the 2014 West Side Fires is:• in excess of amounts typically found in the Klamath Province (see response to issue 1 above); • in excess of amounts required in the Forest Plan; and• likely to create unacceptable fuel loads in the future. The Westside Fire Recovery project has a higher probability of retaining large structures until the next stand is capable of producing them than does taking no action (Alternative 1) because salvage of fire-killed trees reduces the severity of future fires that would likely kill surviving green trees and consume snags and down wood present on the landscape (Fuels and Vegetation sections of this Chapter of the final EIS; Appendix E)See response 5873-72, EIS Chapter 3, Responsible Opposing Views and Agency’s Responses to Issues Raised and Appendix E.See Also:Knapp, E. J. 2015. Long-term dead wood changes in a Sierra Nevada mixed conifer forest: Habitat and fire hazard implications. Forest Ecology and Management 339 (2015) 87–95Ritchie M.W. , E. E. Knapp, C. N. Skinner.2012. Snag longevity and surface fuel accumulation following post-fire logging in a ponderosa pine dominated forest. Forest Ecology and Management 287 (2013) 113–122Peterson , D. W., E. K. Dodson and R. J. Harrod. 2003. Post-fire logging reduces surface woody fuels up to four decades following wildfire Erich K. Forest Ecology and Management 338 (2015) 84–91Skinner, C. N. 2002. Influence of fire on the dynamics of dead woody material in forests of California and Southwestern Oregon. Pages 445-454 in Symposium on the ecology and management of dead wood in western forests, November 2-4, 1999, Reno, Nevada.Skinner, C. N., A. H. Taylor, and J. K. Agee. 2006. Klamath Mountains bioregion. Pages 170-194 in N. G. Sugihara, J. W. van Wagtendonk, K. E. Shaffer, J. Fites-Kaufman, and A. E. Thode, editors. Fire in California's Ecosystems. University of California Press, Berkeley and Los Angeles, CA.Taylor, A. H., and C. N. Skinner. 1997. Fire regimes and management of old-growth Douglas fir forests in the Klamath Mountains of Northwestern California. Pages 203-208 in Fire Effects on Threatened and Endangered Species and Habitats. International Association of Wildland Fire,

Code	Comment Number	Comment Text	Response
			Fairfield, WA, Coeur d'Alene, ID.Taylor, A. H., and C. N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111:285-301.""
240.24 - LWD	#12346-15	On page 23 of the ACSOR the Forest Service mistakenly contends that the project will have "no effect" on large wood recruitment to streams because some (fish bearing) streams will receive a two tree length buffer and some (non fish-bearing) streams will receive a one tree length buffer. In fact, as acknowledged on page 34 of the DEIS, the Forest Service anticipates that hazard trees will be removed more than 250' feet above some road locations due to "slope" considerations. The agency may not simultaneous claim that large wood may travel more than 250' down slopes to reach a road, but that it can only travel one tree length to reach a stream. The aquatic ecosystems of both fishbearing and non-fish bearing streams benefit from large wood recruitment of the kind that the Forest Service claims happens to roads located more than 250' downhill of hazard trees.	Project design features that address this concern have been modified to require retention of large wood near all streams. There is no harvest planned in hydrologic Riparian Reserves except where roadside hazard units intersect Riparian Reserves. The only reason material would be removed from a hydrologic Riparian Reserves is to facilitate safe and reasonable management of the transportation system and/or to reduce fuels adjacent to the road. Within 25 feet of all streams and springs all trees, regardless of size, would be retained. Between 25 feet and one tree length of all streams, only hazardous trees between 14 and 26 inches in diameter can be removed. Any tree deemed a hazard to the road that is above 26 inches in diameter would be felled and left on-site. Below roads, hazard trees that could reach the stream if felled that direction would be retained. See Project Design Features for watershed in Chapter 2.

Code	Comment Number	Comment Text	Response
240.24 - LWD	#17111-11	In summary, general salvage of large snags and logs is clearl y antithetical to the goal of rapid recovery of fully functional late-successional forest habitat and inappropriate within the Late-Succesional Reserves. If large fuels are viewed as a critical fire control issue, then this could be dealt with by creating appropriate Fuel Management Zones or snag-free corridors.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Only a small fraction of the project area is proposed for salvage harvest. Within these units, general snag retention and the retention of large snags and other legacy components is proposed. See Chapter 2 under project design features of the final EIS for details. See response to comment number 18918-22.See response to comment number 17111-11.See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
240.24 - LWD	#18852-6	Secondly, the project plan does not fully disclose the key attributes and benefits of large woody debris in our ecosystem as standing snags, downed wood for slope stabilization, or as an key attribute within our tributaries and riverine environments (though it is mentioned).	The Forest concurs that downed wood is a key attribute to stream and riverine environments. This is why no salvage harvest is proposed within hydrologic Riparian Reserves for any project action Alternative. In addition, Project Design Features establish that hazard trees >26" diameter at breast height within the first site-tree distance of all streams (fish-bearing, perennial nonfish-bearing, and intermittent) will be retained on-site to provide for riparian zone and aquatic function and habitat.
240.24 - LWD	#5873-135	This LSR is already severely over-harvested and therefore likely to be severely deficient in large woody debris across the landscape. This disturbance event is a welcome site of LWD build-up that helps to balance out the overall shortage in the analysis area. The NEPA document did not disclose this cumulative/landscape perspective.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The commenter provides no evidence to support the contention that the Late-Successional Reserve was over-harvested, and as a result is severely deficient in coarse woody debris. The Klamath National Forest Late-Successional Reserve Assessment does not support the assertion that the area is severely over-harvested or that the Late-Successional Reserve is severely deficient in large woody debris across the landscape. The National Environmental Policy Act document did not provide this perspective because the Forest Service does not believe the Late Successional Reserves are severely deficient in large woody debris. If anything, the opposite is true because of a century of fire suppression. Skinner et al. (2006) observed that: "Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve."

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240.24 - LWD	#5873-146	Salvage logging in LSRs must retain typical amounts of large woody debris. Retaining large woody debris is especially important in LSRs because many spotted owl prey species are associated with down wood including flying squirrels, red-backed voles, bushy-tailed woodrat, dusky-footed woodrat, Douglas' squirrel, Townsend's chipmunk. Carey, Andrew B. November 1991. The biology of arboreal rodents in Douglas-fir forests. PNW-GTR-276. Portland, OR. in Huff, Mark H.; Holthausen, Richard S.; Aubry, Keith B., tech. coords.; Biology and management of old-growth forests. http://web.archive.org/web/20030406073837/http://www.fs.fed.us/pnw/pubs/gtr276.pdf. Sztukowski and Courtney. SEI. 2004. Appendix 4: Summary of Prey Biology. in Courtney, Blakesly, et al. 2004. Scientific Evaluation of the Status of the Northern Spotted Owl. http://www.sei.org/owl/finalreport/Appendices.pdf. The Northwest Forest Plan ROD provides Standards & Guidelines for salvage logging in LSRs that include: "Province-level plans will establish appropriate levels of coarse woody debris and decay rates to be used. Levels will be 'typical' and will not require retention of all material where it is highly concentrated, or too small to contribute to coarse woody debris over the long timeframes discussed." Pp C-14 – C-15. The agencies too often provides only minimal amounts of large woody debris in salvage sales and the agencies fail to consider the fact that abundant large woody debris is "typical" after fire and retaining all large wood is necessary to sustain LWD levels over time. "Legacies of snags, logs, and other woody debris are typically very large following an intense natural disturbance …" Dr. Jerry F. Franklin, Professor of Ecosystem Studies, College of Forest Resources, University of Washington, July 15, 2004. TESTIMONY FOR THE RECORD ON OVERSIGHT HEARING ON "RESTORING FORESTS AFTER CATASTROPHIC EVENTS" BY HOUSE COMMITTEE ON RESOURCES, SUBCOMMITTEE ON FOREST AND FOREST HEALTH. (emphasis added). According to Jerry Franklin, after a fire there is no ecological excess of large wood and that if you remove some you are taxing the ecological recovery processes. There is a price to pay and LSRs not the place for that.	We agree that retention of large structures is beneficial for northern spotted owls and many other species as described in the provided literature citations, and that any material over time would serve an ecological function for the simple reason that there is no "excess" in nature. We also agree that we should strive to maintain large structures that would persist until the next stand is capable of producing large material. That is a requirement of the Forest Plan (4-87; MA 5-30). Retention however, of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current Late-Successional Reserve land allocation (EIS Chapter 3 – Fuels). We do not agree that all fire killed trees, or all large fire killed trees must be retained. Province level plans were never developed to provide additional guidance for retention of coarse woody debris and decay rates. In the absence of other guidance, to determine how much dead wood should be retained on the landscape, we use the Guidelines provided by the Forest Plan for snags (4-30, Table 4-4) and coarse woody debris (4-23). The Late-Successional Reserve Assessment (3-1, 3-2, 3-3) also provides metrics for snags and coarse woody debris that closely match the values in the Forest Plan. These values were developed from studies of late successional and old-growth forests. The commenter fails to provide evidence that these amounts are not adequate on the Klamath National Forest. Since the Forest Plan was developed in 1995, new research has shown that even the amounts of coarse wood debris noted in the Forest Plan may be excessive for the Klamath Province when compared to historical norms. Skinner et al. (2006) observed that: "Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve." - Skinner et al. (2006).This suggests that even the levels of coarse woody debris retention described in the Forest Plan, which are far lower than the post-fire conditions of current landscape would increase the risk of future stand replacement fire above historical levels. As previously noted, retaining all of the fire-killed snags, is likely to create fuel loading that would actually increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; Appendix E Figure 7; EIS Chapter 3 - fuels). Because of fire frequency in the Klamath Province it is highly unlikely that any dead wood could persist for 80-100 years until the next stand is capable of producing large wood (Taylor and Skinner 2007; Skinner 2002) without effective reduction of surface fuels. The Westside Fire Recovery Project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by• Retaining large "legacy" trees wherever they occur. By virtue of their location and / or inherent resistance to fire, these trees are most likely to persist until the next stand can develop large structures.• Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less intensity. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in association with Riparian Reserves (see map packet) or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity.• Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Figure 7). • Treating small fuels in Riparian Reserves by broadcast burning at the time that activity fuels within units are burned. This reduces the small surface fuels that readily ignite and carry fire.Appendix E, Figure 12 shows that of the 29,600 acres of trees greater than 24 inches in diameter in the Late Successional Reserves, in all burn severities, 1,750 acres (6% of the size class) would be removed by the Westside Fire Recovery project in salvage harvest units. An estimated additional 240 acres of trees greater than 24 inches in diameter would be removed in roadside hazard cleanup (Table 3) in moderate – high severity burn areas. With salvage units and roadside hazard combined, approximately 2,000 acres of trees greater than 24 inches in diameter would be removed within the Eddy Gulch and Seiad Late Successional Reserves from moderate – high severity burn areas. Of trees greater than 24 inches in diameter, this represents about 23 percent of the 8,650 acres moderate - high severity burn acres and about 7% of the large tree diameter class in all burn severities in the Late Successional Reserves. Of the trees greater than 24 inches in diameter that are in moderate to high severity burn patches, 77 percent would be retained. Overall, over 90 percent of the trees greater than 24 inches in the Seiad and Eddy Gulch Late Successional Reserves would be retained.

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240.24 - LWD	#5873-61	Briefly meeting management plan snag targets is grossly inadequate. Historically, a mosaic of recent and not-so-recent fires, left lots of "snag patches" and patchy accumulations of down wood of various sizes and decay-stages. These snag patches provided tremendous habitat value for a whole host of wildlife species, include birds, mammals, amphibians, insects. 96 species are known to be associated with snags and 86 species are associated with down wood. Most of these species depend upon or prefer large snags and wood. With aggressive salvage policies that continue to this day, these snag patches are an under-represented feature on the landscape. The agency's snag retention guidelines are based on wildlife needs, but fail to consider or analyze the need to large snags and large down logs for shade, water storage, disturbance (via falling and sliding), nutrient storage, channel forming, sediment trapping, soil conservation, underground processes, etc.	See Chapter 1 of the EIS for a discussion of salvage harvest in Late Successional Reserves. The project is retaining snags at a level that meets or exceeds the Forest Plan standards and guidelines for snag retention and Late-Successional Reserve and consistent with the northern spotted owl recovery plan. See the wildlife section of Chapter 3 of the EIS and the submittal to the regional ecosystem office by the Forest Service for details. Much of the project is not being salvage harvested and there is no timber salvage proposed for hydrologic Riparian Reserves. Snags are also being retained within snag retention areas within and adjacent to treatment units. See Chapter 2 of the EIS for applicable project design features under wildlife. In response to Endangered Species Act consultation with the U.S. Fish and Wildlife Service and other consultation and public comments, the preferred Alternative is the modified Alternative 3; see Chapter 2 for a description of proposed treatments and additional snag retention incorporated into this Alternative. The agency recognizes the importance of snag retention for the benefit of wildlife species and other resource components and functions. Shade is considered in the hydrology report and aquatic resources (hydrology) section of the EIS, and potential stream channel shade produced by burned trees was considered. Additionally, the 2014 wildfires did not burn with high severity significantly along project area streams with only up to 3% of perennial stream miles burned at high severity in the Whites Fire Area (Table 15 of the hydrology report) and the Happy Camp Complex and Beaver Fire areas having < 3% of perennial stream miles burned high severity. These fire effects mean that stream shading in the project area has largely been maintained post-fire. Effects of the proposal on terrestrial and aquatic resources is disclosed in Chapter 3 of the EIS and supporting documents. In the soils report, the surface organic matter indicator analyzes the impacts of removing coarse wood and is met when sufficient organic matter is available for long term soil productivity. Coarse wood can improve soil productivity by increasing soil moisture, soil nutrients, soil micro and macroorganisms and organic matter. In addition, coarse wood can increase the survival of vegetation which in addition to coarse wood, provides soil cover thereby increasing soil stability and conserving soil organic matter. See response to comment number 5873-72 about in response to concerns about the concern about snag retention not being adequate.
240.24 - LWD	#5873-64	In Congressional testimony in July 2004, Jerry Franklin said: It is sometimes argued that following a stand-replacement fire in an old-growth forest that snags and logs are present in "excess" of the needs of the site, in terms of ecosystem recovery. In fact, the large pulse of dead wood created by the disturbance is the only significant input of woody debris that the site is going to get for the next 50 to 150 years—the ecosystem has to "live" off of this woody debris until the forest matures to the point where it has again produced the large trees that can become the source for new snags and logs (Maser et al. 1988). Dr. Jerry F. Franklin, Professor of Ecosystem Studies, College of Forest Resources, University of Washington. July 15, 2004. TESTIMONY FOR THE RECORD ON OVERSIGHT HEARING ON "RESTORING FORESTS AFTER CATASTROPHIC EVENTS" BY HOUSE COMMITTEE ON RESOURCES, SUBCOMMITTEE ON FOREST AND FOREST HEALTH. http://www.signaloflove.org/clearcutting/reports/fire3/Franklin%20Jerry%20July%202004%20testimony.pdf. Similarly, Johnson & Franklin's 2008 Forest Plan for the Klamath Tribes says of large fires — Such fires do generate a large pulse of dying, dead and down material. After a stand-replacement fire, that pulse of large wood is all of the large wood that the recovering ecosystem is going to get for the next century or more—i.e., until trees of large size are once again a part of the stand. Some of this dead wood legacy will persist and fulfill important functional roles in the recovering forest for many decades and, in the case of the largest and most decay resistant material, even for a century or more.	This comment accurately reflects Dr. Franklin's testimony, however Dr. Franklin's comments are not necessarily applicable to the circumstances of the Westside Fire Recovery Project. We agree that retention of large structures is beneficial for northern spotted owls and many other species, and that any material over time would serve an ecological function for the simple reason that there is no "excess" in nature. We also agree that we should strive to maintain large structures that could persist until the next stand is capable of producing large material. That is a requirement of the Forest Plan (4-87; MA 5-30). Retention however, of all of the dead wood now present on the landscape would create an undesirable risk of future high severity fire that is not consistent with the historical fire regime of the Klamath Province, the objectives of the Forest Plan or development of desired late successional stand conditions in the current Late-Successional Reserve land allocation (EIS Chapter 3 – Fuels). We do not agree that all fire killed trees, or all large fire killed trees must be retained. This comment appears to equate the snag and down wood trajectories of the fire regime of the Klamath Province with that of more mesic areas of the Northwest Forest Plan. That is not correct (See Background, EIS Chapter 1; Appendix E). The fire regime of old-growth Douglas fir dominated forests of the Klamath Mountains differs from more mesic old-growth Douglas fir forests of Oregon and Washington (described in Franklin et al. (1981)) in fire frequency, fire severity, and structural attributes such as amount and persistence of snags and coarse woody debris (Taylor and Skinner 1997). The characteristic fire regime of the Klamath Mountains is actually one of frequent low to moderate intensity fire with low to moderate severity effects (Skinner et al. 2006), not "stand-replacement or mixed" that is typical in the Coast Range and western Oregon and Washington Cascades. With frequent fire, surface fuels are maintained at low levels – too low for intensity sufficient to produce much stand-replacement fire, except under unusual circumstances. Also, as noted by Taylor and Skinner (1997) and Skinner (2002), dead wood in the Klamath province rarely lasted long enough, even in a low to moderate fire severity environment, to actually decompose because snags and down logs are receptive to embers, and once partially rotted, are easily consumed by fire. In a fire regime dominated by low to moderate severity effects, tree mortality with wildfire is by definition generally low. In the Klamath Mountains, patches of moderate to high severity fire, when they did occur historically, were more likely on upper slope positions and on south and west-facing aspects (Skinner et al. 2006). Patches of high severity would produce a pulse of snags and then eventually down logs, until those logs were consumed by subsequent fires. Because frequent low-moderate severity fires consume wood, it is unlikely that coarse woody debris accumulated to levels seen in more mesic old-growth Douglas fir forests of Oregon and Washington (Taylor and Skinner 1997). In the Klamath Mountains snags and logs were likely clustered in time and space, with long intervals and large areas where dead wood was sparse (Skinner 2002). To determine how much dead wood should be retained on the landscape, we use the Guidelines provided by the Forest Plan for snags (4-30, Table 4-4) and coarse woody debris (4-23). The Late-Successional Reserve Assessment (Tables 3-1, 3-2, 3-3) also provided metrics for snags and coarse woody debris that closely match the metrics in the Forest Plan. These metrics were developed from studies of late

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			successional and old-growth forests. Since the Forest Plan was developed in 1995, new research has shown that even the amounts of snags and coarse wood debris noted in the Forest Plan may be excessive for the Klamath Province when compared to historical norms. Skinner et al. (2006) observed that: "Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve." - Skinner et al. (2006).This suggests that even the levels of snag and coarse woody debris retention described in the Forest Plan, which are far lower than the post-fire conditions of current landscape would increase the risk of future stand replacement fire above historical levels. As previously noted, retaining all of the fire-killed snags, is likely to create fuel loading that would actually increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; Appendix E Figure 7; EIS Chapter 3 - fuels). Because of fire frequency in the Klamath Province it is highly unlikely that any dead wood could persist for 80-100 years until the next stand is capable of producing large wood (Taylor and Skinner 2007; Skinner 2002) without effective reduction of surface fuels. The Westside Fire Recovery Project seeks to meet the objective of retaining large material until the next stand is capable of producing such material by• Retaining large “legacy” trees wherever they occur. By virtue of their location and / or inherent resistance to fire, these trees are most likely to persist until the next stand can develop large structures.• Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less intensity. Large snags are more likely to persist than small snags. • Designating additional snag retention areas in association with Riparian Reserves (see map packet) or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower intensity.• Reducing fuels around Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels, the risk of future high severity fire affecting remaining snags and down wood is reduced (Figure 7). • Treating small fuels in Riparian Reserves by broadcast burning at the time that activity fuels within units are burned. This reduces the small surface fuels that readily ignite and carry fire.Peterson et al. (2015) observed that:“post-fire logging can serve as an effective tool for managing fuel loadings in forests regenerating after high severity wildfires. By strategically applying and varying post-fire logging treatments within landscapes, post-fire logging could reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects. If applied using best management practices and with consideration for possible environmental impacts and meeting other management objectives, post-fire logging could serve as an effective option – along with mechanical thinning, prescribed fire, and managed low to mixed severity wildfires – for reducing fuels and restoring low and mixed severity fire regimes in dry coniferous forests of western North America and other fire-prone forest types.”
241 - Vegetation	#18909-19	The Joint Fire Science Program Final Report did have relevant Key Findings and Implications that were not considered, (emphasis added), in the DEIS as follows: Predicting Post-Fire Regeneration Needs: Spatial and Temporal Variation in Natural Regeneration in Northern California and Southwest Oregon. Key Findings: * On most sites, natural regeneration of conifers was abundant 10 to 20 years after high severity forest fire in the Klamath-Siskiyou region of northern California and southwest Oregon. * Natural regeneration was most limited on the drier, hotter sites (low elevation, eastern Klamath Mountains). * Natural regeneration of conifers was usually abundant up to 450m from living trees. It was difficult to find places more than 450m from living trees. * Conifers continued regenerating 10-15 years after the fire. * While most conifers were still within the shrub matrix, many were already well above the shrub layer. Even those still within the shrub canopy had reasonable height growth and good live crown ratios (average 68%) suggesting they would survive and grow above the competing vegetation. * Nine to 19 years after high severity wildfire, average conifer density varied among forest types, for example, the True Fir zone 2,454 (±529 stderr) trees/ac. (median 2,104), Douglas-fir/Tanoak zone 1038.4 (±stderr 266.3, n=18) trees/ac. (median 725.4) and lowest in the mixed conifer zone at 775.3 (±stderr 181, n=62) trees/ac (median 223.5). * Shrub cover was always dense. * Hardwood regeneration as stump sprouts was also abundant except at higher elevations. Key Implications: * Most post-fire areas in the Klamath Mountains are well stocked with successful regeneration within 10 to 20 years of a fire so planting is not required to assure a future forest. * The hottest, driest sites in the region require planting to either assure stocking or to secure a pine component to the forest. * A companion study (Masters Thesis) is showing that planting after these same fires did increase both conifer and hardwood tree size by age 20 but only by modest amounts.	The Joint Fire Science Program Final Report was considered in the Environment Consequences section of the EIS: "Successful natural regeneration in one to two decades, though highly variable, has been documented following stand-replacing fires in the Klamath Province within white fir, Douglas-fir, and Douglas-fir/tanoak stand types (Shatford, Hibbs and Puettman 2007; Joint Fire Science Program Final Report, Project 05-2-1-40 2009)"The findings of Shatford et. al. 2007 have been considered in the Vegetation Effects section of the EIS: "Although natural regeneration of conifer species has occurred elsewhere, following more typical wildfire site conditions, the project area has a higher percentage of acres burned at high intensities than more typical historic patterns, resulting in prolonged regeneration periods and variable stocking patterns on unplanted sites (Shatford et al. 2007)." The action Alternatives would remove primarily dead vegetation and may damage live trees or plants during harvest operations, but the extent of damage would be localized and long term effects to vegetation would be negligible. The range, sensitive plants, soils, watershed and wildlife sections disclose any localized effects on specific vegetation. While studies following wildfire indicate that regeneration tends to be highest in low to moderate severity patches (Lentile et al. 2005), Bonnet et al. (2005) found that seedling establishment was very successful in patches of high severity that were within 39.4 ft. (12 m) of unburned forest canopy. The ability of a forest to regenerate on its own after a stand replacing fire is highly dependent upon available seed sources. As patch sizes increase, the distance to the nearest seed source increases and seed availability drops off at an exponential rate (Bonnet et al. 2005).

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241 - Vegetation	#18909-20	The DEIS on page 112 states: "More typically, vegetation is likely to go through an extensive time-period of hardwood- and brush-dominated site occupancy (Zhang, Webster, Powers and Mills 2008). Reforestation will slowly occur naturally but may take many decades to replace brushfields (Zhang et al. 2008)." As we have seen from the Shatford et al. study, this claim is not entirely true. Further, the Zhang et al. 2008 paper looks at intensively managed industrial timberland in Sierra Nevada mixed conifer stands located in northeastern California, southeast of Mt. Shasta. Looking at Ponderosa pine industrial timber lands, that also utilized "hack and squirt" methods and used the herbicide Hexazinone for over sixteen years, is of no relevance to the claim made in the DEIS. Zhang et al. 2008 states, "If wood production is a primary goal, decisions must follow quickly and be based on regulations and management knowledge to avoid wood decay in salvageable material and site occupancy of aggressive shrub vegetation." We remind the agency that wood production is not a primary goal for Riparian Reserves e.g., unstable and potentially unstable areas or Late-Succesional Reserves, which constitute a vast majority of larger units proposed for logging in the project area. We do not disagree that hardwood and brush species grow in post fire but we do disagree with the claim that it is an extensive time period or that reforestation may take many decades. This type of language throughout the vegetation section and the DEIS, lead to false claims not supported in science, hence misleading and misinforming the public.	The draft EIS quote is accurate and is reflective of best available science Zhang et al. 2008 was referring to natural regeneration under no action, which is relevant to the no action Alternative considered in the EIS. Likewise, the no action analysis of the draft EIS states that, "Without salvage, site preparation and planting, severely burned stands will likely be replaced by shrubs and brush (Skinner, Taylor and Agee 2006); regeneration of conifers and restoration of forested wildlife habitat may take decades." No herbicide use is proposed with this project, so this part of the comment is outside the scope of this project; see Chapter 2 of the EIS for a description of proposed actions. Likewise, timber production is not the primary goal of this project; see Chapter 1 of the EIS for a description of the purpose and need of this project. The salvage harvest proposed is largely within Late-Successional Reserve and is being proposed to promote Late-Successional Reserve conditions, as described in the "salvage in Late-Successional Reserve" section of Chapter 1 of the EIS. No salvage harvest is proposed in hydrologic Riparian Reserves; see Chapter 2 of the EIS for a description of proposed actions. Salvage harvest is proposed in geologic Riparian Reserves; see the aquatic resources analysis in Chapter 3 of the EIS and the Aquatic Conservation Strategy analysis in the Appendix of the EIS for a description of how treatments are consistent with Aquatic Conservation Strategy objectives of the Forest Plan.
241 - Vegetation	#18909-23	The Vegetation Direct and Indirect Effects section of the DEIS for Alternative 2 states on page 114: "Therefore, effective fuel treatment is an essential component of sustainable reforestation in the Klamath Province (Peterson et al. 2014)." As noted above, the DEIS fails to consider the magnitude or timing of the proposed project. The DEIS analysis seems to rely on the assumption that all activity fuels treatments and other fuels reduction would take place on 100% of the project area. There is no guarantee that fuels reduction would take place, especially given that only 32% of the funding would be provided from timber sale receipts. Further, as noted in the Fire and Fuels section of the DEIS page 122, helicopter logging, nearly 50% of the project area, leaves the greatest amount of fuel loadings and activity slash can be extremely difficult to treat.	Thank you for your comments on the Westside Fire Recovery Project. Comments that state a position for or against a specific action are appreciated as it gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See response to comment number 18878-16 about project funding for implementation. Treatment of fuels and proposed harvest systems are considered in the Fire and Fuels Environmental Consequences section Chapter 3 of the EIS: "The short term effect of logging is an elevated surface fuel loading from broken tops and branch wood. The greatest fuel loadings post-harvest is expected to occur within helicopter units, followed by cable and ground based units. However, post logging activity breaks the structure and composition of the fuel bed. Upon completion of fuel reduction activities, ground based units would be expected to reduce the greatest amounts of surface fuels due to the ease of facilitating piling and other fuels reduction activities on gentler slopes. Steeper slopes (greater than 40 percent) would be anticipated to require hand piling and or broadcast burning to achieve desired surface fuel loadings of less than 10 tons/acre. Compared to ground-based and cable units, within helicopter units or those areas on steep slopes, larger diameter (greater than 3" diameter) fuels may have increased loads as these fuels can be difficult to pile by hand."
241.02 - Invasive, Noxious Plant Species	#18926-19	Non-native Invasive Plant Species! The project has a high risk potential for the introduction and spread of non-native invasive species, which are likely to persist long term. This is due to the high level of ground disturbing activities and increased vectors. There are 995 acres of known non-native invasive plant populations for 12 different species in the project area.! ! A non-native invasive plant project design feature would require removal of the top few inches soil on approximately 24 landings, resulting in major decreases to soil organic matter on landings. Cumulatively there are 8 grazing allotments that overlap treatment units and may contribute to the long-distance dispersal of infestations in the project area.! The Forest Service has a duty to reduce and eliminate noxious weeds on our public lands and the DEIS does not fully consider or analyze the long-term affects to our watersheds and native plant species. ! !	The draft EIS acknowledges the high risk of introduction and spread of noxious weeds for the project area, in all Alternatives, including no action, in the Botany and Non-native Invasive Plant section of Chapter 3. The project design feature for the use of potential landings suggesting removal of material from landings is not required, but will be evaluated at the time of use, and is not the only option for the prevention of spread. The effects of blading potential landings has been evaluated in the soils report, also in Chapter 3. The project design features incorporated into the proposed actions are intended to prevent long term effects to watersheds and native plants by reducing the risk of introduction and spread. The eight grazing allotments that overlap treatment units are considered in the cumulative effects analysis and displayed under the Environmental Consequences section within the Botany and Non-native Invasive Plant section of Chapter 3.
241.02 - Invasive, Noxious Plant Species	#5873-122	Logging and elevated road use are also primary vectors for the dispersal and establishment of noxious weeds (USFS, 1999; 2000b). Noxious weed establishment can increase erosion and sediment delivery and impede the recovery of native vegetation USFS (2000a). This is of special concern in burned landscapes because noxious weeds are well-adapted to disturbed environments.	The draft EIS acknowledges the high risk on non-native invasive plant introduction and spread in the Botany and Non-native invasive plant section in Chapter 3. Project design features identified as non-native invasive species-1 through non-native invasive species-5 in Chapter 2, Project Design Features subheading, were included to reduce this risk.

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241.03 - Forest Health, Insect/Disease	#12354-8	March 2015 published study in PNAS shows that pine beetle infestation does not increase area burned. This is rather conclusive proof that any argument for post-fire logging is false, or worse, corrupted by unscientific USFS practices, or yet worse, corruption by relationship with logging companies. Hart, Sarah J., Tania Schoennagel, Thomas T. Veblen, and Teresa B. Chapman. "Area burned in the western United States is unaffected by recent mountain pine beetle outbreaks." Proceedings of the National Academy of Sciences (2015): 201424037. From the Abstract: "Here, we show that the observed effect of MPB infestation on the area burned in years of extreme fire appears negligible at broad spatial extents. Contrary to the expectation of increased wildfire activity in recently infested red-stage stands, we found no difference between observed area and expected area burned in red-stage or subsequent gray-stage stands during three peak years of wildfire activity .... Although MPB infestation and fire activity both independently increased in conjunction with recent warming, our results demonstrate that the annual area burned in the western United States has not increased in direct response to bark beetle activity. Therefore, policy discussions should focus on societal adaptation to the effects of recent increases in wildfire activity related to increased drought severity." In short, the evidence is entirely against salvage logging.	The referenced "Area Burned in the Western United States is Unaffected by Recent Mountain Pine Beetle Outbreaks" (Hart et. Al 2014) presumes large mountain pine beetle outbreaks have previously occurred prior to fire. That is not the case for the analysis area evaluated in the Westside EIS. This comment is not relevant to this project. The need for salvage harvest in this project is because of wildfire and not beetle infestation.
241.03 - Forest Health, Insect/Disease	#12354-9	I have additional concerns about zoonotic disease resulting from species which may irrupt. Many play host to arthropods which could significantly increase levels of Lyme disease, and should habitat be destroyed for certain predators, some viral diseases which can pose serious dangers to hu mans are carried by rodents, which, as you know, can quickly increase without normal predation. Predators take time to reestablish themselves when heavy human interference/habitat modification occurs. Roading, destruction of interior forest and of natural forest structure, place responsibility directly upon agencies causing the above problems.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The effects of the proposed actions are described throughout Chapter 3 of the EIS.
241.03 - Forest Health, Insect/Disease	#17939-1	I mentioned the recent study showing that pine beetle infestations do not affeect total area burned; here is the correct reference - it was Proceedings of the National Academy of Sciences (PNAS): Hart, Sarah J., Tania Schoennagel, Thomas T. Veblen, and Teresa B. Chapman. "Area burned in the western United States is unaffected by recent mountain pine beetle outbreaks." Proceedings of the National Academy of Sciences (2015): 201424037. From the Abstract: "Here, we show that the observed effect of MPB infestation on the area burned in years of extreme fire appears negligible at broad spatial extents. Contrary to the expectation of increased wildfire activity in recently infested red-stage stands, we found no difference between observed area and expected area burned in red-stage or subsequent gray-stage stands during three peak years of wildfire activity…. Although MPB infestation and fire activity both independently increased in conjunction with recent warming, our results demonstrate that the annual area burned in the western United States has not increased in direct response to bark beetle activity. Therefore, policy discussions should focus on societal adaptation to the effects of recent increases in wildfire activity related to increased drought severity."	The referenced "Area Burned in the Western United States is Unaffected by Recent Mountain Pine Beetle Outbreaks" (Hart et. Al 2014) presumes large mountain pine beetle outbreaks have previously occurred prior to fire. That is not the case for the analysis considered under the Westside EIS.

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241.03 - Forest Health, Insect/Disease	#18909-8	We are concerned with multiple inconsistencies, reliance on unrelated studies, and that the temporal bounding used as the basis for analysis in the vegetation section of the DEIS is skewed and missing years 6-39. The DEIS at page 110 states, "Long-term temporal bounding is for an estimated 40-100 years from project implementation and is based on the maximum time for reduction of surface woody fuels following fire (Peterson, Dodson and Harrod 2014)." How is it that the KNF can choose to eliminate these important years from the vegetation assessment? The DEIS often relies on the Peterson et al. study. From Peterson et al. 2014: "Harvesting fire-killed trees may reduce future surface woody fuels and related fire hazards, but the magnitude and timing of post-fire logging effects on woody fuels have not been fully assessed." Thus, the study on which the DEIS relies itself acknowledges that the proposed actions are not fully supported by science. The DEIS fails to consider the magnitude or timing of the proposed project. The DEIS analysis seems to rely on the assumption that all activity fuels treatments and other fuels reduction would take place on 100% of the project area. However, there is no guarantee that fuels reduction would take place. Further, as noted in the Fire and Fuels section of the DEIS page 122, helicopter logging, nearly 50% of the project area, leaves the greatest amount of fuel loadings and activity slash which can be extremely difficult to treat.	As per the Vegetation section Chapter 3 of the EIS: "Both short-term and long-term effects will be considered in this analysis. Short-term temporal bounding is the time period in which treatments occur from harvest activity, site preparation, and planting; this is about one to five years because effects on regeneration will begin to be visible during this time period. Long-term temporal bounding is for an estimated 40-100 years from project implementation and is based on the maximum time for reduction of surface woody fuels following fire (Peterson, Dodson and Harrod 2014) and computer-generated modeling that showed stand conditions approaching the desired late-successional characteristics." The effects analysis is based upon the fuels treatments proposed by Alternative. See Chapter 3 of the EIS and the fuels report for methodologies and assumptions.
241.03 - Forest Health, Insect/Disease	#19058-1	These organizations need to understand how their efforts will destroy what they think they are trying to save. Please. They need to be educated on the diseases that these burned timber will get if not removed. The sad part is not only will this timber go to waste but the disease that infest the burned timber will quickly spread to what is left of healthy timber.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We acknowledge that dead trees not removed will result in an increase of insect and disease. The effects of the proposed actions are described throughout Chapter 3 of the EIS, especially the vegetation section, for a discussion of vegetation and insects and disease.
241.03 - Forest Health, Insect/Disease	#19079-6	Where in the DEIS does it count the bugs? What categories, which stands of timber, be it green, half burnt or hot burned is it documented the detection or the evidence where the bugs are? I believe the bugs are one reason for the call for an emergency fast tract DEIS reporting which leaves the public with less time to appropriately respond to DEIS document. What are the man hours required and expended for gathering this data? What are the results of this research?	"A substantial portion of the trees within moderate severity areas have either been killed by fire or are expected to experience high mortality due to fire injury, insects, and the effects of prolonged drought. Continued overall low levels of rainfall and particularly low snowfall amounts this winter are not alleviating drought conditions in northern California...dry conditions will further decrease the survivability of fire damaged trees, even in areas that burned in lower severity" (p. 4-5 of the draft EIS). The project is consistent with National Environmental Policy Act regulations for site-specific analysis of the effects of the proposed action; there is no requirement or expectation for the agency to conduct research analysis for National Environmental Policy Act compliance.
242.01 - Timber Receipts/ Revenue	#18878-43	DEIS: While modeling predicts an expected increase in surface fuels less than 3 inches diameter at breast height as compared to the alternative 1, after implementation of proposed 11 of22 activities, modeling results predict that within ten years alternative 2 will continue to promote low accumulations of surface fuel loadings would be reduced. (Pg.124) Comment: The projected shortfall in post salvage treatment from timber receipts analysis should have been conducted to determine surface fuel loading and revegetation in those scenarios. Once again Klamath National Forest should have been upfront with their plan where timber receipts do not fully cover fuel treatments to reduce surface fuel loading and other necessary follow-up activities. The economics should have been analyzed throughout the DEIS in terms of impacts to the project and the landscape. The above statement seems to contradict what is stated in the Fire Behavior Synopsis (Pg. 125) "When compared to alternative 1, proposed treatments in alternative 2 effectively reduce fuel loading in the short and long term which in turn reduces fire behavior."	Site preparation and planting are planned actions after salvage harvest; see Chapter 2 of the EIS for a description of proposed actions. Receipts from the timber sale are not expected to fully cover expenses for these actions. However, appropriated funding and other funding sources are expected to help cover costs associated with this project. See response to comment number 18878-16 about project funding for implementation. Since proposed follow up fuels treatments would occur post-salvage harvest, there would be less fuel loading in proposed units compared to Alternative 1. Not doing follow-up fuels treatments is not being proposed, and therefore, not analyzed. Proposed salvage logging will increase surface fuel loading in the short-term until planned fuel treatment activities occur. When proposed fuels treatments occur, a reduction in fuel loading in the short term and long term will reduce fire behavior when compared to Alternative 1. For further information, see Vegetation report and Social Economics report in the EIS.

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242.01 - Timber Receipts/ Revenue	#18934-13	Timber Volume The lack of any data related to projected or estimate timber volumes from the project as well as individual units makes it impossible to determine the actual scale of timber removal in any given area. Without reasonably accurate timber volume and market value estimates, it is impossible to judge whether economic justifications for an Emergency Situation Determination (ESD) are valid. There are no documents available to the public that address the economic components of the Forest's request for an ESD, making public assessment of this issue impossible. Additionally the scope and scale of this project calls into question whether the Forest has the resources on hand to be able to pull off this project if implemented. The strain on the forest staff and the effect on other important project work has been noticed across all departments just for the creation of the Scoping Document and DEIS for this project. What elements will be left out due to lack of funds, or resources? How effective can those in charge of making sure that the treatments outlined in the final EIS are implemented as they are planned. Even with the much smaller Salmon Salvage project we found many inconsistencies from design to implementation and were told that there simply weren't the resources available to regulate the contractors who were implementing the project. How will the KNF assure that the project is implemented as designed?	The estimated volume to be removed for this project is stated in Chapter 3 of the EIS under the Vegetation section and the estimated value of timber to be removed is stated in Chapter 3 of the EIS under the Social and Economic Environment. Project design features to address project objectives , to minimize resource impacts, and to ensure compliance with the Forest Plan and applicable laws and regulations can be found in Chapter 2 of the EIS, section Project Design Features. See response to comment number 18878-43 about implementation funding. The Forest Service has timber contracting representatives to ensure that implementation of the project meets what is proposed during National Environmental Policy Act. Also see the monitoring section in Chapter 2.
242.02 - Timber volume/output	#18934-13	Timber Volume The lack of any data related to projected or estimate timber volumes from the project as well as individual units makes it impossible to determine the actual scale of timber removal in any given area. Without reasonably accurate timber volume and market value estimates, it is impossible to judge whether economic justifications for an Emergency Situation Determination (ESD) are valid. There are no documents available to the public that address the economic components of the Forest's request for an ESD, making public assessment of this issue impossible. Additionally the scope and scale of this project calls into question whether the Forest has the resources on hand to be able to pull off this project if implemented. The strain on the forest staff and the effect on other important project work has been noticed across all departments just for the creation of the Scoping Document and DEIS for this project. What elements will be left out due to lack of funds, or resources? How effective can those in charge of making sure that the treatments outlined in the final EIS are implemented as they are planned. Even with the much smaller Salmon Salvage project we found many inconsistencies from design to implementation and were told that there simply weren't the resources available to regulate the contractors who were implementing the project. How will the KNF assure that the project is implemented as designed?	See response number 18934-13.The project and the emergency situation determination approval are compliant with the regulations at 36 CFR 218.21. The emergency situation determination proposal and approval are in the project record and available on the project's webpage. Staffing and the Salmon Salvage project are outside the scope of this analysis. The Forest Service conducts effectiveness monitoring of Best Management Practices and has contracting officers who ensure implementation meets requirements, as proposed. Projected estimated timber volumes for action Alternatives are provided as a basis for the economic analysis in the social and economic section of Chapter 3 of the draft and final EIS and in the referenced economic resource report. The Record of Decision will include a commitment to implementation of the project as designed, and implementation of the project will be monitored.
242.02 - Timber volume/output	#19-5	To meet your stated objectives, it will be important to complete your NEPA analysis as quickly as possible to allow for salvage logging to take place in the 2015 operating season. There will likely be only five months that operations cab feasibly take place on this project, (July 2015-November 2015). This means that each one month delay in starting timber operations will reduce the amount of work that can be accomplished on this project by 20%!	See response number 28-3
242.03 - Timber Implementation/Contracting	#12368-2	To delay this action will mean that all the salvage logs will become useless to potential bidders.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The comment aligns with the purpose and need of the project; the agency is consulting with regulatory agencies in order to expedite the timeline to the extent possible.

Code	Comment Number	Comment Text	Response
242.03 - Timber Implementation/Contracting	#1-3	I would like to encourage the Forest Service to be aggressive as possible in the sale of timber within this project. Projects of this natural are essential to health and well being not only of our public forest but also the social and economic health of our rural communities. I would also like to encourage the Forest Service to make the work in this project available to as many bidders as possible. It is a fact that, the smaller the sale and the bigger the wood the higher the value returned to the Forest Service and public. The smaller the sale the more people that can participate. I would also like to encourage the Forest Service to move as fast as possible on any fire salvage so that value of the timber can be retained. Selling only smaller diameter trees is discriminatory against small local mills that need large diameter logs to create special products. Having only large sales is discriminatory against small producers that cannot afford the expensive of larger sales. I believe these types of projects to be an important part of or the Forest Services responsibilities to our local communities. I look forward to the opportunity to bid on these sales as they become available.	See response number 28-3. Your comment has been acknowledged; however, the specifics of contracting for implementation are outside the scope of this project. See response to comment number 18878-43 about implementation funding.
242.03 - Timber Implementation/Contracting	#13-5	If you decide to include any traditional logging by ground based, cable or helicopter logging systems please include full logging slash reduction IN THE TIMBER SALE CONTRACT because otherwise most of it will not get done and you will be creating increased future fire risks to firefighters, watersheds, forest residents (human and non-human) and the forest itself. Even collecting "brush disposal" funds does not deal with the logging slash because over time "administrative overhead" consumes most of these funds.	How contracts or their specifications are written or packaged for this project is outside the scope of this analysis. See response to comment number 18878-43 about implementation funding. Following salvage harvest of dead trees Site Preparation treatments will occur to reduce fuel loadings. Site preparation treatment descriptions can be found in Chapter 2 of the EIS in the Site Preparation section.
242.03 - Timber Implementation/Contracting	#17509-2	Murphy Company would like to see all salvage timber sales be economically viable. We hope that the most appropriate harvesting systems are prescribed to help achieve an economically viable sale. We feel that there are several ways to properly harvest any piece of ground, and certain restrictive language can limit some potential bidders, thus driving the bid value down. Including language in the EIS that specifies damage tolerance levels rather than firm restrictions gives the operator flexibility to utilize their equipment to its maximum efficiencies. For example, quantifying a residual stand damage threshold rather than entirely restricting activity during certain months (or restricting log lengths) will allow an operator the flexibility to alter their yarding techniques to meet the threshold throughout the seasons instead of having to completely shut down during certain months.	See response number 28-3
242.03 - Timber Implementation/Contracting	#18852-26	8) Marking guidelines; USFS "Full mark" vs. "Designation by description" is not clearly stated in this report. Allowing contractors to select trees for harvesting appears to allow for a definite conflict of interest between private profit incentives and resource values. This would also be indicative of the inability of USFS personnel to site specifically determine tree selection and retention, due to the large areas and difficult terrain involved in the project.	Designation by description and "Full Mark" are implementation techniques and are not a part of this environmental analysis. The guidelines in Report #RO-11-01 "Marking Guidelines for Fire-Injured Trees in California" (Smith & Cluck, 2011) are stated in Chapter 2 of the EIS under Alternative 2, Salvage Harvest description describe which trees are considered for harvest.
242.03 - Timber Implementation/Contracting	#19-6	- Limit or work to eliminate any limited operating period. Any delay to operations will have a direct effect on merchantability/value of the material to be removed.	The proposed actions are required to meet law, regulation, and policy. We appreciate your concerns with limited operating periods. We have been consulting with Fish and Wildlife Service per Endangered Species Act requirements in order to minimize the application of LOPs to the extent possible, while retaining essential protection of species. For those LOPs in place, surveys are currently being conducted and LOPs can be lifted if surveys determine no reproduction of those species for the year of action.

Code	Comment Number	Comment Text	Response
242.03 - Timber Implementation/Contracting	#4-5	Salvage o Longer term contracts – to salvage timber that dies after sale is marked o Adjust DBH and top size of timber as wood quality deteriorates – industry indicates that sales would be more attractive o Y.U.M. and treat units for fuel reduction	The agency recognizes that timber decays, as is described in Chapter 1 and 3 of the EIS. Following salvage harvest of dead trees, site preparation treatments are proposed to reduce fuel loadings. Site preparation treatment descriptions can be found in Chapter 2 of the EIS in the Site Preparation section. Contracting is outside the scope of this analysis.
244 - Domestic Livestock	#17481-16	Some of the grazing allotments were hit hard by the fires and could use some replanting of native forage species. Restore grazing meadows.	The Range Specialist Report states "The most intense burning occurred where dense closed canopy forest dominated the landscape... Direct effects of the burn on meadows were minimal. Most meadows were either unburned or lightly burned in some areas. In general, the fire did not produce serious mortality on primary rangeland to the point of altering existing conditions." While there are some areas within the allotments that could benefit from seeding of native forage species, it does not meet the purpose and need for this project. Many meadows that experienced a light-moderate burn will regenerate on their own.
244 - Domestic Livestock	#17481-23	Table of Alternatives: "No impact on forage" needs to be altered.	The "no impact on forage" has been changed to "no additional increase of forage" in the effects for Rangeland Resources.
244 - Domestic Livestock	#17481-34	o Livestock grazing as a fuel reduction and meadow retention tool	Livestock will continue to graze areas within allotment boundaries and will continue to provide these benefits.
244 - Domestic Livestock	#17481-43	How many range improvement were lost? Can they be included in recovery?	No range improvements were lost during the fire. Range-1 project design feature will require that any improvements damaged by project logging or fuels operations will be repaired or replaced.
244 - Domestic Livestock	#17481-48	Address moving animals mechanically due to access.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. However, the movement of cattle is outside the scope of the project. Cattle allotments are managed under existing permits and annual operating procedures are adjusted annually as needed to project rangeland conditions.

Code	Comment Number	Comment Text	Response
244 - Domestic Livestock	#17481-51	DEIS P. 69 states for Alternative 1: "There would be no effect on the availability of forage and a neutral effect on rangeland condition." Comment: This cannot be an accurate statement, given the long-term effects that future severe fires will likely have on the soil and vegetation. DEIS p. 80 - Project Design Features. Comment: Have ranchers been consulted regarding range improvements potentially lost in the fires? If structures have been lost, a discussion of funding and carrying out their replacement in a timely fashion is in order. DEIS p. 178 and p. 183 states regarding invasive species: "There are 8 grazing allotments that overlap treatment units and may contribute to the long-distance dispersal of NNIS infestations in the project area... The added cumulative effects of grazing to Alternative 1 would likely increase the risk of NNIS introduction and spread. Comment 1: Extensive research has been done showing grazing can be used as a tool to control invasive species in various ecosystems. This DEIS ignores that fact. Grazing can be used to control invasive weeds (Olson and Lacey 1994, Walker et al.1994, Launchbaugh, K. 2007). Other research suggests that livestock grazing helps prevent invasion by non-native grasses, which threaten plant biodiversity on the land. Grazing can be used to control brush, which also benefits wildlife, helping more grass to take root and decreasing the spread of weeds such as cheatgrass, a highly flammable invasive weed. A study in the Journal of Rangeland Management concluded that "from an ecological standpoint we can argue that if we remove the grazing infrastructure from public rangelands, we would see some adverse consequences. We'd see less variety and too much ground cover, for example, as well as more cheatgrass and the potential for more range fires." Comment 2: Also, grazing is an effective tool in restoring burned areas. Evidence of such successes is seen in some of the literature. A fire science brief from 2011 indicated that a study of successful seeding treatments found that 83 percent had used non-native species (i.e., grasses and cereal grains) (Evaluating the Effects and Effectiveness of Postfire Seeding Treatments in Western Forests Joint fire science programs. Fire Science brief. Fire Science Brief Issue 147 December 2011 Page 1 www.firescience.gov) Comment 3: Reseeding with an appropriate mixture should be accomplished to reduce the probability of noxious weed invasion. Non-native grasses sometimes have the best chance of establishing themselves (in lieu of invasives). Additionally, native seedings can be much more expensive with much lower success rates. DEIS p. 187 states, "The method used to determine effects on rangeland resources included a qualitative comparison of each alternative's likelihood of affecting the amount of forage available for livestock use and rangeland condition. Existing rangeland conditions were determined through field visits, monitoring data, and historical records for each allotment. Comment: The DEIS should address grazing's effect on vegetation (preventing brush, aiding in recovery), not just alternatives' effect on forage for grazing. See research references above. DEIS p. 188 states, "Seiad/Johnny, South Klamath, and Scott Bar Mountain will not be discussed further as they are vacant and are not expected to be restocked within the next 10 years." Comment: USFS should explore restocking options based on local producer interest. This will aid in long-term resource protection and promote the purposes of this DEIS.	The "no impact on forage" has been changed to "no additional increase of forage" in the effects for Rangeland Resources. Fires, such as this one generally burned with low severity on primary rangelands. The Range Specialist Report states "The most intense burning occurred where dense closed canopy forest dominated the landscape... Direct effects of the burn on meadows were minimal. Most meadows were either unburned or lightly burned in some areas. In general, the fire did not produce serious mortality on primary rangeland to the point of altering existing conditions." No range improvements were lost during the fire. Range-1 project design feature will require that any improvements damaged by project logging or fuels operations will be repaired or replaced. We are not proposing to limit livestock grazing in any active allotment overlapping project units as part of the Westside Fire Recovery Project. Grazing can be used as an effective control of selected species of noxious weeds under specific controlled conditions and during the appropriate time of year. In an open range grazing system, as is present on the Forest, cattle can and will continue to help control non-native annual grasses, such as cheat grass, and understory vegetative growth but are not effective for noxious weed control. The areas of active allotments burned last year are not “rangeland” in the classical sense, but predominantly forested areas with intermittent shrubby openings and meadows where the heaviest use is. In an open range system, cattle often only consume the rosette stage and/or tops of noxious weeds in passing, when they are palatable early in the season, and do not remove or kill the plant (especially dicots, which are primarily what we are referring to in the Non-native Invasive species report). Without complete removal of the root system many weeds can persist for multiple generations resulting in increased plant vigor and population size. Additionally, grazing of above ground vegetative parts makes it much more difficult for noxious weed crews to identify and remove plants in the field, and often stimulates re-sprouting of reproductive parts of the plant. Many noxious weeds are also capable of producing a second generation of flowers and subsequently seeds, if seasonal conditions are appropriate, potentially mitigating the effects of the cattle grazing all together. If cattle are still actively grazing an area once noxious weeds have set seed, they can very easily contribute to dispersal, either through ingestion or by transport on their fur. UPDATED 7/7/2015 We do not refute the fact that livestock can be used in certain circumstances as a tool to help restore burned areas, and the Westside Project will not remove livestock grazing from theses allotments. The fire science brief "Effects and Effectiveness of postfire seeding treatments in Western Forests" indicates seeding may or may not help prevent weeds, "Out of 11 papers that evaluated the effectiveness of seeding to curtail non-native plant invasions, 54 percent indicated that seeding treatments were effective and 45 percent indicated that the treatments were ineffective. Of those treatments that were regarded as effective, however, 83 percent used non-native species (i.e., grasses and cereal grains)". While there are some areas within the allotments that may benefit from seeding of forage species, it does not meet the purpose and need for this project. Many meadows that experienced a light-moderate burn will regenerate on their own. Permitting grazing is not a part of the purpose and need of this project, however vacant allotments are being assessed for grazing suitability in other projects.

Code	Comment Number	Comment Text	Response
244 - Domestic Livestock	#17481-52	DEIS P. 191 states: "To allow for post-fire recovery of vegetation, livestock grazing areas will be modified within the project area where necessary. For the Middle Tompkins allotment, livestock grazing permits will not be authorized until 2016 or later. Lake Mountain and Dry Lake allotments will be monitored prior to the 2015 grazing season to determine if vegetation has recovered enough to support grazing and grazing won't hinder tree establishment. If grazing is allowed, animals may be turned out at a later date and/or the season may be shortened in the fall to allow for optimal vegetation recovery and the most beneficial use of livestock grazing. These modifications for post-fire livestock use of rangelands will be variable based to rangeland conditions and climate as observed by rangeland managers." Comment: Economic factors should be included in this statement. Allowing for "optimal vegetation recovery" must be balanced with producers' economic needs-which will best promote the purposes of this DEIS in the long term. DEIS p. 193 states: "Where capable rangeland overlaps with salvage logging or fuels treatments, the project will likely provide new areas of transitory range. This will temporarily (5-10 years) increase the amount of forage available for livestock and wildlife, encourage animals to disperse on the landscape, and decrease grazing pressure on primary rangelands. Comment: This "temporary" increase in forage is reflective of the historic landscape, which USFS should strive to recover. Livestock should be used as a tool to recover meadows now taken over by brush and conifer encroachment. USFS admits in this DEIS that the hottest parts of the fire took place where the canopy was heaviest. Reestablishing meadows is important to prevent future catastrophic wildfires; to promote wildlife habitat; and to promote economic stability in the area. DEIS p. 230 states "Further, annual operating instructions provided to permittees will limit permitted grazing activities as needed to minimize impacts, not only to rangeland health but also to soil conditions (see range section of this chapter and the Rangeland resource report)." Comment: We understand the importance of allowing flexibility to range managers via annual operating instructions (AOIs). However, those AOIs should be developed in close coordination with the permittee and, when requested, local government in order to ensure an AOI does not pose financial and logistic threats to the permittee. DEIS p. 250 - Social and Economic Environment section Comment: The importance of livestock grazing is not included here. This sector is of great socio-economic importance in the area. USFS should recognize in this section that activities such as rebuilding range improvements; reseeding; and preventing future catastrophic fire are important to our economy and culture	This decision does not include timing of grazing on the allotments: it is an administrative process. The statement on draft EIS pg.191 was only used to disclose what kind of grazing management will occur. Livestock grazing will continue to be a multiple use on these lands and will continue to be used as a tool for fine fuel reduction. While there are some areas within the allotments that may benefit from seeding of forage species, it does not meet the purpose and need for this project. Many meadows that experienced a light burn will regenerate on their own. AOI's are an administrative process and not a part of this decision. However, Annual Operating Instructions are generally developed with input from the Permittees. The importance of livestock grazing is not included in the socio economic report as grazing is not part of the purpose and need. Grazing is considered only in a context of what effect project actions will have on rangelands.
244 - Domestic Livestock	#18909-93	The DEIS states that to allow for post-fire recovery of vegetation, livestock grazing areas will be modified within the project area where necessary. For the Middle Tompkins allotment, livestock grazing permits will not be authorized until 2016 or later. Lake Mountain and Dry Lake allotments will be monitored prior to the 2015 grazing season to determine if vegetation has recovered enough to support grazing and grazing won't hinder tree establishment. If grazing is allowed, animals may be turned out at a later date and/or the season may be shortened in the fall to allow for optimal vegetation recovery and the most beneficial use of livestock grazing. These modifications for post-fire livestock use of rangelands will be variable based to rangeland conditions and climate as observed by rangeland managers. While we encourage the recovery of our wild places, grazing cattle continues to be one of the most harmful practices on our national forests and certainly on the KNF. There is little confidence the agency will follow through with its commitments. Five years of monitoring and documenting grazing allotments on the KNF has shown the consistent failure to meet water quality and KNF Forest Plan standards.	Please see the "Allotment Monitoring Section" within the Rangeland Specialist Report. Most areas are meeting water quality standards and Forest Plan Standards. Livestock grazing will continue to be managed to respond to variable conditions.
250.01 - Public Access	#18872-1	Safe Forest access (Public Domain) will assist with addressing worker and public safety, safe forest access will benefit the public, Shasta nation and when needed fire suppression traffic to previously inaccessible areas. The benefits that the public, hunters and fire suppression personnel will experience is in agreement with availability of public domain to all.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
250.01 - Public Access	#18872-9	plus identifying and repairing access routes in the forests	The action alternatives analyzed respond to the need to provide safe egress for the public and employees on Forest system roads and trails though the removal hazard trees.
260 - Recreation	#17501-3	I hike the PCT through the Marble Mountains all the way to the Kangaroo Roadless Area and into the Siskiyou Mountains on a regular basis and I am very concerned with how this logging will affect people hiking on the trail and the viewshed of the trail. I urge you to drop all Westside Project Units that are along the PCT or would be visible from this internationally renowned and beloved national treasure.	The Recreation and Scenery Project Design Features identified in Chapter 2 of the EIS address protecting and maintaining recreational access and settings, and providing visitor information about trails closures, or setting changes.
260 - Recreation	#18918-10	A number of rivers and stream segments in northwestern California are designated as "Wild and Scenic Rivers". Please examine rivers and streams (and their segments) which fall under the Wild and Scenic Rivers Act to determine the Outstandingly Remarkable Ecological Values for which the segment / watercourse was designated. Please also determine what OREVs prompted the proposal to nominate some rivers / streams / segments for inclusion under the National Wild and Scenic Rivers Act. Sometimes those OREVs are "Scenery" and "Fish" - but there could be others since I have not had time to look up the OREVs on all current or proposed segments relating to the WFRP.	The 1995 Forest Plan identifies all Outstandingly Remarkable Values for both designated and recommended wild and scenic rivers on the Forest. The Wild and Scenic Rivers Report lists these Outstandingly Remarkable Values by river segment and analyzes effects to these Outstandingly Remarkable Values.

Code	Comment Number	Comment Text	Response
260 - Recreation	#18926-20	Visual Quality Objectives (VQO) ! The project proposal does not adequately protect the Scenery values of the forest, or its local residents and tourists, primarily because it fails to apply standard wildfire restoration scenery protection measures, such as those recently applied on the Mt Hebron Fire Recovery Project. ! These include:! Retention of a representative pattern of standing dead trees within all High and Moderate Sensitivity views, with the specific purpose of retaining the forest's natural scenic character, and retaining visible evidence of the forest's natural wildfire processes. ! 2) Reduce the height and scenery impacts due to project-created stumps, skidding and yarding activities.! These protection measures have proven to be fully implementable, produce negligible effects upon other resource objectives, and consistently benefit resources such as wildlife and watershed. If these measures are not applied, adverse LONG TERM scenery impacts would persist along many of the Forest's most highly valued recreational settings and tourism attractions.! ! The project's Scenery report is helpful and informative in many respects, however has some important shortcomings that have very likely adversely influenced the Project's scenery outcomes:! ! Page 13 & 14 of the report incorrectly implies that Visual Resource Management S&G 11-7 indicates that the Klamath Forest Plan's intent is for an unlimited period of delay allowed in meeting Forest VQOs, "to recover forest vegetation". However, Klamath Plan VRM S&G 11-3 more specifically states "Visual objectives may be foregone in the short-term, following extreme natural events." Thus, long term scenery impacts to sensitive views, such as the excessive removal of fire killed trees, or persistence of visible tall stumps, etc are not consistent with this more specific S&G. These long term scenery impacts must therefore be prevented by protection measures consistent with those applied by the KNF's recent Mount Hebron project (included requirements for retaining a representative % of the standing dead trees in natural appearing patterns of individual trees and clumps).! ! The project's Scenery Report fails to provide any illustrative photographs to visually communicate the project's scenery conditions and the potential effects of its alternatives. It is unreasonable to expect the reforestation planning team member, decision-maker, or interested citizen to translate the Scenery Report's technical jargon of "VQOs" or narrative Scenic Character descriptions into what one would actually see in these important Klamath National Forest recreation settings. The few local photographs provided by other sections of the Westside Fire Recovery document are helpful but lack the necessary scenery translation to communicate existing scenery conditions, Forest Plan scenery requirements, and scenery effects from proposed alternatives. Failure for the Scenery Report to provide pertinent photography, even at a summarized representative level for this large project, prevents readers from being able to determine whether the scenery they value is adequately protected.! Forest Scenery is a primary element of Siskiyou County's quality of life, recreation settings, tourist attractions and unique identity. This project would potentially affect the scenery within 60 precious views, include at least 4 Wild and Scenic Rivers, 1 Scenic Byway, 1 National Scenic Trail, 5 campgrounds, 7 recreational trails, 7 river accesses, 4 mountain top lookouts, and several local communities. There is no reasonable excuse on earth that the scenery protections identified above should not be fully implemented, to protect these views from the project's proposed long term eyesores. Even a project as large and potentially scenery-impacting as this CAN be done in a way that protects these important quality of life values. It just takes the commitment to do so, and the FS Mission of Public Service demands it.! !	The Forest does not have a standard list of wildfire restoration scenery protection measures. Project design features (project design project design features) are developed specifically on a project by project basis. Additional Recreation and Scenery project design project design features have been developed to reduce effects to recreation settings and scenery. However some long term effects to scenery would exist after project implementation and are identified in the Scenery Amendment Report. The Westside Fire Recovery Project proposes treatments on approximately 7 % of the 183,000 acres burned; thus 93% or 100,000 acres would display visible evidence of the forest 's natural wildfire processes. Illustrative photographs are not required by law, policy, regulation or the Forest Plan to be included in the Scenery Report. The Forest Plan Standard and Guideline number 11-7 referenced in the comment was truncated, rather Standard and Guideline number 11-7 reads in full "In the case of recovery activities after extreme catastrophic events such as intense wildland fires, time periods to achieve the Visual Quality Objectives stated in Forest-wide and Management Area Standards and Guidelines may be extended. This would be necessary where previously unnoticed scenery alterations are exposed to view due to loss of vegetative screening, or during timber salvage activities where recovery of forest vegetation is determined to be of greater importance than achievement of Visual Quality Objectives within the time periods established." The Forest interpretation is that Standard and Guideline number 11-7 takes precedence over Standard and Guideline number 11-3. Standard and Guideline 11-7 states "...time periods....may be extended" without any qualifying time limitations. The total number of potentially affected viewsheds have been revised from 60 to 62 and are identified in the Scenery Amendment Report.

Code	Comment Number	Comment Text	Response
260 - Recreation	#18926-25	The Klamath, Scott and North Fork Salmon River are Wild and Scenic Rivers all known for their outstandingly remarkable fisheries values. Elk Creek, Kelsey Creek and South Russian Creek are eligible for inclusion to the Wild and Scenic River system.! The project proposes: * 425 acres of logging units and 379 acres of roadside in the Klamath River corridor! * 17 acres of units and 491 acres of roadside in the Scott River corridor ! * 83 acres of units and 250 acres of roadside in the North Fork Salmon corridor! * 599 acres of roadside logging in Elk Creek corridor! * 41 acres of units and 7 acres of roadside in Grider Creek corridor! * 1 acre unit and 122 acres of roadside in South Russian Creek corridor! ! Elk Creek is also recognized for geologic and wildlife values because the Siskiyou Mountains Salamander has been found there. Grider Creek is recognized for its undisturbed old growth mixed conifer forests and for wildlife because bald eagles and peregrine falcons nest there. South Russian Creek- fed from the Russian Wilderness is recognized for its magnificent stand of old growth Engleman Spruce and for pristine water quality. The DEIS states that, "Analysis determined that all action alternatives would protect the outstandingly remarkable values and would be fully compliant with all Wild and Scenic River Act protection requirements and Forest Plan Standards and Guidelines. Select information on resource effects for outstandingly remarkable values is reiterated in this report as taken from the Aquatic Resources, Hydrology, Wildlife, and Scenery reports. For complete details see those reports." These reports and the DEIS fail to meet requirements of the KNF Forest Plan Standards and Guidelines and thereby failing to protect Wild and Scenic River values, such as fisheries, wildlife, recreation, scenery, geology, history, cultural features, or other values including ecology.! !	The comment lacks sufficient information regarding which Forest Plan standards and guidelines they state are being violated, therefore the Forest is unable to respond specifically to the commenters concerns, other than to state that the project was planned in compliance with the Klamath Forest Plan. The Forest Plan consistency checklist is located in the project file and available upon request.
260 - Recreation	#18927-3	Impacts to Wild and Scenic Rivers and Candidate Streams We are also concerned about activities proposed in existing and USFS recommended Wild and Scenic Rivers. The project proposes logging, fuels treatment, and site preparation within and adjacent to the existing Klamath, Scott, and North Fork Salmon Wild and Scenic Rivers and their watersheds, as well as segments of Elk Creek, Grider Creek, and South Fork Russian Creek recommended by the USFS for Wild and Scenic protection. The DEIS admits that there will be at least temporary loss of scenic quality within and along some existing and recommended Wild and Scenic River corridors. A range of vegetation management and timber harvest practices are allowed in Scenic and Recreational River corridors, "…if these practices are designed to protect users, or protect, restore, or enhance the river environment, including the long-term scenic character." (FSH 1909.12, Chap. 80, Sec. 82.53 [9][b]). The Project analysis has failed to adequately make the case that all of the activities proposed in and adjacent to Scenic and Recreational River corridors meet these important guidelines. Particularly disturbing is the project focus on traditional post fire "fixes" such as salvage logging, as well as site preparation for new plantations and post-planting release to reduce competition from other vegetation. We are concerned that the overall plan perpetuates the USFS' century-old exclusion of fire, reliance on plantation forestry, and increasing timber yields. This approach has only served to degrade the biological diversity, scenic character, recreational values and Native American cultural values of the Klamath-Siskiyou region.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The comment as written expresses general concerns but provides general comments and no substantive evidence that the proposed Westside Fire Recovery Project would not meet the guidelines in the for management of Scenic or Recreational Rivers in the Klamath National Forest Plan. Management Area 12 in the Forest Plan (4-117) provides management direction for designated and recommended Scenic Rivers. Guideline MA 12-20 (Forest Plan 4-119) notes that "salvage of trees killed by wildland fire....or other natural processes is permitted consistent with area management goals. Management Area 13 (Forest Plan 4-120) provides Management Direction for designated and recommended Recreational Rivers. Guideline MA 13-15 (Forest Plan 4-122) notes that "Lands may be managed for a full range of silvicultural uses to the extent currently practiced." From these citations, it is evident that salvage operations are not inconsistent with the management direction for Scenic and Recreational Rivers. See Chapter 3, Recreation for additional discussion. Users will be protected during project implementation with safety signing at river accesses, flaggers stopping rafters, and public notifications on Web pages and news releases. The reforestation of some burned areas in the river corridors would occur in salvage units and site preparation and planting areas where conifers were historically found. These treatments would speed up recovery by 50 years or more to a conifer dominated forest, thereby meeting desired future conditions for scenic character. The Forest is analyzing a range of Alternatives, including a no action Alternative, wherein no salvage, site preparation, planting or fuels treatments will occur. The no action Alternative serves as a comparative basis to evaluate the action alternatives against. Refer to the Vegetation section of Chapter 3 for more information on the environmental consequences of the 5 Alternatives analyzed in detail. The reference noted in the comment is corrected here as Forest Service Handbook 1909.12, Chap 80, Sec. 84.3, [9], [b] which states: "Scenic and Recreational Rivers. A range of vegetation management and timber harvest practices are allowed, if these practices are designed to protect users, or protect, restore, or enhance the river environment, including the long-term scenic character."

Code	Comment Number	Comment Text	Response
260 - Recreation	#18934-17	The Scenery Resource Report incorrectly assumes that the North Fork Salmon River Road (1C01), which is actually named Sawyers Bar Road, is a proxy for visibility from the North Fork Salmon River (page 1). In reality, the viewshed from the river is quite different than that from the road not only for the parallax differential but because sightlines are much longer both in the upriver and downriver directions from the river and because the lack of vegetation over the river channel allows for greater views up the side canyon slopes. These differences account for a significantly expanded viewshed from the river that is not at all approximated along the roadway. The identical assumption was made in the methodology of the Scenery Resource Report and EA for the 2014 Salmon Salvage project, which is also visible from the North Fork Salmon River, and on-the-ground post-project assessment from the waterway of the North Fork Salmon River indicates that the use of the roadside views as a proxy for the river views was entirely incorrect. In fact, a significant number of Salmon Salvage units deemed not visible from the river are, in fact, plainly visible from the river. Further, neither the Westside DEIS nor the accompanying Scenery Resource Report nor the Wild and Scenic Rivers Resource Report make any specific mention of which salvage units, roadside hazard tree removal areas, or other project features are visible from the North Fork Salmon River or any other viewpoints within the project area. In fact, the Scenery Resource Report acknowledges that there has been absolutely no on-the-ground assessment of the project's impacts to scenery at any of the listed viewpoints or Wild & Scenic Rivers. Taken together, the erroneous assumptions, lack of specificity, and absence of any field verification in the Scenery and Wild and Scenic Rivers analysis amount to an insufficient assessment and disclosure of the project's impacts in these areas. In particular, salvage units 409, 411, and 415 will highly impact the scenic integrity of the North Fork Salmon River due to their locations immediately adjacent to and above the river. Limiting tree removal in unit 411 to that already programmed for hazard tree removal would significantly decrease the visual impact to the river corridor. The placement of unit 409 and 411 diagonally across the river from each other means that river recreationalists will travel through an extensive clearcut corridor that will visually persist for much longer than MA-13 Partial Retential VQO guidelines permit.	It is recognized that the viewshed from the river is different than that from the road. These differences are acknowledged in the Scenery Resource Report " Differences in elevation, adjacent vegetation, topographic screening, slope position, and horizontal alignments were factors considered in determining visibility and effects from the river perspective." Five additional field reviews occurred between the draft EIS and the final EIS; results have been incorporated into the Scenery, Wild and Scenic Rivers, and Recreation Reports. Specific mention of salvage units 409, 410, 411, 412, and 415 that would be visible from the North Fork Salmon River has been noted. The retention of trees in Riparian Reserves in unit 411 would break up the unit to a scale consistent with other openings in the characteristic landscape. The North Fork Salmon River viewshed is managed with a Partial Retention Visual Quality Objective, where management activities may be noticeable but subordinate to the characteristic landscape. As noted in the Scenery and Scenery Amendment Reports, "The disturbances associated with various project activities such as soil disturbance, stumps, burnt vegetation, etc. would recover in three years' time with seasonal leaf and needle cast, weathering (graying) of tree stumps and chips, and resprouting of vegetation or "greening up. Hence all activities would appear near natural and meet their assigned Visual Quality Objectives."
260 - Recreation	#3678-27	Scenery – No Action direct and indirect effects "Decay and wind disturbance would lead to the smaller diameter, fire-killed trees falling down within the first ten years, with the majority of all trees falling down within the next 20 years (Russell et al. 2006). Standing trees would provide visual clues of the past fires for decades. As dead trees fall, the scenic character of areas once-forested would change becoming much more open. Extremely high fuel loads would develop creating a landscape that is susceptible to a high intensity, high severity fire. In many areas these conditions would likely create a long term vegetation change away from a conifer-dominated vegetation type towards a shrub-dominated ecosystem. Observation: Mr. Talley, never before have I encountered a landscape architect or recreation specialist who said the scenery will be enhanced when the area is logged as you have done here.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
260.02 - Rec. Resource Usability	#17481-15	I applaud the work being done on the Pacific Crest Trail and recommend to include other trails in the plan, or state what has been done or is planned to be done. These trails are needed for access to the wilderness for recreation and livestock grazing. There will be the likelihood of large trees and landslides closing these trails for years to come.	Hazard Trees associated with trails within the project area will be addressed separately from this project as part of routine trail maintenance. Trail-side hazard trees will be prioritized and treated based on risk level including probability of tree failure and probability of a target. Selective treatment of hazard trees along trails allows for protection of scenery and the recreation setting. The Recreation and Scenery Project Design Features identified in Chapter 2 of the EIS address protecting and maintaining recreational access and settings, and providing visitor information about trails closures, or setting changes.
260.02 - Rec. Resource Usability	#17481-47	Campsite safety around lakes and trail camps.	This can be considered campground maintenance under a separate CE and National Environmental Policy Act. Some campground treatments are being considered within the scope of this analysis. Campgrounds, lakes, and trail camps outside of the project area are outside the scope of analysis.

Code	Comment Number	Comment Text	Response
260.02 - Rec. Resource Usability	#17481-5	I have some concerns about defending this plan. There is a lot of salvage volume proposed in the vicinity of the Pacific Crest Trail. There is little mention of recreation. Mitigation needs to address potential for further disruption for hikers. Are the roads around Cold Spring depicted accurately? Proposed temp construction in that area near PCT need to be defended in terms of affects to recreational use. That is with trail closures due to fire in 2012 as well as 2014. Now the movie is out the PCT is getting international attention and powerful support. Since the book "Wild" was published, PCT use has increased exponentially each season. If proposed treatments can make the trail safer in future and prevent future disruption of use, may want to highlight.	The Recreation Report has been updated with additional recreation effects analysis to PCT trail users, including effects to viewsheds and disruptions to hikers during project implementation. Additional field review has verified that the locations for two segments of the Pacific Crest Trail have been displayed incorrectly on project maps. The revised trail alignments are identified and displayed on Figures 7 and 8 of the Recreation Resource Report. These new trail locations will need to be surveyed and mapped to current GIS standards before incorporation into the Forest's Trails corporate data layer. Recreation and Scenery Project Design Features (see Chapter 2 of final EIS for a complete listing) have been added which will protect the trail from harvest and machine access.
260.02 - Rec. Resource Usability	#18873-1	concerns associated with potential impacts to the viewshed of the PCT and experience of the trail user. There are two areas where operations associated with the proposed action could have significant impacts on the PCT, one is the section of PCT that is co-aligned with the Grider Creek Road immediately north of the Grider Creek campground. The second is the section nearest the Cold Spring Trailhead immediately north of the Marble Mountains Wilderness boundary. The section of the PCT on the Grider Creek Road presents challenges and those challenges will only be magnified when confronted with the possibility of a logging operation and the associated increase in vehicle traffic the PCT users will encounter. It will be important that the Forest staff and PCTA work together to identify a viable strategy for PCT users to safely navigate the road section during the logging operation. One idea that I have discussed with PCT leadership and Forest staff is the possibility of a 'road block' for trail users at either end of the affected section of the Grider Creek Road. While we wouldn't want to delay trail users for more than a couple hours, if trail users were provided water, a shaded place to wait, and accurate information regarding the delay that could be a viable strategy. I stand ready and willing to work closely with Forest staff to come up with the best solution.	The Recreation and Scenery Reports have been updated to include additional viewshed and recreation experience effects analysis to PCT trail users. Forest representatives met on-site with the commenter on May 13, 2015 to address the commenter's concerns. Additional project design project design features were developed (see Chapter 2 of final EIS for a complete listing) to minimize effects to PCT trail users at the Cold Springs Trailhead and Grider Creek Road. At the Grider Road where it is co-aligned with the PCT, delays during project implementation to PCT hikers (as well as other recreationists) are typically expected to be 15-20 minutes up to several hours. Safety signing will be placed along the PCT advising hikers of "logging operations ahead" and on the Grider Creek Road advising log truck drivers of "hikers on roadway".
260.02 - Rec. Resource Usability	#18883-14	Please show the Pacific Crest Trail (PCT) and other major trails connecting parking areas to the PCT on all maps. No work on or near the PCT or other trails should be allowed either in a planning document or on the ground during adjacent activity. Hikers and others using trails like to have snags and woody debris within at least 100 feet of each side of trails for shade and rest areas. No harvesting or equipment access should be allowed to occur within at least 100 feet of each side of these trails or campsites.	The Pacific Crest Trail was included in all maps, but was not specifically labeled or highlighted in the Draft EIS. The display of the Pacific Crest Trail has been highlighted on all maps in the final EIS. Also "Recreation Features" maps for the Beaver Fire, Happy Camp Complex, and Whites Fire have been added to the Recreation Amendment Report (see Figures 1-6). These maps display the Pacific Crest Trail as well as campgrounds, dispersed campsites, other trails, trailheads, and river accesses by project area. Recreation and Scenery Project Design Features (see Chapter 2 of final EIS for a complete listing) have been added which will protect the trail from harvest and machine access. The boundary of unit number 224 has been moved 50 feet away from the PCT. As agreed upon in the 05/13/15 field review between Forest representatives and the Pacific Crest Trail Association, no roadside hazard trees would be removed adjacent to the PCT out to a distance of 15 feet. No salvage harvest would occur within 50 feet of the trail. No marking paint would be visible from the PCT. The large format and 11 x 17 maps have been updated to include the Pacific Crest Trail with a bolder line, labeled "Pacific Crest Trail" and is currently itemized in the legend for the final EIS. Also "Recreation Features" maps for the Beaver Fire, Happy Camp Complex, and Whites Fire have been added to the Recreation Amendment Report (see Figures 1-6). These maps display the Pacific Crest Trail as well as campgrounds, dispersed campsites, other trails, trailheads, and river accesses by project area. Recreation and Scenery Project Design Features (see Chapter 2 of final EIS for a complete listing) have been added which will protect the trail from harvest and machine access. The boundary of unit number 224 has been moved 50 feet away from the PCT. As agreed upon in the 05/13/15 field review between Forest representatives and the Pacific Crest Trail Association, no roadside hazard trees would be removed adjacent to the PCT out to a distance of 15 feet. No salvage harvest would occur within 50 feet of the trail. No marking paint would be visible from the PCT. Project design features have been incorporated that will protect the PCT trail.
260.03 - Wild and Scenic Rivers	#18876-1	Please avoid this plan, and all activities that could harm existing and proposed Wild & Scenic Rivers, water quality and threatened salmon, and roadless areas that provide refuge for wildlife.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
260.03 - Wild and Scenic Rivers	#18909-99	The Klamath, Scott and North Fork Salmon River are Wild and Scenic Rivers all known for their outstandingly remarkable fisheries values. Elk Creek, Kelsey Creek and South Russian Creek are eligible for inclusion to the Wild and Scenic River system. The project proposes: * 425 acres of logging units and 379 acres of roadside in the Klamath River corridor * 17 acres of units and 491 acres of roadside in the Scott River corridor * 83 acres of units and 250 acres of roadside in the North Fork Salmon corridor * 599 acres of roadside logging in Elk Creek corridor * 41 acres of units and 7 acres of roadside in Grider Creek corridor * 1 acre unit and 122 acres of roadside in South Russian Creek corridor Elk Creek is also recognized for geologic and wildlife values because the Siskiyou Mountains Salamander has been found there. Grider Creek is recognized for its undisturbed old growth mixed conifer forests and for wildlife because bald eagles and peregrine falcons nest there. South Russian Creek- fed from the Russian Wilderness is recognized for its magnificent stand of old growth Engleman Spruce and for pristine water quality. The DEIS states that, "Analysis determined that all action alternatives would protect the outstandingly remarkable values and would be fully compliant with all Wild and Scenic River Act protection requirements and Forest Plan Standards and Guidelines. Select information on resource effects for outstandingly remarkable values is reiterated in this report as taken from the Aquatic Resources, Hydrology, Wildlife, and Scenery reports. For complete details see those reports." However, these reports and the DEIS fail to meet requirements of the KNF Forest Plan Standards and Guidelines and thereby failing to protect Wild and Scenic River values, such as fisheries, wildlife, recreation, scenery, geology, history, cultural features, or other values including ecology.	See response to 18926-25.
260.03 - Wild and Scenic Rivers	#19076-5	Addressing such a large area in one general document should address existing And proposed Wild & Scenic Rivers.	Procedural. The site specific effects to designated and recommended Wild and Scenic Rivers have been addressed for the project. See Chapter 3 of the final EIS.
260.03 - Wild and Scenic Rivers	#19076-8	We are particularly concerned about proposed activities that could adversely impact the existing Klamath, Scott, and North Fork Salmon Wild & Scenic Rivers and segments of Elk Creek, Grider Creek, and South Fork Russian Creek recommended by the Forest Service for Wild & Scenic protection.	To clarify, there are no activities proposed within areas designated as Wild Rivers. In the management of Scenic and Recreational Rivers the Forest is guided by Forest Service Handbook 1909.12, Chap 80, Sec. 84.3, [9], [b] which states: "Scenic and Recreational Rivers. A range of vegetation management and timber harvest practices are allowed, if these practices are designed to protect users, or protect, restore, or enhance the river environment, including the long-term scenic character." Users will be protected during project implementation with safety signing at river accesses, flaggers stopping rafters, and public notifications on Web pages and news releases. The reforestation of some burned areas in the river corridors would occur in salvage units and site preparation and planting areas where conifers were historically found. These treatments would speed up recovery by 50 years or more to a conifer dominated forest, thereby meeting desired future conditions for scenic character. The Forest is analyzing a range of Alternatives, including a no action Alternative, wherein no salvage, site preparation, planting or fuels treatments will occur. The no action Alternative serves as a comparative basis to evaluate the action alternatives against. The effects to designated and proposed scenic and recreational rivers are analyzed and displayed in Chapter 3 of the EIS.
270.02 - Wilderness, Roadless Character	#14120-1	So much of our wilderness has already been ruined by development, drilling, pollution, and logging. Enough is enough! The wilderness is supposed to be a place of peace and quiet for us, and the wildlife which live in it!	There are no treatments proposed in Wilderness areas under any Alternative.
270.02 - Wilderness, Roadless Character	#14120-3	PLEASE save the wilderness for all future generations before it is permanently ruined. Some damage cannot be undone!	See response to number 14120-1.

Code	Comment Number	Comment Text	Response
270.02 - Wilderness, Roadless Character	#17312-2	In addition, I am opposed to any logging and mechanical entry into roadless areas, including areas proposed in legislation introduced by Senator Barbara Boxer in 2002 and 2006 for addition to the Marble Mountain and Russian Wilderness areas.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Activities proposed in inventoried Roadless Areas of the Westside Fire Recovery project include roadside hazard treatments, along roads that currently exist in inventoried Roadless Areas or along roads that border the inventoried Roadless Areas. Other activities are treatments along roads to reduce fuel accumulations and some site preparation and planting of conifers using only hand treatments. There are no salvage logging activities proposed within Inventoried Roadless Areas. The effects of these activities are disclosed in the inventoried Roadless Area section of Chapter 3 of the EIS. Areas proposed for wilderness designation in proposed wilderness legislation are managed according to the standards for the management area in which they occur as defined by the Forest Plan.
270.02 - Wilderness, Roadless Character	#17322-3	We have very few "roadless" areas left and once they are segmented and damaged by roads, the integrity of the ecosystem is damaged for ever. I am opposed to any logging and mechanical entry into roadless areas, including areas proposed in legislation introduced by Senator Barbara Boxer in 2002 and 2006 for addition to the Marble Mountain and Russian Wilderness areas.	Same response as number 17312-2
270.02 - Wilderness, Roadless Character	#17368-1	We need roadless areas. What man has not discovered he has not destroyed. We need to allow nature to 'salvage' this timber.	Same response as number 17312-2
270.02 - Wilderness, Roadless Character	#17436-1	My family recreates (hiking, camping, and kayaking)every year in this area of California. We need to treasure and protect it from any further development. Keep this area roadless and wild.	No new development is being proposed in this project in Roadless Areas, only post-fire restoration and recovery. The Recreation and Scenery Project Design Features identified in Chapter 2 of the EIS address protecting and maintaining recreational access and settings, and providing visitor information about trails closures, or setting changes.
270.02 - Wilderness, Roadless Character	#17481-33	* Wilderness o Trails maintenance and hazards (possibly chainsaw exemption in burned area) o Erosion control - burned trails o Trailhead and campsite hazards	See response to comment number 17-1.Hazard Trees associated with trails within the project area will be addressed separately from this project as part of routine trail maintenance. Trail-side hazard trees will be prioritized and treated based on risk level including probability of tree failure and probability of a target. Selective treatment of hazard trees along trails allows for protection of scenery and the recreation setting. Erosion control is part of project design for proposed actions; see chapter 2 watershed project design features.
270.02 - Wilderness, Roadless Character	#17481-45	Take another look at access for non-commercial property as related to released roadless areas.	It is unclear what the concern is about non-commercial property access as it relates to this project and released Roadless Areas.

Code	Comment Number	Comment Text	Response
270.02 - Wilderness, Roadless Character	#18857-5	No salvage logging or planting units within Inventoried Roadless Areas (IRA), including the Grider, Tom Martin, Russian, Snoozer, Kelsey, or Johnson Roadless Areas.	See response to number 17312-2.
270.02 - Wilderness, Roadless Character	#18876-1	Please avoid this plan, and all activities that could harm existing and proposed Wild & Scenic Rivers, water quality and threatened salmon, and roadless areas that provide refuge for wildlife.	See response to number 18913-3.
270.02 - Wilderness, Roadless Character	#18883-24	There should be a half mile no disturbance zone outside the boundary of all Wilderness, Backcountry, Research Natural Areas, Recommended Wild Rivers, and Inventoried Roadless Areas to protect the scenic beauty and allow for natural regeneration of natural forest conditions.	This comment reflects the opinion of the author, not the requirements of the Forest Plan. The commenter has recommended a no disturbance zone around areas of special concern that is not consistent with the Forest Service Manual 2320.3(5) which does not require buffers around wilderness. For other areas, this recommendation is not in line with the Forest Plan final EIS; none of the Alternatives, including the one selected for the Forest Plan, include blanket requirements to buffer reserves (Forest Plan final EIS, Appendix K, page K-36). No site-specific amendment to the Forest Plan is considered for the Westside project.
270.02 - Wilderness, Roadless Character	#18883-24	Roadless areas provide many important ecological and social values. Chapter 3, pages 3-7 of the Roadless Area Conservation FEIS offers an excellent summary of these values: Clean water for domestic, agricultural, and industrial uses, that helps to maintain abundant and healthy fish and wildlife populations, and that provides the basis for many forms of outdoor recreation; Undisturbed or less disturbed habitat that conserves native biodiversity by providing areas where nonnative invasive species are rare, uncommon, or absent; Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land; Opportunities for people to enjoy high-quality non-motorized recreation activities, including hiking, camping, mountain biking, picnicking, wildlife viewing, hunting, fishing, cross-country skiing, swimming and whitewater boating; "Reference landscapes" that can provide comparison areas for scientists seeking to evaluate and monitor the differences between natural settings and more intensely managed areas; High quality scenery that contributes directly to local tourism and to real estate values in neighboring communities; and Many important Native American cultural sites and valuable historical resources. The EIS failed to discuss any of these values because the USFS fails to acknowledge that it is proposing to log roadless areas. Once again, we request that all salvage, site-preparation and replanting not occur in any IRA or in the roadless lands mapped by CalWild. Please keep these areas intact so that their future can be considered in the forthcoming revision of the KNF LRMP. We do not, however, object to the use of fire, including prescribed fire, to manage these landscapes	The disclosure of effects of project Alternatives and proposed activities on inventoried Roadless Areas has been expanded in Chapter 3 of the final EIS and an amendment to the summarized and referenced amendment to the inventoried Roadless Area resource report. The disclosure of the effects of cutting and possibly removing and selling trees that are removed along roadsides is included in these documents. The effects of site preparation and planting are also discussed in the IRA section of Chapter 3 of the final EIS; potential negative effects are minimized or eliminated by the implementation of a project design feature displayed in Chapter 2 of the final EIS. None of the proposed activities will harm the roadless character of inventoried Roadless Areas or preclude future designation of these areas.

Code	Comment Number	Comment Text	Response
270.02 - Wilderness, Roadless Character	#18926-14	Risk is Significant in Dust Abatement In Taking Water From the Source for Watering Roads and Other Uses The DEIS incorrectly states on page 295 that, "Minor and insignificant direct effects from water drafting. Over-all effects to sediment, stream shade, and temperature from project treatments are expected to be discountable and effects to aquatic species are expected to be minor under all action alternatives" Using water for dust abatement or other project uses from streams and rivers may add to the dewater of these sources because the conditions presented in the 4th year in the on-going drought in our region is a significant action that should be discussed and disclosed in the Final Environmental Statement and in the related decision notice! ! Roads Should Not Be Used For Salvage Logging in LSR! Impacts to Roadless Areas Page 299 of DEIS states, " The effects of the project on the currently roadless portions of IRAs and the portions that include roads are analyzed and disclosed separately because retaining roadless character is difficult, if not impossible, in areas of IRAs that already include roads." How many of these roads are in LSR? These roads should be dropped from prescriptive use for salvage logging as they are in LSR designations and would be inappropriate to use for salvage logging. ! !	Controlling dust on forest roads during management operations is a safety issue for the public and those involved in the operations. See response to comment number 18878-47 for more information on water drafting and the monitoring team. As noted in the inventoried Roadless Area section of Chapter 3 of the final EIS, no salvage harvest will occur in these areas. Dead trees that are a roadside hazard will be cut and removed in these areas, primarily in the sections that were determined to no longer exhibit roadless character by the 1995 Forest Plan as disclosed in the expanded inventoried Roadless Area section of Chapter 3 of the final EIS. A discussion of logging in Late Successional Reserves in included in the expanded Chapter 1 of the final EIS.
270.02 - Wilderness, Roadless Character	#18927-5	We are particularly concerned about proposed activities within and adjacent to roadless areas that could adversely impact their potential wilderness character. Some of the areas slated for mechanical entry in this Project were proposed for addition to the Marble Mountain and Russian Wilderness areas in legislation introduced by Senator Barbara Boxer in 2002 and 2006. We thank the USFS for not proposing to log inventoried roadless areas (IRA) within the project area. We also thank the USFS for discussing IRAs and impacts to IRAs in the EIS. The problem, however, is that roadless lands extend beyond the boundaries of the IRAs. The Roadless Area Review and Evaluation (RARE) surveys from the 1970s that produced the current system of IRAs are now badly out of date for a variety of reasons, including: ? The many miles of road decommissioning that has occurred since that time; ? Vehicle route designation efforts, especially the recent Motorized Travel Management process; The recovery of lightly-damaged areas so that they now meet the naturalness criteria described in the Wilderness Act of 1964; The acquisition of land that was private during the RARE surveys; and The fact that there have been more recent surveys of wilderness-eligible land conducted by non-governmental organizations such as the CalWild that have mapped many "new" roadless areas or extensions of IRAs. Regarding the last point, from 1998-2001 CalWild conducted a "Citizens Wilderness Inventory" (CWI) to arrive at a more accurate reckoning of roadless land in the Golden State. The CWI identified 7.4 million acres of land in over 300 separate areas that still qualify for Wilderness designation on federal lands in California. This total included 5,254,228 acres of NFS land, which is 16 percent more than the 4,417,000 acres of RARE IRAs that existed at the time of the 2001 Forest Service Roadless Area Conservation Final Environmental Impact Statement (RAC FEIS). Since that time, we have been encouraging individual national forests to take a fresh look at their roadless areas when they initiate forest plan revision processes. In fact, this is a requirement of the new USFS planning regulations. Since the KNF has not yet begun to revise its Land and Resource Management Plan (LRMP), we have not raised the issue of a new roadless inventory until now. On the KNF, during the CWI we identified a much larger Grider Creek Roadless Area than was identified during the RARE surveys. The difference between what we surveyed in 2001 and what the USFS identified during the 1970s is shown in the map at left. The blue area is the Grider Creek Roadless Area as mapped by CalWild, while the IRA boundary identified by the USFS during RARE is shown in red. It was this larger area that was proposed as an addition to the Marble Mountain Wilderness in Senator Barbara Boxer's California Wilderness Heritage Act of 2002. While we strongly encourage the USFS to adopt an alternative similar to the one proposed by the Karuk Tribe, if Alternative 2 is pursued, we request that the following units be dropped from the proposed project so as to not damage the Grider Creek Roadless Area as mapped by CalWild: 50, 51-1, 53-1, 61, 226, 228-4, 228-5, 520, 525-2, P175, P191A, P192, P228, P229 and P321. CalWild also identified the true extent of Wilderness-caliber roadless lands in the Tom Martin region. As is shown on the map at right, the Tom Martin Roadless Area as mapped by CalWild (in blue) is significantly larger than the version of IRA of the same name mapped almost four decades ago. Again, while we encourage you to adopt the alternative approach advocated by the Karuk Tribe, if Alternative 2 is pursued,	Identifying and evaluating Roadless Areas other than those that are already codified through the Roadless Area Review and Evaluation (RARE) II process as "inventoried Roadless Areas" is beyond the scope of this project. An evaluation of the effects of proposed treatments identified in this comment is addressed in various resource sections of Chapter 3 of the EIS. The Karuk Alternative is addressed in Chapter 2 of the EIS.

Code	Comment Number	Comment Text	Response
		we request that the following units be dropped from the proposed project so as to not damage the Tom Martin Roadless Area as mapped by CalWild: 033-1, 034, 035, 036, 039, 040, 501-1-1, 508, 508-1, 508-3, 508-4, 508-4-1, 509 and 510. CalWild also identified the true extent of Wilderness-caliber roadless lands adjacent to the Russian Wilderness. As is shown on the map at right, the Russian Roadless Areas as mapped by CalWild (in black hatches) is significantly larger than the version of Russian IRAs mapped almost four decades ago. Much of this area was proposed as additions to the Russian Wilderness in Senator Boxer's 2002 bill. Again, while we encourage you to adopt the alternative approach advocated by the Karuk Tribe, if Alternative 2 is pursued, we request that the following units be dropped from the proposed project so as to not damage the Russian Roadless Areas as mapped by CalWild: 401-1, 406, 407, 407-1 and 426.	
270.02 - Wilderness, Roadless Character	#18927-6	We are vehemently opposed to the following elements of the Klamath National Forest proposal to: * Build 22 miles of new permanent and temporary roads, especially given the conflict with this has with the Klamath National Forest mandate to create a "minimum system" road network under Subpart A of Travel Management Rule in 2015. Roads across the Forest are a major source of erosion and sediment, which degrades water quality and cements spawning gravels for native fishes. This new road network has the potential to affect more than 3,000 acres in the Klamath, Scott, and North Fork Salmon Wild & Scenic Rivers, as well as proposed Wild and Scenic sections of the Elk, Grider, and South Russian Creek. 6,300 acres of roadless lands are also affected by construction of these new roads, which we find unacceptable if we are to meet state and federal objectives that better enhance headwater habitat for trout, salmon and steelhead.	See response to comment number 18913-3

Code	Comment Number	Comment Text	Response
270.02 - Wilderness, Roadless Character	#19076-9	We are opposed to any logging and mechanical entry into Roadless areas (some of which have been proposed in legislation as additions to the Marble Mountain W1J.derness and Russian Wilderness Areas, although the DEIS stat.es no entry into roadless areas.	The final EIS clarifies that no salvage harvesting and no road construction will occur in inventoried Roadless Areas. However, there will be roadside hazard treatment (salvage logging along roadways to reduce hazards) within IRAs as proposed. The effects of roadside hazard treatments, site preparation and planting using hand treatments, and fuels reduction treatments (including prescribed burning and fuelbreak construction) on the roadless character of inventoried Roadless Areas is disclosed in Chapter 3 of the EIS.
270.02 - Wilderness, Roadless Character	#3681-1	The Grider and Ukonom Roadless areas are the only wilderness connecting corridors between the Salmon Mountains and the Siskiyou Mountains. Enclosed is a map showing the outlines of these wild corridors. Many times in the DEIS the Forest Service says there will be NO cumulative impacts for the proposed action. That is absolutely a lie. The proposed action will contaminate one of only two biodiversity corridors between the Salmon Mountains and the Siskiyou Mountains. I cannot express how concerned I am about this. Evidently the Forest Service doesn't understand what a cumulative impact is. Please take the time to open my file and consider that YOU WILL HAVE A DEVASTATING IMPACT if you proceed with your proposed action.	The Ukonom and Grider Inventoried Roadless Areas (IRA) are not congressionally designated Wilderness areas, but rather as IRAs, they are subject to evaluation for potential wilderness designation. Cumulative Effects, as described in the Analyzing Environmental Consequences section of Chapter 3, result when the incremental effects of actions that overlap in time and space and are added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions. Past activities contributing to the existing condition are considered in the affected environment. Present and reasonably foreseeable future actions are assessed along with the effects of the proposed action to determine whether significant cumulative effects may occur. To clarify, salvage logging is not proposed in any of the Alternatives within Inventoried Roadless Areas. As shown in Table 2-40, Alternatives 1 and 5 do not include planting in inventoried Roadless Areas, whereas Alternatives 2 through 4 include about 490 acres of site preparation and planting, with methods designed to minimize disturbance. Please see the IRA section of Chapter 3 for further details on effects. The IRA project design feature (IRA-1) identified in Chapter 1 of the EIS, is applied to Alternatives 2 through 4 to minimize negative impacts of planting on IRA characteristics by specifying that site preparation and planting within IRAs will be by hand and not include ground-based mechanical equipment. Few, if any, projects on the Forest include any treatments in IRAs. The consideration of the direct, indirect and cumulative effects to IRA characteristics, which are defined in 36 CFR Part 294, are provided in the Inventoried Roadless Area section of Chapter 3.
270.04 - Private Property/Inholdings	#17481-32	I support the Westside Fire Recovery Project (Alternative 2) and the attempts at improving the health and safety of the relevant forests, their residents, and workers. As a resident of Sawyers Bar on the Salmon River of Siskiyou County, CA, a Shasta Nation tribal member, a Salmon River Volunteer Fire and Rescue member, a retired timber faller, a commercial sixth generation packer and guide, hunter, fisherman, former Forest Service firefighter, supporter of watershed management, and a member of both the citizens and county supervisors steering groups I feel the need to comment. Recommendations * Expand treatment adjacent to private property o Rainbow Mine - west and north boundaries o Finley Camp - Westside adjacent o Mouth of Hickey Gulch - both sides of N.F. Salmon River eastward o Uncle Sam Mine - west ridgetop between White's and Eddy's Gulch o Taylor Hole	Thank you for your comments on the Westside Fire Recovery Project.. Alternative 3 Modified proposes additional hazardous fuels treatment proposed by the Karuk Alternative and to address WUI needs adjacent to private property. In Modified Alternative 3, approximately 55 acres of treatment in the Rainbow Mine area are proposed. See response to number 25-1.
270.04 - Private Property/Inholdings	#18874-4	Wildland Urban Interface Treatment is shown in Alternatives 2 and 5 adjacent to the Maplesden Ranch in the same quarter section. This treatment would also reduce fire intensity in the future. Temporary access from the north via 47N56 to these two project areas (through the Maplesden Ranch) could be granted by temporary written agreement.	Thank you for your offer of temporary access.
270.04 - Private Property/Inholdings	#25-1	Clean up dead, fire burned trees on my property plus more importantly dead trees & needles on your property, close by & adjacent to my property. John Morone 27729 Scott River Rd. Scott Bar 530 496 3284	Treatments on private property are beyond the scope of this project. Treatments on the Forest to reduce fuel accumulations are part of each Alternative.

Code	Comment Number	Comment Text	Response
280.01 - Jobs	#17434-2	Even better, the jobs created through adoption of the Tribe's proposal will be long-term, sustainable opportunities rather than the short-term ones that would be utilized in the DEIS proposal.	Thank you for your comments on the Westside Fire Recovery Project. Chapter 2 of the final EIS includes a discussion of how the Karuk Alternative was considered and incorporated into the preferred Alternative. See the social and economic section of Chapter 3 of the EIS for a discussion of jobs.
280.01 - Jobs	#18852-41	24) Job creation as a result of this projects implementation should prioritize locally available workforces, total jobs created should not give the impression of a lasting influence to local economies as this is a short-term project (stated clearly by the DEIS, based upon the need to maximize commodity benefits before timber quality deteriorates).	The social and economic section of Chapter 3 of the final EIS includes the direct, indirect and induced economic value, including jobs. The duration of jobs under all Alternatives is included in this section; the economic effects of the Karuk Alternative are disclosed in Chapter 3 of the final EIS. The contract award process is beyond the scope of the National Environmental Policy Act analysis, however comments that state a position are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action.
280.01 - Jobs	#18853-3	ACL represents the largely family-owned, multi-generational loggers and log truckers of California. Loggers and log truckers are the infrastructure for timber harvesting in California, and can provide the workforce for coming developments in the battle against climate change, in the development of woody biomass alternative fuel, and in forest fire prevention, firefighting and clean-up. But we are losing an increasing number of the hard-working and skilled people who perform these tasks. The timber harvesting season is short, existing regulatory requirements are costly, and loggers must look to make a living and pay for government regulation in a short window of time to continue in the trade. As workers quit or retire, a new generation is leery of stepping up to replace them.	The social and economic section of Chapter 3 of the final EIS includes the direct, indirect and induced economic value, including jobs. The ACL is beyond the scope of the National Environmental Policy Act analysis, however comments that state a position are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action.
280.01 - Jobs	#18869-4	Look no further than the communities within 150 mile and see the need for the jobs that would be created. Please consider the human race when making your decision. These commonities will further deteriorate without this work opportunity. Since we can't log live trees, lets harvest the dead one and put the resource to good use. Creating job, supporting the local folks and businesses.	The purpose and need of the project as described in Chapter 1 includes maintaining and/or creating jobs in forest management and providing timber to the local mill which are major employers of these rural communities. The proposed activities to address this include salvage harvest of fire-killed trees in selected areas, and salvage of fire-killed and other hazard trees along roadways and near infrastructure. The social and economic section of Chapter 3 of the EIS includes the direct, indirect and induced economic value, including jobs.
280.02 - Local Economics	#12334-2	The regrowth of a forest ensures tourism revenue and a healthier forest.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. We acknowledge the comment.

Code	Comment Number	Comment Text	Response
280.02 - Local Economics	#17111-9	One of the major motivating factors in conducting salvage logging in the Westside fire area - including the LSRs - seems to be economic and not ecologic (DEIS, 10-11), which is further indicated by the Chief s "Emergency Situation Determination" and the "Alternative Arrangements" secured from the Council on Environmental Quality. The NWFP specifically directs that, "Salvage will not be driven by economic or timber sale program factors" in LSRs (NFP SFEIS F-21). The teams that put together FEMAT and the NWFP specifically wanted the LSRs to be exempted from the pressures of programmed timber harvest, because the primary drivers in LSRs were ecological and not economic. Hence, it would seem that the salvage proposed within LSR segments as part of the Westside Salvage Project is inconsistent with the goals and principles of LSR management.	The question of salvage in Late Successional Reserves was anticipated in the development of the Northwest Forest Plan and was squarely addressed in the Northwest Forest Plan ROD. The report of the Forest Ecosystem Management Assessment Team provided the basis for the Northwest Forest Plan. Forest Ecosystem Management Assessment Team considered salvage with three different prescriptions, ranging from no salvage, to salvage with minimum guidelines. Prescription 2, (Forest Ecosystem Management Assessment Team II-18) which limited salvage in Late Successional Reserves was carried through to the Northwest Forest Plan ROD. “Valuable trees that are dead can be used for commercial purposes with the attendant employment and economic benefits. …Increased fire danger or risk to insect and disease resulting from large accumulations of dead trees can be reduced in an economically feasible fashion. Avoided are the perceptions of economic waste if patches of dead trees are not salvaged.” (Forest Ecosystem Management Assessment Team II-18) The topic of salvage in Late Successional Reserves generated public responses in the Northwest Forest Plan requesting salvage be restricted only to Adaptive Management Areas. The Secretaries of Agriculture and Interior, the signing officials for the Northwest Forest Plan, noted their logic for salvage in Late Successional Reserves in the Response to Comments (Northwest Forest Plan ROD, Page 66): “Salvage is not required to be beneficial, but is designed to permit recovery of a timber volume in those instances where catastrophic events clearly kill more trees (resulting in more snags and down logs in the short and long term) than are needed to maintain late successional conditions.” See Chapter 1 of the EIS for a discussion about salvage in Late Successional Reserves. Also see Chapter 1 of the final EIS for a discussion of emergency situation determination and Alternative arrangements. Since the draft EIS comment period, the agency has decided not to seek additional Alternative arrangements for elimination of the 90-day wait period between draft and final EIS or the 30-day wait period between final EIS and ROD. The purpose and need for the Westside Fire Recovery project includes ecologic and economic factors as stated in Chapter 1 of the final EIS. Standards for managing in Late Successional Reserves are provided in the Forest Plan (pages 4-86 through 4-88) and are followed in this project. Economics are not the driving factor in determining whether or not the project will be implemented in reserves. As stated in the Forest Plan (page 4-86), "Thinning and other silvicultural treatments inside reserves are subject to review by the Regional Ecosystem Office to ensure that the treatments are beneficial to the creation of late-successional forest conditions." The Westside Fire Recovery project has been submitted to the Regional Ecosystem Office for review. The Forest Plan also emphasizes that management activities focused on reduction of "insect, disease and fire threats" are encouraged in Late Successional Reserves; therefore, salvage harvest proposed within Late-Successional Reserve segments is consistent with the goals of Late-Successional Reserve management on the Forest. The statement, in response to a comment on the Northwest Forest Plan EIS, states that "Salvage in Late Successional Reserves will be permitted only where operations will not diminish the quality of late-successional habitat, where stand-replacing disturbance events exceed 10 acres, and under a number of other conditions listed in SEIS Appendix B5, Recovery Plan Standards and Guidelines. Salvage will not be driven by economic or timber sale program factors." The conditions listed in the SEIS, Appendix B5, are those reiterated in the Forest Plan on pages 4-86 through 4-88. The social and economic effects of the project Alternatives as disclosed in the social and economic section of Chapter 3 of the EIS.
280.02 - Local Economics	#17349-3	plus creating the critically important social/economic benefits from local employment, and increased 25% funds for schools and roads.	The social and economic effects section of Chapter 3 of the EIS discloses effects of Alternatives on local employment and economic returns to Siskiyou County for schools and roads.
280.02 - Local Economics	#17359-2	Moreover, if the Klamath logs these trees, it would condone and facilitate the persistent hopes of certain economic factions for periodic influxes of large-diameter timber, which will remain until the Forest Service commits to stop logging these largest trees. By proposing to log these trees, the FS is implicitly endorsing a model of ecosvstem management that will lead only to greater social conflict and tension with the science of fire ecology. This will certainly not be the last fire to occur in the Klamath's roadless forests, inside or outside its old-growth and roadless jewels. In addition, the market for wood and pulp is currently low, and many reqent FS sales have been under-priced due to the attendance of only one or a few bidders. The assistance of the FS in such a "supply-side" timber market is profoundly unhelpful to a country that should be seeking greater efficiency and conservation of our wood and fiber resources, rather than wasting these resources at artificially low prices.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
280.02 - Local Economics	#17481-46	Economics through tourism and recreation has not been addressed - position should be to not allow agency to say wilderness does not have economic value.	The effects of the project Alternatives on recreation are disclosed in the Recreation section of Chapter 3 of the EIS, and the effects on scenery are disclosed in the Scenery section of Chapter 3 of the EIS. These two factors are primary components of appeal to tourists (National Visitor Use Monitoring report 2012). The economic value of Wilderness is outside the scope of this project since no activities are proposed in Wilderness.
280.02 - Local Economics	#18852-2	As a resident of the Happy Camp area, I wish to see a long-term forest products industry which is well planned and implemented, ideally where value-added products are created and not just an industry where commodity logs are shipped to mills outside of our area.	The Forest Plan supports a well-planned forest products industry but developing a value-added industry is beyond the scope of the Westside Fire Recovery project.
280.02 - Local Economics	#18853-4	The timber industry provides good middle-class jobs in rural communities where the unemployment rates are well above those of the rest of California, and where, in recent years, the once-robust timber economy has been transformed, on the North Coast, in the Sierra, and in practically every pocket of rural timberland California by a "replacement" economy of illegal drug production that is criminal, lethally dangerous to timber workers, hikers, campers, and government employees alike; that presents an increased risk of wildfire thanks to illegal campfires, chemical explosions and other risks; and that has no regard for environmental safeguards as water quality, species, and habitat are destroyed.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
280.02 - Local Economics	#18857-2	Purpose and Need for Action: The stated "Purpose and need for action" appears to be economic rather than ecologically based. I understand that you must manage the forest for various competing interests. As someone who has derived the bulk of my livelihood as a forest products producer and/or consumer I have concerns about this stated need for action. I spoke at the meeting with your staff regarding bidding qualifications to participate in the sale of the proposed project and it was clear that the qualifications due to bonding capacity and performance capacity in general are unattainable for the local small forester and timber business owner to truly participate in a way that directly benefits them. To be clear, I personally don't have interest in bidding on this project or its units. My concern is that the Forest Service is painting the false picture that somehow the economic benefits of this project are designed to be beneficial to the local communities economically. I'm not sure how that is possible when the treatment required can only be undertaken by large out of area corporations? The stated purpose of "a project that is economically viable…and benefiting our local communities" should come with some baseline criteria. If the desired result of the forest "recovery" is truly as you have stated please undergo some sort of formal review and/or sidebar development with the community as it pertains to economic recovery and community benefit. For instance, I propose the following questions be answered yes to truly satisfy the stated need: * Are the majority of project bid winners residing in the community? * Do the bid winners pay taxes in the local community? * Are the bid winning companies required to hire local labor? * Is the majority of the resulting harvest available for purchase within the bioregion? * Are the bonding requirements low enough to allow for local and regional business to participate? * Does the project support the local economy as it now functions? * Does the project support and strengthen other local and regional economic activities including Tourism? * Are there restrictions on log exports? I'm sure the community would willingly add to this list. Without a framework to manage the true benefit to the community, the desired results are really just talking points to divide the factions of the community that are pro salvage vs. pro environment. This has worked for the Forest Service in the past, but these issues are far more nuanced than currently being described in the various alternatives. The community and the forest stakeholders, including the Timber Industry really deserve more from the Forest Service in this regard.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. The full purpose and need for action is disclosed in Chapter 1 of the EIS. As described, there are three parts of the purpose and need, including ecological, economic, and social/safety needs for action. Contract development and awards for implementation are outside the scope of the analysis for this EIS; however, it is likely that the project will be split into multiple sales, which could address some of your concerns related to bonding or the feasibility of implementation within required time frames of contract(s). The comment regarding economic benefits and the local community is a position statement, not supported by scientific rationale. In terms of benefits to the local communities wildfire protection is addressed in the fire and fuels section of Chapter 3 of the EIS; benefits to safety and to the economic returns to Siskiyou County are addressed in the social and economic section of Chapter 3 of the EIS .As shown in Table 3-26, Alternative 2 would provide the greatest number of jobs as well as the most amount of revenue from timber sales and to the county.
280.02 - Local Economics	#18869-2	Using best practices coupled with cutting ease equipment the community could realize an economic gain while extracting a natural resource	The relationship of this comment to the environment effects of the project is unclear.

Code	Comment Number	Comment Text	Response
280.02 - Local Economics	#18926-28	The social and economic impacts to public trust resources such as clean water, wildlife, fisheries and carbon storage were not evaluated.!	Social and economic impacts of project Alternatives to clean water, wildlife, aquatic resources, and carbon storage are qualitatively included in the hydrology (water quality), wildlife, aquatic resources, vegetation and climate change sections of Chapter 3 of the EIS. The sections have been expanded between the draft and final EIS to provide more information on effects to these resources.
280.02 - Local Economics	#18926-29	Only 32% of the cost for the fuels treatments and the site prep and plant would be captured. This leaves a small chance that these activities, that the DEIS relies on for reducing fuels and "restoring" forests faster, would actually happen. The increased fire danger from not treating activity fuels and small fuels around communities is not considered	Additional funding sources will augment treatment of activity fuels. See response to comment number 18878-43 about implementation funding. The Westside Fire Recovery Project proposes to treat all activity-generated fuels; therefore, analysis of Alternatives incorporates treating activity-generated fuels. This can be compared to the effects of Alternative 1, in which no treatments is proposed. Position statement. The economic analysis of the effects of the project includes a discussion of the percentage of dollars provided by each Alternative that will be available to implement fuels reduction activities. As noted in Chapter 2 of the EIS, treatment of activity fuels will be included in salvage and roadside hazard sales. Other fuels reduction activities will be implemented within 10 years.
280.02 - Local Economics	#18926-34	How much funding would be generated from the treatments outlined in the Karuk Alternative? An update of the Environmental Impact Statement (either in a the Draft or Final) should reflect these funds. ! ! Generating the income for Siskiyou County in its communities and providing jobs is consistent with the purpose and need, but it should be generated in a manner that protects life, first, and second protect private, public and tribal improvements and private property is buffered with a third priority on resources. Maximum income for the communities and in Siskiyou county would be available on the products that can be utilized. as is consistent with the protection, in prioritized order of: life, property, and resources ! !	See response to comment number 18878-43 about implementation funding. Many components of the Karuk Alternative have been incorporated into Modified Alternative 3, as described in Chapter 2 of the final EIS.
280.02 - Local Economics	#19006-1	As a possible purchaser of some of the timber from this project this is critically important to our mill and the recovery of veneer from the logs that would come from this project. We can't stand to loose the majority of the veneer from this timber to the worms and insects that will destroy their value over the next year.	Statement of support. Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. To expedite the process, an Emergency Situation Determination was requested by the Forest and issued by the Chief of the Forest Service for this project; see Chapter 1 of the final EIS. See response to comment number 17501-1 and 2. See response to number 12368-1. Effects of all Alternatives are analyzed based on implementing the project in time to maximize the opportunity to recover forest products.
280.02 - Local Economics	#19157-6	Encourage the use of Small Business Timber Set Aside Program.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. This is a matter of implementation, not of analysis; however, the comment has been acknowledged.
280.02 - Local Economics	#23-3	Consider the economic benefit that would result from Salvage Logging to the immediate and surrounding communities. This economic benefit also includes the increase in the tax base of the area to help pay for needed public services: roads, public safety, schools, and health departments.	See response to comment number 18869-4.
280.02 - Local Economics	#8825-1	The cumulative impacts of logging in sensitive ecosystems must be assessed using the best science. Fires and drought must be included in any comprehensive plan. Planning for a drought of at least ten years must be studied and included in any Logging plan. Plan for the future not a short term economic gain. Economic costs must also be included in this plan. Cost of fire fighting, water diversion and the loss of tourism must be adequately assessed in this plan.	Cumulative effects (impacts)of all Alternatives, as defined by the Council on Environmental Quality National Environmental Policy Act regulations at 40 CFR 1500-8, are analyzed in Chapter 3 of the EIS. Cumulative impacts are those created by adding the effects of the proposed project to the impacts of past, present, or reasonable foreseeable future actions, not of events such as fire or drought. Fire fighting is outside the scope of this project. The only water diversion proposed in this project is related to watering the roads for dust abatement; for this, there is a watershed project design feature in Chapter 2 of the EIS and effects are analyzed for in the hydrology and aquatic resources sections in Chapter 3 of the EIS. See the social and economics section of Chapter 3; the project will improve safety conditions and road access for the recreating public. The effects of the project on recreation opportunities are disclosed in the recreation section of Chapter 3 of the final EIS, and the effects to scenery are disclosed in the scenery section of that Chapter; these are a proxy for effects on tourism. As described in the purpose and need in Chapter 1 of the EIS, the project is designed to address the needs for future forested conditions for improved long-term habitat and watershed conditions. See response to 17481-46.

Code	Comment Number	Comment Text	Response
280.05 - Social - Other	#17481-7	All Project Plans in the recovery area should include the Socioeconomic effects and the planned mitigation.	Social and economic impacts of project Alternatives are disclosed in Chapter 3 of the EIS; these impacts include implementation of project design features (mitigation measures) as described in Chapter 2 of the EIS.
280.05 - Social - Other	#18878-65	Social and Economic Environment DEIS: The indicators used for the social analysis include lifestyles, values, beliefs, health and safety of individuals and communities. (Pg. 251) The American Indian population is a greater percentage of the population in Siskiyou County than in the State of California; therefore, potential impacts of management actions on the American Indian population will be disclosed. (Pg. 253) There will be no disproportionate effects on American Indians (Pg. 256) Comment: Since admittedly, "The American Indian population is a greater percentage of the population in Siskiyou County than in the State of California." In addition, it can be argued Karuk Tribal Members are the largest sub-set of Native Americans to be impacted by the proposed action. Lastly, the Karuk Tribe is Federally Recognized with a fully developed and functional tribal government. To our knowledge no effort to contact or coordinate the drafting of this section has occurred. We have to wonder how the author of this section reached a one sentence conclusion that there will be no disproportionate effects on "American Indians", let alone Karuk Tribal Members. It is our conclusion the analysis failed to take into account the social and economic impacts on "American Indians".	Environmental justice is defined in the 1994 executive order on Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations (EO12898). The 1995 USDA Department Regulation on Environmental Justice (5600-002) define what this means to USDA agencies, including the Forest Service: "Environmental Justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by, government programs and activities affecting human health or the environment." Chapter 1 of the final EIS provides details on opportunities all populations have to comment on the Westside Fire Recovery project. Opportunities for federally recognized American Indian tribes, including the Karuk, to comment and provide information to be considered, are provided through the consultation process as noted in the final EIS. The Forest consulted with the Karuk on the effects of the project to? cultural resources, including effects on tribal traditional use-areas and plants; project design features and mitigation measures were developed to minimize or eliminate these effects, which are disclosed in the cultural resources section of Chapter 3 of the final EIS. Effects on cultural plant collecting areas are disclosed in the botany section of Chapter 3 of the final EIS; negative or adverse effects are minimized or eliminated through implementation of project design features displayed in Chapter 2 of the final EIS. The expanded disclosure of social and economic effects of the project in the social and economic effects section of Chapter 3 of the final EIS references the information provided in the cultural resources and botany sections. The expanded legal and regulatory compliance section of this Chapter discusses compliance of the project with EO 12898.
280.05 - Social - Other	#18909-105	Only 32% of the cost for the fuels treatments and the site prep and plant would be captured. This leaves only a small chance that these activities, which the DEIS relies on for reducing fuels and "restoring" forests faster, would actually happen. The increased fire danger from not treating activity fuels and small fuels around communities is not considered. The Forest Service has a long record of selling timber that is worth less than logging costs, generating large economic burdens for taxpayers and the overall economy16. The GAO Biscuit project report17 has clear relevance to the Westside project. The report concluded on page 57, that "[i]t remains to be seen how much of the other recovery work - wildlife habitat rehabilitation, fuel management zones, monitoring and the adaptive management study - will be accomplished given the lack of funding and schedules." 16 Niemi, Ernie. Economic Risks of Salvage Logging: the Biscuit Fire. ECONorthwest, March 2004. 17 General Accounting Office Biscuit Fire Recovery Report-Analysis of Project Development, Salvage Sales, and Other Activities. September 2006 GAO-06-967 The social and economic impacts to public trust resources such as clean water, wildlife, fisheries and carbon storage were not evaluated. We agree that it is hard to put a price on the source of sustenance and a quality life. Helicopter logging and 'salvage' logging in general would extract the largest trees, leave the small trees creating a deep sea of slash and flammable fuels. The Salmon Salvage timber sale, implemented last year on the KNF is a testament to that. The same forest managers are scratching their heads trying to figure out how to deal with all that slash. The KNF is considering dropping fire from a helicopter to engulf the flammable ground fuels left behind from logging on these steep mountain slopes. Logging in this manner does not create fire safe communities. It puts communities at risk with immeasurable ecological costs. The DEIS fail to meet the forest wide Economic Goal in the KNF LRMP (2010) at page 4-9 which states, "Promote the economic stability of local communities. Develop partnerships with local and Regional agencies, groups, or individuals to promote economic stability." "Promote the development of non-traditional Forest-based resources that could contribute to the economic stability of the area. Emphasize the harvest of wood fiber (biomass), fishing and wildlife viewing, harvest opportunities, and recreational opportunities, while meeting resource management goals. Highlight the importance of a visually pleasing setting to support local economic development strategies that focus on recreation opportunities or tourism." (Emphasis added). The DEIS fails to consider the actual costs of the NEPA planning thus far and the costs of all the mechanized and manual treatments throughout the 218,600 acre planning area.	See response to comment number 18878-43 about implementation funding. See response to comment number 18926-29 for response to the first three sentences and number 18926-28 and number 18934-13 for other sections of the comment. Consistency with Forest Plan economic standards is disclosed in the Forest Plan consistency checklist, summarized and referenced in the social and economies section of Chapter 3 of the EIS. As noted there, most economic goals are beyond the scope of this project. The costs of National Environmental Policy Act planning are beyond the scope of the environmental effects of the project; costs of treatments are included in the costs of the project that are disclosed in the social and economic effects of Alternatives in Chapter 3 of the EIS.

Code	Comment Number	Comment Text	Response
282.0103 - Traditional Way of Life	#18872-7	The Shastas have maintained these magnificent forests in our Native lands as has other tribes throughout the United States of America. Tribal burning in the fall throughout the centuries has created a logical common sense approach, and the only method to preserve these forests. Since the creation of the Forest Service and illogical forest practices we have forests with catastrophic fire and fuel load conditions. As a guide to follow back to pristine forest conditions every recovery action plan must be on a journey back to native conditions.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. This project incorporates underburning and addresses fuels conditions, as described in Chapter 2 of the final EIS.
282.0105 - Scenery, Visual Resources	#12346-69	The scenery analysis contained at 275 of the DEIS indicates that the KNF intends to conduct salvage logging activities across the Tom Martin Peak and Bear Lake Trails as well as at the Tyler Meadows and Cold Springs trailheads such that attainment of VQOs will not meet Forest Plan standards. Similarly, page 290 of the DEIS acknowledges that proposed logging units within Wild and Scenic (and eligible) corridors for the Klamath, Scott, North Fork Salmon Rivers and Grider Creek will not achieve the VQO time period objectives.	The Forest does not have a standard list of wildfire restoration scenery protection measures. Project design features (project design project design features) are developed specifically on a project by project basis. Additional Recreation and Scenery project design project design features have been developed for Modified Alternative 2 to reduce effects to recreation settings and scenery. However some long term effects to scenery would exist after project implementation and are identified in the Scenery Amendment Report. The Westside Fire Recovery Project proposes treatments on approximately 7 % of the 183,000 acres burned; thus 93% or 100,000 acres would display visible evidence of the forest 's natural wildfire processes. The Forest Plan Standard and Guideline number 11-7 reads in full "In the case of recovery activities after extreme catastrophic events such as intense wildland fires, time periods to achieve the Visual Quality Objectives stated in Forest-wide and Management Area Standards and Guidelines may be extended. This would be necessary where previously unnoticed scenery alterations are exposed to view due to loss of vegetative screening, or during timber salvage activities where recovery of forest vegetation is determined to be of greater importance than achievement of Visual Quality Objectives within the time periods established." The Forest interpretation is that Standard and Guideline number 11-7 takes precedence over Standard and Guideline number 11-3. Standard and Guideline 11-7 states "...time periods....may be extended" without any qualifying time limitations.
282.0105 - Scenery, Visual Resources	#17312-1	I am particularly concerned about proposed activities that could adversely impact the existing Klamath, Scott, and North Fork Salmon Wild & Scenic Rivers and segments of Elk Creek, Grider Creek, and South Fork Russian Creek recommended by the Forest Service for Wild & Scenic protection.	See response to comment number 18927-3.
282.0105 - Scenery, Visual Resources	#17322-1	In particular I am very concerned about proposed activities that could adversely impact the existing Klamath, Scott, and North Fork Salmon Wild & Scenic Rivers and segments of Elk Creek, Grider Creek, and South Fork Russian Creek recommended by the Forest Service for Wild & Scenic protection.	See response to number 18927-3
282.0105 - Scenery, Visual Resources	#17460-9	The "Recreation Resource Report" is puzzlingly inadequate. Somehow it manages to conclude that the impacts to recreation in Alternatives 2, 3, 4, and 5 are all the same. Here are two obvious differences between alternatives that were missed in the report; other examples can easily be found: 1. Camping at Grider Creek Campgrounds will be significantly impacted by the noise, dust, and salvage harvest activity under Alternative 2 by salvage operations in units 61, 62, 62-1 , and 62-2. Views will also be impacted for decades; these impacts will also affect local users of the Pacific Crest Trail. No such local disturbance would occur under Alternative 5. 2. Camping and hiking along the Pacific Crest Trail in the Cliff Valley area of the Grider Creek watershed will be impacted by noise, dust, and activity under Alternative 2 salvage operations in units 224, 228 x, and 229 x; some of these units border the PCT directly. Views, again, will be impacted for decades by clearcuts directly adjacent to the PCT. No such local disturbances would occur under Alternative 5. Similarly, recreation at Tyler Meadows would be affected by adjacent salvage operations, some units of which are flagged for salvage right up to the edge of Tyler Meadows. At a minimum, some setback of salvage units directly bordering Tyler Meadows should be implemented, for both wildlife connectivity, and to preserve its scenic views. These examples of the failure of the "Recreation Resource Report" to distinguish differences in impacts between Alternatives 2-5 are by means exhaustive.	This oversight in the Draft analysis has been corrected in the Recreation, Scenery, and Wild and Scenic Rivers Reports. We dropped some units on the north side of Tyler meadow against the wilderness boundary. We'll discuss marking some additional snags along Tyler meadow with our implementation team. Thank you, this is a good idea.

Code	Comment Number	Comment Text	Response
282.0105 - Scenery, Visual Resources	#18851-4	The project proposal does not adequately protect the Scenery values of the forest, or its local residents and tourists, primarily because it fails to apply standard wildfire restoration scenery protection measures, such as those recently applied on the Mt Hebron Fire Recovery Project. These include: 1) Retention of a representative pattern of standing dead trees within all High and Moderate Sensitivity views, with the specific purpose of retaining the forest's natural scenic character, and retaining visible evidence of the forest's natural wildfire processes. 2) Reduce the height and scenery impacts due to project-created stumps, skidding and yarding activities. These protection measures have proven to be fully implementable, produce negligible effects upon other resource objectives, and consistently benefit resources such as wildlife and watershed. If these measures are not applied, adverse LONG TERM scenery impacts would persist along many of the Forest's most highly valued recreational settings and tourism attractions. The project's Scenery report is helpful and informative in many respects, however has some important shortcomings that have very likely adversely influenced the Project's scenery outcomes:	See response to comment number 18926-20.
282.0105 - Scenery, Visual Resources	#18851-5	Page 13 & 14 of the report incorrectly implies that Visual Resource Management S&G 11-7 indicates that the Klamath Forest Plan's intent is for an unlimited period of delay allowed in meeting Forest VQOs, "to recover forest vegetation". However, Klamath Plan VRM S&G 11-3 more specifically states "Visual objectives may be foregone in the short-term, following extreme natural events." Thus, long term scenery impacts to sensitive views, such as the excessive removal of fire killed trees, or persistence of visible tall stumps, etc are not consistent with this more specific S&G. These long term scenery impacts must therefore be prevented by protection measures consistent with those applied by the KNF's recent Mount Hebron project (included requirements for retaining a representative % of the standing dead trees in natural appearing patterns of individual trees and clumps). In addition, the project's Scenery Report fails to provide any illustrative photographs to visually communicate the project's scenery conditions and the potential effects of its alternatives. It is unreasonable to expect the reforestation planning team member, decision-maker, or interested citizen to translate the Scenery Report's technical jargon of "VQOs" or narrative Scenic Character descriptions into what one would actually see in these important Klamath National Forest recreation settings. The few local photographs provided by other sections of the Westside Fire Recovery document are helpful but lack the necessary scenery translation to communicate existing scenery conditions, Forest Plan scenery requirements, and scenery effects from proposed alternatives. Failure for the Scenery Report to provide pertinent photography, even at a summarized representative level for this large project, prevents readers from being able to determine whether the scenery they value is adequately protected. Forest Scenery is a primary element of Siskiyou County's quality of life, recreation settings, tourist attractions and unique identity. This project would potentially affect the scenery within 60 precious views, include at least 4 Wild and Scenic Rivers, 1 Scenic Byway, 1 National Scenic Trail, 5 campgrounds, 7 recreational trails, 7 river accesses, 4 mountain top lookouts, and several local communities. There is no reasonable excuse on earth that the scenery protections identified above should not be fully implemented, to protect these views from the project's proposed long term eyesores. Even a project as large and potentially scenery-impacting as this CAN be done in a way that protects these important quality of life values. It just takes the commitment to do so, and the FS Mission of Public Service demands it	See response to comment 18926-20.
282.0105 - Scenery, Visual Resources	#18857-11	No salvage logging in designated or recommended Wild and Scenic River segments.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. Management Area - 3 "Recommended and Designated Wild River" is listed in Table 1-5 of the draft EIS because of its occurrence within the project boundary. However no project treatments are proposed within the Wild River corridor. Table 1-5 of the final EIS has been revised to clarify that no project treatments are proposed in this management area. The Wild and Scenic River report describes effects of the project. .

Code	Comment Number	Comment Text	Response
282.0105 - Scenery, Visual Resources	#18873-2	The section of PCT near the Cold Springs Trailhead presents a different set of challenges. As the PCT follows the ridge line just north of the Marble Mountains Wilderness boundary, there are project units proposed to be in close proximity to the trail as well as a temporary road. In reviewing the map associated with the DEIS, it appears there are a total of eight units that the PCT either passes through or along a unit boundary. The Unit numbers are as follows; 224, 228-1, 228-3, 229-1, 229-2, 229-3, P321, and P323. In addition, based on my map review it looks as though the temporary road to be built to access the 228 Units is quite close to the trail. The Recreation Resource Report associated with the DEIS references the Visual Quality Objectives associated with the project, however it is not very specific in regards to the visual impacts on the PCT where the Units referenced above are in close proximity to the trail. I respectfully request that the Forest consider including more specific visual mitigations for the PCT in the Final EIS. For example, cutting stumps as low to the ground as is feasible and angling the cut faces away from the trail would help to minimize visual impacts to the trail in the short term. In addition, hand raking ground disturbance associated with the logging activity would also help maintain the scenic integrity of the PCT. And perhaps most importantly, a project of this scale warrants a field visit with Forest staff. I can personally commit to making myself available in a timely manner for field visits to the Cold Springs area to preview the Units listed above as well ground truth the existing roads and proposed road in the area and the potential impacts on the PCT. As a point of reference, the Hat Creek Ranger District of the Lassen National Forest implemented the visual mitigation measures below during a similar timber operation near the PCT following the Reading Fire: * Protect NFS trails, including the Pacific Crest National Scenic Trail, from damage during implementation of the proposed activities. * Equipment crossings would be limited to designated crossings. The trail tread would be restored at crossings. * No leave-tree marking would be applied within 150 feet of NFS trails falling within Retention (R) and Partial Retention (PR) VQO classes. * Stumps would be cut to a maximum of 8 inches within 50 feet of NFS trails. * To minimize soil displacement, avoid turning equipment within 50 feet of NFS trails. * Activity-generated fuels created within 150 feet of NFS trails, viewpoints, and other high-use areas would be piled and burned or removed within one year of operations. Piles would be located a minimum of 100 feet from trails and trailheads. * In areas of high recreational use, some vegetation, where available, would be left along the edge of trails and roads. Residual vegetation can act as a visual barrier to discourage future unauthorized routes. I look forward to speaking with Forest staff about how similar mitigation measures could be implemented during the Westside Forest Recovery project implementation.	Recreation and Scenery Project Design Features (see Chapter 2 of final EIS for a complete listing) have been added which will protect the trail from harvest and machine access. The boundary of unit number 224 has been moved 50 feet away from the PCT. As agreed upon in the 05/13/15 field review between Forest representatives and the Pacific Crest Trail Association, no roadside hazard trees would be removed adjacent to the PCT out to a distance of 15 feet. No salvage harvest would occur within 50 feet of the trail. Stumps will be cut 6" or lower and angle cut away from the PCT. No marking paint will be visible from the PCT.
282.0105 - Scenery, Visual Resources	#18878-13	Table 1-5 pg 9. "MA3 Recommended and Designated Wild River DEIS: Ecological processes shall shape the vegetative patterns within the management area. The salvage of dead trees, or the reforestation of these areas following catastrophes, should not be permitted. Schedule no timber harvest from this management area (pp. 4-78 to 4-79)" Comment: In addition to the above, on page 4-88 of the Klamath National Forest Land and Resource Management Plan, Grider Creek is portrayed as a "Designated & Recommended Wild River". The stated Desired Future Condition pg. 4-90 indicates "Viewers see fire scars from the rivers, evidence of the ecological processes that shape the vegetative patterns viewed from the river." Since the vast majority of salvage harvest is to occur in the Grider Creek watershed the Refined Proposed Action deviates from the Desired Future Condition.	Management Area - 3 "Recommended and Designated Wild River" is listed in Table 1-5 of the draft EIS because of its occurrence within the project boundary. However no project treatments are proposed within the Wild River corridor. Table 1-5 of the final EIS has been revised to clarify that no project treatments are proposed in this management area.

Code	Comment Number	Comment Text	Response
282.0105 - Scenery, Visual Resources	#18909-102	KNF LRMP page 4-7, Manage visual resources to conserve the natural scenic character of the Forest. Meet the Forest Plan's adopted visual quality objectives (VQOs). Emphasize management of the visual resource seen from communities, high-use recreation areas and major roads and trails. Conserve the inherent scenic attractiveness of distinctive landscapes. This includes units located in the foreground of Highway 96, Klamath Wild and Scenic River, Tyler Meadows Trailhead, Cold Springs Trailhead, Grider Creek, Grider Creek Campground, Grider Creek road, and the Pacific Crest Trail. The DEIS fails to consider the diminished visual quality from the Marble Mountain and Russian Wilderness Areas and areas visible from the Pacific Crest Trail. The project would create large openings with line and texture contrasts with adjacent burned or forested areas. Units and roadside treatments in Retention Visual Quality Objective (VQO) areas would likely not meet the visual quality standards. Recreation settings would also be would be adversely affected. While an exception is allowed under the KNF Forest Plan Standards and Guideline 11-7 which states "In the case of recovery activities after extreme catastrophic events such as intense wildland fires, time periods to achieve the VQOs may be extended. This would be necessary where previously unnoticed scenery alterations are exposed to view due to loss of vegetative screening, or during timber salvage activities where recovery of forest vegetation is determined to be of greater importance than achievement of VQOs within the time periods established." However, clearcut logging is not a recovery activity and the visual quality of these naturally recovering stands is already meeting visual quality objectives.	As noted in Tables 3-27 and 3-30 of the draft EIS and in a similar section in the final EIS, multiple wilderness trails are considered in the scenery analysis. These trails include Hogan Lake, South Russian Creek, Statue Lake, Twin/Big Blue/Paynes Lake and the Pacific Crest Trail.
282.02 - Health, Safety	#17-1	Our unit of the Backcounty Horsemen of California supports the Klamath National Forest Westside Fire Recovery Project as it is written in Draft Form, with one exception. The Top of the State Unit of BCHC would like to add Hazard tree removal to the KNF system of trails that are in the affected areas, included in the proposed action. These trails receive hundreds of Visitors each year and burned trees deemed "hazard trees" adjacent to these trails should be removed and included in this project. The public using these trails should have the same safety precautions in effect as persons traveling the State Highways and County Roads. Waiting for these trees to fall naturally may take years and will jeopardize trail user safety.	Hazard Trees associated with trails within the project area will be addressed separately from this project as part of routine trail maintenance. Trail-side hazard trees will be prioritized and treated based on risk level including probability of tree failure and probability of a target. Selective treatment of hazard trees along trails allows for protection of scenery and the recreation setting.
282.02 - Health, Safety	#2-1	The first thing to notice skimming the deis for the westside project is the constant mention of public and worker safety. As of the date of the draft release, Highway 96 and county roads inside KNF are perfectly safe to travel. Most road threatening snags have been removed and access is not dependent on any of the deis alternatives. I also assume that main USFS roads have already been treated for safety hazards or are well into the process of being treated. So talking about treating public roads for safety hazards as part of the deis should be limited to the public roads that have not been treated. Also, the deis over-states the danger to workers and the general public from falling snags. Really, the movement of log trucks along narrow roads will be much, much more of a hazard to the public than any falling snag could be. The main hazard to workers in the woods will be from heavy equipment and chain saws. Also, road dust is a huge contributor to lung disease, and more traffic on dirt roads will definitely impact worker health. As a property owner near the fire line, I am very concerned about health hazards the proposed logging poses for me and my family.	The socio-economic section of Chapter 3 of the final EIS expands on the effects on Alternatives on safety of the public, forest workers, and travelers along roads. Safety of workers using heaving equipment and chain saws is part of implementation of projects. An expanded discussion of the effects of the project on dust is discussed in the air quality section of Chapter 3 of the final EIS.

Code	Comment Number	Comment Text	Response
282.02 - Health, Safety	#5873-11	Hazard tree removal is far too aggressive. Removing trees along roads that receive little use will sacrifice significant ecological values to gain little in terms of safety. Reaching out 250' on each side of roads is not necessary. The probability of hazard trees hitting roads decreases significantly beyond 100 feet. Hazard tree removal must be limited to imminent hazard trees within 150 feet of well-travelled roads. The FS should consider alternatives such as keeping workers out of the hazard zone around valuable wildlife trees (i.e., all large snags), closing less well-used roads to discourage public exposure to hazards, and signage to remind people of hazards. Generally the public is cognizant and tolerant of such hazards when out in nature. Large snags are the least likely to fall within 5 years and should not be considered imminent hazards. Small trees near high use areas should be the priority for hazard tree felling. Hazard trees should be felled but not removed from reserve land allocations.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. See Chapter 2 of the EIS for a full description of what is being proposed in terms of roadside hazard treatment. The 250-foot buffer is simply where fire-damaged trees will be evaluated to determine whether or not they are hazards according to the criteria in Chapter 2 of the EIS--not all will be removed. The removal of hazard trees has been developed within the standards of the Northwest Forest Plan, and the Project activities have been developed to protect the health and safety of the public and forest workers, as outlined in the purpose and need statement of the Project. Changes to the Forest transportation system are outside the scope of the project. Recreation and Scenery-6 project design feature in Chapter 2 of the EIS addressed signing needs for safety related to operations.
282.03 - Cultural, Hist., Anthro. Resources	#18878-18	DEIS: The following modifications or clarifications were made following scoping: Release includes manually removing all vegetation within a minimum of a fivefoot radius from a planted or naturally regenerated conifer seedling. (Pg. 17) Comment: The manual removal of hardwoods should be prohibited as these are a critical component of the landscape, increase fire resiliency in the landscape, and removal of such species is contrary to discussions during government-to-government consultation.	As described in Chapter 2 of the EIS "Growth of existing hardwoods will be encouraged; hardwoods will be included in the target stocking for units in areas where they exist. "Vegetation removed through release generally consists of forbs, grasses, and shrubs. Because planting prescriptions specify that conifers will be planted away from hardwoods, it is unlikely the hardwoods would exist within the grubbing radius of the planted conifer seedling.
282.03 - Cultural, Hist., Anthro. Resources	#18878-5	After numerous communications and based upon our review of the DEIS we feel it necessary to reaffirm the United States Forest Service as a federal governmental entity that has the legal and moral obligation to protect tribal trust resources and culturally significant resources which are defined in our Draft Karuk Tribe Department of Natural Resources Eco-Cultural Resources Management Plan (06-05-10) (ECRMP): "Culturally significant resources are not simply artifacts and anthropological histories. They encompass a wide range of physical, social and spiritual characteristics. The physical resources include, but are not limited to food resources such as deer, elk, salmon, lamprey eels, acorns, berries, and mushrooms. The spiritual characteristics of these culturally significant resources incorporate the need for the human influence in management for the perpetuation of cultural resources, practices and 1of22 knowledge base necessary to maintain Karuk Culture. The spiritual nature behind cultural resources not only validates the cultural principle that humans are the stewards of natural processes, but shows that everything in nature is at some level a significant cultural resource (Holmlund 2006)."	We agree that culturally significant resources are more than simply artifacts and anthropological histories. Any identified culturally significant resources will be protected from project activities using project design features and/or Standard Resource Protection Measures. The Forest Service is actively consulting with the Karuk Tribe; see Chapter 1 of the EIS.

Code	Comment Number	Comment Text	Response
282.03 - Cultural, Hist., Anthro. Resources	#18878-58	DEIS: Karuk people were engaged in a seasonal subsistence rounds. The people would foray out from permanent village sites throughout the year as resources became available for harvesting and processing. When resources had been procured, individuals and families would return to the village sites and store the supplies for future use. The project area has numerous culturally significant plant stands (e.g. tanoaks, bear grass, hazel, huckleberry) within and adjacent to natural openings, plantations and meadow areas. Important species were often managed and enhanced by tribes through the use of fire. (Pg. 246) Comment: There are two major points which need to be addressed regarding this statement in particular and for this whole section in general; 1) The use of the past tense is an affront and demonstrates a fatal lack of understanding of the Karuk People. The impression either intentionally or not gives the non-Indian reviewer an impression that we are no longer around and do not currently practice subsistence gathering, and use fire to manage "culturally significant plant stands". While it maybe said these practices have over time been declared illegal and a concentrated effort has been made by the Forest Service to curtail such activities, it has been demonstrated with the other National Forest which resides within our Aboriginal Territory an active acknowledgement of our cultural practices in a contemporary setting. Our cultural practices are not a quaint aspect of the past, but a living breathing aspect of the world today. 2) Some of our "culturally significant plant stands" have been named, yet none of these or other cultural resources were analyzed. How does the Forest Service meet the trust obligation in regards to our resources when they fail to perform any analysis beyond "physical artifacts". It is very clear to us absolutely none of our Scoping Comments, let alone the decades of actively engaging and educating the Forest Service were considered when drafting this DEIS. Once again Forest Service actions speak louder than words. At this time, the Karuk THPO cannot recommend Karuk participation in the Westside Fire Recovery Programmatic Agreement. The purpose of a Programmatic Agreement, as stated in the Region 5 PA, is to modify the Section 106 process, and the THPO is not yet satisfied that section 106 concerns have been properly addressed. Based on a comparative analysis of the WFR PA and the Stanislaus PA for the 2013 Rim Fire, we question whether the Stanislaus PA is an appropriate model for the WFR Project, as the extent of the salvage operations proposed in the WFR is much larger and the consultation period is much shorter. It is also important to note that in recent years the Karuk Tribe has recommended decertification of the 16 of22	Any identified culturally significant resources will be protected from project activities through project design features and/or Standard Resource Protection Measures. Identified resources were analyzed by specialists (see Chapter 3 of the final EIS). Comments regarding the WFR Programmatic Agreement are being addressed directly with the Karuk through consultation.
282.03 - Cultural, Hist., Anthro. Resources	#18878-62	Under Alternative 1, Cumulative Effects, the Tribe strongly agrees with the statement that the No Action Alternative "will lead to the degradation of traditional-use areas and plants ... resulting in the loss of culturally important places, and the ability to sustain traditions and cultures." Moreover, the Tribe would encourage the Klamath National Forest to acknowledge elsewhere in the DEIS the implicit truth in this statement: that these are timehonored practices that have taken place for millennia. The landscape contained within the Project area is replete with cultural resources - watercourses, trees, occupation sites, gathering sites, major trade routes, access trails, ceremonial trails, cairns, altars, and much more - that demonstrate the antiquity and historicity of these practices.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

Code	Comment Number	Comment Text	Response
282.03 - Cultural, Hist., Anthro. Resources	#18878-67	According to the USDA Departmental Regulation 1350-002, Tribal consultation is the timely, meaningful, and substantive dialogue between USDA officials who have delegated authority to consult, and the official leadership of Federally recognized Indian Tribes, or their designated representative(s), pertaining to USDA policies that may have tribal implications. It is our view that KNF's consultation was neither timely, meaningful, or substantive. Despite our concerns with the consultation process, we still believe that there is time for KNF to address our concerns and to provide assurances that project implementation, including but not limited to contract management and post implementation monitoring, can be conducted in accordance to the agreed terms and conditions. Finally, the need to reintroduce more natural fire regimes to the landscape cannot be overstated. It is critical that we work together to make our forests more fire resilient in the face of a changing climate and the need to protect our local communities from the risks associated with catastrophic wildfire. Any project proposed which does not include 20 of22 this component is contrary to our past practices, present needs, and future vision for the Klamath Basin.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.
282.03 - Cultural, Hist., Anthro. Resources	#18878-86	We consistently maintain the believe and expectation there is time to address the concerns of the Karuk Tribe, and provide assurances that the project implementation including, but not limited to contract development, and post implementation monitoring is conducted in accordance to agreed terms and conditions. In addition to the above, the following general principles should be also incorporated into post-fire projects. Please note these are not in any particular order of importance; 1) Research component uniquely 6) Incorporation of Tribal tailored to the Mid-Klamath Environmental Knowledge in Region; project planning, implementation 2) Enhancement of hydrologic and effectiveness monitoring; function of the Forest 7) Prescribed Burn Plans for retransportation system through introduction of fire on the road maintenance and landscape utilizing existing improvement actions, such as control lines and features; culvert replacement, road surface 8) Effective long term legally replacement and road enforceable agreements and/or decommissioning; independent conflict resolution 3) Economic Value utilizing a truly mechanisms to ensure restoration local and Karuk Tribal actions agreed upon will be workforce; implemented; 4) Enhancement of Tribal 9) Set aside areas within large burns Trust/Culturally Significant that will remain unsalvaged; Resources; 10) In areas where burned habitat is 5) Improvement of Government to rare, do not conduct salvage Government Coordination and harvests; Cooperation with the Karuk 11) Leave sufficient course woody Tribe in conjunction with our debris, good-quality snags within Tribal Historic Preservation salvage areas based on biological Office; 8of11 needs of species associated with post fire conditions ; 12) Avoid riparian buffers to minimize impacts to watercourses and promote L WD recruitment; 13) Delay salvaging where possible so that the important immediate post-bum ecological values can persist; 14) Salvage area with 90%+ overstory mortality; 15) No post-fire salvage operations in areas where fires were ingnited form the bottom of the slope during suppression efforts; 16) In riparian reserves, fall trees as needed on contour to reduce erosion for high severity areas 17) Retain larger trees greater than 30 inches in diameter (living or dead) 18) Retain all green trees at time of harvest 19) Retain/plant fire/droughtresistant species suitable to future climate conditions (site specific) 20) No planting within low and moderate severity areas 21) No new roads, including temporary roads 22) Return fire as an ecological force in forested landscapes; and 23) Avoid salvaging areas of burned forests adjacent to unburned forests. Finally, it cannot be stressed enough it is critical we work together to return fire to it's rightful place on the landscape, and any project proposed which does not include this component is contrary to our past, present and future management vision and practice. Baker, M. A. 1981. The Ethnobotany of the Yurok, Tolowa, and Karok Indians of Northwest California. Master Thesis. Humboldt State University	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation. These comments are being addressed through on-going tribal consultation. Also see response to comment number 12364-1.

Code	Comment Number	Comment Text	Response
282.03 - Cultural, Hist., Anthro. Resources	#18878-97	Klamath National Forest from the Region 5 Programmatic Agreement as a result of repeated abuses of the PA' s protocol. The THPO recognizes the benefit of a Programmatic Agreement to an agency, but believes that trust is an essential yet missing component of such an agreement. The THPO underscores the Cultural Resource Report statement that the disclosure of locations and character of historic or archaeological resources may open the resources to a risk of harm, theft, or destruction. The DEIS continues, "Therefore, discussion of the effects of this project is generalized to types of historic properties and cultural resources rather than individual properties or resources. Project design features are sufficient to protect the resources while not disclosing their locations. Management and/or SRPMs are prescribed at the individual property or resource level and are documented in the Archaeological Survey Report for this project (R2014-05-05-2188-0)." While the THPO agrees that this language is appropriate for an EIS, which is a public document, these statements do not apply to consultation and coordination with the Karuk Tribe, where the timely, specific, and full disclosure of site records, surveys and other related information is required to be shared. In the absence of such, the THPO is unable to concur with the finding that "project design features are sufficient to protect the resources." Accordingly, the THPO requests the site records and the Archaeological Survey Report (R2014-05-05-2188-0) referenced above. The THPO office has reviewed the Standard Protection Measures (SPM) specified in the Region 5 PA, which states that Indian Tribes shall be consulted regarding SPMs. The Karuk THPO would welcome such consultation regarding SPMs. While we are encouraged by the inclusion of additional SPMs in the WFR PA, they do not apply to "prehistoric "or more properly, "pre-contact" sites. SPMs form a central part of Section 106 clearance and should be used with discretion to safeguard historic properties rather than to justify a finding of No Adverse Effect. The Forest Service's ability to make an expedited ineligible determination under the WFR PA, as per the Region 5 PA stipulation 7.7(c), is subject to the consent of Indian Tribes. The Section 106 implementation guidelines, 36 CFR 800.4 (c)(2) state that "If an Indian Tribe ... that attaches religious and cultural significance to a property off tribal lands does not agree, it may ask the Council to request the agency official to obtain a determination of eligibility." While this provision is reassuring, it is entirely contingent on timely notification and full disclosure of relevant information to the Tribe.	Records for sites within Karuk territory have been provided; survey findings within Karuk territory will be shared at consultation meetings and the final report provided after surveys are completed. Project design features for protecting cultural resources were shared with the Karuk in January and input requested. Tribal consultation is on-going.

Code	Comment Number	Comment Text	Response
282.03 - Cultural, Hist., Anthro. Resources	#18878-98	The THPO is likewise concerned that a lack of specificity concerning sites or properties may result in significant adverse effects to potentially eligible properties, especially without meaningful consultation or oversight. As stated under Analysis Indicators, at-risk properties are significant, retain integrity and have been identified as being susceptible to adverse effects by specific undertaking activities. While we agree that pre-contact sites may be in danger from such practices as the making of skid roads, landing areas, and heavy equipment staging, we also believe that many of these sites remain unidentified. The Cultural Resources Report reveals that there are 159 recorded sites within the Area of Potential Effect. However, there is no specification of the proportion of pre-contact and post-contact sites. The Draft EIS states that there are no designated TCPs or Sacred Sites located within the proposed project area. However, the implementation guidelines to section 106 (36 CFR 800) make clear that the requirement for historic properties applies to properties eligible for inclusion on the National Register of Historic Places. While there are a number of Karuk sacred sites or TCPs that have been listed or determined eligible for listing on the National 17 of 22 Register, it is important to understand that each of these nominations came about in response to a specific threat to the property. Therefore, having no listed properties within the APE should not be interpreted to mean that there are no significant properties present within the APE. In point of fact, the sheer size and scope of the WFR Project tends to reinforce our belief that the likelihood of eligible properties existing within the APE is actually quite high. Likewise, it is important to remember that in the case of Sacred Sites or TCPs the guidelines do not empower the agency to make eligibility determinations; these are judgments made only by the Tribe. The THPO is concerned by the statement in the DEIS that: "Approximately 75% of the Area of Potential Effect has never been surveyed for historic properties, though about 80% of this area has slopes greater than 30 percent." Taken at face value, this would mean that 25% of the APE has been surveyed. This later number seems unbelievably high, and we would appreciate any additional information you can provide relative to the methods used to determine this number. Additionally, the reference to 80% of the area having slopes greater than 30% needs further elaboration i.e. what does this mean? We assume that this reference is related to survey protocols found in the Region 5 PA which allow the agency to forego surveys in areas with greater than 30% slope. If our assumption is correct, we must once again reiterate our long standing objection to the use of this survey protocol within Karuk territory. While one would clearly expect a much greater density or concentration of historic sites and properties in the immediate vicinity of permanent occupation sites located along river valleys and tributary streams, evidence of intensive Karuk use, past and present, is found across the landscape within the project area. The DEIS includes a somewhat brief outline of Tribal use of the landscape under Affected Environment. This brief treatment serves to perpetuate the long held myth of indigenous peoples as passive hunter gathers. Karuk people have actively managed a diversity of natural resources across the landscape for thousands of years. The widespread use of low intensity fire to promote and rejuvenate a wide variety of plant resources and facilitate the exploitation of various fish and wildlife resources is well established in our oral history. The development of complex and intricate ceremonial systems and ritual practices associated with important Karuk population centers such as Inaam, Katimiin, Tishaniik, Ameekyaaraam, and Vunxarak are widely known. Less known are the inextricable linkages that exist across the landscape connecting these population centers and specific high country areas. Karuk people traditionally made use of ridgelines for trails; meadows for harvesting plant and wildlife resources; slopes for gathering various nuts, berries, fungi, and other food and medicinal plant resources; watercourses of all sizes including high mountain springs and streams were utilized for harvesting and gathering various aquatic and terrestrial resources; established both permanent and seasonal occupation sites; conducted religious ceremonies, as well as personal quests for power and wisdom - often on slopes greater than 30%	The Klamath is complying with all cultural resource laws and tribal consultation is on-going. Efforts to identify historic properties and cultural resources will be completed prior to project implementation, and any identified historic properties/cultural resources will be protected by project design features and/or Standard Resource Protection Measures. Following tribal consultation, survey strategies for Karuk ancestral territory were expanded to include areas up to 45% when contiguous with areas up to 30%; the efficacy of this strategy will be checked periodically and adjusted accordingly. High probability land forms and random samples have always been included in the forest survey strategy.

Code	Comment Number	Comment Text	Response
282.03 - Cultural, Hist., Anthro. Resources	#18894-2	The project area is culturally and spiritually important to Tribes and Tribal Consultation is an important component of the decision-making process associated with the project. We encourage the Forest Service to continue meaningful consultation throughout the NEPA process, with all potentially affected tribal governments. We recommend that the results of consultations with tribal governments and with the Tribal Historic Preservation Office/State Historic Preservation Office be inbluded in the FEIS. EPA has rated the DEIS and preferred alternative 2 as Lack of Objections-LO (see enclosed "Summary of Rating Definitions"). We support the best management practices and resource protection measures included in the project design. We recommend that the FEIS incorporate the additional measures and information specified above.	We agree that tribes and tribal consultation are an important part of the decision-making process. The Klamath National Forest is consulting and conferring with all tribes with ties to the project area and will continue to do so through project implementation. A summary of consultation will be provided in the final EIS. Tribal consultation is ongoing.
282.03 - Cultural, Hist., Anthro. Resources	#18909-104	The project has the potential to affect 159 previously recorded historic properties and an unknown number of unrecorded historic properties and cultural resources. The project area is within Karuk Ancestral Territory. The DEIS does not consider numerous culturally significant trees, plants or animals as required for cultural botanical resources nor does it consider or incorporate Traditional Ecological Knowledge.	Historic properties and any identified culturally significant resources will be protected from project activities through project design features and/or Standard Resource Protection Measures' see Chapter 2 of the EIS. Specialists did analyze for identified resources (see Chapter 3 of the final EIS).
282.03 - Cultural, Hist., Anthro. Resources	#18909-106	We are concerned that the Karuk Tribe was not mentioned in the social environment for consideration. Although this may be a formality, the cut and paste nature of the document seems to reflect the actions of KNF leadership. The American Indian population is a greater percentage of the population in Siskiyou County than in the State of California; therefore, potential impacts of management actions on the American Indian population will be disclosed. DEIS page 253. Looking at effects of the no action alternative the DEIS at page 253 states: "The lifestyles, values and beliefs of the people in Siskiyou County will not be changed and the wish that resources of the Forest be used to benefit local residents will not be fulfilled." Looking at direct social effects of Alternative 2 at page 257: "The lifestyles, values and beliefs of the people in Siskiyou County will include some fulfillment of the desire that resources of the Forest be used to benefit local residents. The concern regarding the fire-safe character of the communities will be addressed through fuels treatments on ridges and near communities." The DEIS does not take into consideration the lifestyles, values and beliefs of the native people. The document does not define 'resources'. It does not appear the cultural resources were considered. Further, as supported throughout these comments the project as proposed would threaten the fire-safe character of the communities. The DEIS states that the potential impacts to the American Indian population will be disclosed, however the only statement we found was "there will be no disproportionate effects on American Indians or the poor'. The KNF has a responsibility and an opportunity to work with the tribe in their ancestral territory.	The social environment is described in the categories used by the U.S. Census; therefore, the description is of American Indians and Alaska Natives as a whole. The social environment section has been expanded to reference other sections of this Chapter that disclose the effects of the project on tribal traditional use areas and cultural plant collecting areas. The Karuk and other tribes are included in the discussion of the affected environment for in the cultural resources section of Chapter 3 of the final EIS. Effects on identified culturally important resources have been analyzed as required under law and are reported on in that section of Chapter 3 of the final EIS. The Klamath National Forest is consulting and federally recognized tribes with ties to the project area and will continue to do so through project implementation as noted in Chapters 1 and 4 of the final EIS.

Code	Comment Number	Comment Text	Response
282.03 - Cultural, Hist., Anthro. Resources	#3678-26	Cultural Resources – No Action direct and indirect effects "There would be no direct effects to archaeological sites because no management actions would be implemented. However, there would also be no actions taken in the project area to reduce fuels or fire-weakened trees from within and around archaeological sites. Tree-mortality, such as that resulting from wildfires, puts historic properties and cultural resources at risk. When trees are left to fall naturally, these trees may damage or destroy site features or displace the same when uprooting (e.g. rock walls, house pits). The effects of tree fall are often compounded by erosion which can bury or displace cultural deposits, fuel loading if left on the ground (see below), and accelerated decay as previously unexposed surfaces become exposed. Lack of road roadside hazard treatments may also affect linear resources through erosion, and blowouts where culverts are plugged creating negative effects to morphological features. Therefore, a possible indirect adverse effect resulting from alternative 1 is the continued risk of damage to sites from wildfire, tree fall and erosion. At particular risk are large scale historic mining sites (tens to hundreds of acres) consisting primarily of earthen and rock features (e.g. hydraulic headwalls, ditches, raceways, waste-rock piles, processed sediment deposits, roads, etc.). The indirect, short-term effects to archeological resources would be negligible but indirect, long-term effects would be moderate to major."	This comment was written by the interdisciplinary team specialist for the project and quoted in the comment letter. No response required.
282.05 - Justice	#18872-13	The environmental lawsuits filed to stop safe forest and River practices are in violation of the Sovereignty of the Shasta Nation. As a Sovereign power existing before the Constitution of the United States with the power to form a Tribal Government and a Court of Law. Being Federally Recognized Corporation to receive federal funding is not a prerequisite	Issues of sovereignty, court proceedings and federal funding of tribes are outside the scope of this project's National Environmental Policy Act analysis. The Klamath National Forest is continuing to consult and confer with all tribes with ties to the project area and will continue to do so through project implementation.
282.05 - Justice	#18872-14	The environmental lawsuits filed to stop safe forest and River practices are in violation of the Sovereignty of the Shasta Nation. As a Sovereign power existing before the Constitution of the United States with the power to form a Tribal Government and a Court of Law. Being Federally Recognized Corporation to receive federal funding is not a prerequisite	See response to comment number 18872-13.
282.05 - Justice	#18872-16	The Shasta Nation has retained Unextinguished Indian land title to all of the Westside Fire Recovery Project area, on the Salmon, Klamath and Scott Rivers. Any Tribal logging or considerations thereof will be of or by the Shasta Nation. The Shasta Nation is A Sovereign entity, our Sovereignty is above that of a Corporation status, or sub corporations, Karuk Tribe of California Inc., Karuk Tribe Inc.Other Tribes may comment as a courtesy, but not as a lawful Sovereign entity.	Issues of tribal sovereignty are outside the scope of this project's National Environmental Policy Act analysis. The Klamath National Forest is continuing to consult and confer with all tribes with ties to the project area and will continue to do so through project implementation. Logging will be conducted through a bid system.
282.05 - Justice	#18870-3	I support the Karuk alternative.	Thank you for your comments on the Westside Fire Recovery Project. This comment reflects the opinion of the commenter. Comments that state a position for or against a specific action are appreciated as this gives the Responsible Official a sense of views and beliefs about a proposed course of action. While such information can be used by the decision maker in arriving at a decision, it cannot be used to improve the environmental analysis or documentation.

United States
Department of
Agriculture

Forest
Service

R5-MB-287

July 2015

Final Environmental Impact Statement

Westside Fire Recovery Project
Volume III – Appendices C through H

Happy Camp Oak Knoll and Salmon/Scott River Ranger Districts,
Klamath National Forest
Siskiyou County, California

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Westside Fire Recovery Project

Klamath National Forest

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Appendix C: Actions Considered for Cumulative Effects

Current and future foreseeable actions considered for analysis within the twenty-nine 6th field watersheds (Table C-1) that intersect the Westside Fire Recovery Project boundary are listed below. Actions considered for cumulative effects can vary by resource. See chapter 3 for details. Ongoing and future foreseeable actions are discussed in separate sections. The stage of each project is listed in parenthesis. For the purpose of this project, it is assumed that private Timber Harvest Plans (THPs) submitted between 2010 and the present are still on-going and will be analyzed under cumulative effects; THPs submitted prior to 2010 are considered past actions. Additionally, to account for current year salvage projects on private property under cumulative effects analyses, it is assumed that all private lands burned at moderate to high severities are or will be salvage logged.

Table C-1: The twenty-nine 6th field watersheds that intersect the Westside Fire Recovery Project boundary separated by fire area subpart.

Subpart	6th Field Watershed	
A - Beaver	McKinney Creek – Klamath River	Hungry Creek – Beaver Creek
	Horse Creek	West Fork Beaver Creek
	Kohl Creek – Klamath River	Little Humbug Creek – Klamath River
	Empire Creek – Klamath River	Dutch Creek – Beaver Creek
B – Happy Camp Complex	Scott Bar – Scott River	Lower Indian Creek
	Bittenbender Creek – Klamath River	Grider Creek
	Canyon Creek	Upper Elk Creek
	Kelsey Creek	Lower Elk Creek
	East Fork Elk Creek	Oak Flat Creek – Klamath River
	Kohl Creek – Klamath River	Tompkins Creek – Scott River
	Seiad Creek	China Creek – Klamath River
C - Whites	Whites Gulch – North Fork Salmon River	South Russian Creek
	Little North Fork Salmon River	Sugar Creek – Scott River
	French Creek	North Russian Creek
	Main East Fork South Fork Salmon River	Yellow Dog Creek – North Fork Salmon River

On-going Actions (Klamath National Forest)

Project Area A: Beaver Fire

Fish Meadow Restoration Project:

This project is located in Siskiyou County, California, within Township 47 North, Range 10 West, Sections 32-33, Mount Diablo Meridian.

The purpose of this project is to promote growth and vigor of oaks, reduce conifer encroachment on fish meadow, improve wildlife habitat, and reduce the likelihood of future high intensity wildfire and pine mortality from pine beetle outbreaks. Treatments

include thinning of small, understory trees, piling, and pile burning. Additionally, the project area will be under-burned.

Johnny O'Neil Late Successional Reserve Habitat Restoration and Fuels Reduction Project:
This project is located north of Horse Creek, Hamburg, and Seiad Valley, in Siskiyou County, California, within Township 47 North, Range 11 West, Sections 15, 22-27; Township 47 North, Range 10 West, Sections 20 and 30; Township 46 North, Range 11 West, Sections 1-3 and 10-15; and Township 46 North, Range 10 West, Sections 6 and 18, Mt. Diablo Meridian.

This project proposes to retain and promote the development of late-successional habitat and reduce the risk of large, high severity wildfires to move toward more ecologically resilient conditions on approximately 7,280 acres of the Johnny O'Neil Late Successional Reserve. Proposed treatments include a combination of under-burning, mastication and thinning of small trees, and thinning of larger trees using variable density thinning techniques.

Singleton Project:
This project is located near Scott Bar, in Siskiyou County, California, within Township 45 North, Range 9 west, Section 10, 16, 18, 20, 32; Township 45 North, Range 10 West, Section 24, 26, Mount Diablo Meridian.

The purpose of this project is to promote late-successional and old-growth habitat, increase the resiliency of mid-seral vegetation, and to promote connectivity between late-successional reserves. Proposed treatments include commercial thinning, non-commercial thinning, under-burning, roadside fuels reduction, maintenance of existing fuels breaks, and creation of new fuel breaks.

Thom-Seider Vegetation Management and Fuel Reduction Project:
This project is located in between Hamburg and Happy Camp, in Siskiyou County, California within Township (T)16N, Range (R) 7E, Sections 1, 2, 11-14 and 24; T17N, R7 E., Sections 1, 2, 11-13, 24, 25, 35, and 36; T18N, R7E, Sections 1-3, 10-15, 22-26, 35 and 36; T19N, R7E, Sections 33-36; T16N, R8E, Sections 4-6, 7-9, 15-18, 19-20 and 28-30; T17N, R8E, Sections 4-6, 7-9, 16-21, and 28-33; T18N, R8E, Sections 7-9, 16-21, and 28-33; Humboldt Meridian. T45N, R10W, Sections 6 and 7; T46N, R10W, Sections 19, 29,and 30-32; T45N, R11W, Sections 1-18; T46N, R11W, Sections 3-10 and 13-36; T47N, R11W, Sections 7-10, 15-22, and 27-34; T45N, R12W, Sections 1-21; T46N, R12W, Sections 1-36; T47N, R12W, Section 7, 8, and 13-36; Mount Diablo Meridian.

The project is intended to reduce the potential for high-severity wildland fires to harm people private and public land, and older forest habitats by responding to the increasing density and fuels hazard evident along the Klamath River between Hamburg and Happy Camp, California. Treatments include thinning and understory burning on 29,300 acres within and adjacent to the wildland urban interface.

Project Area B: Happy Camp Complex

Elk Thin Project:

This project is located in the Happy Camp Ranger District of the Klamath National Forest, in Siskiyou County, California. The legal location is various sections in T15-16N, R7-8E, Humboldt Meridian. The purpose and need is to : 1) provide a programmed, non-declining flow of timber products, sustainable through time; 2) Maintain conifer stocking levels and high growth rates commensurate with the capability of the site to produce wood fiber; 3) Manage stands to maintain vigor and resilience to disturbances such as wildfire, insects and disease; and 4) Provide for defense of life and property, maintain water quality in the Happy Camp municipal watershed, and protect suitable habitat for federally listed threatened and endangered species.

Treatments include light thinning and under-burning on 910 acres, and roadside hazard tree removal along two miles of National Forest System Roads.

Goff Fire Fuels Reduction Project (Implementation):

This project is located near the community of Seiad Valley, in Siskiyou County, California, within Township 46, Range 12 West Section 1-4, 10-11; Township 47 North, Range 11 West, Section 20, 28-29, 31-33; Township 47 North, Range 12 West, Section 32-36, Mount Diablo Meridian.

The purpose of this project is to reduce fuels within the wildland urban interface affected by the Goff fire. Proposed treatments include the removal of fire damaged trees, non-commercial thinning, chipping, mastication, piling and pile burning.

Grider Creek Campground Hazard Tree Project:

This project is located 5 miles southeast of Seiad Valley, in Siskiyou County, California, within Township 45 North, Range 12 West, Section27, Mount Diablo Meridian.

The purpose of this project is safety to the public within an administration/recreation site after the 2014 wildfire went through the campground. Proposed treatments cut, bucked, limbed, and moved 10-20 hazardous trees.

Happy Camp Fire Protection Project, Phase 2:

This project is located within the Happy Camp Community “defense zone” (within ¼ mile of private property) and the “threat zone” (within approximately 1½ mile of private property), in Siskiyou County, California.

The purpose of this project is to reduce the threat of catastrophic wildfire to the community of Happy Camp by reducing hazardous fuels adjacent to or within 1½ miles of improved private land, and also provide a fuel-break along a strategic ridge that would connect to the road system surrounding the community. Treatments include 221 acres of commercial thinning, 101 acres of pre-commercial thinning, 748 acres of under-burning, and the creation of a 54 acre fuel break from Highway 96 toward Cade Mountain

Johnny O’Neil Late Successional Reserve Habitat Restoration and Fuels Reduction Project:

Described above.

Lake Mountain Foxtail Pine Botanical Special Interest Area:
This project is located near the community of Hamburg, in Siskiyou County, California, within Township 45 North, Range 11 West, Section 17, Mount Diablo Meridian. The project includes pile burning, which is complete, and foxtail pine planting planned for spring 2015.

The purpose of this project is to restore the existing stand of Foxtail pine and promote the continued growth of Foxtail pine within the Lake Mountain Botanical Special Interest Area. Treatments include the hand-thinning, piling and pile burning of conifers (mostly red fire and Doug fir) less than 10 inches DBH on approximately 37 acres within the Lake Mountain Botanical Special Interest Area.

Lower Scott Roads Maintenance and Stormproofing Project:
This project is located throughout the Lower Scott River Watershed (5th field), in Siskiyou County, California

The purpose of this project is to stormproof 40.4 miles of road in the lower Scott river 5th field watershed. Storm-proofing consists of improving road drainage to protect the road surface and upgrading stream crossings to reduce the maintenance needs and protect riparian and stream ecosystems. About 2.05 miles of road will be placed in hydrologic storage, and about 56.95 miles of road will undergo road maintenance work including improving drainage and upgrading road surfaces to reduce sediment delivery to stream systems. The project also added 26 miles of non-system roads to the road system to provide better maintenance of the road in the future.

Mill Luther Watershed Restoration Project:
This Project is located on roads throughout the Indian Creek 5th –field watershed, north of Happy Camp, in Siskiyou Country, California.

The projects purpose and need is to protect water quality and fish habitat in the Indian Creek watershed by: 1) reducing the risk of channel/road crossings failing during large storm events; 2) reducing the amount of fine sediment within the road prism, if a failure should occur and 3) reduce the miles of Forest Service system roads to match projected declining road maintenance dollars.

The project would decommission a total of 9.5 miles of NFTS roads, stormproof a total of 90.3 miles of NFTS roads, put 6 miles of NFTS roads into self-maintaining storage and convert 1.8 miles of road into a Forest trail.

Oak Flat Thin Project:
This project is located in Siskiyou County, California within Township 17 North, range 6 east, Section 2, 11; Township 16 North, Range 6 East, Section 25, 36; Township 16 North, Range 7 east, Section 19, 28-32; Township 15 North, Range 7 East, Sections 5, 6, Humboldt Meridian.

The purpose of this project is maintaining stand health and resilience, provide a flow of timber products, restore fire to its natural role, and to protect and enhance conditions of late-successional reserves. Treatments include commercial thinning and subsequent fuels treatment on approximately 438 acres, and under-burning on an additional 570 acres outside of commercial thinning units.

Singleton Project: described above.

Thom-Seider Vegetation Management and Fuel Reduction Project: described above.

Two Bit Vegetation Management Project:
This project is located in Siskiyou County, California within Township 16 North, Range 6 East, Section 1-4, 10-11; Township 16 North, Range 7 East, Sections 5-6; Township 17 North, Range 6 East, Sections 1-4, 9-16, 21-28, 33-36; Township 17 North, Range 7 East, Sections 2-36, Township 18 North, Range 6 east, Sections 1-5, 8-17, 19-30, 32-36; Township 18 North, Range 7 East, Sections 3-20, 15-22, 26-35; Township 19 North, Range 6 East, Sections 32-36, Township 19 North, Range 7 East, Sections 31-33, Humboldt Meridian; and Township 41 South Range 6 West, Sections 7-9, 15-18; Township 41 South, Range 7 West, Sections 12-15, Willamette Meridian.

The purpose of this project is to sustain diverse, fire-resilient ecosystems and a functioning forest and watershed while providing a flow of timber products on about 9,530 acres of National Forest System land. Treatments include 1, 980 acres of thinning, 140 acres of specialized treatments (pole harvest, sanitation thinning, and hardwood release), 160 acres of meadow enhancement treatments, and prescribed under-burns on 7, 250 acres. . In addition, this project will decommission approximately 4.1 miles of National Forest Transportation Systems roads.

Project Area C: Whites Fire

Eddy Late Successional Reserve Project (Implementation):
The Eddy LSR project is located in Siskiyou County, California within various sections of Townships 38, 39, 40, and 41 North, Ranges, 10, 11, and 12 West, Mount Diablo Meridian.

The purpose of this project is to protect late-successional habitat used by the Northern Spotted Owl and other late-successional dependent species, to protect communities, and to create safer emergency access routes. Two objectives were developed for the project based on current conditions (1) habitat protection and (2) community protection. The selected alternative will treat 25, 969 acres in order to protect late-successional habitat and communities. Within those acres, 16 Fuel Reduction Zones (FRZs), totaling 8,291 acres, will be constructed to increase resistance to the spread of wildfires, 17,524 acres of Prescribed Burn treatments will occur to increase resiliency to wildfires and protect habitat, and 60 miles of Roadside (RS) treatments along emergency access routes will be conducted.

Glassups Timber Sale (Implementation):
This project is located in Siskiyou County, California within Township 40 North, Range 12 West, Sections 25, 35, 36; Township 40 North, Range 11 West, Sections 18 and 19; Township 39 North, Range 12 West, Sections 11 and 12; Township 40 North, Range 11 West, Sections 29-33, Mount Diablo Meridian. In the project, 206 acres of under burning remain to be completed. These treatments are follow-up activity fuels treatments from the Glassups Timber Sale in 2000.

Petersburg Pine Restoration Project:
This project is located near the community of Cecilville, in Siskiyou County, California, within Township 37 North, range 11 West, Section 3-12, 14-18; Township 38 North, Range 25 West, Section 25, Mount Diablo Meridian.

The purpose of this project is to reduce hazardous fuels in the Cecilville area, retain and reestablish forest ecological resilience, and improve wildlife habitat by implementing the Forest Elk management Strategy and meet the big game objectives of the Forest Plan. Proposed treatments include thinning, fuel reduction (fuels-breaks, roadside, and WUI), and under-burning activities on 7,350 acres.

Salmon Reforestation Project (Implementation):
This project is located near Sawyers Bar and Forks of the Salmon, in Siskiyou County, California, within Township 40 North, Range 11 West, Section 7-10, 15-21, and 30; Township 41 North, Range 12 West, Section 35; Township 40 North, Range 12 West, Section 10-24 and 27-31, Mount Diablo Meridian; Township 10 North, Range 8 East, Section 4-6 and 8-9; Township 11 North, Range 8 East Section 28 and 32-33, Humboldt Meridian.

The purpose of this project is to promote reforestation and reduce fuel loading in areas to be planted on National Forest System lands burned during the Salmon Complex (part of the Forks Complex). The proposed treatment is needed to facilitate establishment of forest cover and diversity within the burned plantations and natural stands and reduce the amount of hazardous fuels created by fire-related tree mortality. This project will maintain, protect and eventually restore conditions of late-successional and old growth forest ecosystems, which serve as habitat for associated organisms. Proposed treatments include approximately 395 acres of site preparation and planting and approximately 510 acres of planting only (including 340 acres of Salmon Salvage Project units and 170 acres of Inventoried Roadless Areas) for a total of 905 treated acres. The Salmon Salvage Project units are proposed to be planted regardless of the salvage harvest.

Salmon Salvage Project:
This project is located at T40N R11W S7-10, 15-21, 30; T41N R12W S35; T40N, R12W S 10-24 and 27-31, Mount Diablo Meridian; T10N R8E S 4-6 and 8-9; T11N R8E S28 and 32-33, Humboldt. The 14,779-acre project area is within the area burned by the Salmon Complex in 2014. The project is intended to abate hazard trees along the roads, salvage fire-damaged trees and to aid in reforestation of the area. The project will meet the purpose and need on about 1,240 acres by salvage logging (on about 270 acres) and removing roadside hazard trees (on about 973 acres along 23 miles of road).

Seiad Creek Legacy Roadbed Rehabilitation Project:
This project is located north of Seiad Valley, in Siskiyou County, California, within T 46N, R 11W, Sections 5, 7, and 8; T 47N, R 11W, Sections 18, 20, 27, 28, 32-34; and T 47N, R 12W, Sections 13, Mt Diablo Meridian.

The projects purpose and need is to: 1) improve the condition of the Seiad Creek watershed as defined in the USFS Watershed Condition Framework; 2) Repair legacy sediment sites to address sediment load allocations of the Klamath Stream Temperature

TMDL and conditions of the water board waiver and 3) maintain and restore the condition of Riparian Reserves and in steam aquatic habitat

Treatments include hydrologic stabilization of about 6 miles of existing roadbeds and maintenance of about 5 miles of NFTS roads needed to access the existing roadbeds.

South Taylor Roadside Hazard Project:
This project is located southwest of Callahan, in Siskiyou County, California within Township 38 North, Range 11 West, Sections 11-14, and 25 and Township 38 North, Range 10 West, Sections 2-4, 6-10, 15-17, 19, Mount Diablo Meridian.

The purpose of this project tis reduce threats to public safety along National Forest Transportation System roads open to public use within the Taylor late-successional reserve. Roadside hazard trees will be mitigated on approximately 23 miles of road along system roads 38N03, 38N04, 38N07, 38N10, and 38N14. Merchantable hazard trees will be felled and removed while non-merchantable trees will be felled and left on-site.

North Fork Roads Storm-proofing Project (Implementation):
This project is located in Siskiyou County, California within Township (T) 39N, Range (R) 10W, Sections 4, 5, and 8 Mount Diablo Meridian (MDM); T39N, R11W, Sections 3-6, 10, 11, 14, 15, and 16 MDM; T39N, R12W, Sections 7-12, and 16 MDM; T40N, R10W, Sections 8, 9, 14-16, 18-23, 29-30 MDM; T40N, R11W, Sections 7, 12-13, 18-19, 26, 29, 31-36, MDM; T40N, R12W, Sections 11-17, 24-26, and 34-36 MDM; T41N, R10W, Sections 20-21, and 28-29 MDM; T41N, R11W, Sections 31, and 35 MDM; T41N, R12W, Sections 26-27, and 35 MDM; T10N, R8E, Sections 6, and 16 Humboldt Meridian (HM); T11N, R8E, Sections 28, and 31 HM.

The purpose of this project is to reduce stream sedimentation originating from roads. Approximately 90.8 miles of roads (32 roads total), within the North Fork Salmon River watershed, were identified for storm-proofing. Storm-proofing may entail any or all of the following treatments: outslope road surface (3-5 percent), minimize road width, apply rock aggregate, add rolling dips, stabilize road prism landslides, upgrade stream crossing culverts, treat stream crossings to reduce fill, eliminate in-board ditches, and spot rocking.

Sugar Creek Watershed Improvement Project:
This project is located in Township 40 North, Range 8 West, Section 4 and Township 40 North, Range 9 West, Section 1-3, 9-11, 14-17, 20-21, 24, 26, 28-29, 32-34, Mount Diablo Meridian.

The purpose of this project is improve watershed condition and restore vegetative cover and natural stream shade in areas where shade has been reduced by roads, mines, and other human disturbances. Treatments include road work (storm-proofing, storage, and hydrological stabilization), rehabilitation of three mine sites, meadow rehabilitation, and gully stabilization.

Burned Area Emergency Response Work (On-going):
Burned Area Emergency Response (BAER) is currently underway. Implementation of BAER treatments for the Beaver, Happy Camp Complex, and Whites incidents must be

completed within one year of their respective containment dates. For the Beaver fire, approved treatments include protection of cultural sites, noxious weed detection and removal, and about road drainage treatments. For the Happy Camp Complex and Whites fire, approved treatments include protection of cultural sites, noxious weed detection and removal, trail safety and drainage treatments, and road drainage treatments. The Happy Camp Complex, Beaver Fire and Whites Fire BAER road packages include road drainage treatments on about 94 miles, 27 miles and 32 miles, respectively.

Livestock Grazing Allotment:
There are nine active livestock grazing allotments within the Westside Fire Recovery Project area.

Project Area A: Beaver Fire
East Beaver, Dry Lake and Horse Creek

Project Area B: Happy Camp Complex
Horse Creek, Lake Mountain, Marble Valley and Middle Tompkins

Project Area C: Whites Fire Fire
Etna Creek and South Russian

Allotments are managed using an Adaptive Management Strategy intended to move or maintain Forest resources toward desired condition and Forest plan objectives. Table C-2 provides the name, status, use period, and permitted number of cattle for each active livestock grazing allotment within the Project area.

Table C-2: Active Livestock Grazing Allotments within the Westside Fire Recovery Project area.

Allotment Name	Status	Use Period	Permitted Cattle (Pairs)	Notes
East Beaver	Active	April 1 - June 15	44	Includes number of animals permitted on private
		June 16 – Oct. 30	250	
Dry Lake	Active	April 15 - June 9	116	Includes number of animals permitted on private
		June 10 – Oct. 15	170	
Horse Creek	Active	April 15 – Oct. 15	101	Includes number of animals permitted on private
Lake Mountain	Active	July 15 – Oct. 15	25	Part of Lake Mountain Middle Tompkins On-going Project
Middle Tompkins	Vacant	NA	NA	Part of Lake Mountain Middle Tompkins On-going Project
Big Ridge	Active	July 15 – Oct. 15	120	Allotment is in Wilderness = No Project Activity Units
Marble Valley	Active	July 15 – Oct. 15	35	
Etna Creek	Active	July 15 – Oct.15	54	Includes number of animals permitted on private
South Russian	Active	July 15 – Oct. 15	40	

On-going Actions (Private)

Non-industrial Timber Harvest Management Plans: Grider Creek Land Company:

This Company has two non-industrial harvest management plans located within subpart B (Happy Camp Complex) of the Westside Fire Recovery Project area. One unit is 37 acres and is located in Township 46 North, Range 12 West, Section 10, 11, 14, 15, Mount Diablo Meridian. The second unit is 60.2 acres and is located in Township 46 North, Range 12 West, Section 11, 14, Mount Diablo Meridian

Timber Harvest Plans (THP):

Since 2010, 12 THP's have been submitted within the twenty-nine 6th field watersheds intersecting the Westside Fire Recovery Project area.

Project Area A: Beaver Fire
THP numbers: 27, 41, 50, 85, 87 and 90

Project Area B: Happy Camp Complex
THP numbers: 11, 17, 28, and 68

Project Area C: Whites Fire
THP numbers: 21 and 75

Table C-3 lists the year the THP was submitted, the THP number, timber owner, the acreage for which they have THP's in place and the 6th field watershed that they are located in.

Table C-3: Active Timber Harvest Plans within the Westside Fire Recovery Project area.

THP Year	THP #	6th Field Watershed	Timber Owner	Acres
2010	50	Hungry Creek-Beaver Creek	Fruit Growers Supply Co.	291.02
	68	Scott Bar-Scott River		928.95
2011	11	Scott Bar-Scott River		19.32
	21	French Creek	Donna and Arleigh Reynolds	99.63
	27	Dutch Creek-Beaver Creek	Fruit Growers Supply Co.	550.37
	85	Kohl Creek-Klamath River	Michigan California Timber Co	231.7
		Mckinney Creek-Klamath River		122.12
2012	87	Little Humbug Creek-Klamath River	Michigan California Timber Co	30.22
		Mckinney Creek-Klamath River		917.97
	90	Mckinney Creek-Klamath River		8.12
2013	41	Dutch Creek-Beaver Creek	Fruit Growers Supply Co.	600.89
		Little Humbug Creek-Klamath River		163.03
		Mckinney Creek-Klamath River		2473.69
	75	French Creek	Michigan California Timber Co	1505.43
2014	17	Lower Indian Creek	Northwest Skyline Logging	19.39
		Oak Flat Creek-Klamath River		70.35
	28	Scott Bar-Scott River	Dan Larivee	0.05

Emergency Timber Harvest Plans:

In order to account for current year salvage projects on private property, it is assumed that all private lands burned at moderate to high severities are being salvage logged.

Future Foreseeable Actions (Klamath National Forest)

Project Area A: Beaver Fire

Craggy Vegetation Management Project (In Development):

This Project is located in the Humbug Creek and Yreka Creek 6th field watersheds in Siskiyou County, California, within Township 46 North, Range 8 West, Sections 12, 23-28, 32-35; Township 45 North Range 8 West, Sections 1-17, 21-24; Township 46 North, Range 7 West, Sections 16-18, 20, 22, 28, 30, 32-34; and Township 45 North, Range 7 West, Sections 3-5, 8-9, 17-20, Mount Diablo Meridian.

The purpose of this project is to protect communities and promote forest health on approximately 5,000 acres. Planned treatments include fuels reduction, vegetation management, and improvement to deer winter range habitat.

East End Vegetation Management Project (Planning-On Hold):

This project is located in the Beaver Creek watershed, Siskiyou County, California, in Township 48 North, Range 8 West, Sections 22, 23, 26, and 27, Mount Diablo Meridian.

The purpose of the project is to reduce stand density, promote structural and species diversity, and promote resiliency to large-scale disturbances. Treatments are proposed on approximately 1,200 acres and consist of commercial and non-commercial thinning with subsequent fuels treatments. A Proposal for this project is currently being developed, and an EIS is expected.

McCollins Late Successional Reserve Habitat Restoration Project (Planning):

The McCollins LSR Enhancement project is located east of Horse Creek, in Siskiyou County, California in Township 46 North, Range 9 West, Sections 9, 10, 15-22, 27-33; and Township 46 North, Range 10 West, Sections 13, 21-28, and 32-36, Mount Diablo Meridian.

The purpose of the project is to (1) promote the continued development and retention of Late Successional Old Growth conditions; (2) promote resilience of early-and mid- seral vegetation to large-scale disturbance events such as wildfire or insects and disease; (3) restore and maintain pine/oak forest type, oak woodlands, and wildlife habitat; and (4) reduce wildfire threat and potential fire intensity within the WUI, especially surrounding private residences and structures. Treatments are proposed on approximately 2,700 acres and consist of commercial and non-commercial thinning, and the subsequent pilling and burning of activity generated fuels.

Project Area B: Happy Camp Complex

Scott Bar Mountain Underburn and Habitat Improvement Project (Under Analysis):

This project is located west of Fort Jones, in Siskiyou County, California, within Township 44 North, Range 11 West, Sections 14, 15, 22-27, Mount Diablo Meridian.

The purpose of this project is to reduce hazardous fuel loading, maintain currently acceptable fuel loadings, improve wildfire defensibility, enhance foraging habitat for deer and turkey, and protect Scott Mountain salamander habitat. The proposed action will treat approximately 1,660 acres within the 1,960 acre project boundary. Treatments include 1,660 acres of under-burning to reduce encroachment in openings and meadows, and the creation of a 1.5 mile shaded fuel break along lower portions of western and eastern private boundary flanks and southern private land boundaries.

Elk Creek Watershed Condition Framework Project (In Development):
This project is located within the Elk Creek 5th –field watershed south of Happy Camp in Siskiyou County, California. The purpose and need and proposed actions are currently being developed. The Elk Creek watershed was recently selected as the Happy Camp Oak Knoll Districts priority watershed under the USFS Watershed Condition Framework. The project will be an integrated resource management project likely including fuels treatments, commercial and non-commercial thinning, meadow restoration and transportation management actions.

Lake Mountain and Middle Tompkins Grazing Allotment Management Plan Project (Under Analysis):
This project is located near Lake Mountain and Tom Martin Peak, in Siskiyou County, California, within Township 44 North, Range 11 West, Sections 3-10, and 16-18; Township 44 North, Range 12 West, Sections 1, 12, and 13; Township 45 North, Range 11 West, Sections 2-5, 8-11, 14-18, 19-23, and 26-34; Township 45 North, Range 12 West, Section 25 and 36; and Township 46 North, Range 11 West, Section 17, 20, 21, 26-29, and 32-36, Mount Diablo Meridian.

The proposed project authorizes grazing permits for 10 years under an Adaptive Management Strategy and updates Allotment Management Plans (AMPs) for the Lake Mountain and Middle Tompkins allotments. The project includes redevelopment of Lookout Spring in the Lake Mountain Allotment with construction of a half-acre ex-closure around the springhead and seep, and the placement of a fence around the Faulkstein head-cut to prevent cattle from accessing unstable ground. Additionally, the project includes altering the Lake Mountain Allotment boundary by removing 4,697 acres, most of which are areas where suitable forage is severely limited and to increase Middle Tompkins Allotment by 2,034 acres, correcting a known boundary issue to include areas of historically utilized forage.

Lovers Canyon Project (Under Analysis):
This project is located west of Fort Jones, in Siskiyou County, California, within Township 44 North, Range 12 West, Section 25 and 36; Township 44 North, Range 11 West, Section 19, 21, 25-35; Township 43 North, Range 12 West, Section 1; Township 43 North, Range 11 West, Section 2-8, Mount Diablo Meridian.

The purposed of this project is to improve forest health and diversity, improve threatened and endangered species habitat, implement objectives of the Lower Scott River Fire Safe

Council Community Wildfire Protection Plan, and provide commodity outputs. The project will treat approximately 2,700 acres within the 11,810 acre project boundary. Proposed treatments include 2,400 acres of thinning; 190 acres of created fuel breaks; removal of hazard trees along National Forest System roads, county roads, campgrounds, and other high use recreation areas within the project boundary; and prescribed burning.

Forest Service Funded Projects on Private Land

One Forest Service funded project on private land will be implemented within the Westside Fire Recovery project area in 2015-2016 with fuel reduction units of about 100 acres within the Happy Camp Fire Area in T46N, R10W, Section 31, and T46N, R12W, Sections 10, 11, 13, 14, and15 nearby the communities of Hamburg, CA and Seiad Valley, CA. Another Forest Service funded project on private land will be implemented within the Westside Fire Recovery project area in 2016-2017 to reduce fuels on about 80 acres around the community of Scott Bar, CA.

Project Area C: Whites Fire

Jess Project (Planning):

This project is located in Township 40 North, Range 12 West, Sections 23, 24, 26-28, and 34-36; Township 40 North, Range 11 West, Sections 28-33; Township 39 North, Range 12 West, Sections 1-4, and 9-12; and Township 39 North, Range 11 West, Sections 4-6, Mount Diablo Meridian.

The purpose of the project is to (1) manage fuel loadings to reduce the risk of wildfires affecting nearby communities; (2) improve compositional, structural, and functional, attributes of biological diverse forest ecosystems by restoring ecological processes that build resiliency to high-intensity wildfire and insect and disease infestation; and (3) provide a broad range of ecosystem services including wood products, rural economic health, biodiversity, and beneficial use of water. The preferred alternative will treat approximately 1, 960 acres including 810 acres of commercial timber harvest 140 acres of non-commercial treatments to increase growth and vigor in young plantations (includes 70 acres of hand piling of small diameter trees <9inches diameter at breast height and burning the piles, 60 acres of mastication, and 10 acres of meadow treatments), 185 acres of non-commercial ridgetop treatments to reduce fuels and improve defensibility of the area against wildfire(includes 85 acres of hand piling of small diameter trees < 9inches diameter at breast height and burning the piles, 70 acres of mastication intended to rearrange the fuels and reduce ladder fuels, and 30 acres in two fuel breaks that will be treated to remove small diameter trees and hazard trees), and 250 acres of under-burning.

Sawyers Bar Fuels Reduction Project:

Located at T40N R11W S20-22, 27-30. The project is a 2,600 acre underburn intended to reduce fuels near the community of Sawyers Bar, California.

Appendix D: Best Management Practices

Best Management Practices (BMPs) were developed to comply with Section 208 of the Clean Water Act. BMPs have been certified by the State Water Quality Resources Control Board and approved by the Environmental Protection Agency (EPA) as the most effective way of protecting water quality from impacts stemming from non-point sources of pollution. These practices have been applied to forest activities and have been found to be effective in protecting water quality within the Klamath National Forest (Forest). Specifically, effective application of the Region 5 Forest Service BMPs has been found to maintain water quality that is in conformance with the Water Quality Objectives in the North Coast Regional Water Quality Control Board's Basin Plan (http://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/).

Region 5 Forest Service BMPs have been monitored and modified since their original implementation in 1979 to make them more effective. Numerous on-site evaluations by the North Coast Region Water Quality Control Board have found the practices to be effective in maintaining water quality and protecting beneficial uses.

The Forest monitors the implementation and effectiveness of BMPs on randomly selected projects each year. From 2000 to 2012, BMP implementation requirement were met on 78-100 percent (91 percent average) of sites sampled, and BMP effectiveness requirements were met on 88-100 percent (94 percent average) of the sites sampled (USDA Forest Service, 2013c). The critical BMP evaluation is *effectiveness* which is a field evaluation to determine how well the BMP worked to prevent sedimentation. The success rate for effectiveness has been in the high 80s and 90s each year since 1993.

Best Management Practices first identified and utilized by the Klamath National Forest are listed in appendix D of the Forest Plan. These basic BMPs have been revised over the years, and are currently similar to those listed in the 2012 Region 5 BMP update in Chapter 10 of the Soil and Water Conservation Handbook, which additionally includes a narrative and objective of each (USDA USFS 2011); and where there are differences, direction is to employ the newer BMP list. The following 'on-the-ground' prescriptions below are incorporated into the project (see chapter 2 of draft EIS).

BMP 1.1 – Timber Sale Planning Process:

Requires the Interdisciplinary Team (interdisciplinary team) to consider methods of reducing water quality impacts during the planning phase of a project. This is accomplished during the planning process of the Timber Sale project.

- An interdisciplinary team review was completed and project design features have been incorporated into the project design (See Chapter 2 of the EIS).

BMP 1.2 – Timber Harvest Unit Design:

Requires the interdisciplinary team to consider methods of reducing water quality impacts due to changes in unit design. This is accomplished during the planning phase of a project. Examples of design changes are restricting timing of tree removal and utilizing less impacting yarding systems.

- An interdisciplinary team review was completed and project design features have been incorporated into the project design (See Chapter 2 of the EIS).

BMP 1.3 – Use of Erosion Hazard Rating for Unit Design:

Identifies high or very high erosion hazard areas and adjust management activities to prevent downstream water quality impacts; and to increase soil cover for those areas that have a high risk of contributing sediment into streams. This is done during the planning and layout phase of the project.

- Based on field review and site data (percent slope distribution, soil texture), the Forest Soil Scientist determined the surface erosion hazard rating for each treatment unit and prescribed logging systems and soil cover needs based on the erosion hazard rating.

BMP 1.4 – Use of Sale Area Maps for Designating Water Quality Protection:

Identifies sensitive areas and water uses as part of the Timber Sale contract to assist operators in locating water concerns and applying protection methods. This is accomplished during contract preparation and implemented during layout of the sale.

- The Sale Area Map will include all protected stream-courses, unstable land features, springs, wetlands, meadows, water drafting sites, landings, temporary roads, and logging system for each unit.

BMP 1.5 – Limiting Operating Period of Timber Sale:

To prevent soil compaction and erosion from operations during wet weather; and to ensure placement of erosion control structures prior to the onset of winter to reduce water quality impacts. This is accomplished during the timber sale operations.

- The project is proposed to take place during the normal operating season (NOS) that is defined as May 1 to October 31. All ground disturbing activities, whether inside or outside of the NOS, will be implemented according to the Forest's Wet Weather Operation Standards (Klamath National Forest, 2002).
- Areas where soil has been disturbed by project activities within Riparian Reserves must be stabilized prior to the end of the normal operating season, prior to sunset if the National Weather Service forecast is a "chance" (30 percent) of rain within the next 24 hours, or at the conclusion of the operations, whichever is sooner. This includes skid trails that cross swales (i.e. linear depressions perpendicular to the slope contour that do not meet definition for designation as a Riparian Reserve). Restoration generally consists of removing excess sediment, reshaping and waterbarring former approaches, and spreading slash on the former crossing.

BMP 1.6 – Protection of Unstable Lands:

Provides for special treatment of unstable areas to avoid triggering mass slope failure with resultant erosion and sedimentation.

- Tractors and mechanical harvesters will be excluded from all riparian reserves associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits. In Roadside hazard tree units the equipment will be restricted to the road surface.

- To limit slope disturbance, inner gorge terrain (greater than 65 percent slope) that extends beyond Riparian Reserves will be buffered by 20-foot slope distance and excluded from mechanical equipment activities. In areas where treatments may conflict, a hydrologist will be consulted.
- There will be no salvage logging on active landslides except for units 5, 23, 32, 39, 55, 56, 57, 59, 64, 226, 268, 406, 520, 524, 525, and 530 which have been field reviewed by the Forest Geologist (see Geology amendment for details on criteria for exceptions).
- Limit equipment disturbance within 20 feet on either side of swales by minimizing equipment crossings and avoiding running trails up the axis of swales, except at designated crossings.

BMP 1.8 – Streamside Management Zone Designation:

Designates zones adjacent to water and/or riparian areas as zones of special management. This is accomplished during the planning and layout phase of the project.

- Project Riparian Reserves are established in the following manner per the Forest Plan (site tree for Salmon and Happy Camp districts is 170 feet, site tree for Scott and Oak Knoll districts is 150 feet):
- For fish-bearing streams, it is the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream), whichever is greatest. For Salmon and Happy Camp ranger districts, this will be 340 feet (680 feet total).
- For permanently flowing nonfish-bearing streams, it is the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream), whichever is greatest. For Salmon and Happy Camp ranger districts, this will be 170 feet (340 feet total) and 150 feet for the Oak Knoll and Scott River Ranger District.
- For intermittent streams, , the stream channel and extending to the top of the inner gorge, or extension from the edges of the stream channel to a distance equal to the height of one site potential tree, or 100 feet slope distance, whichever is greatest. For unstable lands, it is the extent of unstable and potentially unstable areas.
- Consistent with Forest Plan direction, Riparian Reserves for wetlands and springs will be defined by the edge of the feature out to a distance equal to 1 site potential tree. These RRs will be flagged and avoided during salvage harvest.

BMP 1.9 – Determining Tractor Loggable Ground:

Minimize erosion and sedimentation resulting from ground disturbance of tractor logging systems.

- In salvage units and subsequent site preparation, skidding equipment will be restricted to slopes less than 35 percent. Skid trails that connect benches in dormant landslide terrain can have minor portions of the skid trails on slopes

greater than 35 percent. Ground-based equipment can travel up to 100 feet on slopes 35 to 45 percent.

- Site preparation treatments would be designed to meet soils management direction in the KNF Forest Plan. This may include use of low ground pressure equipment, retaining slash and large woody material and implementing hand treatments instead of mechanical. Site preparation will be used to reduce fuels where the sum of one hour, ten hour, and 100 hour fuels exceeds 7 tons per acre.

BMP 1.10 – Tractor Skidding Design:

Designates a tractor skid pattern over steepened areas, designates tractor crossings, and reduces skid patterns in sensitive areas to reduce erosion and compaction. This is accomplished during the sale layout and operations phase of the project.

- In salvage units and subsequent site preparation, skidding equipment will be restricted to slopes less than 35 percent. Skid trails that connect benches in dormant landslide terrain can have minor portions of the skid trails on slopes greater than 35 percent.
- In site preparation units (where no salvage will occur) mastication, felling, and skidding equipment will be restricted to slopes less than 35% on granitic and schist soil types, and up to 45% on all other soil types. Site preparation treatments in Riparian Reserves will be by hand only.
- Use existing skid trails instead of building new skid trails unless using existing skid trails will have greater negative effects. Space skid trails at least 75 feet apart, except near landings and where trails converge. Use no skid trails in areas in which ground-based mechanical equipment is excluded (Designation of new skid trails will be approved by a Timber Sale Administrator. Erosion and sedimentation control structure will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.
- No full bench skid trails will be constructed. Full bench skid trails have the entire skid trail cut into the hillslope.
- Locations where skid trails intersect roads will be obliterated or effectively blocked to vehicle access.

BMP 1.11 – Suspended Log Yarding in Timber Harvesting:

Protect the soil mantle from excessive disturbance; maintain the integrity of the Streamside Management Zone and other sensitive watershed areas, and to control erosion on cable corridors.

- Skyline corridors will be placed on the landscape as to minimize disturbance to active landslides, inner gorges and toe zones of dormant landslide deposits. All skyline and ground-based yarding will require one-end suspension in corridors and on skid trails. Corridors for skyline yarding that are parallel to the stream channel will be placed outside of the Riparian Reserve. The corridor may cross the stream channel with full suspension of logs within ten feet from the stream bank. Apply erosion control measures as necessary in cable corridors to control erosion and runoff. This could include hand construction of water bars and /or spreading slash from adjacent areas.

BMP 1.12 – Log Landing Location:

Locate new landings or reuse existing landings in such a way as to avoid watershed impacts and associated water quality degradation.

- See BMP 2.4
- Existing landings will be used to the extent possible. New landings in stream-course Riparian Reserves will not involve removing stream shade over perennial stream channels. For the six new landings in Riparian Reserve approved for use in this project, Forest Service watershed specialists will be involved in site specific decisions related to vegetation removal, drainage and erosion control, and hydrologic stabilization. Existing landings in stream-course Riparian Reserves will not be expanded towards stream channels, or on to active landslides, or where vegetation that provides shade to a stream would need to be cut. Existing landings in Riparian Reserves will be shaped and treated for erosion control at the end of each season of use, and hydrologically restored at project completion (including subsoiling and covering with slash/mulch as needed). Reused landings in Riparian Reserves will have site specific erosion control measures to reduce risk of sediment delivery into streams.
- During opening or construction of any landings, material will not be sidecast into intermittent or perennial stream channels.
- At project conclusion, landings will be configured for long-term drainage and stability by reestablishing natural runoff patterns. All landings will be covered with at least 50 percent effective soil cover. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient.

BMP 1.13 – Erosion Prevention and Control Measures During Timber Sale Operations:

Ensures that Purchasers operations shall be conducted reasonably to minimize soil erosion. This is accomplished during the pre-operations meeting with the purchaser, and throughout the operations phase of the timber sale.

- Erosion control measures are discussed during the pre-operations meeting with the purchaser and the Forest Service. They are updated throughout the operations phase of the timber sale.
- The Klamath Wet Weather Operation Standards (USDA Forest Service 2002) will be used for all project activities (harvest, hauling, planting).

BMP 1.16 – Log Landing Erosion Prevention and Control:

Works to reduce erosion and subsequent impacts sedimentation from log landings. Timber Sale Contract provide for erosion prevention and control measures on all landings. This is best done by design of landing drainage measures during the planning phase of the project, and implemented during the operations phase.

- See BMP 1.12.

BMP 1.17 – Erosion Control on Skid Trails:

Employs preventive measures such as drainage structures to reduce water concentration and erosion. This is accomplished during the operations phase of the project. Because of the timing of this project, pre-staging of straw bales for timely construction of water bars will be called for.

- Where skidding occurs through units with less than 50 percent soil cover, mulch skid trails of greater than 15 percent slope, to achieve at least 50 percent effective soil cover on skid trails (approximately 40 acres across the project area may require this). Effective soil cover could include plant litter, woody material in contact with the soil, living vegetation, and rock fragments with a diameter of ½ to 3 inches. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient.

BMP 1.18- Meadow Protection during Timber Harvest:

The objective is to avoid damage to ground cover, soil and hydrologic function of meadows.

- Equipment will be excluded from wetlands or wet meadows (excluding small springs and seeps).

BMP 1.19 – Streamcourse Protection:

Protects the natural flow of streams and reduces the entry of sediment and any other pollutants into streams. The location of stream crossings must be agreed to by the Sale Administrator and the Hydrologist. The accomplishment of the objective of this measure is during the operations phase of the project.

- Tractors and mechanical harvesters will be excluded from all Riparian Reserves associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits. In roadside hazard tree removal units, ground based equipment will be restricted to the road surface.
- To limit slope disturbance, inner gorge terrain (greater than 65 percent slope) that extends beyond Riparian Reserves will be buffered by 20-foot slope distance and excluded from mechanical equipment activities. In areas where treatments may conflict, a hydrologist will be consulted.
- All hazard trees cut within 25 feet of a stream channel or spring will be left on site unless it continues to pose a threat to safety or accessibility (see watershed-4 for equipment exclusion restrictions). Along all stream channels (perennial and intermittent), all hazard trees 26 inches in diameter at breast height and greater within the first site tree (150-170 feet) will be left on site unless after felling, it continues to pose a threat to safety, infrastructure, forest road drainage system integrity or accessibility.
- Any hazard tree (equal or greater than 26 inches) below a road that would contact a fish bearing stream channel if felled that direction will be retained on site.
- Live trees directly rooted into the banks or otherwise integral to the stability of the channel bank will not be felled unless they pose an overhead hazard and, if felled, will be left on site unless this poses a hazard on the ground per Forest Service safety requirements.
- Directional felling will be used to protect streambanks where hazard trees need to be mitigated for public or employee safety.

BMP 1.20 – Erosion Control Structure Maintenance:

Requires periodic inspection of erosion control structures to assess maintenance needs and effectiveness. This is accomplished during the operations and post-operations phase of the project; this ensures the adequacy of erosion control measures.

- Skid trail erosion control work will be kept current during implementation. Erosion control and drainage of skid trails will be complete prior to shutting down operations due to wet weather or at project completion.

BMP 1.21 – Acceptance of Erosion Control Measures Before Timber Sale Closure:

Erosion control measures are inspected for adequacy to ensure erosion control as planned. This is accomplished during the post-operations phase of the project during the contract final inspection.

- At project completion, permanent operating water bars will be installed and/or repaired as necessary on all skid trails, and slash scattered on all skid trails if necessary.
- The Timber Sale Administrator will inspect the Erosion Control Measures for compliance with contract.

BMP 2.4 – Road Maintenance and Operations (Temporary Roads):

The objective is to improve road slope stabilization by applying mechanical and vegetative measures. This is accomplished during the operations phase of the project.

- New temporary roads or landings will not be constructed in any Riparian Reserve associated with stream channels, on toe zones of landslides, active landslides or inner gorges. Exceptions for this project design feature for Alternative 2: Landings # DZ03, DZ10, DZ23, L043, L044, and L090. . For the six new landings in Riparian Reserve approved for use in this project, Forest Service watershed specialists will be involved in site specific decisions related to vegetation removal, drainage and erosion control, and hydrologic stabilization.
- Following harvest activities achieve at least 50 percent effective soil cover on new temporary roads (if it's available on site) and block them after the harvest season (prior to the first winter after use). Depending on soil texture and slope, new temporary roads will also be sub-soiled, tilled (or tilled, or roughed up) after use.
- All temporary roads (new, existing or re-opened decommissioned roads) will have the takeoffs from system road obliterated or blocked to avoid unauthorized use. All temporary roads will be hydrologically stabilized including removal of culverts and fills at stream crossings, out-sloping of road surfaces, and proper construction of water bars. Erosion and sedimentation control structures (water bars) will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.

BMP 2.4 – Road Maintenance and Operations (System Roads)

- Improvements to existing system roads in the project area will avoid over-steepened road cuts where possible, minimize sidecasting, and maintain ditches, cross drains, and any outsloped road segments.
- Roads will be watered as appropriate to maintain road fines on site. Other materials may be used for dust abatement as approved by the Forest Service.
- Upgrades or improvements to stream crossings will be built to Forest Plan standards.
- Activities which require culvert replacement or removal will occur during the least critical periods for water and aquatic resources: when streams are dry or during

low-water conditions; and in compliance with spawning and breeding season restrictions.

- Legacy sediment site treatments within or adjacent to streams will have erosion-prevention techniques applied such as silt fences, straw waddles, or mulch to minimize the risk of discharge. All project-related temporary structures, materials and project-related debris will be removed from riparian areas and stream channels prior to wet weather and winter shutdown.
- For legacy sediment site repairs, fill materials generated will be reincorporated back into subgrade to the extent possible; all excess fill materials will be spoiled at a site reviewed and approved by Forest Service botanist, watershed, and heritage specialists.

BMP 2.5 - Water Source Development Consistent with Water Quality Protection:

The objective is to limit and mitigate the effects of water source development through the planning of impoundments and withdrawals.

- Draft water only at sites designated by the Forest Service. Decisions related to where water drafting occurs will be coordinated with a Forest Service fisheries biologist so that potential impacts to anadromous fish, and the thermal refugia they rely upon, are sufficiently minimized.
- Sites that are not likely to have rearing Coho salmon present will be prioritized for use, such as mainstem sites on the Klamath, Scott, and Salmon rivers. Priority will also be given to sites that involve drafting relatively warmer waters in mainstem rivers; drafting from tributaries and colder water sources, especially in their lower reaches, will be avoided particularly during late summer and early fall (when fish survival is dependent upon thermal refugia). Water storage facilities such as foldable tanks are encouraged and will be assessed for sites with moderate flows that simultaneously support rearing SONCC coho salmon, and may be subject to high drafting use (e. g., Walker Creek). Project-related water drafting will be monitored, and shifted away from streams if their baseflows will no longer sustain drafting-related water withdrawal consistent with PDFs. The following creeks will be avoided, due to their small size, small summer base flows, and consistent presence of rearing SONCC Coho salmon - Tom Martin Cr, O'Neil Cr, Little Horse Cr, and China Cr.
- When drafting from waters designated as coho salmon Critical Habitat: NOAA Fisheries Water Drafting Specifications (2001) apply:
- Intakes will be screened with 3/32" mesh for rounded or square openings, or 1/16" mesh for slotted openings. When in habitat potentially occupied by steelhead trout, intakes will be screened with 1/8" mesh size. Wetted surface area of the screen or fish-exclusion device shall be proportional to the pump rate to ensure that water velocity at the screen surface does not exceed 0.33 feet/second.

    1. Use of a NOAA approved fish screen will ensure the above specifications are met.
    2. Fish screen will be placed parallel to flow.
    3. Pumping rate will not exceed 350 gallons-per-minute or 10 percent of the flow of the anadromous stream drafted from.
    4. Pumping will be terminated when tank is full.

5. Additional applicable specifications:
6. There will be no modification/improvement of drafting sites in Coho Critical Habitat.

- Water drafting by more than one truck shall not occur simultaneously.
- When drafting from waters that are not coho salmon Critical Habitat, Forest Service BMP 2.5 direction applies:

1. For fish-bearing streams, the water drafting rate should not exceed 350 gallons per minute for streamflow greater than or equal to 4.0 cubic feet per second (cfs).
2. Below 4.0 cfs, drafting rates should not exceed 20 percent of surface flows.
3. Water drafting should cease when bypass surface flows drop below 1.5 cfs.
4. Intakes, for trucks and tanks, shall be placed parallel to the flow of water and screened, with opening size consistent with the protection of aquatic species of interest.
5. Fish-bearing streams that are temporarily dammed to create a drafting pool shall provide fish passage for all life stages of fish.
6. For non-fish-bearing waters, drafting rate should not exceed 350 gallons per minute for stream flow greater than or equal to 2.0 cubic feet/second.
7. Drafting rate should not exceed 50 percent of surface flow.
8. Drafting should cease when bypass surface flow drops below ten gallons per minute.
9. Drafting by more than one truck shall not occur simultaneously.

- Rock and gravel will be applied to drafting sites if it is needed to prevent stream sedimentation.
- Water drafting sites located outside of Coho salmon Critical Habitat only may include minor instream modification, such as fine sediment removal and building of temporary dams with board/plastic. All board and plastic materials will be removed after use and prior to winter shutdown.

BMP 2.11 - Servicing and Refueling of Equipment:

Prevent fuels, lubricants, cleaners, and other harmful materials from discharging into nearby surface waters or infiltrating through soils to contaminate groundwater resources.

- Refueling will not take place within Riparian Reserves except at designated landings in locations where most disconnected from water resources. A spill containment kit will be in place where refueling and servicing take place.

BMP 2.13 – Erosion Control Plan:

Effectively limit and mitigate erosion and sedimentation from any ground-disturbing activities, through planning prior to commencement of project activity, and through project management and administration during project implementation.

- An Erosion Control Plan will be completed prior to project implementation.
- The Forest's Wet Weather Operations Standards are included in the Erosion Control Plan.

BMP 5.2 – Slope Limitations for Mechanized Equipment Operations:

The objective is to reduce gully and sheet erosion and associated sediment production by limiting tractor use.

- See BMP 1.9 and 1.10.

BMP 5.5 – Disposal of Organic Debris:

The objective is to prevent gully and surface erosion with associated reduction if sediment production and turbidity during and after treatment.

- During site preparation, material greater than 8’’ inches in diameter would not be removed unless needed to reduce 1,000 hour fuel loading to seven tons per acre, retain as close to seven tons per acre as possible.

BMP 5.6 – Soil Moisture Limitations for Mechanical Equipment Operations:

The objective is to prevent soil compaction, rutting, and gulling that may result in increased sedimentation and turbidity.

- All ground based equipment will follow the Wet Weather Operation Standards.

BMP 6.3 Protection of Water Quality from Prescribed Burning Effects:

The objective is to maintain soil productivity; minimize erosion; minimize ash, sediment, nutrients, and debris from entering water bodies.

- Prescribed fire effects in Riparian Reserves will mimic a low intensity backing fire, except for handpiles where higher intensity may occur to consume pile material. Ignition of underburns will generally not occur in Riparian Reserves. Approval by the District Fish Biologist is needed for underburn Riparian Reserve ignitions.
- Handpiles and windrows in Riparian Reserves will be placed in a checkerboard pattern whenever possible (not piled directly above another). Handpiles will be less than 6 feet in diameter and will be more than 15 feet away from intermittent streams and 30 feet away from perennial streams.
- For underburning, hand-line construction in riparian vegetation shall be avoided and in general should be farther than 25 feet from stream channels. Handlines will be mitigated (waterbarred and covered with organic material) immediately following prescribed burning, when safe to do so.

References for Best Management Practices

USDA Forest Service. 2013c. Klamath National Forest Best Management Practices Evaluation Program: Water Quality Monitoring Report 2013. Klamath National Forest, Yreka, CA. Retrieved from http://www.fs.usda.gov/detail/klamath/landmanagement/resourcemanagement/?cid=stelprdb5312713 on June 6, 2014.

USDA Forest Service. 2011. Soil and Water Conservation Handbook. Chapter 10 – Water Quality Management Handbook.

USFS. 2002. Wet Weather Operating Standards. Klamath National Forest, Region 5. US Forest Service.

Appendix E: Risk Reduction Salvage in Late Successional Reserves

Full Report Submitted to the Regional Ecosystem Office on July 12, 2015

Proposed Activities in Late Successional Reserves
Westside Fire Recovery Project

Klamath National Forest

Introduction

In August, 2014 multiple lightning fires burned together to create three large fires on the west side of the Klamath National Forest collectively known as the Westside Fires. The Westside Fire Recovery Project was developed in response to the conditions created by these fires. The Westside Fire Recovery project is composed the Beaver Fire, Happy Camp Complex, and the Whites Fire of the July Complex. The Beaver Fire, Happy Camp Fire, and Whites Fire burned a total of 183,200 acres, including 162,300 acres of National Forest System lands and 20,800 acres of private land. See Table 1.

Table 1
General Fire Information

Project Area	Fire	Fire Start Date	Containment Date	Acres Burned: Forest Service	Acres Burned: Private	Total Acres Burned
A	Beaver Fire	July 30, 2014	August 30, 2014	14,600	17,800	32,400
B	Happy Camp Complex Fire	August 12, 2014	October 29, 2014	114,800	2,100	116,900
C	Whites Fire	July 31, 2014	September 25, 2014	32,900	900	33,800
Total of All Fires (acres)				162,300	20,800	183,100

Approximately 56,400 acres of the Seiad Late Successional Reserve (LSR) lies within the Happy Camp Complex. Approximately 24,800 acres of the Eddy Gulch LSR lies within the Whites Fire area. Overall, approximately 81,200 acres of the LSR land allocation were within the boundaries

of the Westside Fires. Table 2 provides an overview of fire severity in each LSR and an overall total.

Historical Stand Conditions in the Klamath Province

It is important to understand the fire history of the Klamath Province and the context of the Klamath Province in the area of the NWFP. Most of the area of the NWFP lies in the Oregon and Washington Cascades and Coast Ranges. There is often a mistaken presumption that the conditions described for those forests apply to forests of the Klamath Province as well. Key old-growth structural attributes of the Coast Range and Oregon and Washington Cascades include large live old trees, a large number of snags of various ages, a multilayered canopy, and moderate to high accumulations of logs or coarse woody debris on the forest floor (Franklin, 1981).

The fire regime of old-growth Douglas fir dominated forests of the Klamath Mountains differs from more mesic old-growth Douglas fir forests of Oregon and Washington (described in Franklin et al. (1981)) in fire frequency, fire severity, and structural attributes such as amount and persistence of snags and coarse woody debris (Taylor and Skinner 1997). The characteristic fire regime of the Klamath Mountains is actually one of frequent low to moderate intensity fire with low to moderate severity effects (Skinner et al. 2006), not "stand-replacement or mixed" that is typical in the Coast Range and western Oregon and Washington Cascades. In a study from a late successional reserve just north of the Happy Camp Complex, Taylor and Skinner (1998) reported fires prior to Euro American settlement burned on average every 14.5 years. Fire return intervals were shorter on south and west facing aspects than on north and east facing aspects, but the average was 16.5 years or less on all aspects. Wills and Stuart (1994) reported pre-settlement fire to occur every 10 to 17 years in the Hotelling Ridge area, and wrote that fire return intervals in the southern portion of the range of Douglas fir are considerably shorter than those found in southern or west-central Oregon. In the southern-most portion of the Klamath Mountains, fire return intervals (fires scarring two or more trees over the study area) as short as 4 to 7 years have been reported (Fry and Stephens, 2006). With frequent fire, surface fuels are maintained at low levels – too low for intensity sufficient to produce much stand-replacement fire, except under unusual circumstances.

Even though fire suppression has since altered the fire regime and produced an unnatural accumulation of surface fuels in many areas, fire in the Klamath Mountains still generally burns with predominantly low to moderate severity effects today. Odion et al. reported that only 12% of their study area within the 1987 fires burned at high severity, with 59% of the area burning at low severity and 29% burning at moderate severity. Using somewhat different fire severity categories for remotely sensed satellite data for all fires from 1987 to 2008 and constraining the data to only forested areas, Miller et al. (2012) reported an average of 15.8% high severity, with the remainder burning at low to moderate severity. The reason for predominantly low to moderate severity effects can be explained by the topographic complexity of this landscape. With mountains and deep river canyons, smoke from large fire events tends to become trapped under inversions when atmospheric conditions are stable, leading to conditions that cause fires to burn at low intensity despite the steep slopes and added fuels of the fire suppression period (Skinner et al. 2006, Miller et al. 2012). The current elevated fuel conditions do sometimes lead to fires of higher intensity and severity. Such fires most frequently occur on upper slopes above where such inversions set up, but also occur at lower elevations when inversions break and the atmosphere destabilizes, or can be caused by a wind event (Skinner et al. 2006). Both of these conditions

combined with record drought and high fuel loads contributed to the relatively high severity of the 2014 Westside Fires. As stated in Skinner et al. (2006),

"The extent of recent high-severity burns appears to be different than historic burning patterns. More area is burning at higher intensity, and this is related, in part, to higher quantities and more homogeneous fuels caused by accumulation during the fire-suppression period."

The percentage of historical high severity is not known, but the lower fuel loading and continuity in times of frequent fire likely led to an amount of high severity fire considerably less than the contemporary percentage of 15.8% reported by Miller et al. 2012. For comparison, the moderate / high severity percentage of the 2014 Westside Fires was 25 -35%, with high severity patch sizes that exceed 1,000 acres in many locations. These metrics are well outside of the typical natural fire regime of the Klamath Province (Figures 4, 5, 6).[1]

In a fire regime dominated by low to moderate severity effects, tree mortality with wildfire is by definition generally low. In the Klamath Mountains, patches of moderate to high severity fire, when they did occur historically, were more likely on upper slope positions and on south and west-facing aspects (Skinner et al. 2006). Patches of high severity would produce a pulse of snags and then eventually down logs, until those logs were consumed by subsequent fires. Because frequent low-moderate severity fires consume wood, it is unlikely that coarse woody debris accumulated to levels seen in more mesic old-growth Douglas fir forests of Oregon and Washington (Taylor and Skinner 1997). In the Klamath Mountains snags and logs were likely clustered in time and space, with long intervals and large areas where dead wood was sparse (Skinner 2002).

Under historical conditions, an event with the amount, large patch size and geographic extent of high severity fire that occurred in the Westside Fires would have been highly unlikely to occur because there would have been substantially less surface fuel, less fuel continuity and lower stand density compared to contemporary conditions. The limited surface fuels and discontinuous canopy that existed prior to the fire suppression era made it more likely that fire would burn on the ground rather than traveling into the tree canopy. Under historical conditions, there would have also been much less dead wood (both snags and down logs), with large areas on upper slopes and south and west aspects where there would have been little dead wood. The late successional stand structure under historical conditions would have been shaped by frequent low to moderate intensity fire that consumed most of the dead and down wood on upper slopes, and created a patchy stand structure with complex mosaics of age, size and structure (Wills et al. 1994). Large dead and down wood would have been present on lower slope positions, but at much lower densities than today.

2014 Westside Fire Severity in the Late Successional Reserves

Beardsley and Warbington (1996) noted that

[1] Since this data was collected, significant post-fire mortality has occurred in the moderate (50-75%) severity class from drought and subsequent insect attacks. Field observations indicate many of the areas inventoried as moderate severity burn in 2014 (50-75% mortality) are now high severity (75-100% mortality). Moderate and high severity burn areas are combined for this assessment because of this trend.

"*Fire suppression has altered the forest structure and created a buildup of fuels to such an extent that a natural fire in such an unnatural situation might put any remaining old growth forests at risk."*

Monitoring of the NWFP has verified these trends. Since the mid-1980s, the frequency and intensity of high severity wildfire in the range of the northern spotted owl has increased (Miller et al. 2009, cited in Davis et al. 2011). Moeur (2011) noted similar findings related to the loss of late-successional and old-growth forests favored by northern spotted owls.

The fifteen-year monitoring report for the Northwest Forest Plan (Davis et al. 2012) noted that:

Although the relationship between wildfire frequency and severity on owl demography is not fully understood, habitat loss is the primary reason for the owl's decline and subsequent listing as "threatened" under the Endangered Species Act (USDI 1990). The habitat monitoring results presented in chapter 3 (this report) identified wildfire as the leading cause of current spotted owl nesting and roosting habitat loss (3.4 percent) and its future recruitment on federal lands. This was also the finding in the 10-year monitoring report (Davis and Lint 2005), and since completion of that report, several more large wildfires have occurred within the owl's range and more nesting/roosting habitat has been lost. Thus, loss of habitat to wildfire remains a significant concern for the management and conservation of the spotted owl.

The 2011 Recovery Plan for the northern spotted owl also noted habitat loss or degradation from stand-replacing wildfire as one of the most important range-wide threats to the northern spotted owl (USFWS 2011). Davis et al. (2012) mapped areas prone to future large stand-replacing fires, noting the Klamath Province as one of the geographic areas most likely to experience large (>1,000 acres) stand-replacing fires in the future. The recently released 20 year monitoring report of NSO habitat in the area of the NWFP verified this prediction (Figure 1) (Davis et al. 2015). Figure 1 shows that the largest losses of spotted owl habitat to stand replacement fire have occurred in the LSRs of the Klamath Province of California (Davis et al. 2015).

In the wildfires that occurred in the 2014 Westside Fire Recovery project area (Beaver, Whites, and Happy Camp fires) over 7,000 acres of functioning nesting-roosting habitat and 9,600 acres of foraging habitat were lost to stand-replacement (i.e. high severity) fire. Thus, it is well established that stand-replacing, high intensity wildfire negatively affects northern spotted owl habitat within the Klamath Province and that the potential for future habitat losses in the Klamath Province is high. Given probable climate change scenarios, the rate of habitat loss from stand-replacement fire is likely to increase. From this, it follows that land managers should consider opportunities to reduce the probability of future large stand-replacement fires. That is the objective of risk-reduction salvage harvest in the Westside Fire Recovery project.

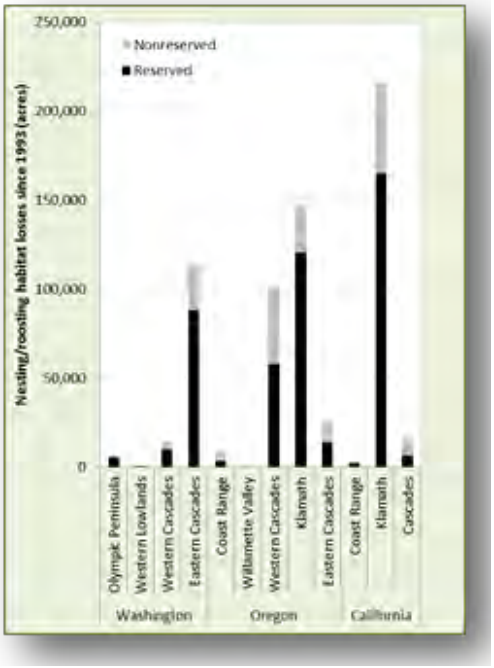


Figure 1: NSO Habitat Losses to Stand Replacing Fire in the Area of the NWFP

In many areas of the KNF, and in much of the high severity burn areas in the Westside Fire Recovery Project, there has been no recorded fire because of fire suppression since the establishment of the KNF in 1905. Most of the high severity fire that occurred in the LSR land allocation in the 2014 Westside Fires was in areas that have not had a recorded fire in the history of the Forest (See Figure 2 and 3). A contributing factor to abnormally high severity on portions of the Happy Camp Complex was heavy fuels that were created by the 1987 fires that had not been treated. Fire suppression has resulted in surface fuel buildup and increasing fuel continuity. These factors were likely drivers of the abnormally high fire severity experienced in the 2014 Westside Fires (FEIS Chapter 3 Fuels).

Remote Assessment of Vegetation Condition after Wildfire (RAVG) was used to measure the fire severity of the 2014 Westside Fires. In the 2014 Westside fires, approximately 82,800 acres burned within the LSR land allocation of which approximately 25,000 acres were moderate to high severity fire where tree mortality ranged from 50 to 100 percent. In many parts of the high-severity burns, patch sizes with near - total stand mortality are in the multiple hundreds of acres to over one thousand acres. Table 2 provides a breakdown by fire severity class for each LSR. Figures 4, 5 and 6 show a breakdown for each LSR and total LSR acres. This is based on vegetation-based fire severity RAVG data from October, 2014. Since this data was collected, substantial post-fire mortality has occurred in the moderate (50-75%) severity class from drought and subsequent insect attacks. Field observations indicate most of the areas inventoried as moderate severity burn in 2014 (50-75% mortality) are now high severity (75-100% mortality). Moderate and high severity burn areas are combined for this assessment.

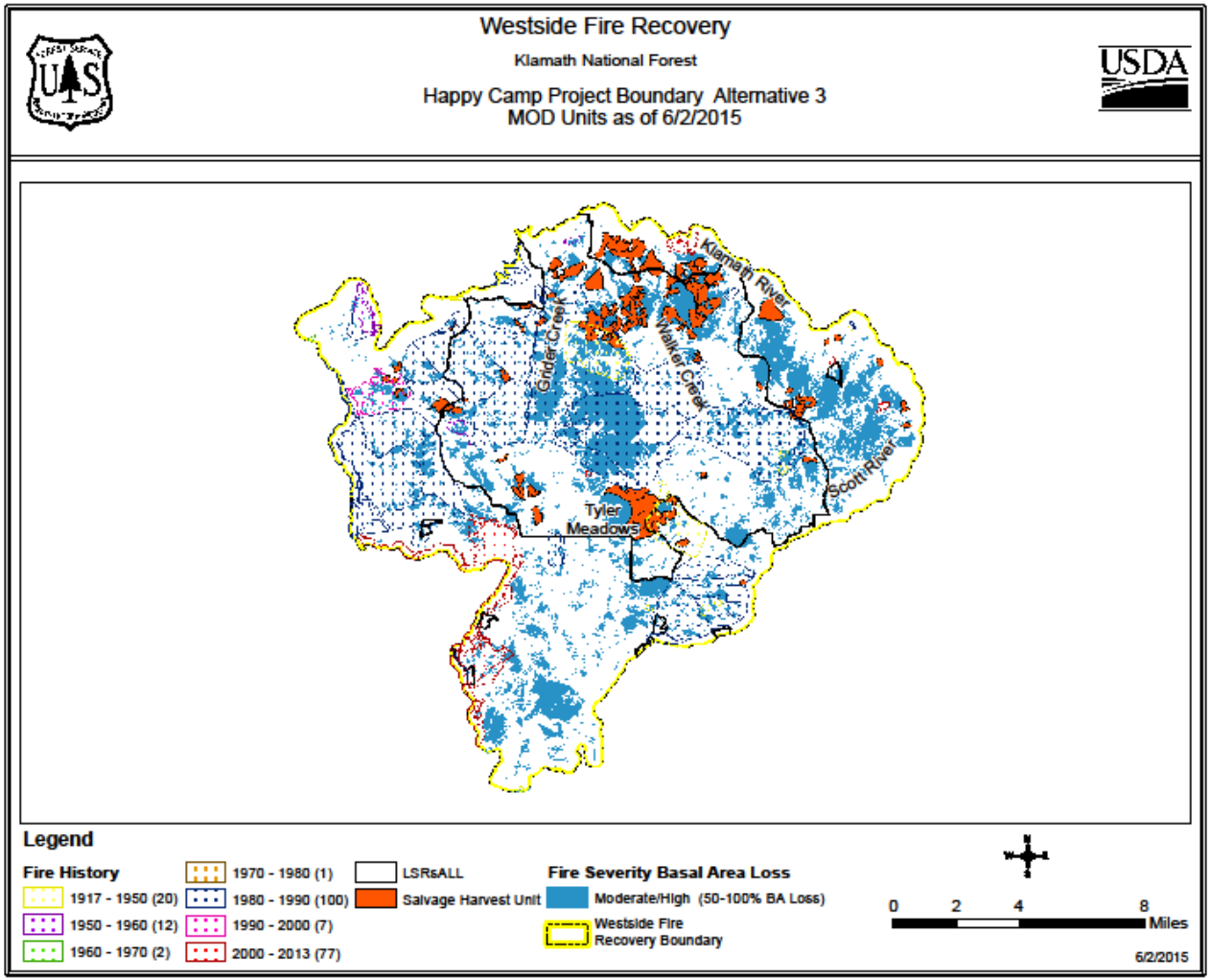


Figure 2: Fire History and Proposed Risk-Reduction Salvage Units, Happy Camp Complex

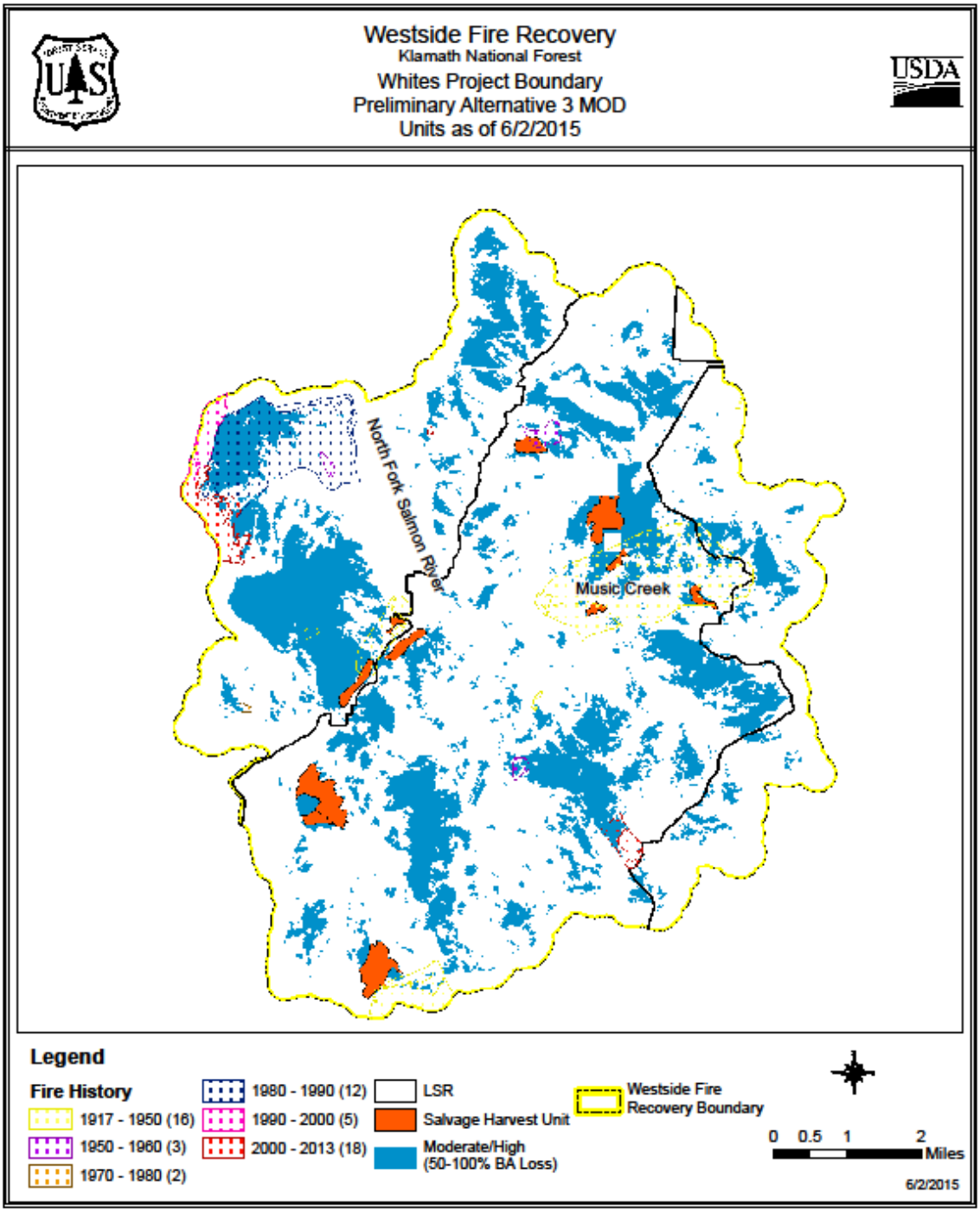


Figure 3: Fire History and Proposed Salvage Units, Whites Fire

Table 2
Fire Severity by LSR (Acres)

LSR	Very Low 0-25% Mortality	Low 25-50% Mortality	Moderate 50-75% Mortality	High 75-100% Mortality	Grand Total
Seiad LSR - Happy Camp Complex	33,418	4,517	3,385	15,092	56,412
Eddy Gulch LSR - Whites Fire	16,998	1,446	1,067	5,292	24,804
Grand Total	50,417	5,963	4,452	20,384	81,216

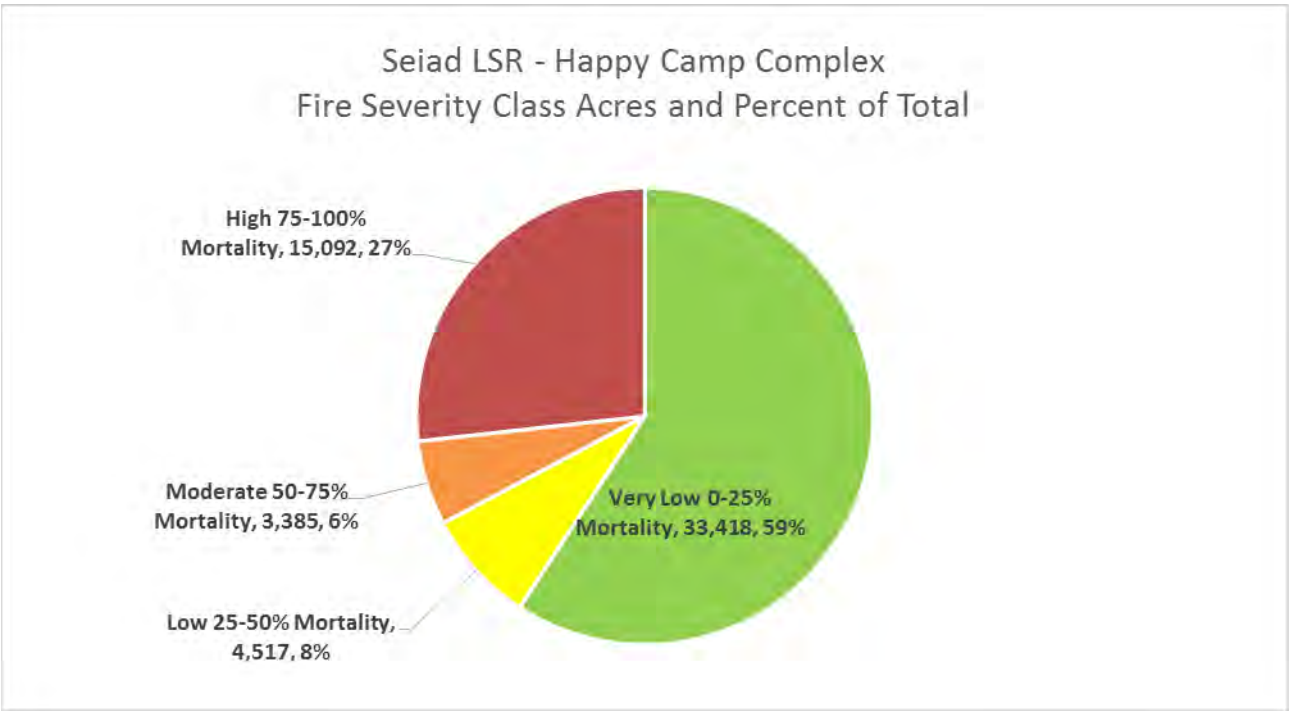


Figure 4: Fire Severity Class by Acres and Percent of Total Acres in the Seiad LSR

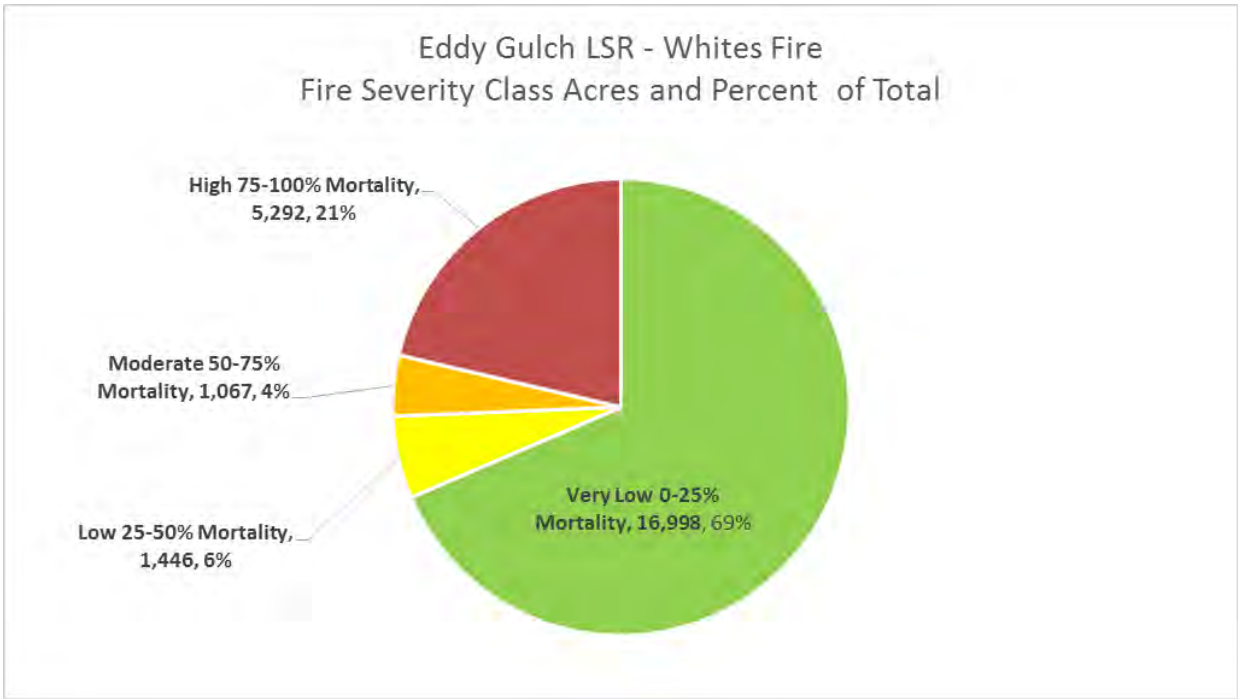


Figure 5: Fire Severity Class Acres and Percent of Total Acres in the Eddy Gulch LSR

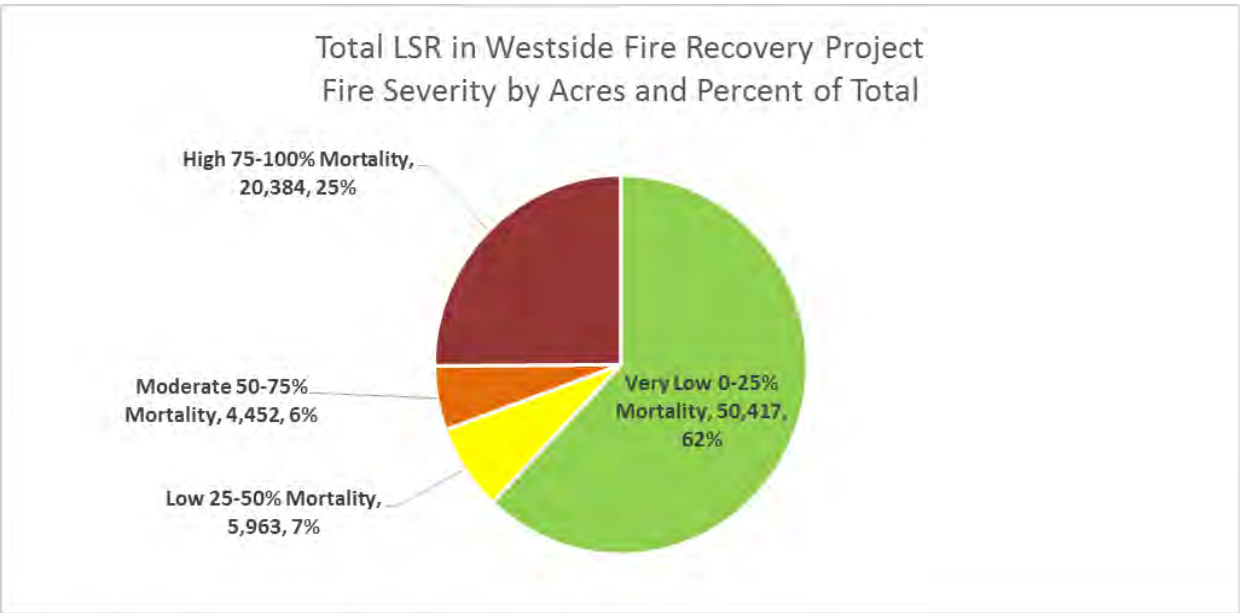


Figure 6: Fire Severity Class Acres and Percent of Total Acres Combined in the Eddy Gulch and Seiad LSRs

Risk of Future Stand-Replacement Fire from Fuels Created by the 2014 Westside Fires

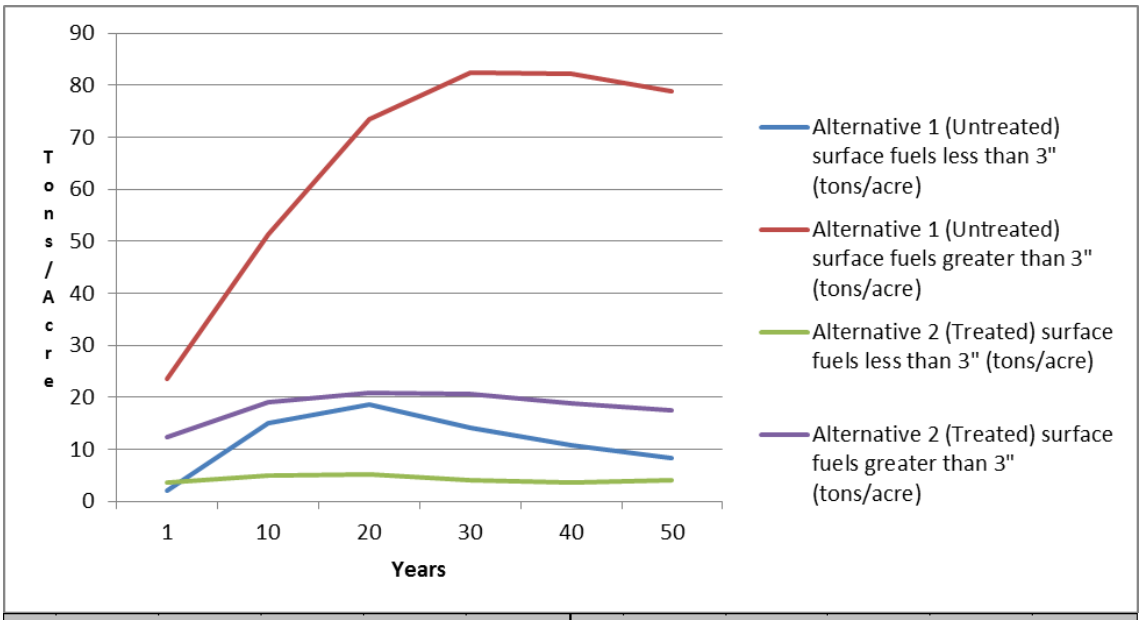
Criteria for salvage in LSRs include an allowance for actions that reduce the risk of future large scale disturbances that would inhibit the development of late successional stand conditions. The intended purpose of salvage of fire-killed trees is to reduce future fuel accumulation that would cause high-severity fires.

Approximately 60,000 acres of the 2014 Westside fires burned at high severity where most of the trees were killed. These patches of dead trees range from a few acres to large patches that span several thousand acres. When these snags begin to fall down, they become ground fuels. Knapp (2015) found that:

Dry dead wood is also combustible and too much can contribute to extreme fire behavior. While larger diameter dead wood loses moisture slowly, climate in the western US is characterized by long periods with relatively little precipitation, and both snags and CWD are generally readily consumed in wildfires. Burning snags can loft embers, and the common management practice prior to the 1970s was to fell snags in order to reduce fire hazard (Show and Kotok, 1924; Oliver, 2002). Once on the ground, dry dead wood provides a receptive surface for embers to ignite. The long burnout time and amount of heat released from combustion in large woody fuels can lead to torching and crown fire (Brown et al., 2003). Large numbers of snags and down logs are an issue for management or control of fire and safety of firefighting personnel working in proximity (Page et al., 2013). Concerns have also been raised about the negative effects to soil resources when excessive amounts of CWD are burned (Monsanto and Agee, 2008).

This tension between dead wood as habitat and dead wood as fuel has raised the question of how much wood is appropriate in fire-dependent forested ecosystems (Brown et al., 2003; Ucitel et al., 2003; Lehmkuhl et al., 2007; Scheller et al., 2011; Ritchie et al., 2013). Because wood is readily consumed by fire, one likely consequence of fire exclusion in unlogged forests where fire was historically frequent is an excess of coarse woody debris (Skinner, 2002). This is particularly true for heavily rotted wood, which is most readily consumed by fire (Kauffman and Martin, 1989; Skinner, 2002; Stephens and Moghaddas, 2005; Uzoh and Skinner, 2009). Historically, frequent fire would have likely resulted in rotten wood being maintained at relatively low levels (Stephens and Moghaddas, 2005).

The density of fire-killed trees per acre in the Westside fires area is much higher than the density of trees that existed naturally in the pre-suppression era (Beardsley and Warbington, 1996: 5; Skinner 2006). As noted by Knapp (2015), this material is all potential fuel, and can increase future fire severity. Since the density of trees per acre is significantly higher than historical levels because of fire suppression, it follows that the amount of heavy fuel created by these dead trees will be much higher than historical levels, and can cause elevated fuel levels for more than 40 years (Peterson et al. 2015; See also Figure 7). The Fuels Report in chapter three of this EIS provides an in-depth analysis of the fuel loading and predicted resistance to control that will result from fire killed trees under the no-action and action alternatives. Figure 7 shows a graph of the typical fuels accumulation from the Tyler Meadows area of the Westside fires. Similar graphs are provided for other parts of the fire area in FEIS Chapter 3-Fuels and the Fuels Report.



Walker Creek Stand ID 050552ABCD0292						Walker Creek Stand ID 050552ABCD0292					
Year	Surface Fuel < 3" dbh (tons/acre)	Surface Fuels > 3" dbh (tons/acre)	Intensity (btu/ft/sec) 26 ch/hr	Intesity (btu/ft/sec) 40 ch/hr	Resistance to Control	Year	Surface Fuel < 3" dbh (tons/acre)	Surface Fuels > 3" dbh (tons/acre)	Intensity (btu/ft/sec) 26 ch/hr	Intesity (btu/ft/sec) 40 ch/hr	Resistance to Control
1	2.10	23.61	87	87	Low	1	3.62	12.28	69	69	Low
10	14.95	51.34	5379	8213	Extreme	10	5.00	19.10	1901	2902	Moderate
20	18.57	73.51	7199	10991	Extreme	20	5.28	20.90	2046	3124	Moderate
30	14.20	82.47	6902	10537	Extreme	30	4.08	20.65	1821	2781	Low
40	10.81	82.30	6291	9605	Extreme	40	3.52	18.92	1630	2489	Low
50	8.21	78.92	5650	8626	Extreme	50	4.06	17.42	1645	2512	Low

Figure 7: Fuel Accumulation from Fire Killed Trees in No Treatment Areas (left) and Salvage (right)

As shown in Figure 7 and the accompanying analysis, fire-killed trees from the 2014 Westside fires are likely to create a significant fire hazard in the next 10-30 years as snags fall to the ground. Once ignited, these heavy fuels may significantly increase the resistance to control and severity of future fires.

Proposed Recovery Actions in Late Successional Reserves

In response to the 2014 Westside Fires several recovery actions were proposed. A draft EIS was published in March 2015. Alternative 2 was the Proposed Action. In the course of consultation with the US Fish and Wildlife Service, Alternative 3 with modifications has become the Preferred Alternative. Alternative 3 Modified removed all salvage harvest units from the Beaver project area. Additional salvage units were dropped in the Happy Camp and the Whites project areas after the initial Wildlife Biological Assessment was submitted. Alternative 3 Modified is intended to strike a balance between the need to reduce long-term risk of stand replacement fire and the current needs of northern spotted owls and Pacific fishers in a post-fire environment. All units were reevaluated by the Forest Service and removed from treatment if they did not contribute to the overall fuels strategy and if they were within northern spotted owl core areas classified as having moderate or higher potential for owls to remain on site, reproduce, and contribute to the

demographics of the population of the area. Units were also removed from treatment if they were no longer economically viable. Acres were adjusted after units were dropped within each project area. Alternative 3 Modified still meets the Project objectives though at a lesser scale than the original Proposed Action.

These actions are summarized for Alternative 3 Modified below, and summarized in Table 3. See the Map Supplement for maps of these actions.

- **Risk-Reduction Salvage:** This action would remove dying and fire killed trees greater than 14 inches in diameter by a combination of helicopter, skyline and tractor yarding. The objective of this action is to reduce heavy surface fuel loads that would otherwise be created by fire-killed trees as they break or fall to the ground. Approximately 3,900 acres of risk-reduction salvage is proposed within the LSR land allocation. Where live trees occur within units, they are marked for retention. Virtually all of the proposed LSR risk-reduction salvage is in RAVG Class Four stands that have greater than 75% mortality. This action is discussed in detail in following sections.
- **Site-Preparation and Planting**: This action restores existing conifer plantations that burned severely and replants areas where risk-reduction salvage occurs. Because Late-Successional Reserves have been established to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions (NWFP C-14; LSRA 1-24). Site preparation and planting is intended to increase the likelihood and speed by which burned forested areas are restored to coniferous forest and late successional habitat. Approximately 3,480 acres of site preparation and planting in existing plantations and natural stands, and 3,900 acres within salvage units within the LSR are proposed (Table 3). This action is consistent with the LSRA and is not further discussed in this document. Approximately 65% of the high severity burn area in the LSRs will not be replanted and will go through an early seral phase that may last decades in large burn patches.
  More rapid and successful reforestation is accomplished by reducing fuel loading and creating openings for safe planting. This will create some pockets of established coniferous forest more quickly, providing habitat and creating some heterogeneity particularly in some of the very large burn patches. Careful evaluations were made to prioritize treatment units likely to support successful reforestation. Units within the project area are highly variable, so criteria differ slightly for determining site-preparation needs within natural units versus existing plantations. For the purposes of this project, reforestation needs were stratified into three categories for field evaluation: 1) burned conifer plantations; 2) conifer units proposed for salvage harvest; and 3) conifer units not proposed for salvage harvest for which there is a need to reforest with conifer species. Planting prescriptions are site-specific and are intended to achieve an open stand structure stocked with about 100 trees to the acre with variable spacing typical of a frequent low to moderated fire severity environment. Site prep and plant units are shown in the Map Supplement prepared for this document. Areas were considered for site preparation, planting and release if they:
  - Were identified as areas determined to have been historically dominated by conifers, as determined by the 1945 Wieslander Vegetation mapping (Kelly, M.B. et. al 2005) in addition to visual cues based upon Forest Service professional judgment;
  - Had successful vegetation growth before the 2014 fire;
  - Had evidence that, prior to the fire, conifers were successfully re-establishing, and competing vegetation (brush and hardwoods) were not dominating the site;

- Had little availability of natural seed source within seed distribution distances;
- Had favorable site class, aspect, slope position, and elevation for artificial regeneration; and,
- Had favorable regeneration potential by prioritizing areas based on site quality and moisture availability and avoiding areas with a history of repetitive high severity burns if likely to re-burn before a stand reaches a level of fire resilience.

- **Fuels Treatments:** Fuels treatments include construction of fuel management zones (FMZs or fuel breaks) along strategic roads and ridgelines, understory prescribed fire and WUI understory fuel treatments (Table 3). These actions are intended compliment and support risk reduction salvage actions, and should be viewed as parts of the overall fuels reduction strategy of the Westside Fire Recovery Project. See the EIS, Chapter 3 - Fuels for a more complete description of these actions. These actions are consistent with the LSRA and Klamath National Forest LRMP and are not further discussed in this document. Fuel treatments are summarized in Table 3 and shown in the map supplement for this document. These actions include:
  - **Wildland Urban Interface Fuels Reduction (WUI)**: This action would reduce ladder fuels and surface fuels within the WUI by cutting and piling trees less than 12 inches in diameter that create ladder fuels, and piling dead surface fuels. A combination of hand treatments, mastication and machine piling would be used as appropriate for ground conditions. Activity fuels created would be piled and burned. The objective of these prescriptions is to reduce surface and ladder fuels sufficiently so that underburns could be accomplished in the future to return selected areas to a low to moderate fire severity regime. Approximately 480 acres of WUI fuels reduction is proposed in LSRs in the Westside Fire Recovery Project.
  - **Fuels Management Zones (FMZ)** These are shaded fuel breaks that extend 250 feet either side of strategic ridgelines used to contain the 2014 fires as well as existing fire lines from previous large fires within the project area. Most of these control lines are already in place and partially cleared. The treatments aim to maintain existing control lines by removing all dead vegetation including snags, brush greater than two feet tall and thinning live conifer trees less than 12 inches in diameter at breast height to approximately 20 foot spacing. Hardwoods would be retained. Retained conifers will be pruned up to seven feet above the ground within these zones to increase canopy base height, and reduce ladder fuels and the potential for crown fire initiation. Activity-generated fuels will be disposed of by a variety of methods. A combination of mechanical, mastication, and hand work is proposed. Where hand thinning is proposed, lopping and scattering of fuels, piling and burning, and/or chipping will be used to reduce fuels. Mechanical or mastication equipment may be used to pile activity slash within these areas in addition to, or in lieu of, hand work. Hanging branches will be removed if they hang below seven feet above ground level. Approximately 2,280 acres of LSR would be included in this action.
  - **Roadside Fuels**: Roadside treatments identified as strategic for fuels reduction will assist with future locations to hold a planned or unplanned fire within the project area. Roadside treatments outside of identified strategic road systems will include hazard tree removal of activity-generated fuels to provide for access for fire suppression resources responding to future unplanned ignitions. Activities similar to those described above within fuels management zones will be used to treat roadside fuels. Roadside fuels are further split into “hot slope” (south and west aspects and upper slopes) and “cool slope” (north and east aspects and lower slopes).

- "Hot Slope" or complete—complete understory treatments are proposed in areas of higher solar radiation, including upper slope positions and westerly and southerly aspects. Treatment spacing will average 20 to 25 feet between leave trees. Leave trees will contain a mixture of hardwood and conifer species with good color and vigor. Approximately 920 acres within the LSR are included in this action.
- Cool Slope" or modified—modified understory treatments are proposed in areas with important wildlife habitat elements and areas of low solar radiation, including treatment: Cool Slope (northerly and easterly slopes and lower slopes all aspects. Leave tree spacing will average 15 feet. Leave trees will be retained in mosaic pattern, incorporating clumps of at least ¼ acre in size, which will be interspersed throughout areas proposed for modified understory WUI and roadside fuels treatment and will cover 10 to 20 percent. Preference for retention will be hardwoods located away from areas identified as strategic for fuels reduction (e.g. future locations to hold fire line for planned or unplanned fire within the project area). Approximately 1,390 acres within the LSR are included in this action.

- **Understory Prescribed Fire:** This action will occur 2-10 years in the future as small fuels created by the Westside Fires begin to die and fall to the forest floor. Understory burning is intended to reduce current fuel loading to the historic fuel loads typical of the Klamath Province. Implementation will occur under cool weather conditions which promote low intensity fires. A mosaic post-burn condition will exist with isolated pockets of tree mortality, and burned and unburned understory vegetation. Second-entry burns in units identified for prescribed burning will be used to maintain surface fuel loading and increase heterogeneity of forest structure and vegetation by consuming surface fuels and small understory vegetation. A mosaic burn is anticipated where some areas fully consume surface fuels and other areas are partially burned or unburned. Many of the prescribed burning locations will use existing control lines established in recent large fires within the project area. Line construction activities will occur around the perimeter of the fire and will include using dozers to re-scrape control lines to mineral soil; where control lines are inaccessible for equipment, hand-line construction to mineral soil will occur. Removal of understory vegetation along control lines will include cutting brush and conifer trees less than 12 inches in diameter to facilitate holding operations during prescribed fire implementation. Approximately 5,700 acres within LSR are included in this action.

- **Roadside Hazard Removal:** In addition to these actions, dead and fire damaged trees resulting from the Westside Fires need to be removed from system roads to provide for public and forest worker safety. This action consists of cutting and removing dead and dying trees that pose a hazard to the road. In areas of low and very low fire severity (1-50% mortality) hazard tree removal is widely scattered. In areas of moderate to high fire severity not in salvage units hazard tree removal is more concentrated. Hazard tree removal as proposed is provided for in Guidelines for LSRs and is not further addressed in this document. Approximately 1,640 acres of scattered roadside hazard removal and 800 acres of concentrated roadside hazard reduction would occur within the LSR. See Table 3 for a summary of roadside hazard removal acres.

Table 3
Westside Fire Recovery Project Actions in LSR (Acres)

Treatment Type	Happy Camp Complex Non-LSR	Seiad LSR, Happy Camp Complex	Happy Camp Complex Total	Whites Fire Non-LSR	Eddy Gulch LSR, Whites Fire	Whites Fire Total	Total LSR in Westside Fire Recovery Project	Total, All Land Allocations
Risk Reduction Salvage								
Risk-Reduction Salvage Gross Acres	2,164	4,020	6,208	63	624	687	4,645	6,895
Hydrologic Riparian Reserves and Snag Retention Areas	N/A	648	N/A	N/A	124		773	1,155
Net Risk Reduction Salvage	N/A	3,372	N/A	N/A	500		3,872	5,740
Site Preparation and Planting								
Site Prep and Plant	1,999	2,919	4,918	0	556	556	3,475	7,367
Fuels Reduction								
Fuels Management Zone	1,000	1,696	2,695	194	581	775	2,277	5,004
Roadside Complete	837	831	1,668	294	87	381	918	2,549
Roadside Modified	1,479	901	2,380	19	487	506	1,388	3,085
Understory Prescribed Fire	1,269	276	1,544	3,757	5,436	9,194	5,712	11,183
WUI	1,305	152	1,457	219	327	546	478	2,628
Treatment Type	Happy Camp Complex Non-LSR	Seiad LSR	Happy Camp Complex Total	Whites Fire Non-LSR	Eddy Gulch LSR	Whites Fire Total	Total LSR in Westside Fire Recovery Project	Total, All Land Allocations
Roadside Hazard								
Roadside Hazard Scattered	NA	1,268	2,075	NA	368	423	1,636	2,838
Roadside Hazard Concentrated.	NA	681 (170 > 24”)	845	NA	119 (70 > 24”)	130	800 (240 >24”)	1,330

Many of these treatments overlap, so acres would not add up to a total footprint. For example, roadside hazard removal, and roadside fuels reduction may overlap a salvage unit. Broadcast burn and WUI acres overlay all actions that occur within those areas.

Risk Reduction Salvage in Late Successional Reserves

The Klamath National Forest (KNF) Land and Resource Management Plan (LRMP) describes land allocations, goals for management of the Forest, and provides management direction (Guidelines) to accomplish those goals (LRMP Chapter 4). The 2014 Westside Fires created areas of fire-killed trees that in the future will become areas of continuous high fuel loading as dead trees break or fall and become surface fuels. In future fires, areas of continuous, high fuel loading have a high probability of burning with high severity (Figure 7, FEIS Chapter 3 – Fuels). This condition conflicts with the Forest-wide Goals for Fire Management (KNF 4-8) which state:

Reduce unacceptable fuel buildups and potential acreage of future high intensity wildfires.

The primary reason that salvage harvest is proposed within the LSR is to reduce the risk of future stand-replacement fire from heavy fuel accumulations that will result from trees killed in the 2014 Westside Fires. This section addresses how the proposed salvage of fire-killed trees in the Westside Fire Recovery project would contribute to LRMP goals for fire management (LRMP 4-8) and be compatible with LRMP direction to protect and enhance late-successional ecosystems within the LSR land allocation (LRMP 4-83). Late Successional Reserves are described in the Record of Decision (ROD) for the NWFP and are part of Management Area (MA) 5 in the KNF LRPMP. The objective of Late-Successional Reserves is to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl (NWFP Standards and Guidelines C-9; KNF LRMP 4-83).

Reducing risk by salvaging fire killed trees has a long term positive impact because it reduces fuels and reduces the probability of large stand-replacement fire. It also provides additional protections for areas where snags are retained such as hydrologic Riparian Reserves by reducing adjacent fuels. When combined with strategic fuel breaks along watershed boundaries, salvage of fire-killed trees helps increase the probability that large fires could be contained without affecting multiple watersheds (FEIS Chapter 3 Fuels).

Approximately 3,900 acres of risk-reduction salvage harvest would occur within the Late Successional Reserve (LSR) land allocation as part of the Preferred Alternative in the proposed Westside Fire Recovery project. This represents about 13% of the acres that burned at moderate to high severity within the LSR land allocation and about 5% of the total LSR acres within the Project area. See Figure 8, 9 and 10 for a breakdown proposed risk-reduction salvage in the LSR land allocation by LSR and total LSR acres. Figure 11 shows the land status of moderate and high severity burn areas and the net salvage proposed. Figure 12 shows the diameter classes of total Project acres in LSR, areas that burned at greater than 50% mortality and net acres of proposed salvage Eddy Gulch and Seiad LSR combined.

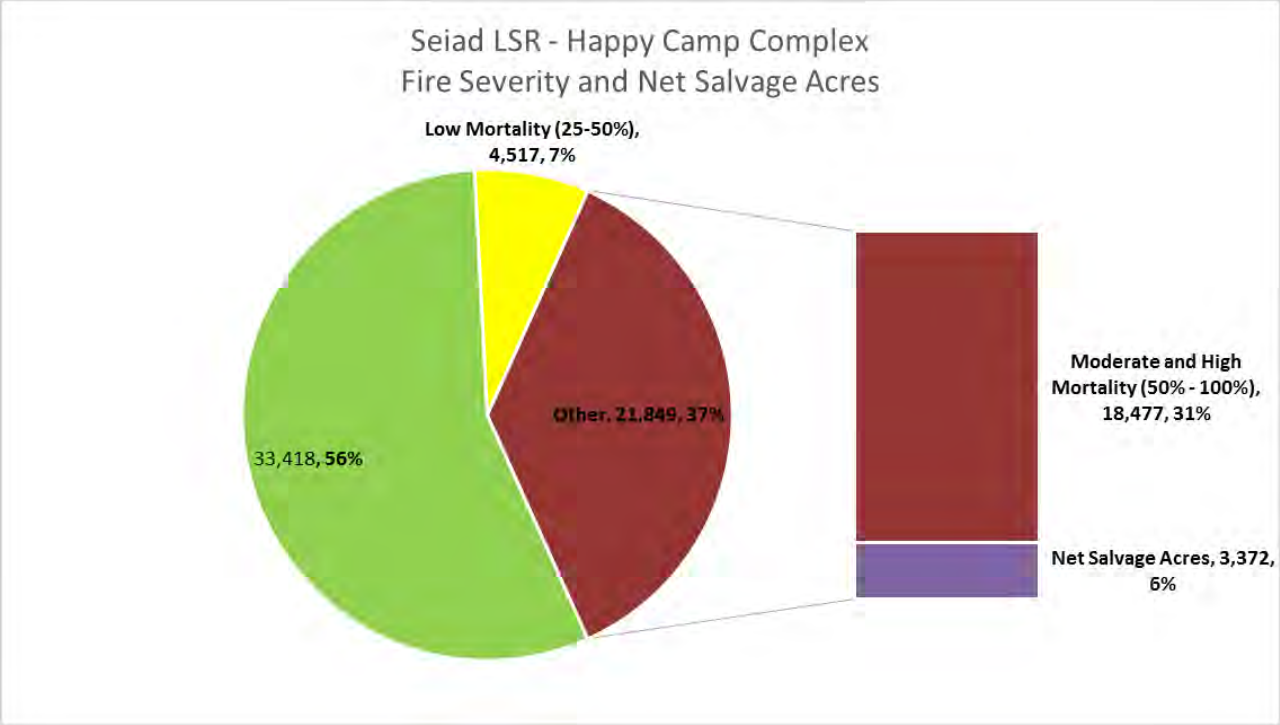


Figure 8: Fire Severity and Proposed Salvage Acres and Percent of Total Acres in the Seiad LSR. Moderate (50-75%) and High Severity (75-100%) are combined because of ongoing secondary mortality in the moderate severity burn areas.

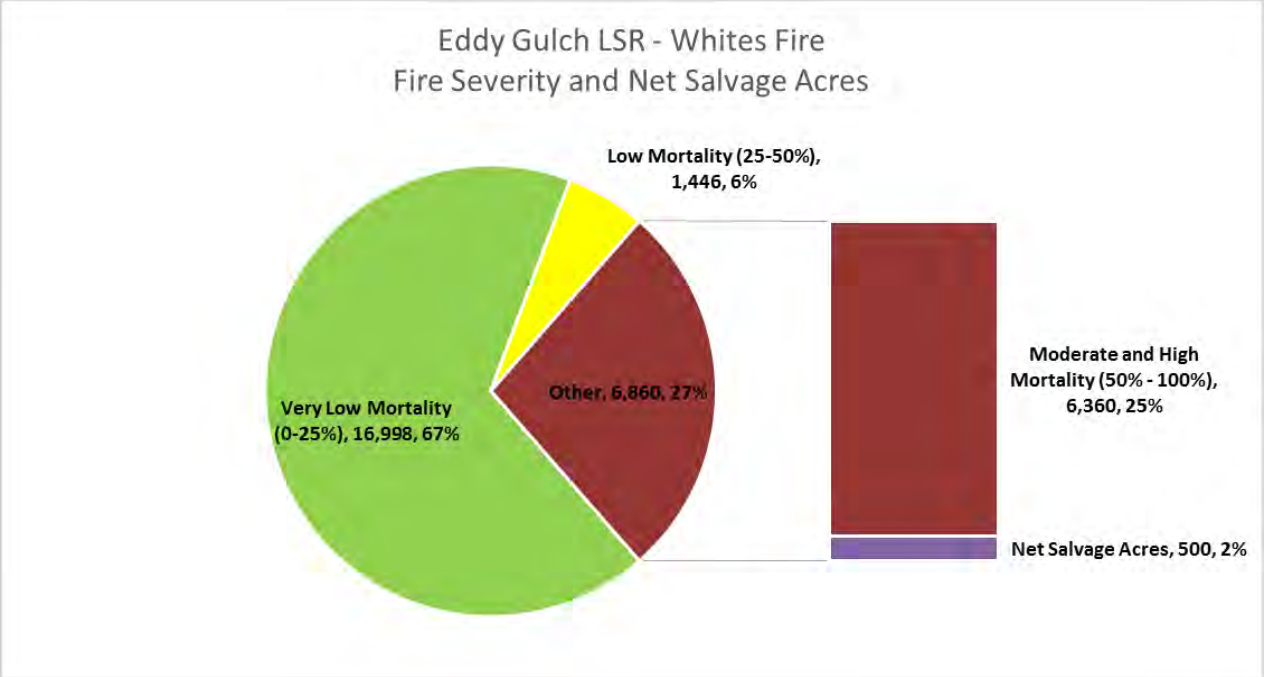


Figure 9: Fire Severity and Proposed Salvage Acres and Percent of Total Acres in the Eddy Gulch LSR. Moderate (50-75%) and High Severity (75-100%) are combined because of ongoing secondary mortality in the moderate severity burn areas.

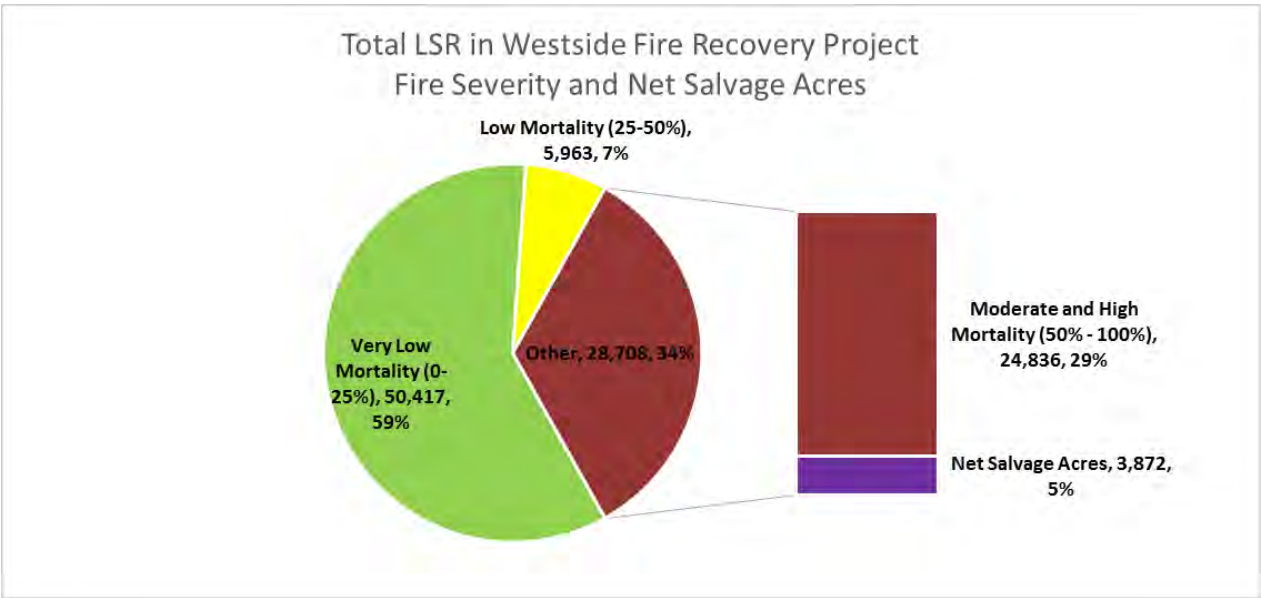


Figure 10: Fire Severity and Proposed Salvage Acres and Percent of Total LSR Acres in the Eddy Gulch and Seiad LSRs. Moderate (50-75%) and High Severity (75-100%) are combined because of ongoing secondary mortality in the moderate severity class.

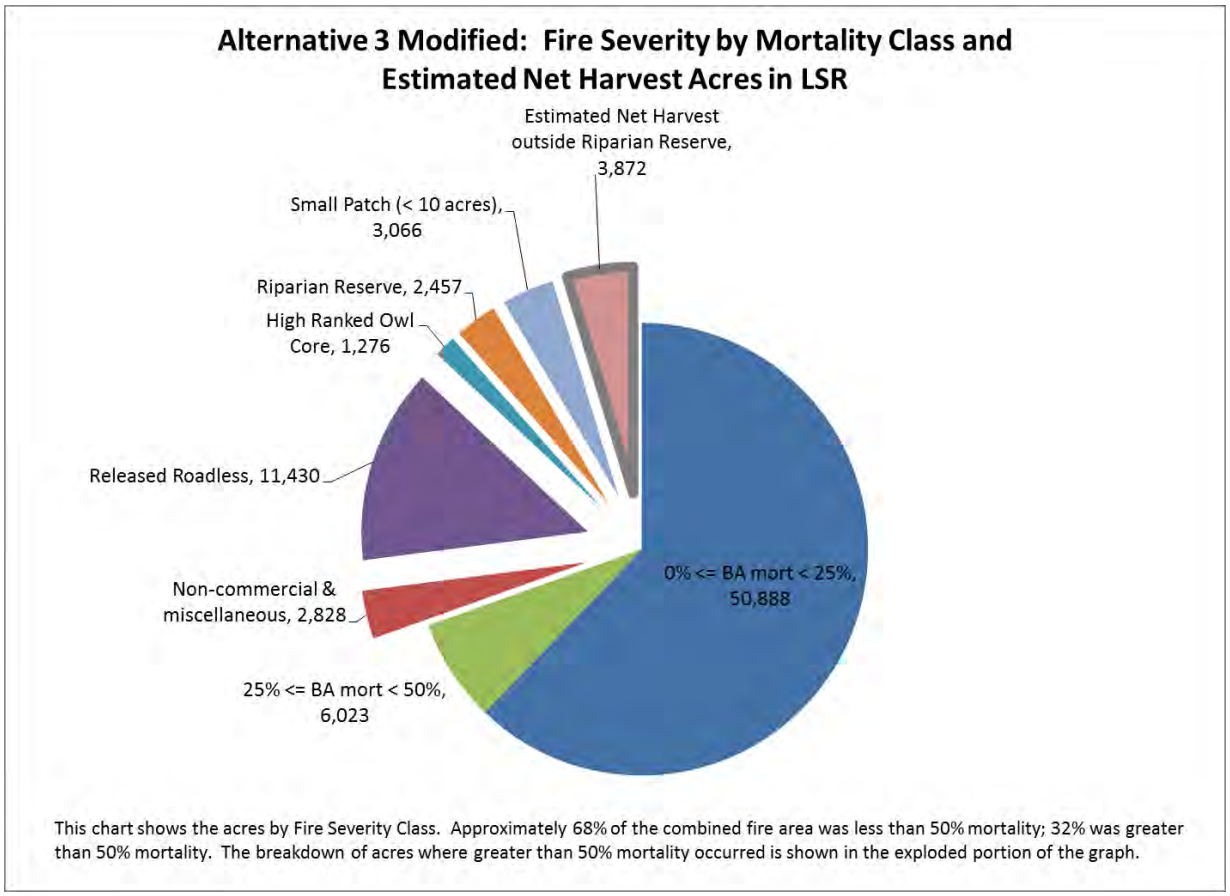


Figure 11: Acres by diameter class, fire severity and proposed salvage in the combined Eddy Gulch and Seiad LSRs

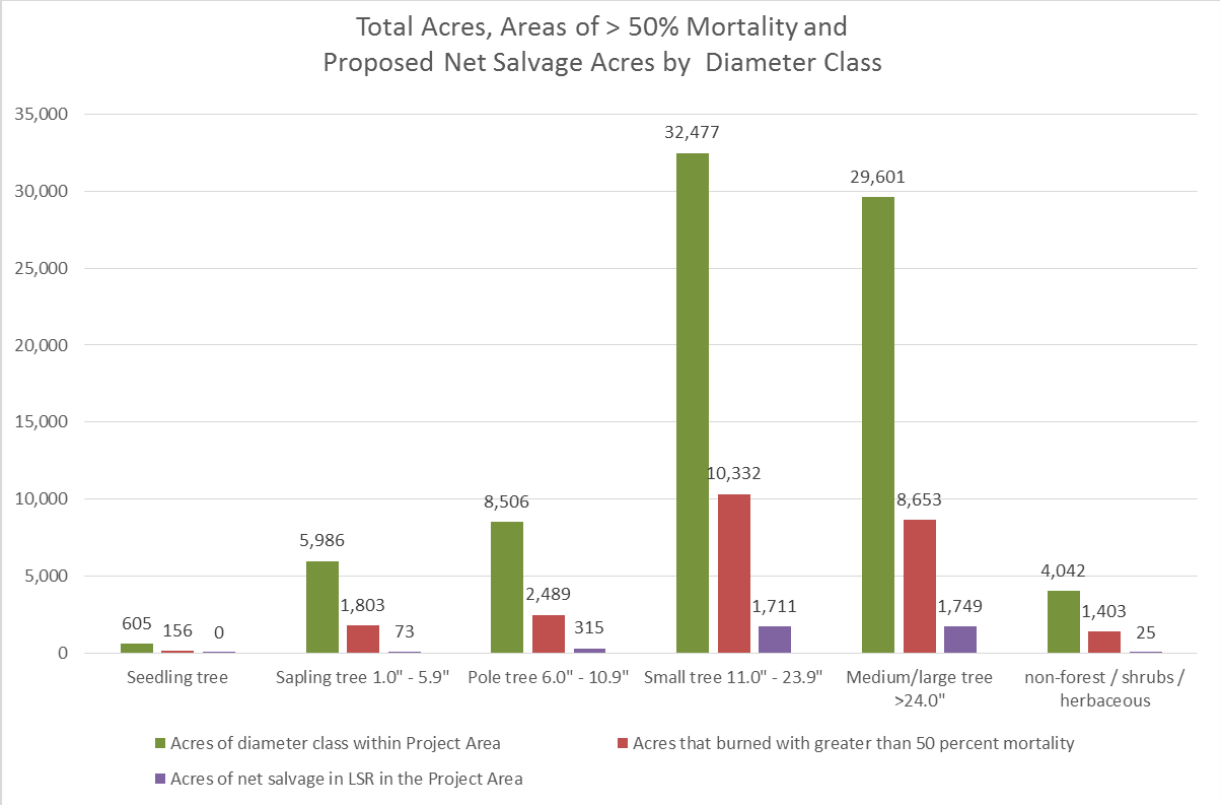


Figure 12: California Wildlife Habitat Relationship (CWHR) Diameter classes of total Project acres in LSR, areas that burned at greater than 50% mortality and net acres of proposed salvage Eddy Gulch and Seiad LSR combined.

Using California Wildlife Habitat Relationship (CWHR) data, Figure 12 shows that of the 29,600 acres of stands with a quadratic mean diameter (QMD) greater than 24 inches in diameter in the LSRs, in all burn severities, 1,750 acres (6% of the size class) would be removed by the Westside Fire Recovery project in salvage harvest units. An estimated additional 240 acres of stands greater than 24 inches QMD would be removed in roadside hazard cleanup (Table 3) in moderate – high severity burn areas. With salvage units and roadside hazard combined, approximately 2,000 acres of stands with a QMD greater than 24 inches would be removed within the Eddy Gulch and Seiad LSRs from moderate – high severity burn areas. Of stands with a QMD greater than 24 inches, this represents about 23 percent of the 8,650 acres of moderate - high severity burn acres and about seven percent of the of that diameter class in all burn severities in the LSRs. Of the stands where the QMD is greater than 24 inches that are in moderate to high severity burn patches, 77 percent would be retained. Overall, over 90 percent of the stands with a QMD greater than 24 inches in the Seiad and Eddy Gulch LSRs would be retained.

As described in the fuels analysis in the FEIS, the majority of the areas that burned at high severity in the 2014 wildfires exhibited unnaturally high levels of surface fuels, fuel continuity and stand density due to decades of fire suppression and / or accumulated fuels from previous high severity fires (FEIS Chapter 3 Fuels). The high tree densities that existed prior to the 2014 fires means that in the post-fire environment, there will be more snags and future down wood within severely burned areas than would have existed naturally. Over the next 10-30 years, most of the fire killed trees from the 2014 fires will break off or fall and become ground fuels (Figures

7, 11). In a recent study in Black's Experimental Forest on the Lassen National Forest, eight years after the Cone Fire, most of the ponderosa pine snags had fallen. Only 16% of pine snags between 30 and 45 cm and 41% greater than 45 cm were still at least partially intact (Ritchie et al, 2012). In their snag fall model, Harrod et al. choose 45 years as the time when all snags have fallen, which they term as "generous". The literature summarized by Harrod et al. 1998 shows most snags, even the large ones, don't last more than 20-25 years. Occasionally, very large snags in sheltered locations may persist until the next stand is producing large material, but this is exceedingly rare in the frequent fire environment of the Klamath.

Elevated surface fuels can constitute a significant risk to the succeeding stand (Agee and Skinner, 2005) and present a challenge and safety risk to fire crews in any subsequent burn of these areas (Ritchie et al. 2012). This dead wood contributes to heavy fuel loading and increases the likelihood and risk of future high severity fire (Figure 7; Knapp 2015; see also Fuels Report and FEIS Chapter 3- Fuels). Since the 2014 Westside Fires created large, continuous, or nearly continuous areas of fire-killed trees, those same areas would, in the future, become areas of high surface fuel loading as snags fall and become ground fuels.

Peterson et al. (2015) observed that:

"Post-fire logging can serve as an effective tool for managing fuel loadings in forests regenerating after high severity wildfires. By strategically applying and varying post-fire logging treatments within landscapes, post-fire logging could reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects. If applied using best management practices and with consideration for possible environmental impacts and meeting other management objectives, post-fire logging could serve as an effective option – along with mechanical thinning, prescribed fire, and managed low to mixed severity wildfires – for reducing fuels and restoring low and mixed severity fire regimes in dry coniferous forests of western North America and other fire-prone forest types."

Creating adequate breaks in the continuity of heavy fuels using timber salvage, constructed fuel breaks, fuels management zones and Wildland Urban Interface (WUI) fuels reduction provides an opportunity to reduce the risk, acreage and intensity of future fires (FEIS Chapter 3 – Fuels). These actions would contribute to accomplishing the Goal for Fire Management to "Reduce unacceptable fuel buildups and potential acreage of future high intensity wildfires" described in the LRMP on page 4-8. Proposed fuel breaks, salvage harvest units and WUI fuels reduction areas are shown in the Map Supplement for this document. These integrated actions would provide additional protection to communities while increasing options for suppression and managing planned ignitions in the future.

Figure *13*: Fire-killed trees in the Seiad LSR. Over time, fire killed trees break or fall and become surface fuels or block roads that provide needed administrative access.

As noted in the report of the Forest Ecosystem Management Assessment Team (FEMAT II-18) salvage harvest of dead trees provides an economically feasible method to reduce the heavy fuel loads that would otherwise result from fire-killed trees.

Risk reduction salvage units have been proposed because of their location relative to private lands, communities at risk, important access / ingress / egress roads and proposed ridgetop fuel breaks. Proposed salvage units reduce fuels within the area salvaged and are part of a larger strategic risk-reduction strategy (see Fuels Report) that includes creation of fuels management zones (FMZ) along key ridgelines and road systems and integrated fuels reduction within the Wildland Urban Interface (WUI). Reducing fuels by salvage harvest in concert with fuels management zones and WUI fuel treatments creates effective fuel breaks and reduces the risk of future high severity fire that would delay the development of late successional stand conditions. Creating large blocks where fuel loads have been reduced in concert with ridgetop fuel breaks also provides control points for fire suppression, and increases the likelihood that large fires could be contained along watershed boundaries. This reduces the risk of large, stand replacement fire occurring in multiple watersheds in one event as occurred in the 2014 Westside fires. While only a small proportion of affected LSR acres that burned at moderate or high severity are included in this proposal, these are the most important areas from a strategic fuels reduction viewpoint (FEIS Chapter 3 – Fuels). Approximately 13% of the LSR acres of fire killed trees in moderate or high severity burn areas are proposed for risk reduction salvage. Approximately 84% of the moderate or high severity burn areas have no proposed salvage units because of the need to strike a balance between risk reduction and resource protection for northern spotted owl habitat, Pacific fisher connectivity and other resources. The integrated risk reduction strategy of salvage and strategic fuel breaks, fuels management zones and WUI fuels treatments provides additional protections from high severity fire for these resources because it breaks up the continuity of heavy fuel.

Without fuels reduction, areas of high-severity fire from the 2014 fires will likely go through several cycles of stand-replacement fire until surface fuels are reduced enough to allow a low to moderate intensity fire regime to return (Attachment 1 FVS Analysis; FEIS Chapter 3-Fuels;

Fuels Report). Each time a stand replacement event occurs, early seral stand conditions will be reestablished, further delaying creation of desired late-successional stand conditions.

Forest Plan and LSR Assessment Provisions for Risk Reduction by Salvage Harvest in Late Successional Reserves

The question of risk reduction by salvage harvest of dead trees in LSRs was anticipated in the development of the NWFP and was addressed in the NWFP ROD. The report of the Forest Ecosystem Management Assessment Team (FEMAT) provided the basis for the NWFP. FEMAT considered salvage with three different prescriptions, ranging from Prescription 1 - no salvage, to Prescription 3 - salvage with minimum guidelines. The NWFP ROD adopted Prescription 2, (FEMAT II-18) which provided for limited salvage in LSRs. The FEMAT report describes the rationale for Prescription 2 as follows:

*Valuable trees that are dead can be used for commercial purposes with the attendant employment and economic benefits. ...**Increased fire danger or risk to insect and disease resulting from large accumulations of dead trees** (emphasis added) can be reduced in an economically feasible fashion. Avoided are the perceptions of economic waste if patches of dead trees are not salvaged (FEMAT II-18).*

The topic of salvage in LSRs was addressed in the NWFP ROD. Public comments on the Draft of the NWFP opined that salvage should be restricted only to Adaptive Management Areas. The Secretaries of Agriculture and Interior, the signing officials for the NWFP, noted their logic for allowing salvage in LSRs in the Response to Comments:

Salvage is not required to be beneficial, but is designed to permit recovery of a timber volume in those instances where catastrophic events clearly kill more trees (resulting in more snags and down logs in the short and long term) than are needed to maintain late successional conditions (NWFP ROD: 66).

The ROD for the NWFP provided Guidelines to Reduce Risks of Large-Scale Disturbance (NWFP ROD C-12, 13). The Klamath NF LRMP incorporated, and is consistent with, management direction contained in the NWFP. Guidelines from the KNF LRMP (4-87) to reduce the risks of large scale disturbance in LSRs are set forth below in Table 4, as is a short description of how the project will meet the guideline. A more detailed discussion of the project's consistency is provided in the discussion below as noted.

Table 4
LRMP Guidelines to Reduce Risks of Large-Scale Disturbance

Guideline	Implementation
MA5-27 Certain risk management activities, if properly planned and implemented, may reduce the probability of major stand-replacing natural events such as fire.	Salvage harvest units would reduce the threat of future stand replacement fire by removing heavy fuels. Salvage activities are integrated with fuel breaks in a cohesive fuels reduction strategy that reduces the risk of future stand replacement fire. Severely burned areas where risk-reduction salvage is proposed do not meet the definition of suitable habitat. Legacy components have been retained within proposed units where they exist.
MA5-28 Silvicultural activities aimed at reducing risk shall focus on younger stands in LSRs. The objective will be to accelerate development of late-successional conditions while making the future stand less susceptible to natural disturbances. **Salvage activities should focus on the reduction of catastrophic**	

Table 4 LRMP Guidelines to Reduce Risks of Large-Scale Disturbance	
insect, disease and fire threats. Treatments should be designed to provide effective fuel breaks wherever possible. (Emphasis added). However, the scale of salvage and other treatments should not generally result in degeneration of currently suitable owl habitat or other late-successional conditions.	
MA5-29 In some LSRs in these provinces, management that goes beyond these guidelines may be considered. Levels of risk in those LSRs are particularly high and may require additional measures. Consequently, management activities designed to reduce risk levels are encouraged in those LSRs even if a portion of the activities must take place in currently late-successional habitat. While risk-reduction efforts should generally be focused on young stands, activities in older stands may be appropriate if**:** **(1) the proposed management activities will clearly result in greater assurance of long-term maintenance of habitat,** **(2) the activities are clearly needed to reduce risks and** **(3) the activities will not prevent the LSRs from playing an effective role in the objectives for which they were established.** Such activities in older stands may also be undertaken in LSRs in other provinces if levels of fire risk are particularly high.	Future risk levels that would result from large, high severity burn patches are addressed below, and in depth in the Fuels Report and EIS Chapter 3 – Fuels. Risk-reduction salvage harvest is appropriate in older stands where stand-replacement fire occurred because: 1. Management activities result in in greater assurance of long-term maintenance of habitat because reducing heavy fuels in large blocks in concert with strategically placed ridgetop FMZs provides substantial reduction in risk of large-scale stand replacement fire. This also provides a foundation to reintroduce fire and reestablish a low to moderate fire severity regime that would allow late-successional stand conditions to develop. 2. Activities are clearly needed to reduce risk because of the proximity to WUI in Walker, Grider Scott River and North Fork Salmon drainages. There is also a need to reduce the risk that would otherwise be created by large areas of heavy fuels from fire-killed trees outside of the WUI. 3. The LSR network is intended to be robust able to absorb impacts and still function (Dr. Jerry Franklin, public comment letter). Proposed activities would not affect LSR function in the short term because over 90% of the stands of larger trees (>24 inches QMD) would be retained. Using California Wildlife Habitat Relationship (CWHR) data, Figure 12 shows that of the 29,600 acres of stands with a quadratic mean diameter (QMD) greater than 24 inches in the LSRs, in all burn severities, 1,750 acres (6% of the size class) would be removed by the Westside Fire Recovery project in salvage harvest units. An estimated additional 240 acres of stands greater than 24 inches QMD would be removed in roadside hazard cleanup (Table 3) in moderate – high severity burn areas. With salvage units and roadside hazard combined, approximately 2,000 acres of stands with a QMD greater than 24 inches would be removed within the Eddy Gulch and Seiad LSRs from moderate – high severity burn areas. Of stands with a QMD greater than 24 inches this represents about 23 percent of the 8,650 acres of moderate - high severity burn acres and about seven percent of that diameter class in all burn severities in the LSRs. Of the stands where the QMD is greater than 24 inches that are in moderate to high severity burn patches, 77 percent would be retained. Overall, over 90 percent of the stands with a QMD greater than 24 inches in the Seiad and Eddy Gulch	

Table 4 LRMP Guidelines to Reduce Risks of Large-Scale Disturbance	
	LSRs would be retained. Removal of less than 25 percent of the stands with a QMD of > 24 inches the in the moderate - high severity burn area is not expected to prevent the LSR from functioning in the short term because most (77%) of the acres in of moderate –high severity burn this diameter class would not be harvested and components of late-successional forest (legacy trees, snags, down wood) are retained according to LRMP Guidelines (See Tables 7 and 8). Overall, in all burn severities, over 90% of the stands with a QMD >24 inches would be retained. In the long term, untreated areas of high severity fire are likely to go through a decades-long cycle of reburns because of heavy fuel loads created by the 2014 Westside Fires. This puts remaining old-growth forest at risk (Beardsley and Warbington 1996) and will likely delay reestablishment of late successional forest in these areas for multiple decades. The treated areas where salvage harvest occurs are likely to become late successional forest sooner than untreated areas because the risk of future stand replacing fire is reduced where salvage harvest occurs, and those areas are replanted (See Figure 7 and FVS-1).

The primary objective of proposed salvage harvest in the LSR is risk reduction (FEIS Chapter 3 – Fuels). However since salvage harvest could potentially affect LSR objectives, the Westside Fire Recovery Project should also demonstrate compliance with Guidelines for salvage to ensure LSR objectives are met.

Guidelines for salvage harvest in LSRs were provided in the NWFP ROD (C14-15) and were adopted in the KNF LRMP (4-87). These same guidelines for salvage harvest also appear in the KNF LSR Assessment. These guidelines are set forth below in Table 5 as is a short description of how the project will meet the guideline. For several of the guidelines, a more detailed discussion of the project's consistency is provided in the discussion below as noted.

Table 5 KNF LRMP and LSRA Guidelines for Salvage in Late Successional Reserves	
Guideline for Salvage	Project Design
MA5-30-1 The potential for benefit to species associated with late-successional forest conditions from salvage is greatest when stand-replacing events are involved. Salvage in disturbed sites of less than 10 acres is not appropriate because small forest openings are an important component of old-growth forests. In addition, salvage should occur only in stands where disturbance has reduced canopy closure to less than 40%, because stands with more closure are likely to provide some value for species associated with these forests.	Only openings greater than 20 acres with moderate to high severity burn would be included as salvage units. Mortality in most units is nearly 100% and in all cases, canopy closure is less than 40%.

Table 5 KNF LRMP and LSRA Guidelines for Salvage in Late Successional Reserves	
MA5-30-2 Surviving trees will provide a significant residual of larger trees in the developing stand. In addition, defects caused by fire in residual trees may accelerate development of structural characteristics suitable for associated species. Also, those damaged trees that eventually die will provide additional snags. Consequently, all standing live trees should be retained, including those injured (e.g., scorched) but likely to survive. Inspection of the cambium layer can provide an indication of potential tree mortality.	Only dead trees and those trees 70% or greater probability of mortality and not likely to survive with would be included in salvage units. Green trees (those with less than 70% chance of mortality) would not be included. Heavy secondary mortality has been observed in trees with 70% or greater probability of mortality because of drought conditions.
MA5-30-3 Snags provide a variety of habitat benefits for a variety of wildlife species associated with late-successional forests. Accordingly, following stand-replacing disturbance, management should focus on retaining snags that are likely to persist until late-successional conditions have developed and the new stand is again producing large snags. Late-successional conditions are not associated with stands less than 80 years old.	Approximately 1,800 snags greater than 14 inches in diameter and 700 snags greater than 20 inches in diameter in any given 100 acre area will be retained. This meets or exceeds the LSRA description of snag levels in late-successional forests in the KNF and Guidelines for snag retention. Project consistency with this guideline is discussed in detail below. See also Attachment 2, Snag Retention.
MA5-30-4 Following a stand-replacing disturbance, management should retain adequate coarse woody debris quantities in the new stand so that in the future it will still contain amounts similar to naturally regenerated stands. The analysis that determines the amount of coarse woody debris to leave must account for the full period of time before the new stand begins to contribute coarse woody debris. As in the case of snags, province-level specifications must be provided for this guideline. Because coarse woody debris decay rates, forest dynamics, and site productivity undoubtedly will vary among provinces and forest types, the specifications also will vary. Province-level plans will establish appropriate levels of coarse woody debris and decay rates to be used. Levels will be "typical" and will not require retention of all material where it is highly concentrated, or too small to contribute to coarse woody debris over the long timeframes discussed. This standard and guideline represents one item to be considered and may indeed result in no salvage following windthrow in low density stands. As for other management activities, it is expected that salvage standards and guidelines will be refined through the implementation and adaptive management processes.	The project provides for retention of levels of coarse woody debris found in late-successional forests as provided in the LSRA (Table 6) and KNF LRMP (Table 7 and 8). Consistency with this guideline is discussed in detail below.
MA5-30-5 Some salvage that does not meet the preceding guidelines will be allowed when salvage is essential to reduce the future risk of fire or insect damage to late-successional forest conditions. This circumstance is most likely to occur in the California Cascades Province and somewhat less likely to occur in the California Klamath Province. It is important to understand that some risk associated with fire and insects is acceptable because they are natural forces influencing late-successional forest development. Consequently, salvage to such risks should focus only on those areas where there is high risk of large-scale disturbance.	Proposed salvage harvest is designed to reduce the risk of future stand replacement fire. The analysis clearly shows that there is a high risk of future large-scale disturbance in stands where fuels are not reduced. Salvage within some fuel management zones may not fully meet preceding standards and guidelines because of WUI considerations, or ridgetop fuel break design. Consistency with this guideline is discussed in detail below.

Table 5 KNF LRMP and LSRA Guidelines for Salvage in Late Successional Reserves	
MA5-30-6 Removal of snags and logs may be necessary to reduce hazards to humans along roads and trails, and in or adjacent to campgrounds. Where materials must be removed from the site, as in a campground or on a road, a salvage sale is appropriate. In other areas, such as along roads, leaving material on site should be considered. Also, material will be left where available coarse woody debris is inadequate.	The project design is consistent with this direction. Material will be left along roads so long as it does not compromise fuels objectives. Fuel management prescriptions have been adapted to reflect slope position and aspect.
MA5-30-7 Where green trees, snags, and logs are present following disturbance, the green-tree and snag guidelines will be applied first, and completely satisfied where possible. The biomass left in snags can be credited toward the amount of coarse woody debris biomass needed to achieve management objectives.	Project design features are consistent with this direction.
MA5-30-8 These basic guidelines may not be applicable after disturbances in younger stands because remnant coarse woody debris may be relatively small. In these cases, diameter and biomass retention guidelines should be developed consistent with the intention of achieving late-successional forest conditions.	Younger stands are not included in this proposal.
MA5-30-9 Logs present on the forest floor before a disturbance event provide habitat benefits that are likely to continue. It seldom will be appropriate to remove them. Where these logs are in an advanced state of decay, they will not be credited toward objectives for coarse woody debris retention developed after a disturbance event. Advanced state of decay should be defined as logs not expected to persist to the time when the new stand begins producing coarse woody debris.	Down wood that was present on the forest floor and was not consumed by the fire will not be removed.
MA5-30-10 The coarse woody debris retained should approximate the species composition of the original stand to help replicate preexisting suitable habitat conditions.	Coarse woody debris retained will be consistent with the direction in the LSRA and would meet this S&G. See Table 8
MA5-30-11 Some deviation from these general guidelines may be allowed to provide reasonable access to salvage sites and feasible logging operations. Such deviation should occur on as small a portion of the area as possible, and should not result in violation of the basic intent that late-successional forest habitat or the development of such habitat in the future should not be impaired throughout the area. While exceptions to the guidelines may be allowed to provide access and operability, some salvage opportunities will undoubtedly be foregone because of access, feasibility, and safety concerns.	We are not aware of any circumstance where this is applicable.

Forest Wide Late Successional Reserve Assessment

The NWFP required completion of an LSR Assessment prior to initiating projects that may impact late-successional habitat. The Klamath National Forest completed an LSR Assessment (LSRA) in 1999. The Regional Ecosystem Office (REO) reviewed the KNF LSRA and found

that it provided adequate direction for salvage harvest and other management activities proposed in the Westside Fire Recovery Project. The REO concluded that actions that were consistent with the LSRA, including salvage, did not need further review; however because of the size and complexity of this project, the Forest has requested review by the REO. While an LSRA is not a decision document and does not provide enforceable standards and guidelines as does the LRMP, it serves to inform decisions concerning activities in the LSR land allocation. Management Recommendations established in the LSRA for salvage were as follows:

To remove dead trees in order to capture volume following a stand-replacing event. The effect on the LSR must be neutral. Salvage should have a long- term positive effect on late-successional habitat and should not diminish habitat suitability now or in the future. Salvage should focus on long-range objectives, which are based on desired future condition of the forest. Management following a stand-replacing event should be designed to accelerate or not impede the development of late-successional characteristics (LSRA 4-24).

Section 3 of the LSRA makes recommendations for achieving the Desired Condition as described in the LRMP. Desired future condition for LSRs, as described in the LRMP, state that characteristics of individual areas will vary according to the primary vegetative species, site class, topography and other site factors. Table 6 summarizes snag and CWD debris metrics by stand type and aspect from Tables 3-1, 3-2 and 3-3 of the KNF LSRA. The levels and ranges of various attributes should allow for long term viability of late-successional characteristics (LSRA 1-3). The desired amounts of snags and down logs are within the ranges described in the Forest LRMP. The recommended amounts shown here have been adapted for 3 vegetation types and reflect Forest data obtained from the 1992 old growth inventory (Beardsley and Warbington 1996). It must be understood that values represented in this study reflect 60-80 years of fire suppression. These values likely overstate historical snag and down wood numbers.

Snags larger than 15 inches DBH should count toward meeting the guideline in late-successional stands. Coarse woody debris should be in a variety of decay classes; logs 15" in diameter and 10 feet in length count towards meeting the guideline for late-successional stands, but larger down logs (i.e.>20") are preferable. The values shown in Table 6 represents a minimum average for a landscape or treatment area; i.e., 100 acres. Numbers of snags and down logs can vary on any particular acre. **It is desired to exceed this minimum figure, but not to a point that will create the likelihood of a stand replacing event (LSRA 1-3)** (emphasis added)**.** The Westside Fire Recovery Project uses a target level of ten tons / acre of residual fuels to meet project objectives except on lower slopes and areas of larger trees where up to 20 tons / acre of residual fuels could be retained (Chapter 3 - Fuels).

Table 6
Snag and Coarse Woody Debris Guidelines

		Snags >15 Inches DBH	CWD Pieces > 15 inches diameter and 10 feet long
Douglas fir	North and East Aspects	4	12
	South and West Aspects	3	8
Mixed conifer	North and East Aspects	6	10
	South and West Aspects	4	7
True fir	All Aspects	11	15

Source: Tables 3-1, 3.2 and 3.3, KNF LSRA, pages 1-5 and 1-6. The descriptions represents a minimum average for a landscape or treatment area; i.e., 100 acres. Numbers of snags and down logs can vary on any particular acre.

Snag and CWD metrics suggested in the LSRA shown in Table 6 are similar to those described in the LRMP (Table 7 and 8; see also following discussion).

Guidelines for Snag Retention and Coarse Woody Debris

Snag and down wood are essential parts of late successional forest stands. There is however a tension between leaving enough snags and coarse woody debris for habitat needs and leaving so much dead wood that fuel loads are unacceptably high (Knapp 2015). The LSRA, in describing Desired Condition, noted that minimum amounts of snags and CWD could be exceeded, but not to the point that they were likely to create the likelihood of a stand-replacing event (LSRA 1-3). Skinner et al. (2006) observed that:

"Quantities of large woody material for standards and guidelines were developed from contemporary old-growth forests that had experienced many decades of fire suppression. These quantities of woody material were probably unusually high compared to typical pre- fire suppression values. Consequently, a management emphasis on meeting or exceeding standards and guidelines for dead woody material has and will increase fire hazard over time and threatens the very habitat the standards and guidelines were designed to improve."

As noted by Knapp (2015):

While the importance of woody detritus to the ecological health of many forested ecosystems is undeniable, it is also recognized that in seasonally dry forests a balance is necessary so that excessive fire hazard does not result (Brown and See, 1981; Brown et al., 2003; Lehmkuhl et al., 2007). A substantial proportion of lighting- ignited fires start in snags (Komarek, 1968). Burning snags, particularly ones that are highly decayed, are also a prolific source of embers that propagate spot fires, contributing to rapid fire spread (Barrows, 1951). In addition, the instability and unpredictability of burning snags are a serious safety issue for fire management personnel (Page et al., 2013). While a greater proportion of the dead wood biomass in coniferous forests is typically found in CWD than in snags (Harmon et al., 1986), consumption of both standing snags and CWD increases fire-line intensity, contributing to extreme fire behavior and more severe fire effects (Page et al., 2013). <u>With CWD, Brown et al. (2003) speculated that an optimum quantity for warm and dry ponderosa pine and Douglas fir forest types of the western U.S. that would provide for wildlife, nutrients and other ecological benefits, without contributing to excessive risk of an uncharacteristically severe wildfire, would fall within the range of 11.2–44.8 Mg ha-1 (5–20 tons ac-1), with the higher fuel loading acceptable if the CWD was comprised of larger pieces.</u> (Emphasis added).

In the Westside Fire Recovery Project, we address this balance between habitat and fuel accumulation by utilizing landform, slope position and aspect to determine snag and coarse woody debris amounts and distribution. All snags and coarse woody debris are retained in hydrologic Riparian Reserves and designated snag retention areas which are generally associated with hydrologic Riparian Reserves or pockets of larger trees and lower slope positions. This mimics the natural fire pattern because fires burned with lower severity in riparian areas particularly on lower slope positions where riparian areas are wider and denser. Historically even in a frequent fire environment there would tend to be more snags in these areas. Coarse woody debris is retained as specified in the KNF LRMP, but in amounts that vary with slope position (See LSRA recommendations in Table 6).

The Klamath NF LRMP provided guidelines for retention of snags (LRMP 4-30) and coarse woody debris (LRMP 4-25). Guidelines for snag retention in the LRMP are reproduced here in Table 7.

KNF LRMP 8-25: Use Table 4-4 (Reproduced as Table 7 below) as guidelines in ecosystem analysis and project-level planning. The relative numbers of hard and soft snags in various size classes show the habitat needs of the different cavity-association Forest wildlife species. The number of snags on a given acre will vary, depending on the site and on the number of snags within the landscape.

Table 7
Numbers of Snags Required per 100 acres to support "Good" Quality Habitat for Primary Cavity-Association Species ( )= Number of Snags per 100 acres

Snag Diameter (DBH)	Hard Snags	Soft Snags	Total Snags by diameter class
11+		Downy (16)	(16)
15+	Red Breasted / Black Backed (45	Hairy / White hd. (225)	(270)
20+	Vaux's Swift(200)		(200+)
24+	Pileated(14)		(14)
Total Snags			(500)

The LRMP direction does not require that these snag metrics be met on every acre; the LRMP requires that within any 100-acre area, the appropriate number of snags be retained. This allows project design to mimic the natural snag distribution described by Skinner (2002) and Taylor and Skinner (1996) with concentration of snags in time and space, and intervening areas where snags would be relatively sparse or would not occur. Attachment 2 provides documentation that snag retention standards described in the LRMP would be met.

To meet the snag standards of the LRMP shown in Table 7, the following project design features would be implemented:

- Within harvest units, all snags are retained in hydrologic Riparian Reserves, which include inner gorge areas and additional snag retention areas associated with hydrologic Riparian Reserves. Based on GIS mapping and field layout, there are an estimated 770 acres of hydrologic Riparian Reserves and snag retention areas within the LSRs where snags would be retained within proposed harvest units in the Preferred Alternative (Table 3). Using plot data from the Westside Fire Recovery project, there are on average, 55 trees per acre in salvage units. Most of these trees are dead. Thus, hydrologic Riparian Reserves and inner gorge areas and associated snag retention areas within salvage units in the Preferred Alternative have approximately 42,000 green trees or snags that would be retained within salvage harvest units in the LSR land allocation. These green trees and snags are most likely to persist on the landscape if the surface fuels around them have been reduced because reducing surface fuels reduces the severity of future fires. Salvage harvest and follow-up activity fuel treatment would accomplish the objective of reducing future surface fuel loading (Figure 7.). To further verify that the Guidelines in Table 7 were met, 30 randomly generated 100 acre areas were evaluated for snag retention using plot data for hydrologic Riparian Reserves and GIS data for fire severity and size class. Based on this assessment, approximately 1,800 snags greater than 14 inches in diameter and 700 snags greater than 20 inches in diameter are retained per 100 acre area within the fire areas. This meets or exceeds the LRMP and LSRA metrics for snags shown in Table 7. See Attachment 2, Snag Retention Analysis.

- Within hydrologic Riparian Reserves in salvage units, surface fuels would be treated by broadcast burning at the time that activity fuels within units are burned. This reduces surface fuels, and increases the probability that retained snags would survive future fires.
- Green trees and lower-severity fire areas where most of the trees survived will be retained as they occur and are not "included timber" in proposed salvage harvest areas even if they occur within salvage unit boundaries. Over time, these green trees contribute to snags and coarse woody debris. Trees with less than 70% probability of mortality would be maintained. An estimated 8,500 live trees and legacy trees within units in the LSR have been marked for retention (Attachment 2).
- Large, fire-resistant legacy live trees, legacy trees killed by the fire and trees that were dead at the time of the fire are retained where they occur within salvage units. If these pose a safety hazard, they would be felled and left to provide large woody debris.
- Additionally there are 6,600 acres of moderate or high severity fire within the LSR land allocation that were originally proposed for salvage harvest that have been dropped from the project to meet the needs of habitat for northern spotted owls or because of feasibility concerns.

The KNF LRMP also provides Guidelines for coarse wood debris (CWD) (KNF LRMP 6-16: 4-25). These are shown in Table 8, which includes a brief discussion of implementation.

Table 8
Guidelines for Coarse Woody Debris

Guideline	Implementation
6-16 Until standards are developed as described above, the following guidelines apply in areas of regeneration harvests and other vegetation manipulation:	No additional standards have been developed for CWD. The standards provided in the LRMP will be implemented.
a) Manage to provide a renewable supply of large down logs well distributed across the matrix landscape in a manner that meets the needs of species and provides for ecological functions. Develop models for groups of plant associations and stand types that can be used as a baseline for developing prescriptions.	Green trees have been retained wherever they occur. Reforestation will contribute to down logs in the future.
b) Maintain 5 to 20 pieces of CWD per acre in various states of decay. The specific amount of materials specified for retention on individual projects shall be determined by the project ID team. At a minimum, the ID team should consider the amount of materials existing on site, the amount of material needed to provide for nutrient cycling and site productivity, the denning needs of wildlife species, and the fire risk as a result of fuel material on site. Attempt to maintain these levels of CWD on site throughout the life of the project or throughout the rotation (if timber harvest is planned.) Leave large logs, conifer and hardwood, sound and cull of at least 20 inches in diameter and about 40 cubic feet in volume when they are available. Most of the logs should be in Decay Class 3, 4 and 5 (defined in the USDA Handbook 553, page 80) with at least 2 logs per acre in decay Class 1 or 2. Do not count logs less than 12 inches in diameter or stumps as CWD. This guideline may be waived in strategic fuelbreak areas or for documented safety reasons. Down logs should reflect the species mix of the original stand. In areas of partial harvest, the same basic guidelines should be applied, but they should be modified to reflect the timing of stand development cycles where partial harvesting is	CWD in these amounts and size classes will be retained. See Table 6 for specific recommendations by forest type and aspect developed in the LSRA. On upper slopes and south and west aspects, fewer pieces (~5 pieces > 15 inches diameter and 10 feet long - the lower range) would be retained because historically, frequent fires consumed down wood in these locations. On north and east aspects and on lower slopes, relatively more pieces (up to 20 pieces - the upper range) will be retained because historically, these areas burned less frequently, or burned with less severity. Snags in clumps, and green trees within units may count towards these targets. These values are consistent with those recommended by Brown et al. (2003) and cited by Knapp (2015). Fuel modeling (Figure 7) shows that salvage harvest followed by activity fuel treatment would accomplish the LRMP goal of reducing fuel concentrations that would contribute to future high-intensity fire (LRMP 4-8). Areas of snag retention would provide large pulses of dead wood as that material breaks and falls to the

Table 8 Guidelines for Coarse Woody Debris	
practiced.	ground.
c) CWD already on the ground should be retained and protected to the greatest extent possible from disturbance during treatment (e.g., slash burning and yarding) which might otherwise destroy the integrity of the substrate.	All CWD that is currently on the ground will be retained.
d) Down logs should be left within forest patches that are retained under green-tree retention guidelines in order to provide the microclimate that is appropriate for various organisms that use this substrate.	All CWD within patches of standing trees will be retained.

Fuels Reduction and Reestablishment of Coniferous Forest Habitat

Because Late-Successional Reserves have been established to provide high quality habitat for species associated with late-successional forest conditions, management following a stand-replacing event should be designed to accelerate or not impede the development of those conditions (NWFP C-14; LSRA 1-24). Research has shown that the quickest way to reestablish a coniferous forest after stand replacement fire is by active reforestation (Zhang et al. 2008). Research has also shown that plantations established in areas with high slash loadings burned severely, while those where residual slash had been adequately treated burned with much less severity and intensity or not at all (Thompson, Spies and Ganio, 2007; Weatherspoon and Skinner, 1995; Omi and Kalabokidis 1991).

Forest Vegetation Simulation (FVS) modeling (Attachment 1) shows that reforestation will establish forested conditions more rapidly by treating surface fuels and planting trees than by natural succession. It also shows that where surface fuels have been treated by salvage logging and site preparation, the ensuing stand is more resilient to fire than untreated areas. If surface fuels are treated, the risk of future stand replacement fires would be reduced, increasing the probability that planted conifers can persist into the future. In the FVS model, planted stands where fuels had been reduced began to show late-successional stand conditions typical of the Klamath Province with 40% canopy closure and 18 inch DBH trees in 90 years compared to over 200 years for untreated stands to reach the same stage.

Without planting, trees will slowly become reestablished over a period of 10-50 years in severely burned areas, but the probability of a late-successional coniferous forest becoming established is low because of probable reburns. It is probable that areas where fuels are not treated will go through several cycles of stand replacement fire until surface fuels have been reduced to the point that a low to moderate fire severity regime has been reestablished. This would maintain areas where fuels have not been reduced in semi-permanent brush fields for decades rather than accelerating the development of late-successional stand conditions.

The planted trees in areas where fuels have been successfully reduced are expected to provide “islands” of coniferous forest in a sea of brushfields perpetuated by reburns where fuels have not been reduced. This would provide a measure of vegetative diversity that would not otherwise be present on the landscape. These planted stands have a much higher probability of achieving and sustaining the desired late successional stand condition for the LSR than do unplanted areas as shown in the FVS modeling (Attachment 1).

Summary

Every stand cannot, and should not attempt to meet some target for snags and down wood Stephens (2004). Heterogeneity i.e. concentrations of dead wood in some areas with other areas where dead wood was sparse as described by Skinner (2002) would be an indicator of a healthy ecosystem (Knapp 2015). Homogenous or "average" conditions on every acre would not occur naturally in the frequent fire environment of the Klamath. Thus, to reestablish the natural late-successional post-fire environment typical of the Klamath Province, the Westside Recovery Project seeks to replicate the patterns described by Skinner (2002), Taylor and Skinner (1996), and Knapp (2015) where snags and down wood are concentrated in time and space, with intervening areas where concentrations of snags and down wood in time and space are sparse. Retaining snags in hydrologic Riparian Reserves and designated snag retention areas and varying amounts of down wood by slope position and aspect would accomplish this objective. Generally, the largest trees occur within hydrologic Riparian Reserves, which are retained.

Guideline MA5-30-3 states:

"*Snags provide a variety of habitat benefits for a variety of wildlife species associated with late-successional forests. Accordingly, following stand-replacing disturbance, management should focus on retaining snags that are likely to persist until late- successional conditions have developed and the new stand is again producing large snags."*

Because of fire frequency this requirement is difficult to meet in the Klamath Province without reducing fuels. As previously noted, retaining all of the fire-killed trees currently on the landscape is likely to create future surface fuel loading that would increase the probability of future high severity fire that would consume snags and down wood (Skinner et al. 2006; Figure 7; Fuels Report – Chapter 3). Also, as noted by Taylor and Skinner (1997) and Skinner (2002), dead wood in the Klamath province rarely lasts long enough to actually decompose because snags and down logs are receptive to embers, and once partially rotted, are easily consumed by fire. The Westside Fire Recovery Project seeks to meet the objective described in Guideline MA 5-30 by

- Retaining large green "legacy" trees wherever they occur. By virtue of their location and / or inherent resistance to fire, large green trees are most likely to persist until the next stand can develop large structures.
- Retaining snags in Riparian areas. This has the effect of retaining the larger trees, on average on the landscape, in locations that historically burned with less severity or less frequently. Very few, if any snags will persist until the next stand develops large snags (Harrod 1998) but their longevity can be increased by reducing the continuity of adjacent fuels and the probability of consumptive reburns.
- Designating additional snag retention areas in association with hydrologic Riparian Reserves (see map packet) or in pockets of larger trees. Emphasis for additional snag retention areas was placed on lower slopes that historically have burned with lower severity.
- Reducing fuels around hydrologic Riparian Reserves and snag retention areas by salvage harvest and follow-up activity fuel treatment. By reducing surface fuels, the risk of future high severity fire consuming remaining snags and down wood is reduced (Figure 7).

While the risk of loss of snags and down wood from future fires cannot be eliminated, implementation of these measures would provide a higher probability of retaining surviving green

trees, snags and down wood similar to the patterns described by Skinner (2002) and Taylor and Skinner (1996) typical of the Klamath Province, than leaving areas completely untreated.

These measures would meet short term LSR objectives because very little of the Westside Fire Recovery Project area is actually in salvage units (Figures 8, 9, 10, 11, and 12) and because snags and coarse woody debris are maintained in sufficient amounts to meet LSR standards described in the LSRA (Table 6) and the KNF LRMP (Table 7 and 8) where salvage does occur. Using California Wildlife Habitat Relationship (CWHR) data, Figure 12 shows that within the Eddy Gulch and Seiad LSRs:

- Of the 29,600 acres of stands with a quadratic mean diameter (QMD) greater than 24 inches, in all burn severities, 1,750 acres (6% of the size class) would be removed by the Westside Fire Recovery project in salvage harvest units. An estimated additional 240 acres of stands greater than 24 inches QMD would be removed in roadside hazard cleanup (Table 3) in moderate – high severity burn areas.
- With salvage units and roadside hazard combined, approximately 2,000 acres of stands with a QMD greater than 24 inches would be removed within the Eddy Gulch and Seiad LSRs from moderate – high severity burn areas.
- Of stands with a QMD greater than 24 inches, this represents about 23 percent of the 8,650 acres of moderate - high severity burn acres and about 7% of the medium / large tree diameter class in all burn severities in the LSRs.
- Of the stands where the QMD is greater than 24 inches that are in moderate to high severity burn patches, 77 percent would be retained. Overall, over 90 percent of the stands with a QMD greater than 24 inches in the Seiad and Eddy Gulch LSRs would be retained.

Components of late-successional forests (legacy trees, snags, down wood) are retained within harvest areas in amounts specified in the Klamath National Forest LRMP. Long term LSR objectives would be met in salvage units because legacy trees, green trees (to the degree they exist) that can provide future snags and coarse wood and larger trees in hydrologic Riparian Reserves, would be retained. Risk-reduction salvage in concert with ridgetop FMZs would increase the probability that snags and CWD retained would persist within treatment units because these actions would reduce the amount of surface fuels, and thus reduce future fire severity (Figure 7). These measures would also increase the effectiveness of future wildland fire use and understory controlled burns by providing large areas of treated fuels with ridgetop fuel breaks to use for control lines. This would facilitate reintroduction of low to moderate intensity fire to the LSR which is key to protecting remaining late successional and old growth stands and developing late successional stand conditions in the future (Taylor and Skinner (1997; See also FVS Modeling, Attachment 1).

Based on this assessment, we conclude the actions proposed within the Seiad and Eddy Gulch LSRs in Westside Fire Recovery Project are consistent with the recommendations of the LSRA and the Klamath National Forest LRMP as amended.

The areas that are least likely to meet long-term LSR objectives are those areas where no fuels reduction occurs because extensive areas of heavy fuels created the 2014 Westside Fires will likely contribute to repeated high severity fires in the future that would delay the establishment of late-successional stand conditions.

Forest Vegetation Simulator-Westside Fire Recovery

Forest Vegetation Simulator in conjunction with the Fuels and Fire Extension and the Stand Visualization System was used to model the effects of the action alternative and the no action alternative on the relative length of time for a stand to achieve late seral characteristics. The objective was to model the development of a Late Successional Reserve in a fire ecosystem. The two key parameters selected to determine when a stand reached this desired condition for Late Successional Reserves were a canopy closure of forty percent or greater and 15 or more trees per acre greater than twenty inches in diameter at breast height. These parameters were derived from the Klamath Forest-Wide LSR Assessment which described the current condition of the Mixed Conifer zone for Mid and Late Successional stands on the Klamath NF. The Dense stands were classified as having greater than 40% canopy closure. The average number of trees per acre over 20" DBH for those stands was 15 or greater (pages 2-5 and 2-6). The modeled stands were determined to have met the conditions for LSR development when they had met both conditions.

The FVS model is designed to predict stand development relative to other modeled treatments and not predict actual stand development times. In this case the action and no action alternatives were compared based upon equal starting conditions and site characteristics. Table 1 shows a comparison by year and by management action.

Table 1. Under the management action alternative, late seral character becomes present in year 2087, or 70 years after initial reforestation efforts. Under the no action alternative, canopy cover greater than 40% is not achieved until the end of the 200 year analysis period.

	Action Alternative		No Action	
Year	Trees per acre greater than 20" DBH	Canopy Cover %	Trees per acre greater than 20" DBH	Canopy Cover %
2007	47.9	86.49	47.9	86.49
2015	0	0	0	0
2016	0	0	0	0
2017	0	0	0	0
2018	0	0	0	0
2027	0	9.15	0	0.44
2037	0	22.7	0	2.86
2047	0	46.8	0	6.95
2057	0	23.43	0	4.25
2067	0	33.11	0.4	7.25
2077	11.7	42.12	1.4	11
2087	19.5	40.9	2.8	9.57
2097	28.6	48.08	6.7	13.2
2107	37.7	55.71	8.4	17.14
2117	44.5	57.25	9	15.98
2127	49.1	63.89	9.3	19.95
2137	50	70	11.4	24.21
2147	47.7	70.38	12.1	23.26
2157	47	74.17	14.8	27.02
2167	45.6	76.89	15.9	30.97
2177	43	75.27	15.7	30.52
2187	40	75.19	16.2	34.29
2197	37.3	74.22	16.5	37.89
2207	34.8	71.79	16.7	37.51
2217	33.3	72.27	17.5	41.1

Stand data from the Walker Creek area was used for the analysis. The stand identifier is shown as 050552ABCD0292 in the images below. The data in Table 1 corresponds to the images generated below using the stand visualization system. The inventory conditions (Image 1) reflect the year the data was collected. For this stand, data was collected in 2007. We simulated a stand replacing fire in 2014 to represent the Happy Camp Complex (Image 2). Image 3 shows the post fire mortality. The first 3 images are identical for both the Action and No Action Alternatives and therefore not duplicated. For the Action Alternative, salvage logging occurs in year 2016 (Image 4, left) followed by a prescribed broadcast burn to reduce fuels and prepare the site for planting (Image 5, left). Images 4 and 5, right, show the amount of standing dead material for the No Action alternative for the years 2016-2017. Artificial regeneration (tree planting) takes place in year 2017 for the action alternative (no image provided). In the year 2020, a pulse of natural regeneration was simulated in both alternatives. Using Shatford's research in the Klamath-Siskiyous (Shatford, Hibbs, and Puettmann, 2007), we estimated that at an average of 350 meters from the nearest seed source, 100 conifer seedlings per hectare would be established, or approximately 40 conifer seedlings per acre (Image 6). For both alternatives, wildfires were simulated on a 30 year cycle followed by a pulse of natural regeneration 5 years after each fire. The first wildfire was simulated in 2047 with a pulse of natural regeneration in 2052. A second fire was simulated in 2077 with a pulse of regeneration in 2082. We continued this pattern until the end of the simulation period of 200 years. Image 7 shows the stand condition in 2047 prior to the wildfire and Image 8 shows the fire spreading through the seedling stand. Images 9 through 11 show how the stand progresses under each alternative at 50 year intervals. Image 12 shows the stand at the end of the analysis period in the year 2217.

While the stand that developed without treatment (no action) may be appropriate on upper SW facing slopes, it does not meet the basic stand conditions necessary to meet the criteria for tree size and canopy closure until year 200 which delays development by 130 years, or almost three times the duration of the salvaged and planted stands.

Image 1

Stand=050552ABCD0292 Year=2007 Inventory conditions

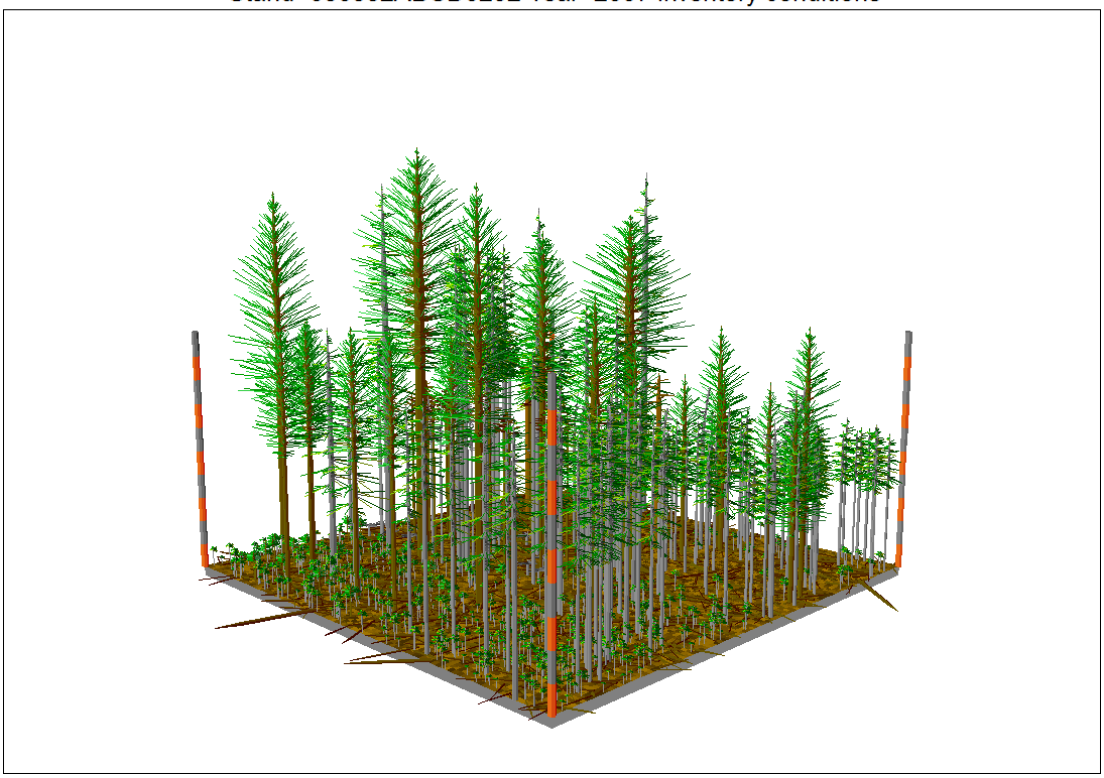


Image 2

Stand=050552ABCD0292 Year=2014 Beginning of fire (01/03)

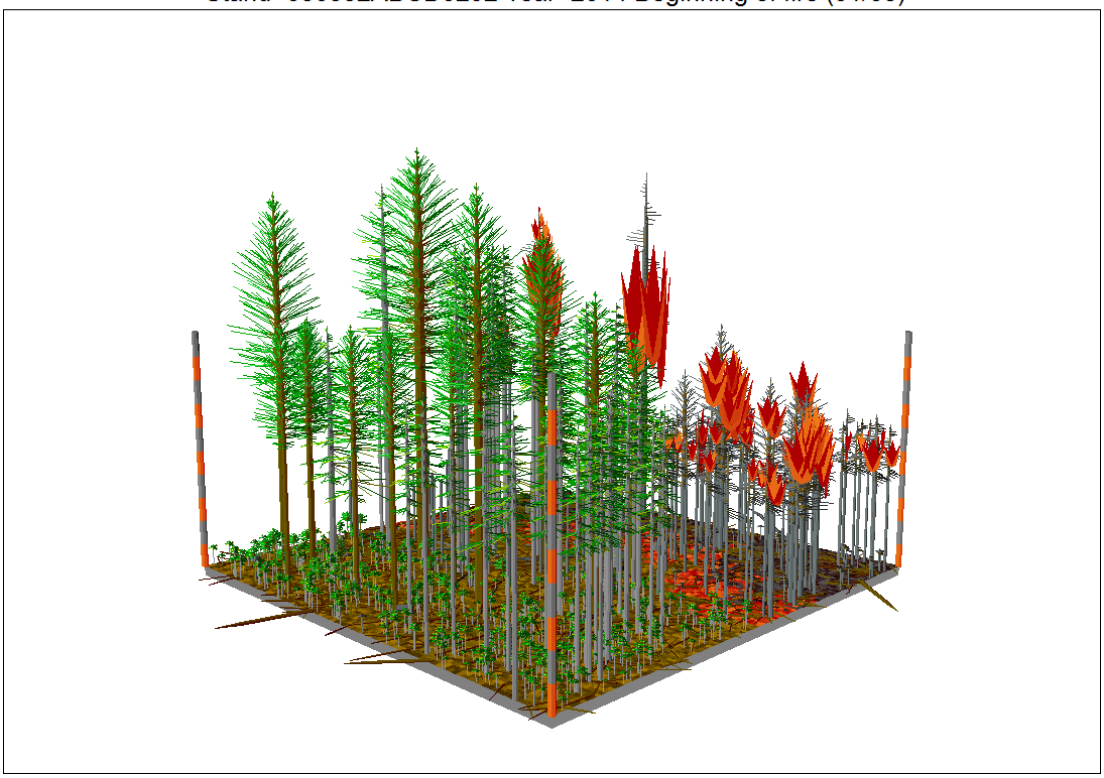


Image 3

Stand=050552ABCD0292 Year=2014 After the fire (03/03)

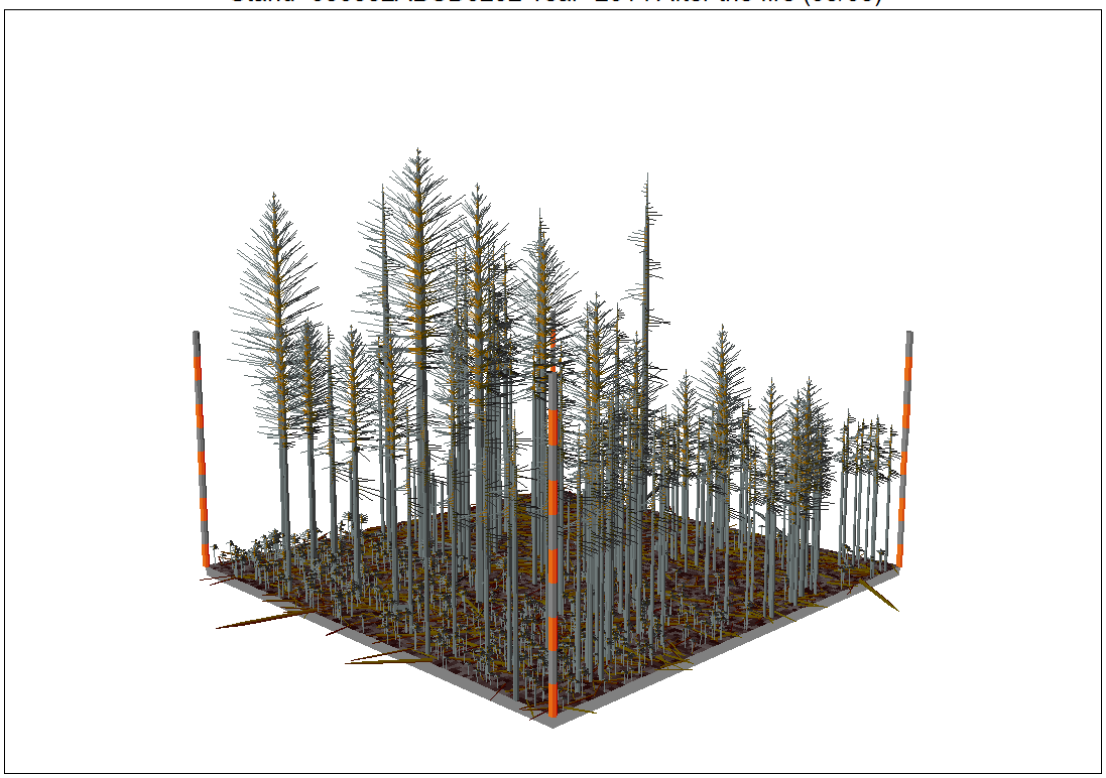
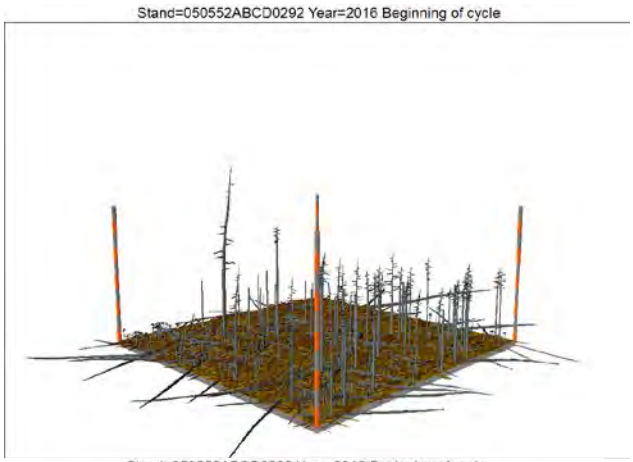


Image 4



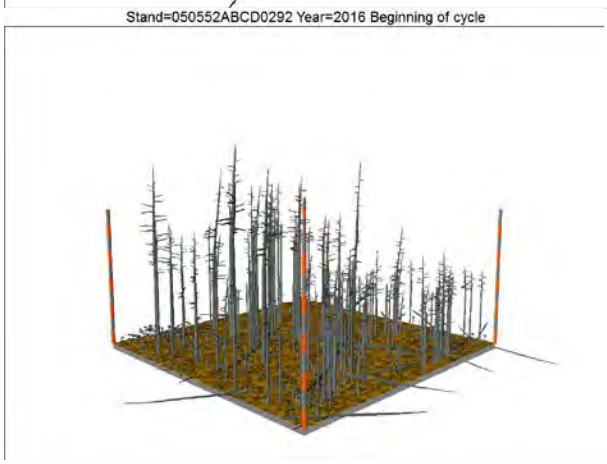
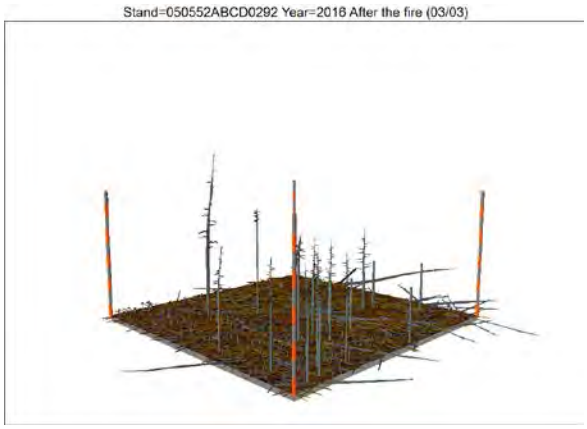


Image 5



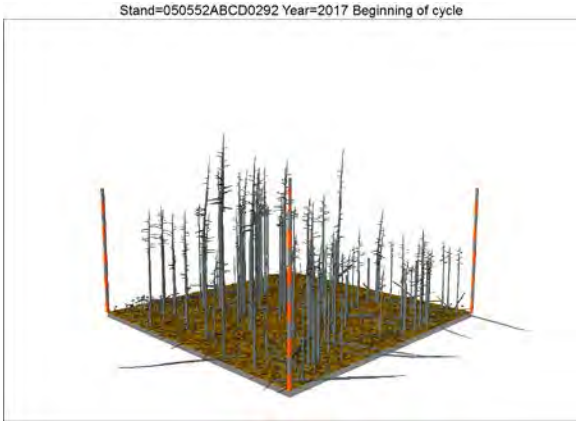


Image 6

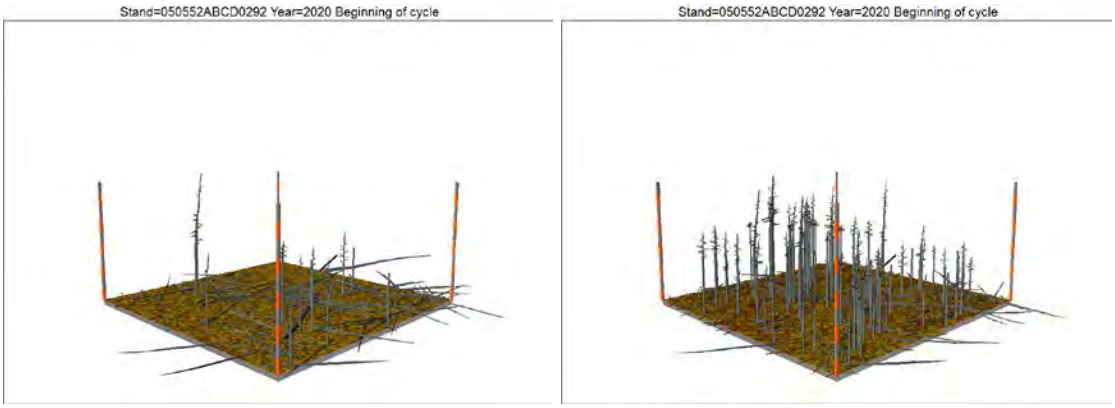


Image 7

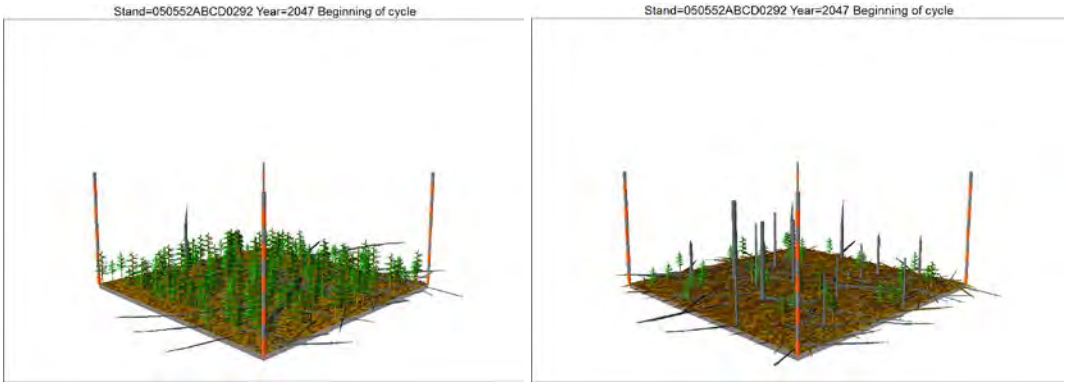
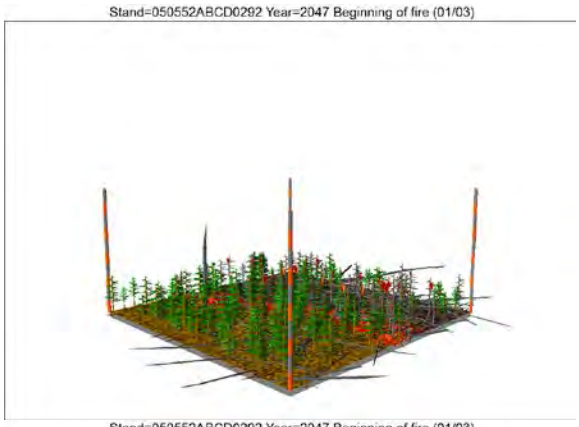


Image 8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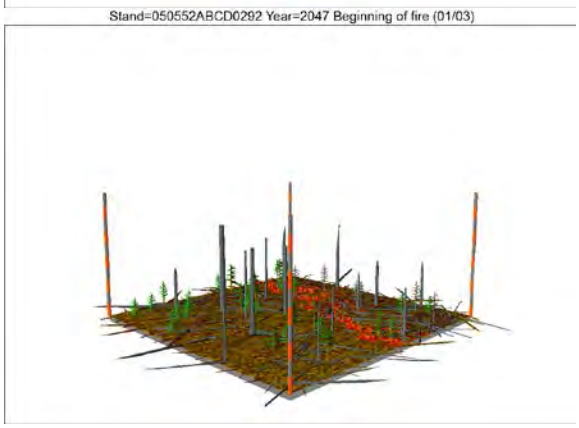
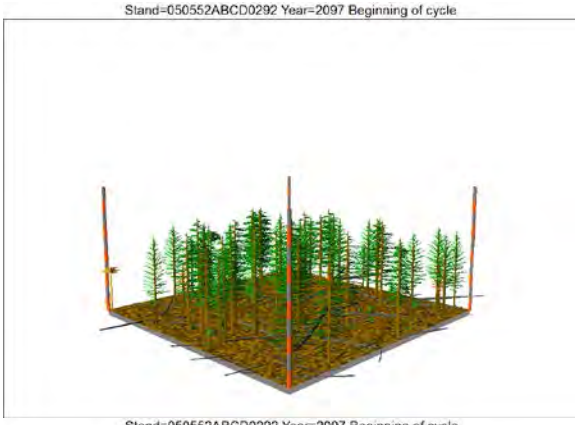

Stand=050552ABCD0292 Year=2047 Beginning of fire (01/03)

Image 9


Stand=050552ABCD0292 Year=2097 Beginning of cycle

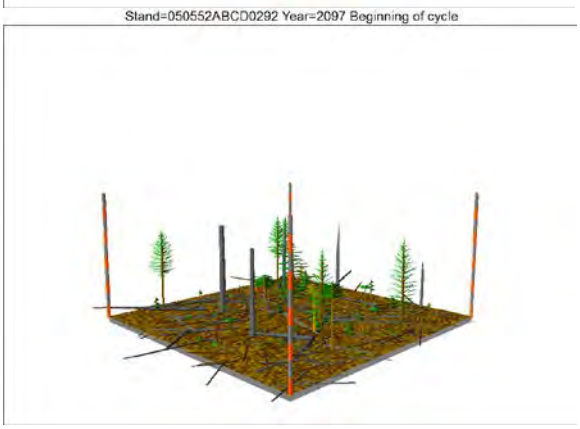
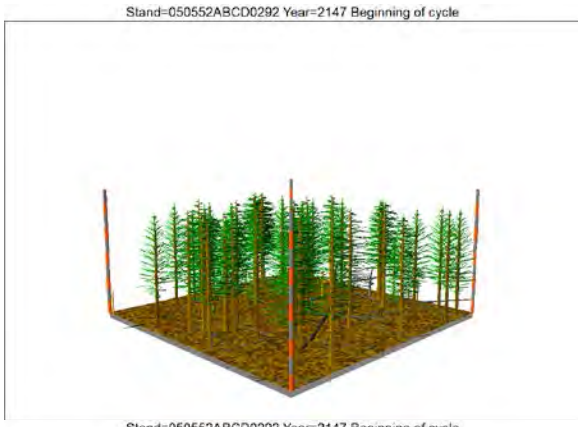
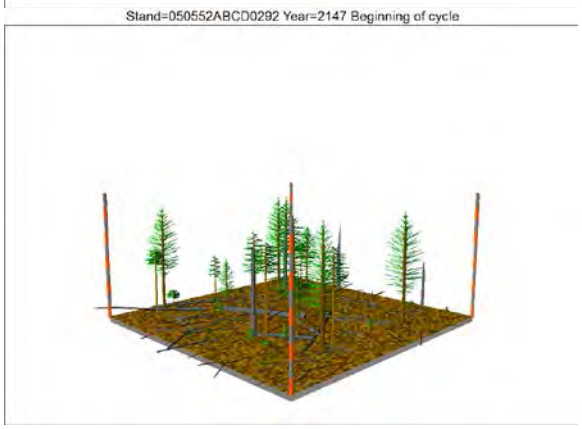

Stand=050552ABCD0292 Year=2097 Beginning of cycle

Image 10





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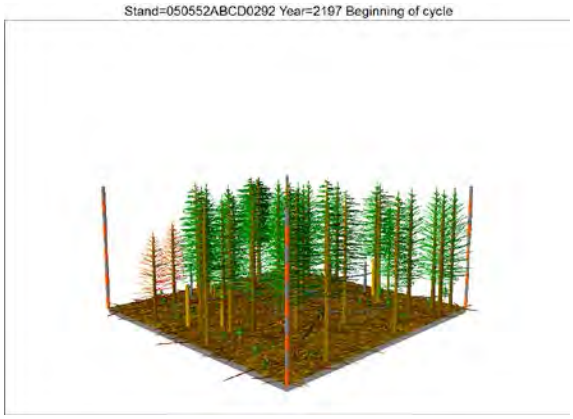

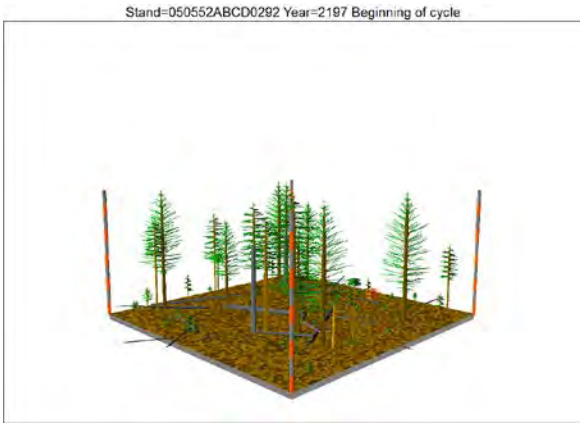

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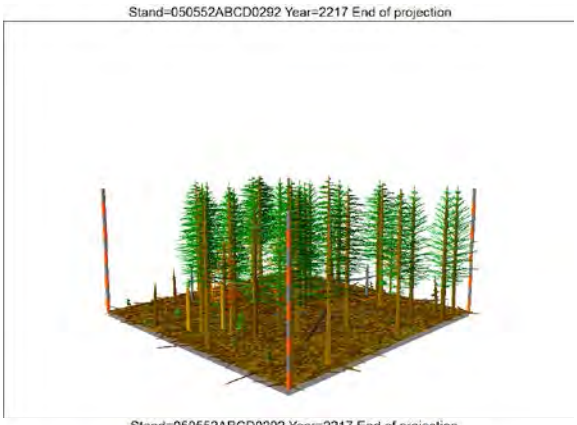
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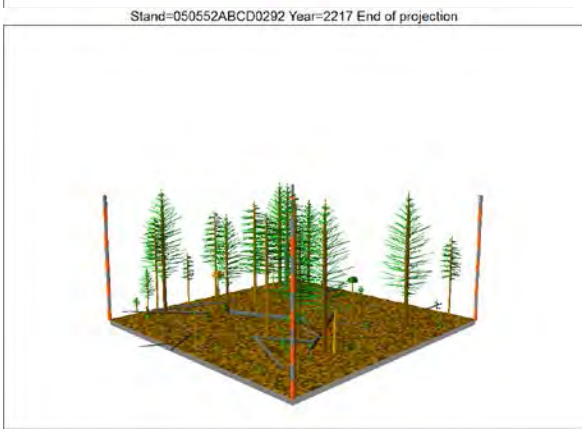
Stand=050552ABCD0292 Year=2217 End of projection

Attachment 2: Snag Retention

The Klamath National Forest LRMP requires that within any landscape, management actions ensure that an appropriate number of snags are retained for wildlife habitat. The LRMP direction does not require that these snag metrics be met on every acre; the LRMP requires that within any 100-acre area, the appropriate number of snags be retained. On the Westside Fire Recovery, snag retention within salvage units will occur in hydrologic Riparian Reserves and designated snag retention areas.

Data Sources:

- Plot data was derived from 75 randomly generated plots taken within hydrologic Riparian Reserves. Data was entered and analyzed in FVS to provide an average per acre snag distribution by diameter class.
- E-Veg and RAVG data were used to define forested areas outside unit boundaries (>10 inches) within RAVG classes 3 and 4 (50 to 100% mortality). Snag diameter distribution in these areas was assumed to be the same as those from the Riparian Reserve plots. Mortality in these areas is presumed to be 100% as very few green trees exist in most of these areas. No snags were included from the 0-50% mortality class because of uncertainty and uneven distribution, so this analysis understates the number of snags on the landscape.
- Acres of Riparian Reserve and snag retention areas within units are from the Project GIS database.

Methods:

- 30 randomly generated center points were delineated in salvage units greater than 50 acres. These points were then buffered with a 100 acre circle.
- Acres within the 100 acre buffer in hydrologic Riparian Reserves and Snag Retention Areas within units, and acres >10 inches in diameter with more than 50% mortality outside were tabulated.
- The total acres of snag retention were multiplied times the trees/acre by diameter class to develop a snag distribution by diameter class and total number of snags for each 100 acre circle.
- Areas where snag counts appear to be low were reviewed to determine whether additional snags should be designated. Snag retention areas were added or modified designated in consultation with the Fish and Wildlife Service as necessary.

In addition to snag retention and riparian reserves individual trees have been marked as leave trees. These trees include live trees that will provide future recruitment of snags, trees along unit boundaries and legacy trees. In order to capture the number of trees that were marked as leave trees crews tallied the number of trees being left by fire area. Within salvage units in the Happy Camp fire there are a total of 7,164 leave trees and 1,542 leave trees in the White Fire salvage units.

Random Pt	Unit (Acres)		Outside Unit From E-Veg / RAVG (Acres) >10" and >50% Mortality	Total Acres Snag Retention per 100 Acres	Snag Diameter Distribution from Plot Data				Total >14" / 100 Acres	Total > 20" / 100 acres	Total Acres
	Riparian Reserve	AddSnagRet			14-20"/ 100 acres (37.1/Ac)	20-26" / 100 acres (8.5/Acre)	26-32" / 100 Acres (8.8/Acre)	>32" / 100 Acres (5.1/ Acre)			
1	12	16	18	46	1,716	393	407	245	2,762	1,045	100
2	8	14	25	46	1,698	389	403	243	2,732	1,034	100
3	6	3	11	19	705	161	167	101	1,134	429	100
4	7	5	6	18	654	150	155	93	1,053	399	100
5	9		11	20	745	171	177	106	1,199	454	100
6	0		16	16	607	139	144	87	977	370	100
7	2	6	24	32	1,204	276	286	172	1,937	733	100
8	1		32	32	1,204	276	286	172	1,938	734	100
9	9		35	44	1,617	371	384	231	2,603	985	100
10	35		41	77	2,850	653	676	407	4,587	1,736	100
11	3	3	13	20	731	168	173	104	1,177	445	100
12	0	13	6	19	701	161	166	100	1,127	427	100
13	0	5	10	15	562	129	133	80	905	343	100
14	18	4	18	40	1,496	343	355	214	2,407	911	100
15	14		13	27	987	226	234	141	1,588	601	100
16	9		35	45	1,663	381	395	238	2,677	1,013	100
17	3	1	28	32	1,179	270	280	168	1,898	719	100
18	0	8	31	39	1,444	331	343	206	2,324	880	100
19	0	8	0	8	290	66	69	41	467	177	100
20	0		42	42	1,559	357	370	223	2,508	949	100
21	0		22	22	819	188	194	117	1,318	499	100
22	1	15	19	35	1,303	299	309	186	2,097	794	100
23	14		29	44	1,618	371	384	231	2,604	986	100
24	3	10	2	15	569	130	135	81	916	347	100
25	0	19	3	22	818	187	194	117	1,316	498	100
26	23		23	45	1,688	387	400	241	2,716	1,028	100
27	11		8	20	725	166	172	104	1,166	442	100
28	0	1	41	42	1,566	359	372	224	2,521	954	100
29	6	9	24	39	1,461	335	347	209	2,351	890	100
30	0	5	6	10	388	89	92	55	624	236	100
Total	195	145	591	932	34,568	7,920	8,199	4,938	55,626	21,058	3,000
Average / 100 Acres					1,152	264	273	165	1,854	702	

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Appendix F: Photo Journal

Photo F-1: NASA imagery on September 7, 2014, showing the smoke plume from the Happy Camp Complex fires.

Photo F-2: Example of air quality issues during the 2014 fires within the Westside Fire Recovery Project area. Residents within northern California and southern Oregon experienced continued weeks of heavy smoke accumulation and low air quality during the 2014 fire

Photo F-3: A smoke column generated by high intensity fire on the Happy Camp Complex. Pre-fire heavy fuel loading conditions contributed to the stand-replacing nature of the fire and its large smoke column. The smoke column carried burning embers aloft, spotting fires ¼ to ½ mile downwind of the fire and accelerating fire spread.

Photo F-4: A fuel break constructed within the Happy Camp Fire, which was used by firefighters for fire suppression. This is an example of moderate to high intensity fire that resulted in nearly total stand mortality. Photo taken on September 4, 2014.

Photo F-5: Low to moderate intensity surface fire activity occurred when the weather conditions and terrain created air inversion layers, which trapped smoke above the fire and reduced fire behavior. Air inversions have reduced fire behavior because of decreased solar radiation, decreased temperatures, and increased fuel moisture at the ground surface. Air inversions were most frequent in the mornings and early afternoons.

Photo F-6: An illustration of fire activity after the air inversion lifted, resulting in extreme fire behaviors. Moderate to high severity fires (>50% tree mortality) occurred within 33% of the project area.

Photo F-7: Example of a mixed severity area within the Westside Fire Recovery project. Along the bottom of the photo, low severity burns can be seen, along with moderate severity in the middle of the photo and high severity along the hillside ridgeline.

Photo F-8: Photo of a large high severity patch within the East Fork of the Walker Creek drainage. Areas like these are proposed for salvage harvest within the Westside Fire Recovery project.

Photo F-9: A high severity burned area above the Scott River Road near Scott Bar, California. Although fire-killed trees still bear needles immediately following the fire, most trees within high severity burn areas are expected to die. Insects (primarily beetles), stain and decay fungi, and weather all act as deterioration agents in fire-killed timber.

Photo F-10: Example of 100% mortality of trees within the Beaver Fire area. Note the lack of groundcover and burned out stumps, which is an indication of a high intensity burned area.

Photo F-11: A high severity burned area within the Beaver Fire area. Note the lack of groundcover and burned out stumps, which is an indication of a high intensity burned area.

Photo F-12: This photo shows an example of an area of high severity burn within the Westside Fire Recovery project. In the background you can see Tanners Peak which is also within the project area and is within an Inventoried Roadless Area where no salvage harvest is proposed.

Photo F-13: Example of a mixed severity patch. Areas within patches that experienced high severity burns are proposed for salvage harvest under alternative 2 of the Westside Fire Recovery project.

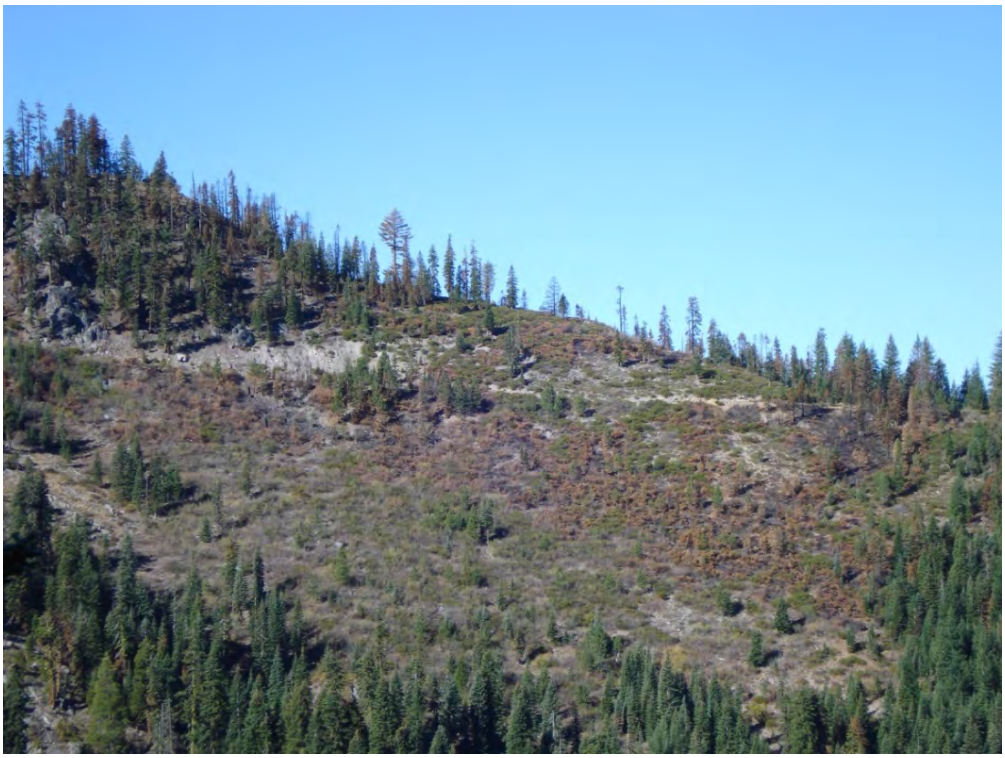

Photo F-14: A plantation that experienced low severity burns and has been excluded from site preparation and reforestation due to the presence of green seed trees, its upper slope position, and the existing vegetation.

Photo F-15: Stand that burned at high severity and is proposed for fuels treatment in order to reduce standing fuels and to promote oak regeneration.

Photo F-16: High severity fire effects on the Happy Camp Complex. The fire consumed duff and needle cast, small branches, and large downed woody material, resulting in low surface fuel loading in the existing condition. Within the canopy, full consumption of leaf and needle foliage occurred, leaving standing dead trees and barren soils. As snags continue to decay, break, and fall, surface fuel loading and the severity and intensity of future fires will increase. Increased fire intensities and fallen snags will inhibit the effective control of future fires and/or put fire suppression crews at increased risk.

Photo F-17: Canopy view of a high fire severity patch within the Whites Fire. Most of the needles are gone.

Photo F-18: Moderate to high severity fire areas within surface and mid-story canopy fuels. Surface fuel loadings were primarily fully consumed during the fires. Pockets of larger downed fuels remain visible on the surface.

Photo F-19: Moderate to high severity fire within canopy fuels. The crown fuel profile varies with some trees being consumed by the fire and other trees retaining needles in the tree canopy.

Photo F-20: A typical area where roadside hazard treatment is proposed with the Westside Fire Recovery project (chapter 2). Patches of green trees can be seen along with patches of trees that experienced high burn severity.

Photo F-21: A roadway that experienced high burn severity during the 2014 fires. Areas such as this will receive roadside hazard treatment under the action alternatives of the Westside Fire Recovery project (see chapter 2).

Photo F-22: Example of an area that would be treated using salvage harvest and preparation and planting, above and below the roadway.

Photo F-23: An example of a fallen fire-killed tree along a roadway, affecting the safety and access of forest workers and the public.

Photo F-24: Example of an area that would receive site preparation and planting under alternative 2 of the Westside Fire Recovery project. High severity burns can be seen in the foreground of the photo.

Photo F-25: Example of a high severity burned area in the foreground with mixed severity in the background.

Photo F-26: A mixed severity area in the background with a high severity area in the foreground with little to no ground cover. The high severity area is an example of the type of area proposed for treatment.

Photo F-27: Stand with a mixture of hardwood components and remnant large tree stumps. The area on the east facing aspect on a middle one-third slope is proposed for hand-cutting, piling and burning, and planting.

Photo F-28: Unit within the Beaver Fire area proposed for site preparation using mastication and planting. Mastication was chosen due to favorable machine access, gentle slope percent, the diameter of material on site, and the low levels of existing ground fuel.

Photo F-29: An example of an untreated area in 2012, ten years after the 2002 Stanza Fire, which was located adjacent to the Happy Camp Complex on the Klamath National Forest. Note the volume of standing and felled snags intermixed with brush. Without treatment (alternative 1), areas within

the Westside Fire Recovery project can be expected to have similar fuels loading conditions ten years from now, increasing their susceptibility to high severity fire.

Photo F-30: Firefighters survey multiple burning snags and employ tactics to safely build line to control the fire. The weakened trees pose a risk to firefighters, both from falling and producing spot

fires ahead of the main fire. Without treatment within the Westside Fire Recovery project area, it will be difficult to suppress large fires in the future.

Photo F-31: Photos displaying a pre-and-post fire condition from the 2012 Chips Fire on the Plumas and Lassen National Forests in northern California. These photos highlight the reburn potential within a 12 year old fire scar of the 2000 Storrie Fire. Shrub regrowth among standing snags created high severity fire effects within the footprint of the 2000 Storrie Fire. Heavy consumption of shrub, herb, grass, snag and downed fuels is evident. The Chips Fire, also subjected to daily thermal inversions like the 2014 fires in this project, started and burned for a long period of time within steep drainages of the Feather River Canyon.

Photo F-32: Salvage and site preparation activities on the Klamath National Forest Salmon Salvage project, adjacent to the Whites Fire. Fire killed trees are cut and removed from the site, with follow-up hand piling to meet surface fuel loading criteria sufficient for low intensity fire. Similar activities are proposed in the Westside Fire Recovery project (chapter 2).

Photo F-33: A masticated fuel bed. Brush and small trees have been mulched to reduce surface fuel bed depth to less than two inches.

Photo F-34: Without action, fire-killed trees will fall over time in "jack-strawed" patterns, increasing fuel bed height above the ground surface. Higher surface fuel beds are subject to wind and preheating of fuels lower in the surface fuel profile, increasing fire behavior potential. Under alternative 2 of the Westside Fire Recovery project, where mastication is identified as a treatment option, chipped material will create a compact fuel bed. Masticated material would also decay faster due to its proximity to the ground and increased fuel moisture conditions. Under the action alternatives, fire-killed trees will be removed before they fall and become "jack-strawed," improving fuel conditions as well as foot travel and safety conditions for forest workers and firefighters during suppression efforts.

Photo F-35: Walker Creek in the Happy Camp Complex area. While significant portions of the watershed burned at moderate and high severity in 2014 (as can be seen in the photo), the main stem valley bottom was left mostly unburned.

Photo F-36: An example of an existing legacy site within the project area where erosion has been an issue. The treatment of this legacy site is proposed for this project in all action alternatives. If this legacy site is not treated, then future erosion and subsequent negative impacts to watershed conditions are likely.

Appendix G: Wildlife Biological Assessment

Submitted July 24, 2015

USDA United States Department of Agriculture | Forest Service | Klamath National Forest Supervisor's Office

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530-842-6131
TDD: 530-841-4573

File Code: 2670
Date: July 24, 2015

Erin Williams
Field Supervisors
USFS Fish and Wildlife Service
1829 S. Oregon Street
Yreka, CA 96097

Dear Ms. Williams:

The Klamath National Forest has determined through the enclosed Biological Assessment that the proposed Westside Fire Recovery Project on the Happy Camp/Oak Knoll and Salmon/Scott River Ranger Districts is likely to adversely affect Northern Spotted Owl and Northern Spotted Owl critical habitat. As a result of consultation, I have made substantial reductions or modifications to the actions that were presented in the previously submitted Biological Assessment and letter requesting consultation dated April 22, 2015.

During the consultation process, your office has provided me recommendations covering about 2,600 acres of specific salvage harvest units. These recommendations included modifying prescriptions or completely removing salvage harvest from the proposal project to further reduce the effects to Northern Spotted Owls. After substantial consideration and discussion with my staff, I adjusted the proposed activities for consultation to the point practicable while balancing the purpose and need of the project. As a result, I decided to remove about 2,950 acres of salvage harvest from consultation. About 1,170 acres of salvage harvest removed overlap your recommendations while the remaining 1,780 acres of salvage harvest were removed for other reasons. It is important to note that while these 1,780 acres of deleted treatment were not included in the Service's earlier request for reduction, this reduced treatment will also lower the amount of disturbance and further reduce the effects to Northern Spotted Owl and its critical habitat.

In addition to the salvage harvest removed from consultation, my specialists have identified about 1,085 acres of retention areas in salvage units (i.e. hydrologic riparian reserves and snag retention patches) that will not be salvage harvested. These acres represent the minimum amount of retention and may increase as other retention areas may be added after sites have been identified for other wildlife species and possibly other resource concerns.

In addition to the reduction of salvage harvest, I have also considered reducing the amount of site preparation and planting and modifying the prescription for roadside hazard tree removal as part of your recommendations. About 780 acres of site preparation and planting were recommended by your office to be removed from the project proposal to reduce the amount of disturbance to the adjacent Northern Spotted Owl suitable habitat. After consideration of the possible effects to the Northern Spotted Owl and the potential benefits of site preparation and planting, I decided to remove about 420 acres of site preparation and planting from consultation. The roadside hazard

Erin Williams 2

prescription was adjusted to focus on hazards created by the fire which will likely reduce the effects to habitat and the amount of disturbance to Northern Spotted Owls. It is important to know that, regardless of the Westside Fire Recovery Project, roadside hazards will continue to be evaluated as part of the Forest's regular operations and imminent roadside hazards will be reduced following the consultation process.

The other species evaluated in the Biological Assessment and determinations are summarized below. The project is outside of the range of the Marble Murrelet and, therefore, will have no effect on the Marble Murrelet or Marble Murrelet critical habitat. Although the project does occur within the range of the Yellow-billed Cuckoo or Yellow-billed Cuckoo critical habitat, the project will have no effect on Yellow-billed Cuckoo or Yellow-billed Cuckoo critical habitat. The project occurs within the possible range of the gray wolf and, for reasons disclosed in the Biological Assessment, the project is expected to have no effect on the gray wolf or gray wolf critical habitat. Finally, the Shasta crayfish, Oregon spotted frog, and vernal pool fairy shrimp, vernal pool tadpole shrimp, and Conservancy fairy shrimp may occur within Siskiyou County and, for reasons disclosed in the Biological Assessment, the project will have no effect on these species or their critical habitat. The fisher, currently identified as proposed for federal listing as threatened by the U.S. Fish and Wildlife Service, is not analyzed in this Biological Assessment, thus conferencing on this species is not requested at this time.

I am requesting formal consultation pursuant to Section 7 of the Endangered Species Act, as amended, regarding the effects of this project on the Northern Spotted Owl and its critical habitat.

Please call Chad Bell, Forest Biologist, at (530) 841-4416, if you have any questions.

Sincerely,

PATRICIA GRANTHAM
Forest Supervisor

USDA

United States
Department of
Agriculture

Forest
Service

July 23, 2015

Wildlife Biological Assessment

Westside Fire Recovery Project

Happy Camp/Oak Knoll and Salmon/Scott Ranger Districts
Siskiyou County, California

Prepared by: _____ **Date:** July 23, 2015
Patricia Johnson
Wildlife Biologist
US Forest Service
VMS Enterprise Unit

Reviewed by _____ **Date:** July 23, 2015
Chad Bell
Wildlife Biologist
Klamath National Forest

Approved by: _____ **Date:** 7·23·15
Patricia Grantham
Forest Supervisor
Klamath National Forest

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Summary of Project Modifications since the Submission of the Draft Biological Assessment

The actions proposed for the Westside Fire Recovery project have changed considerably between the Draft Biological Assessment and this analysis as a result of the consideration of multiple factors including, but not limited to: public comments, more detailed economic evaluations, additional on-the-ground evaluations, additional interdisciplinary review, additional minimization measures for effects to northern spotted owls (NSO), recommendations from the National Marine Fisheries Service, tribal governments, and the US Fish and Wildlife Service.

The NSO analysis area has been reduced in size to capture a reduced treatment footprint. The total number of NSO activity centers (AC) affected by the proposed treatments has subsequently been reduced from 94 to **85**, including one AC that was added as a result of newly detected NSOs that occurred outside of a known AC (see 2015 Survey Summary below). Ten activity centers were dropped from the analysis between the draft and the final BA due to the re-delineation of the analysis area bounding as a result of treatments either being removed or altered. Activity centers **0210, 0269, 0350, 0352, 0358, 1165, 4095, 4097, 4189**, and **0096B** are not further analyzed in this document because no activities are proposed within the core or home range for this consultation. The remaining 84 activity centers and the one new activity center are the focus of this analysis.

In summary, the revised project proposal contains: fewer salvage harvest acres; a clarification of the prescription for site preparation and planting units to exclude from treatment trees that contain green limbs and any trees/snags greater than 10 inches dbh; an adjusted roadside fuels treatment prescription that is based on solar radiation, slope position and aspect, and proximity to NSO core areas; a refined method of identifying hazardous trees/fuels along roadsides to include only trees damaged by the 2014 fires and exclude roads that would require substantial maintenance to become drivable. Effects to

NSO from prescribed burning were re-evaluated and the determination of effect was adjusted to reflect a refined treatment prescription (see Direct and Indirect Effects section below).

I. Introduction

The Westside Fire Recovery Project was developed in response to the 2014 wildfires on the Happy Camp/Oak Knoll and Salmon/Scott River Ranger Districts of the Klamath National Forest (Forest). The 2014 fire season ultimately burned about 215,000 acres on the Forest, of which the Beaver Fire, the Happy Camp Complex, and the Whites Fire of the July Complex overlap the Westside Fire Recovery Project area.

The project area comprises 218,600 total acres, including 187,100 acres of National Forest System land and 31,500 acres of private land. For the analysis within the EIS, the project is divided into three subparts: project area A (Beaver Fire), project area B (Happy Camp Complex), and project area C (Whites Fire of the July Complex).

This Biological Assessment (BA) analyzes the potential effects of the proposed USDA Forest Service action, the Westside Fire Recovery Project, on threatened or endangered species listed under the Federal Endangered Species Act (ESA) or on their designated critical habitat In accordance with the ESA and regulatory guidance, we considered: only those organisms that appear on the official species list as seen in Table G-1(below), and

only those wildlife species under the regulatory jurisdiction of the U.S. Fish and Wildlife Service (USFWS) within the area of the project as determined by the USFWS. If warranted for analysis, fish and plant species found on the USFWS list under the jurisdiction of the National Marine Fisheries Service (NMFS) or USFWS will be considered in a separate document. Federally listed fish and plants are addressed in separate documents.

Species that will not be affected by the proposed activities will be considered briefly and eliminated, with justification, from further, more detailed consideration. We will consider in detail those species that may be present in the action area and may be affected by the proposed activities. We will also consider the effects of the proposed project on the primary constituent elements (PCEs) and/or physical and biological features of designated critical habitat that may be affected by the proposed activities.

This document is prepared in accordance with the requirements of the ESA and its implementing regulations. It is also prepared in accordance with current Forest Service (FS) policy and follows the standards established in Forest Service Manual direction (FSM 2670) and the guidance provided in the USFWS Consultation Handbook (USDI FWS and NMFS 1998). Additionally, this BA is prepared in coordination with the USFWS as agreed upon under the consultation process.

This analysis is based on the best scientific and commercial data available at the time this document was written. This includes information such as data collected from Forest databases, remote sensing vegetation analysis, direct surveys in the field, the most recent and appropriate scientific research or species information, and direct observation on site visits to the project area.

The project area occurs entirely within Siskiyou County; therefore, a county-wide list was generated from the United States Fish and Wildlife Service (USFWS) Proposed, Endangered, and Threatened species which may occur in or be affected by projects within Siskiyou County (IPaC Trust Resource Report #ULVXQ-EIAZF-GN7IH-BBWNE-ZWOMWU*)*; accessed most recently on July 8, 2015.

Table G-1: Federally listed species derived from the species portal lookup on the USFWS website (IPaC Trust Resource Report) on July 8, 2015 for Siskiyou County.

	Common Name	Scientific Name	Status	Critical Habitat Designated?	Critical Habitat to be analyzed in project area?
Invertebrates	Conservancy Fairy Shrimp	Branchinecta conservatio	E	Y	N
	Vernal pool fairy shrimp	Branchinechta lynchi	T	Y	N
	Vernal pool tadpole shrimp	Lepidurus packardi	E	Y	N
	Shasta crayfish	Pacifastacus fortis	E	N	N
Birds	Western yellow-billed cuckoo	Coccyzus americanus	T	N	N
	Northern spotted owl	Strix occidentalis caurina	T	Y	Y
	Marbled murrelet	Brachyramphus marmoratus	T	Y	N
Mammals	Gray wolf	Canis lupus	E	Y	N
	Fisher	Pekania pennanti	PT	P	N
Amphibians	Oregon spotted frog	Rana pretiosa	T	Y	N

Species Dropped from Detailed Discussion

Gray wolf (*Canis lupus*) **-** A single male gray wolf , designated OR7, was radio collared by the Oregon Department of Fish and Wildlife (ODFW) in February 2011. Tracking data from the collar indicates that this animal entered California on December 28, 2011. The wolf travelled hundreds of miles within California, and since April 2013 has returned to Oregon. The future movements of this animal are unpredictable. He may remain in Oregon or return to California. Most other recent “wolf” sightings in California have been found to be something else, such as a coyote, a dog or a hybrid wolf-dog. No wolf pairs or dens, and no documented rendezvous sites have been found in California in recent history. During his movements in northern California, OR7 did not enter the analysis area. There is no scientific evidence that wolves have occurred within the analysis area for over 100 years. The closest wolf is about 60 miles from the analysis area.

Although the wolf is unlikely to occupy the project area, the species could occur in or near the project area and not yet be detected. If a wolf were present in the project area, it would be most likely a dispersing individual. Wolves are generalist predators and if present in the project area, a wolf could find enough food to survive. Despite many reported observations of wolves in recent years made to the California Department of Fish and Wildlife, there has been no confirmed presence of the species, no den sites and

no rendezvous sites recorded anywhere near the project area. In addition, wolves generally avoid areas of concentrated human use such as the project area. If a wolf was present in the project area, the wolf would likely not be near any project activity that may create measurable effects to the species. Therefore, we conclude the project will have "**no effect**" on the gray wolf and will not be further discussed in this document.

Shasta crayfish (*Pacifastacus fortis*) - The Shasta Crayfish occurs only in the mid-reaches of the Pit River drainage and is limited to Fall River, Hat Creek and Sucker Springs Creek, and does not occur in any of the drainages associated with this project (USFWS December 19, 1994). The analysis area lies well outside the expected range of this species. Therefore, the project will have "**no effect"** on this species and it will not be further discussed in this document.

Oregon spotted frog (*Rana pretiosa*) - The areas proposed for treatment are well outside of the sub- basins where this species is either historically or currently extant2, as identified in the Final Rule for Listing (USDI 2014), and there is therefore a discountable chance for it to occur within the project area. Therefore, this project will have "**no effect"** on this species and it will not be further discussed in this document.

Vernal pool fairy shrimp (*Branchinechta lynchi*) and

Vernal pool tadpole shrimp (*Lepidurus packardi)* - The analysis area is outside the range of vernal pool tadpole shrimp and does not contain suitable habitat for vernal pool fairy shrimp and will therefore have "**no effect"** on either species.

Western yellow-billed cuckoo (*Coccyzus americanus*) – The cuckoo is strongly associated with dense riparian vegetation typically composed of woodlands with low, scrubby, dense vegetation and surface water. In some areas, the cuckoo can be found in willow thickets or dogwood patches. On the Forest, cuckoo habitat is limited in distribution to small areas along the Klamath River. The Forest has no record of a cuckoo detection and the closest known detection is located on the Six Rivers National Forest near the mouth of the Eel River. The Westside Fire Recovery Project proposes no treatment within cuckoo habitat. The project will not modify habitat nor disturb potentially nesting cuckoo thus the project will have "**no effect**" on cuckoo. In addition, the Forest doesn't contain any cuckoo critical habitat thus this project will have "**no effect**" cuckoo critical habitat.

Marbled murrelet – *(Brachyramphus marmoratus)* - From 1992 to 1998, extensive protocol surveys were conducted in the area designated by the Forest Ecosystem Management Assessment Team (FEMAT) as "Zone 2", and included the majority of the western portion of the Klamath National Forest. No detections of marbled murrelet were made during these surveys and Zone 2 was relieved of the need to conduct further surveys or consultation by the USFWS *(*see *Status and Distribution of the Marble Murrelet in Interior Northwestern California: Final Report* (May 18, 2000).

2 Lost River sub-basin: Lower Klamath Lake, Upper Pit River sub-basin: Pine Creek-South Pit River (near Alturas), Lower Pit River sub-basin: Town of Pittville-Pit River (near Fall River Mills).

On July 20, 2000, the Klamath National Forest received a letter, *Technical Assistance on the Final Results of the Status of the Marble Murrelet in Interior Northwestern California*, from the USFWS regarding future consultation within marbled murrelet Zone 2. The USFWS letter clarified the implications of negative survey results within the study area, and stated, "…implementation of existing and future projects in this area will not result in harassment of nesting marbled murrelets; therefore, section 7 consultation relative to disturbance of marble murrelets will not be necessary." The USFWS also supports the Forest Service recommendation to discontinue any further surveys for murrelets in the central study area (Zone 2).

The 2011 Revised Critical Habitat rule acknowledged a very low likelihood of murrelet occupancy in the eastern portion of Zone 1 and within Zone 2 between the Klamath River and the Oregon border. The proposed treatments are either in Zone 2 or outside of any marbled murrelet zone. In addition, no marbled murrelet Critical Habitat occurs within the proposed project area. Therefore, it was deemed extremely unlikely that any marbled murrelets would occur within the project area or be affected by the proposed activities. Thus, while the marbled murrelet was listed in the IPaC species list provided by the USFWS website on July 8, 2015, effects to this species and/or its Critical Habitat will not be discussed further in this analysis.

Fisher (*Pekania pennanti*) - The fisher will be addressed through the conferencing process with the US Fish and Wildlife Service as a Proposed Threatened species under the Endangered Species Act. For more information on the fisher, see the project Wildlife Biological Evaluation.

II. Consistency with Recovery Plans and Other Guidance

The content of this BA complies with legal requirements set forth under Section 7 of the Endangered Species Act (19 U. S. C. 1536 (c), 50 CFR 402), and standards established in Forest Service Manual direction (FSM 2672.42).

Northern spotted owl (NSO) Critical Habitat: In the 2012 designation of NSO critical habitat, the U.S. Fish and Wildlife (USFWS) developed suggestions for managing within critical habitat. These suggestions included conserving high quality habitat and actively managing forests to restore ecosystem health such as natural fire regimes. Although the Final Rule doesn't explicitly address the use of post-fire harvest of dead trees within critical habitat, the USFWS did comment on the need to conserve and recruit high quality NSO habitat and the need for late-successional reserve (LSR) management to be consistent with Standard and Guides of the Northwest Forest Plan (NWFP).

Northwest Forest Plan (NWFP): The NWFP was adopted in 1994 to guide the management of more than 9.7 million hectares (24 million acres) of Federal land in portions of western Washington and Oregon, and northwestern California within the range of the NSO. The Klamath Forest Plan incorporates the NWFP and is intended to provide the basis for conservation of the NSO and other late-successional and old-growth forest associated species. The NWFP identifies the high risk of large scale disturbance in mixed conifer forests and suggests, in the event of a stand-replacing fire, the resulting excessive fuel loads may interfere with stand regeneration. Excessive fuel loads also elevate the potential for future fires that may expand into existing high quality habitat.

The Westside Fire Recovery Project uses the Forest Plan Standards and Guidelines to minimize impacts to habitat and reduce the risk of additional fires resulting from the excessive fuel load through land management. This project will not eliminate the potential of future fires within the project area but is intended to, in part, reduce the potential of large-scale high-severity fire which, in turn, will reduce the loss of additional habitat.

Forest-wide Late-Successional Reserve Assessment (LSRA): The Klamath Forest-wide Late-successional Reserve Assessment (1999) sets the objective that salvage effects in LSRs should be neutral and should have a long-term positive effect on late-successional habitat. Salvage should not diminish suitable habitat now or in the future.

NSO Recovery Plan: The 2011 NSO Revised Recovery Plan (RRP) was prepared by a Recovery Team consisting of Federal agencies, State governments, and other interested parties. The RRP was published in June 28, 2011 (USDI 2011). This replaced the 1992 Draft Recovery Plan which had been used as a foundation for the 1994 Northwest Forest Plan, and the 2008 Final Recovery Plan.

The 2011 RRP identifies three main threats to NSO (current and past habitat loss and competition with barred owls) and describes a Recovery Strategy which includes habitat conservation and active forest management as a means by which to address these threats. As a result, the RRP identified a series of Recovery Actions to guide activities that would contribute to recovery objectives. For this Project, Recovery Actions 10, 12, and 32 are most applicable.

Recovery plans are not regulatory documents and are not required to be addressed as part of Section 7 consultation under the ESA. However, in order to provide decision makers and the USFWS, with relevant information, and to address the general compliance requirements as listed under 7(a)(1) of Endangered Species Act, we have provided information regarding project consistency with the Recovery Plan in Table G-2. In addition, see Appendix B for a description of all other Recovery Actions and the manner in which they were addressed for this project.

Table G-2. Recovery Actions Applicable to the Westside Fire Recovery Project

Recovery Action	Description	Applicable Recommendations
10	Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population	Intent of this recovery action is to protect, enhance, and develop habitat in the quantity and distribution necessary to provide for the long-term recovery of spotted owls. Project design features (PDF) have been incorporated to maintain key habitat features such as large snags and large coarse woody debris. Proposed treatments were designed to minimize effects to existing habitat and promote stand development throughout the treatment areas. The treatments provide for long term improvement to the habitat by removing fuels and consequently reducing the potential of high severity fire moving across the treatment into existing NSO habitat. Sites have been categorized based on their potential to contribute to the demographic support of the NSO

Recovery Action	Description	Applicable Recommendations
		population in the area. The identification of activity centers identified as having high and moderate potential to contribute to demographic support resulted in reducing the estimated effects from the proposed activities. All salvage units proposed in core areas of High potential ACs, and the majority of the cores of Moderate potentialACs, were dropped from the project. Fuels treatment prescriptions have been adjusted to reduce the effects of overlapping roadside hazard and roadside fuels treatments in areas with low solar radiation (areas that are more likely to grow high quality NSO habitat now or in the future). Many of the areas with adjusted fuels prescriptions also occur in the core areas.
12	In lands where management is focused on development of spotted owl habitat, post-fire silvicultural activities should concentrate on conserving and restoring habitat elements that take a long time to develop (e.g., large trees, medium and large snags, downed wood)	Intent of this recovery action is to focus silvicultural activities on conserving and restoring habitat elements that take a long time to develop such as legacy components, large trees and snags, and large downed wood for the benefit of future stand development. Project design features (PDF) have been incorporated into the project to retain legacy component trees and snags that provide important habitat component in a developing stand of future suitable habitat and will contribute to future large woody debris.
32	Federal and non-federal landowners should work with the Service to maintain and restore older and more structurally complex multi-layered conifer forests …allowing for other threats, such as fire and insects to be addressed by restoration management actions.	Maintaining forests with high-quality habitat will provide additional support for reducing key threats faced by NSO; protecting these forests should provide NSO high-quality refugia habitat from negative competitive interactions with barred owls that are likely occurring where the two species' home ranges overlap. Salvage treatments will avoid stands that currently provide RA-32 characteristic, though some accidental damage may occur during implementation. Fuels treatments will contribute to the overall reduction of stand replacing fire within areas of high quality habitat through the strategic placement of fuel breaks and prescribed fire.

III. Consultation History

Timelines for the consultation process were adjusted by the consideration by the Forest Service and the Council on Environmental Quality that the Westside Fire Recovery project is an emergency action subject to the provisions of National Environmental Policy Act (NEPA) regulation 40 CFR 1506.11 Emergencies, which states:

Where emergency circumstances make it necessary to take an action with significant environmental impact without observing the provisions of these regulations, the Federal agency taking the action should consult with the Council about alternative arrangements. Agencies and the Council will limit such arrangements to actions necessary to control the immediate impacts of the emergency. Other actions remain subject to NEPA review.

In order to facilitate implementation of this project, the Forest Service requested and received alternative arrangements that shortened the 45-day comment period requirement for the draft EIS by 15 days, resulting in a 30 day comment period (40 CFR 1506.10(c)). The Forest subsequently extended the comment period for 15 days because of the scale

and complexity of the project and to allow the public to consider the information in this draft BA.

The Forest Service is also requesting alternative arrangements with the Council on Environmental Quality in order to:

Eliminate the 30-day wait period between the final EIS and the Record of Decision (40 CFR 1506.10(b)(2)).

The purpose for requesting alternative arrangements is to shorten the time required to publish a Record of Decision for the project so that salvage of fire-killed trees can begin as early in the summer of 2015 as possible.

Therefore, the consultation process and the preparation of the Biological Assessment were accelerated to try to accommodate this timeline. Throughout the project development multiple meetings were held between FS biologists and USFWS Level 1 biologists often weekly or biweekly ("Level 1" teams are comprised of biologists designated by their respective agency as team members. Their role is to assist the participating land management agencies in designing programs and activities in such a way to minimize or avoid adverse impacts to listed and proposed species, and designated critical habitat, and to further those species' conservation in accordance with the Endangered Species Act and its applicable implementing regulations. The Level 1 team may review project design, minimization measures, conservation measures, or preliminary effects determination in part of the consultation process).

A Draft Biological Assessment was submitted to the FWS Yreka office on April 2, 2015 with the preliminary determinations for each NSO activity center (AC) and the affected Critical Habitat. Comments were received back from FWS biologists on April 13, 2015. A revised version of the BA was submitted on April 16, 2015.

Forest Service biologists began addressing the list of essential information but during this time, concerns about the quantity of Likely to Adversely Affect determinations from the project were presented by the Regional Offices of both the Forest Service and the FWS. In response to concerns regarding effects to NSO from the actions consulted upon in the Draft BA, a review of additional ways to minimize impacts to NSO was undertaken.

The FS and FWS held numerous meetings from April through June 2015 during this time period with the goal of minimizing impacts while still meeting the Purpose and Need of the project. Additional measures were identified for project modifications, in order to reduce the number of adversely affected ACs and adverse impacts to Critical Habitat. The FWS provided multiple recommendations for modifications to the action consulted upon that would reduce impacts to NSO across the project area.

During this time, the public comment period on the Draft EIS was in effect and public meetings were being held. Much of the input from public comment was also considered during the process of adjusting prescriptions, reducing the treatment footprint and minimizing impacts to NSO. The actions considered for consultation are described in the analysis below. **The following BA is a modification of the BA submitted April 16, 2015, and consists of a revised analysis that considers the numerous changes made to the proposed activities since the original analysis consulted upon.** While there

continues to be over 50 adversely affected activity centers[3], the overall effects from the project have been greatly reduced since the original analysis. Working in consultation with USFWS, numerous measures have been brought into the project design with the intent of further reducing the potential for "Take[4]" to occur within the adversely affected ACs; so that while adverse effects may occur within a given AC, they may not necessarily result in Take occurring when analyzed by the USFWS.

IV. Description of the Proposed Activities

This section of the BA describes the Proposed Activities with modifications in project design that have occurred during the Level I consultation process. The actions described in this section are for the entire project may or may not include actions that are in northern spotted owl habitat. In the remainder of the BA, acres of treatment will refer only to the areas where treatment occurs in northern spotted owl habitat. The acres of treatment described for the Proposed Activities with modifications will not match the acres described for those activities in the remainder of the BA because there are portions of activities described in this section that occur outside of northern spotted owl habitat.

Table G-3: General location by project area

Project Area	Fire	Legal Location Township (T), Range (R), and Section (S)	Elevation Range (Feet)	Watershed (5th Field)
A	Beaver Fire	Mt.Diablo: T46N R8W S 2-7, 9-11; T46N R9W S1-13,18; T46N R10W S1-3,10-15;T47N R8W S4-10,15-22, 27-35; T47N R9W S1, 9-17, 20-36; T47N R10W S 25, 34-36	1,700-6,300	Beaver Creek, Horse Creek-Klamath River, Humbug Creek-Klamath River
B	Happy Camp Complex	Humboldt: T14N R8E S 5, 8,17, 20; T15N R7E S 1, 2,12,13, 24;T15N R8E S3-10,15-22, 27-28, 34; T16N R7E S1, 2,10-15, 23-25, 35, 36; T16N R8E S6-10,15-22, 27-34 Mt. Diablo: T43N R12W S2-11,14-20; T44N R10W S6; T44N R11W S1-11, 15-22, 28-30;T44N R12W S1-35; T45N R10W S5-9,16-21, 28-32; T45N R11W S1-36; T45N R12W S1-36; T46N R10W S31-32; T46N R11W S 16-22, 26-36; T46N R12W S 10-11,13-16, 20-36	1,100-7,400	Elk Creek, Horse Creek-Klamath River, Indian Creek,Lower Scott River, Seiad Creek-Klamath River, Thompson Creek-Klamath River, Ukonom Creek-Klamath River
C	Whites Fire	Mt.Diablo: T39N R10W S 1-11,17-18; T39N R11W S 1-3,10-15; T40N R8W S 6-7,18-19,30; T40N R10W S 2-36; T40N R11W S 1-4, 9-16, 21-28, 33-36; T41N R10W S 8-22, 27-35; T41N R11W S 24-25,33-36	2,200-8,000	French Creek-Scott River, North Fork Salmon River, South Fork Salmon River

Proposed Treatments

The Westside Fire Recovery project, as described in the Environmental Impact Statement (EIS) , includes the following overlapping treatment types plus the connected actions: (1) **5,760** acres of

3 A determination of Likely to Adversely Affect NSO (LAA)

4 Take is defined as an action that would "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

salvage units[5] (495 acres of snag retention patches and 643 acres of riparian reserves have been subtracted for this net total of salvage harvest); (2) **320** miles (and 14,320 acres) of roadside hazard tree removal; (3) **24,450** acres of hazardous fuel treatments - including wildland urban interface (WUI), fuel management zones (FMZ), roadside fuels reduction, and prescribed burning; and (4) **7,130** acres of site preparation, planting, and release in existing plantations and seedling/sapling natural stands that burned. All salvage harvest units will also be site prepped and replanted with appropriate mix of species. In addition, 317 miles of National Forest System, state, and county roads, would be used, 4.8 miles of previously decommissioned roads would be reopened, 4.6 miles of existing temporary roadbeds and 3.3 miles of new temporary roads would be constructed within the project area.

The overall footprint of the proposed treatments is 42,760 acres. Acres for each treatment cannot be totaled because multiple treatments overlap each other, for example, roadside fuels treatment overlaps hazard tree removal, and prescribed burning overlaps site preparation/planting and FMZs.

- **Salvage harvest treatment** will identify trees for harvest using the Report #RO-11-01 "*Marking Guidelines for Fire-Injured Trees in California*" (Smith & Cluck, 2011). These guidelines are peer-reviewed scientific literature used to evaluate tree species in northern California for mortality. Trees considered for salvage harvest removal include merchantable timber defined as trees greater than 14 inches in diameter. Fire-damaged trees with a 70 percent or higher probability of mortality in the next three to five years were included in the salvage harvest proposal. These treatments will be accomplished by a combination of ground-based, skyline, and helicopter logging systems. Consideration for treatment for the salvage harvest treatment units used the following criteria:
    - Areas of moderate to high severity vegetation mortality with more than ten contiguous acres of medium to high severity vegetation mortality, though unit boundaries may not be exactly coincident with the RAVG high burn severity and will reflect use of logical, on the ground bounding and implementation design, and less than 40 percent crown closure.
    - Areas determined to be feasible in terms of logging systems, accessibility, and economics.
- **Roadside hazard tree removal** - Dead or fire injured, dying trees that are likely to fall and impact a system road and that have been determined to have a 60 percent or greater chance of mortality within the next 3 to 5 years due to fire (as indicated by "Marking Guidelines for Fire Injured Trees"; Smith and Cluck 2011) will be felled and/or harvested. The vast majority of trees to be harvested occur within areas of high and moderate fire severity (RAVG grid code 3 and 4), and generally within larger blocks of high tree mortality. Areas indicated by RAVG as grid code 2 had lower severity fire and are presumed to contain fewer fire-killed trees; though these areas are indicated as having between 25 to 50 percent basal area lost, with varying levels of tree mortality. Grid code 1 is indicative of a range from 0 to 25 percent basal area lost and so is either unburned or slightly burned to the degree that very minimal change is detected in the overstory canopy or basal area. These areas are less likely to contain fire killed trees, and as a result, would have very few, if any, trees removed. Within these low severity areas, there is a small chance that an occasional tree (or small pocket of trees) may have been killed by the fire and would therefore be identified as a hazard to the road, but this is expected to be infrequent and only occur sporadically across the project area. Areas that show no sign of having burned are not targeted for hazard tree removal. Roads that are not

5 Salvage harvest acres do not include Riparian Reserves and snag retention patches. These areas are part of the salvage unit, but will not be harvested.

currently drivable and that would require substantial work to open are not considered for hazard tree removal.

Approximately 14,320 acres would be considered for roadside hazard tree removal on 320 miles of roads. Acres used for the analysis were calculated using RAVG fire severity classes within a 200 foot buffer on either side of affected roads.

- **Hazardous Fuels Treatment** areas were considered based on the following criteria:
  - 200 feet on either side of selected Forest roads (including maintenance level 1 roads), prioritized based on volume of road use, evacuation routes, and ridge-top roads used for suppression efforts.
  - 250 feet on either side of historically-significant ridgelines for fire suppression efforts.
  - Areas determined feasible in terms of slope, accessibility, existing fuels conditions, and logical holding features (i.e. roads, streams, and ridges) and amount of solar radiation.

Hazardous fuels treatments include wildland urban interface, roadside fuels treatments, fuels management zones, and prescribed burn. The following are summarized descriptions of each treatment type.

1. Wildland Urban Interface (2,630 ac.) and Roadside Fuels Treatments (5,710 ac.): A combination of mechanical, mastication, and hand work is proposed. Treatment will include a combination of cutting dead trees between eight and 14 inches in diameter. Other understory vegetation, including conifers and hardwoods two feet or taller and less than eight inches in diameter will be thinned. Brush greater than two feet tall will be cut. After treatment, activity generated slash and brush will be piled, covered with waxed paper or black plastic sheeting, and burned. Retained conifers and hardwoods will be pruned up to seven feet above the ground on the uphill side of the tree to increase canopy base height, and reduce ladder fuels and the potential for crown fire. Hanging branches will be removed if they hang below seven feet above ground level. Areas identified as WUI or roadside fuels will be treated differently based on solar radiation exposure, slope, and aspect. Hot Slope and Cool Slope treatments are described below:
   - "Hot Slope" or complete—complete understory treatments are proposed in areas of higher solar radiation, including upper slope positions and easterly and southerly aspects. Leave trees that contain a mixture of hardwood and conifer species with good color and vigor will be retained.
   - "Cool Slope" or modified—modified understory treatments are proposed in areas with important wildlife habitat elements and areas of low solar radiation, including northerly and easterly slopes and lower slopes all aspects. Leave trees will be retained in mosaic pattern, incorporating clumps of at least 0.25 acres in size, which will be interspersed throughout areas proposed for modified understory WUI and roadside fuels treatment and will cover 10 to 20 percent of the treated area. Preference for retention will be hardwoods located away from areas identified as strategic for fuels reduction (e.g. future locations to hold fire line for planned or unplanned fire within the project area).
2. Fuels Management Zones (4,930 ac.): maintain existing strategic ridge systems used to contain the 2014 fires as well as historic fire lines from previous large fires within the project area. Treatments will include removing all dead vegetation and live understory vegetation along with live conifer trees less than 12 inches in diameter at breast height. Pruning retained conifers up to seven feet high within these zones will increase canopy

base height and reduce the potential for crown fire initiation. Activity-generated fuels will be disposed of by a variety of methods to meet desired conditions.

3. Prescribed Burning (11,180 ac.): will use existing control lines established in recent large fires within the project area. Line construction activities will occur around the perimeter of the fire and will include using dozers to re-scrape control lines to mineral soil; where control lines are inaccessible for equipment, handline construction to mineral soil will occur.

- **Site preparation, planting, and release treatments** include treatment in plantations, natural stands (non-salvage harvested), and salvage harvest stands. The following is a summary of each treatment:

1. Site preparation will include mastication, windrowing, and piling of dead material generally up to 10 inches in diameter. Hand treatments will include the cutting and piling of dead fuels up to 10 inches in diameter. No green trees or hardwoods would be removed for site preparation. Habitat identified as NRF, PFF, or FANR is not targeted with this treatment type (see habitat definitions below).

2. Reforestation will be accomplished using hand methods to plant either bare root or container stock seedlings. Hand planting will increase the likelihood for survival and provide for the desired spatial variability within treatment units and across the project area. Tree species used for planting will include Douglas-fir, sugar pine, ponderosa pine, incense cedar, white fir, and red fir. A mosaic distribution will be achieved over time due to the spatial variability achieved by the planters' micro-site selection. An average of 130 to 300 trees per acre will be planted to achieve acceptable levels of stocking, depending on the site conditions. The goal for planted areas is to have a variable spaced conifer stand with a mix of species, densities and distribution. In general, understory brush will naturally regenerate in areas where grubbing around seedlings does not occur.

3. Release includes manually removing all vegetation within a *maximum* of a five-foot radius from a planted or naturally regenerated conifer seedling (grubbing). This will result in approximately 40 percent of a given acre to be treated (i.e. grubbing and planting), with the remaining 60 percent regenerated naturally in herbaceous and brush vegetation; thereby avoiding the "row crop" appearance of older style plantations.

- Riparian reserves within the plantation site-preparation and planting units would receive site-preparation as needed to achieve ground cover and allow for natural regeneration of vegetation. Treatment will be focused in areas of high and moderate vegetation mortality and where the overhead hazards can be mitigated without equipment entry into the riparian reserves. Treatment will include hand-work only (no ground-based equipment) and lop-and-scatter or other fuels reduction will be implemented if fuel loading is above seven tons per acre; fuels may be hand-piled or windrowed and burned.

- Landing size will be commensurate with operational safety, using existing landings where possible. Helicopter landings will be up to two acres in size. Skyline landings will utilize roads wherever possible; new skyline landings off the road system, and ground-based landings, will average one acre in size but will not be larger than 1.5 acres in size.

- Patches of PFF1 (defined below) would be retained within salvage units where retention of the riparian reserve would not provide desired levels of connectivity between unburned or lightly burned suitable habitat. These areas are patchily distributed throughout the project

area, but are generally placed in larger units where large openings would have been created by the salvage harvest. These areas are also intended to provide snags and large downed logs for the future development of the stand (see description of direct/indirect effects of salvage harvest for more detail).

Proposed Treatment Implementation Methods

Proposed activities described above will use a variety of manual and mechanical methods. The three primary implementation methods will be ground based, cable yarding, and helicopter for extracting logs. Road construction, re-construction, and maintenance will use various equipment types such as bulldozers and excavators. Log trucks and pickup trucks will travel many of the roads in the project area at different levels and be typically concentrated in areas that are currently being implemented. Chainsaws and other small hand equipment will likely be used in all treatment units.

Prescribed fire treatments will use a variety of techniques to reduce the fuels within the treatment units. The fuels treatment method usually depends on the post-implementation fuel levels. High fuel levels may require a different prescription than areas with low fuel levels. Fuels treatments will occur over the next several years.

Project Design Features

The project design features listed in the following table shows the design features pertinent to this analysis and not a complete list of all project design features. The complete list of all project design features can be found in chapter 2 of the Environmental Impact Statement.

Table G-4: Project design features pertinent to this analysis.

Project Design Feature #	Description	Applicable Units
Wildlife – 1	A survey strategy has been developed in coordination with Fish and Wildlife Service for northern spotted owl (NSO) surveys. **Three NSO surveys will be completed each year prior to project implementation, except for roads identified as major ingress/egress access roads that do not occur within occupied core areas** (see Ingress/Egress roads discussion below). If surveys result in a positive detection of NSO, then: No treatment will occur within occupied core areas from February 1 to July 9 unless nesting is confirmed or suspected, then no treatment within the core area until after September 15. No treatment will occur within 0.25 miles of unsurveyed suitable NSO nesting/roosting or foraging habitat (as identified by the project biologist and FWS consultation) prior to July 9, except for the following areas: Units 005-9-1, 22, 23, 23-15, 23-16, 23-17, 23-18, 23-19, 23-30, 51, 52, 56-1-1, 56-2, 58, 059, 520, 523, 524, 525-1, and 525-2 **INGRESS/EGRESS ROADS with Roadside Hazard Treatment:** Limited Operating Periods will **not** apply to ingress/egress roadside hazard treatments occurring *outside* occupied core areas (as determined by the most recent surveys).	All units where applicable

Project Design Feature #	Description	Applicable Units
	Limited Operating Periods will apply to ingress/egress roadside hazard treatments occurring *within* occupied core areas (as determined by the most recent surveys); so treatments will not occur until after July 9. Unless nesting is suspected or confirmed then treatments will not occur within the occupied core area until after Sept. 15. Six NSO surveys will be completed along ingress/egress roads, though 3 surveys may or may not be completed prior to implementation.	
Wildlife – 2	No more than 50 percent of the suitable nesting/roosting, and foraging habitat within an occupied NSO core area and no more than 50 percent of the nesting/roosting, and foraging suitable habitat within an occupied NSO home range will be underburned annually. Underburning will not occur within occupied core areas between February 1 to September 15.	All units where applicable
Wildlife – 7	No roadside treatment between March 1 and June 15 to avoid disturbance of denning fisher.	ML1 roads
Wildlife – 11	Legacy Components Retention for Late Successional Habitat Retain legacy component trees and snags in treatment units. These legacy components will be identified using physical characteristics. • Legacy trees or snag size will vary depending on site condition, but are usually disproportionately large diameter trees that are often remnants of the previous stand on a given site. They are old standing trees that have persisted on the landscape after man-made and/or natural disturbances. For example, large trees containing one or more of the following characteristics: split or broken tops, heavy decadent branching, large mistletoe brooms, otherwise damaged to the degree that a cavity may form such as basal fire or lightning scars, or other features that indicate decay or defect. If the legacy component tree or snag must be felled for safety reasons, retain the log whole in the unit.	All units where applicable
Wildlife – 12	Snags or dying trees that contain cat faces, broken or forked tops, hollows or cavities, burned out cavities, or those that are otherwise damaged to the degree that a cavity may form will be favored for retention. Retain all large hardwood snags or live trees where practicable, particularly those with cavities, broken or split tops, or large broken branches.	All units where applicable
Wildlife – 13	Retain pre-existing (existing prior to the wildfire) conifer and hardwood snags (greater than 14 inches in diameter at breast height) and pre-existing coarse woody debris in the salvage	All units where applicable

Project Design Feature #	Description	Applicable Units
	units. If any pre-existing snags must be felled for safety reasons, these will be left on landscape whole as coarse wood.	
Wildlife – 14	Avoid placing cable corridors through retention patches or any actions that would potentially damage retention areas whenever possible.	All units where applicable
Wildlife – 15	Leave cull trees (greater than or equal to 20inches in diameter) in roadside units where possible. Leave as whole logs where practicable.	All units where applicable
Wildlife - 16	Avoid all salvage harvest within delineated retention patches.	All units where applicable
Wildlife—19	Trees without fire damage will not be removed from within roadside hazard tree units unless they are an immediate hazard.	All hazard tree units

V. Methods and Definitions

Project Area: The 'project area' encompasses all the treatment units using logical, on-the-ground boundaries. This project has been divided into three sub groups for the analysis completed within the FEIS, defined by the 2014 fire perimeters. Sub-group "A" refers to the northern portion of the project area where the Beaver fire occurred; sub-group "B" refers to the largest, more central portion of the project area where the Happy Camp complex; and sub group "C" refers to the southern portion of the project area where the Whites fire burned. Each sub grouping is unique in its geography, land allocation, ownership, vegetative composition, and habitat components and are subsequently analyzed as such within the FEIS. However, this Biological Assessment generally lumps all subgroups into one analysis area in order to capture overall effects to NSO, with the exception of a site specific analysis for activity centers in the Beaver fire area.

Treatment Units: A subset of the Project Area where salvage harvest units, reforestation units, fuels treatments, and hazard trees would be felled or removed; and includes only the areas that would be directly impacted by the proposed activities.

Analysis Area: The analysis area is different for each analysis category: 1) habitat analysis, 2) critical habitat analysis, and 3) activity center analysis. The habitat analysis area is defined as the area within a 1.3 mile buffer of all proposed treatments. The critical habitat analysis area is defined as the portion of each individual critical habitat sub-unit within a 1.3 mile buffer of treatment units that occur within that critical habitat sub-unit. The activity centers selected for this analysis are those that have treatment occurring in the core or home range or that have the potential to be otherwise affected by the proposed treatments (i.e. noise disturbance).

Temporal Bounding: Temporal bounding for this analysis is both short term and long term. The short-term bounding is the time during project implementation because it is tied directly to the potential for noise disturbance and habitat alteration. The vast majority of the salvage harvest and hazard tree removal will be completed in the first two years; fuels treatments and site preparation and planting activities may continue for multiple years as funding allows. Long-term bounding is the time needed for a coniferous forest overstory to begin to recover from a severe wildfire and begin to retain its original functionality, or at least 40 years. This bounding also encompasses the time needed for the re-establishment of the understory components such as duff, litter and large

woody debris and any structural components that may have been lost to fire within the understory.

Core or Core area: "Core" or "core area" are used interchangeably and these terms are referring to the same area. The core is the area within a 0.5 mile buffer (~500 acres) centered on the most biologically relevant point; the center usually represents (in order of importance) an NSO nest, pair sighting, daytime detection, or individual detection.

Home range: The home range is typically defined as the area within a 1.3 mile radius from the center of the activity center (e.g. most recent nest site) which would include the core area; for the purpose of this analysis to explain effects in the core (0 to 0.5 mile) versus effects to the "outer ring" of the home range (0.5 to 1.3 mile), we are using the "core" and "home range" as two separate portions of the activity center. The core is defined above. The home range is the area that begins at 0.5 mile from the center point of the activity center and extends to a 1.3 mile radius circle (a donut shaped area 0.5 to 1.3 mile from the center of the activity center).

Activity Center (AC): For this analysis, an activity center is the combined area of the home range and core area; also referred to as an owl 'site'.

NRF: Nesting/Roosting and Foraging habitat – as defined in detail below.

PFF: Post-fire Foraging habitat – as defined in detail below.

FANR: Fire-Affected Nesting/Roosting habitat – as defined in detail below.

RAVG: RAVG data are essentially remotely sensed vegetation burn severity data that is derived from Landsat Thematic Mapper imagery. The pre-fire and post-fire sub-scenes were used to create a Relative Differenced Normalized Burn Ratio (RdNBR). The RdNBR is correlated to the variation of burn severity within a fire. The RdNBR data are calibrated with the Composite Burn Index (CBI) as well as tree mortality variables. See the USGS National Burn Severity Mapping web site at: http://burnseverity.cr.usgs.gov/fire_main.asp for generic information on fire severity mapping procedures. The severity ratings provided by the derived products are based on the vegetation burn severity. RAVG grid code severity ratings for changes in basal area were converted to a vector format and overlaid with the NSO EVEG habitat layer (pre-wildfire) for each fire perimeter.

Placement of Activity Centers: The center of an activity center is typically identified using survey data and habitat quality. We used the California Natural Diversity Database (CNDDB) and the Forest Service species observations and survey database (Natural Resource Information System) to identify the locations where NSO have been detected. Since these NSO detections span 30 or more years, the landscape has changed and some of the older locations may not reflect current habitat condition. Several natural and manmade disturbances have occurred and resulted in changes to habitat quality (e.g. foraging habitat), quantity (e.g. patch size), and distribution (e.g. distance between patches of habitat); all of which influence current NSO habitat use. Therefore, each AC placement was reviewed for this analysis in order to capture the most biologically relevant placement using the historic and/or most recent survey data.

We started with the known activity centers that have been compiled within the databases and all the survey data. Nest sites were the most biologically relevant location for activity center placement. Lacking nest site information, other observation information was used to place the

center of an activity center, such as pair detections, daytime detections, and single individuals (in order of relevance).

The most recent NSO detections were used for AC placement if more than one year of detections was available; with the most recent nest detection having the most relevance for placement. For example, an NSO nesting detection last year is typically a better placement of the center of an activity center than a nest location identified several years ago. However, the collection of the recent and past detections can provide insight into the concentrated area of use. Comparing these detections, known activity center locations, and current habitat conditions (quality, quality, and distribution), the activity center locations where adjusted as needed. NSO detections from 2015 surveys were used in adjusting NSO activity centers when available.

However, some ACs represent one pair of owls (i.e. one territory) but have two overlapping cores and/or home ranges. This can occur when one pair of NSO associated with an area is not found within the delineated circles of a given core area and is effectively sharing the two activity centers.

Also, in the past, numerous ACs were established using observations of a single individual NSO that was then not detected again in any of the following years of survey. This process resulted in the identification of many ACs that are unlikely to be currently active and do not accurately reflect current or past owl use of the area.

Without consistent, consecutive years of surveys, this process of identifying ACs very likely represents an inflated number of ACs across the project area. However, for this analysis, all ACs on record for the analysis area were analyzed, regardless of the improbably high number, because we lack consistent survey data; nor do we have uniquely marked owls that would help to identify possible AC shifts, possible AC losses, or newly established ACs.

Assumptions for this Analysis

The following assumptions were made for this Biological Assessment in order to establish a baseline of information for an analysis of effects on NSO and its critical habitat. The following list is an attempt to capture areas where knowledge gaps or uncertainty exist and where assumptions were needed in order to facilitate an effective analysis. The assumptions below are not a complete listing of all assumptions that must be made for any effects analysis, but are a description of the uncertainty for particular aspects of the species' biology, in the habitat and/or species location data, and/or where an increased potential exists for differing interpretations of the project design and assumptions were stated for clarity.

- The NSO habitat layer, derived from the EVEG 2007 remotely sensed data, provides a generally accurate depiction of NSO habitat at the scale at which it was used for this analysis; however, variations exist across the landscape, where habitat will be under-typed in some areas and over-typed in others; generally the habitat is depicted accurately. The majority of the uncertainty in the habitat typing within the layer stems from the category assigned to the habitat (i.e. 'nesting/roosting' or 'foraging'), but the designation as 'suitable' is generally correct.
- RAVG data are an accurate depiction of burn severities.

- The fire effects (RAVG) on pre-fire NSO habitat (EVEG) are accurate and the resulting change in habitat type or loss of habitat is accurate (see the crosswalk of changes to habitat below).
- NSO home ranges and core areas represent the "best" placement of an activity center that we can make given the lack of recent surveys for the majority of the project area and the uncertainty inherent in using simple circles to represent owl use patterns at the home range and core area scale. Level 1 biologists reviewed the most current known NSO observation data to within NRIS and CNDDB databases to establish the location of each activity center in the analysis area (see Placement of Activity Centers in Methods section above)
- When salvage units contain inclusions of habitat that burned at low severity (RAVG grid code 1 and 2), the areas that burned at low severity will not be harvested but will instead be delineated as retention clumps; these clumps will be excluded from treatment unless specific circumstances occur where implementation is hampered and these areas must be entered or crossed in order to access a road. When this occurs, all efforts will be made to retain trees that don't meet the set probability of mortality (70% probability of mortality for salvage units and 60% of mortality for roadside hazard). However, in order to account for this potential impact to NSO habitat, we are assuming that 10% of the total grid code 1 and 2 inclusions will be degraded to the point that the NRF may not function as NFR post-treatment due to residual or unintentional damage during implementation.
- When hazard trees are identified along roads that are not within burned areas they will occur as scattered individual trees that occur randomly and are generally widely spaced along the road; areas of unburned forest will not have a substantial opening of the canopy as a result of hazard tree removal.
- Core and home ranges that contain at least the recommended habitat minimums by the USFWS are likely to remain at their current activity center position and have similar habitat use patterns. For example, if an NSO pair returned to their activity center (given the AC contains at least the recommended habitat minimums in the core and home range), the pair will likely nest in the core or possibly in the same nest stand or even the same tree as it did before the 2014 fires.
- For cores that are below the recommended habitat minimums by the USFWS, NSO are much more likely to move outside the core but within the home range to find another nest site. This is likely to occur when the habitat in the core has burned at high severity, but the home range contains adequate suitable habitat. Similarly, NSO activity centers with home ranges that are below recommended habitat minimums are more likely to shift away from the burned habitat to areas that are unoccupied and contain higher levels of unburned, suitable habitat. This topic is discussed in more detail in the section describing Habitat Fitness Potential and how the activity centers were categorization as High, Moderate and Low Potential activity centers.
- Post-fire foraging (PFF) area is most likely to be used by NSO within 500 feet of an existing patch of suitable habitat (patch size is >5 acres of NR and F combined).
- PFF is not equivalent to foraging habitat, but PFF may provide foraging opportunity for NSO. Fire-affected nesting/roosting (FANR) is not equivalent to nesting/roosting habitat, but FANR may provide foraging opportunity for NSO.

Methods for Assessing Pre-fire NSO Habitat suitability

Pre-fire NSO habitat was analyzed using a combination of remote sensing data and on-the-ground assessments. EVEG 2007 (a remotely sensed contiguous GIS layer) was used in conjunction with aerial photography (using the 2009/2010 and 2012 National Agricultural Imagery Program

(NAIP)), field verification, and knowledge and expertise of district and forest personnel. Field reconnaissance was conducted during the fall, winter, and spring of 2014/2015.

Suitable NSO habitat is commonly separated into nesting/roosting, foraging, and dispersal habitat; these habitat types are described in detail in the NSO Recovery Plan (USDI 2011). Nesting/roosting is generally described as mid- to late-seral forests that contain stands of large trees with high canopy cover, multilayered canopies, and nesting platforms. Foraging habitat can be described as slightly reduced canopy cover, fewer large trees, and enough space for NSO to maneuver through the trees for hunting prey when compared to nesting/roosting habitat. Dispersal habitat contains a moderate level of canopy closure and trees large enough to provide shelter and potential foraging opportunities for traveling NSO, but does not contain adequate amounts of other essential habitat components for long term NSO occupation, reproduction or survival. For this analysis, suitable habitat is defined as stated above in this paragraph and is generally referencing NR and F unless otherwise specified. Determination of NSO habitat suitability also considers many factors including size of stand and adjacency to other habitat types which owls may use.

Multiple aspects of suitable habitat are required for habitat to be considered suitable or high quality habitat, such as the presence of defect and decay in the stand, large downed logs and snags, and the presence of water in appropriate distance and juxtaposition to stands that contain these attributes (USDI 2011). These habitat elements cannot be queried from the EVEG data; for specific areas of the project, these elements were assessed through field evaluation, NAIP imagery, and discussions with field personnel familiar with the project area vegetative conditions, so the actual quantity of suitable habitat may be somewhat overestimated. Due to the scope and scale of this project, it was not practicable to field validate the remotely sensed habitat data (EVEG) for all areas affected by all project activities, but the portion that was field evaluated showed that the NSO habitat layer was a reasonably accurate assessment of the NRF habitat on the ground. Where errors occurred it was generally in the splitting of NR from F rather than in the identification of suitable habitat. Even though NR and F are sometimes presented separately in this analysis, most of the analysis combines NR and F to reduce this potential error.

Methods for Assessing Effects to NSO Habitat from Wildfire

To evaluate post-fire habitat conditions, the fire severity data (RAVG) and the percent basal area loss in the RAVG classes described below were applied to; the project area, the EVEG NSO habitat layer, and the treatment units using GIS. Interpretation of the RAVG data allows the spatially explicit assessment of fire effects to vegetation, including changes in the live tree density and canopy cover. In addition to changes in vegetation from the wildfire, changes in vegetation from all sources are also captured in the analysis. Loss of vegetative cover from fire suppression actions of the 2014 fires was also captured and was incorporated into the post-fire habitat baseline. Fire suppression actions that affected habitat were captured and accounted for in the project level, post-fire habitat layer.

Burn severity is defined as the degree of environmental change caused by fire, or how much fire has affected the ecological community, and is generally analyzed on a landscape level. Burn severity can be related to changes in vegetation by comparing the pre-fire vegetation to the post-fire vegetation condition. Burn severity is used to determine the likely effects of fire on habitat. Fire intensity is the driver for burn severity, but that relationship is not necessarily constant, as the ecological community will show varying responses and degrees of sensitivity to fire (USGS-NPS 2010). With all fires, there is a large degree of heterogeneity and range between very low and very high impacts, which results in a mosaic of effects, including patches that remain relatively green among areas of high impact. Burn severity is a measure along that gradient of change (USGS-NPS 2010). General categories used to indicate burn severity, as described by the metadata associated with the RAVG data are as follows:

Very Low or Unchanged: 0% – 25% Basal Area (BA) killed; grid code 1: This means the area was indistinguishable from pre-fire conditions. This does not always indicate the area did not burn.

Low: 25% – 50% BA killed; grid code 2: This represents areas of surface fire with little change in cover and little mortality of the structurally dominant vegetation.

Moderate: 50% to 75% BA killed; grid code 3: This severity class indicates a mixture of effects between low and high on the structurally dominant vegetation.

High: 75% to 100% BA killed; grid code 4: This represents areas where the dominant vegetation incurred high to complete mortality.

Due to the availability of a recent, and relatively local, Biological Opinion from the US Fish and Wildlife Service (USFWS) on a post-fire timber harvest project proposed by the Bureau of Land Management in southern Oregon (*Douglas Complex Post-fire Salvage Project – June 2014*), considerable information has been compiled and reviewed on the impacts of both wildfire and post-fire management actions on NSO. As the regulatory agency, the USFWS is the authority on the recovery of NSO and the effects to NSO from actions proposed by the Forest. Therefore, the USFWS compilation and review of the most recent and pertinent research on NSO use of the post fire landscape, as well as the determination of effects from the actions proposed in the Douglas project, had considerable influence on the effects analysis for the proposed Westside Fire Recovery project. Information within Appendix C of the Douglas Biological Opinion has been incorporated into the analysis of NSO use of a post-fire landscape and the assessment effects from the proposed project.

The approach to the post-fire NSO habitat analysis incorporates aspects of recent research (for example, Eyes 2014, Comfort 2013, Irwin et al 2012, and Clark et al. 2013,) on spotted owl use of burned habitat and the expectations of NSO use patterns and site fidelity to areas within their territories that burned at various fire severities. Two specific aspects of the following post-fire habitat effects analysis were intended to incorporate the findings of many of these studies and were delineated as; 1) "**post-fire foraging**" areas and 2) "**fire-affected nesting/roosting"** areas. More detail on how these habitats are estimated to be affected by the proposed project is described in the Indirect and Direct Effects section below.

"Post-fire foraging" (PFF) areas were delineated in order to capture the potential for continued use by NSO of previously suitable NRF, at least until the ultimate deterioration of the burned habitat and loss of standing trees. Even with the loss of canopy cover and key habitat components generally associated with NRF habitat, studies indicate that burned areas can still function as foraging after the fire, depending on many factors including patch size, edge type, burn severity, and proximity to suitable unburned habitat and known owl sites (Bond et al. 2002, Bond et al. 2009; Clark 2007, Clark et al. 2011, and Clark et al. 2013). The Level 1 team recognized the importance of tracking this habitat and analyzing the effects from post-fire salvage with the assumption that foraging habitat is important for providing a food supply necessary for NSO survival and reproduction, and PFF, although physically different from foraging habitat, may provide foraging opportunity. In addition, research on spotted owl use of post-fire landscapes indicates that spotted owls that use these burned forests may be affected by post-fire salvage occurring within areas of post-fire foraging (USDI 2011).

As described above, the EVEG NSO Habitat Layer provided the baseline of suitable NRF that existed prior to the fire (a.k.a. pre-fire NRF). Post-fire foraging habitat was then determined by applying the RAVG data to the pre-fire NRF. PFF was delineated where moderate fire severity (grid code 3) or high fire severity (grid code 4) occurred in pre-fire foraging habitat or where high fire severity occurred in pre-fire nesting/roosting habitat. Because a large portion of PFF is forest that burned at the highest severity and therefore contains minimal amounts of structure or cover,

it was anticipated that NSO would be less likely to use PFF when it occurred too far from existing cover. Recent research found that patch size and configuration of fire severity within a fire perimeter has a significant influence on how spotted owls will use the landscape (Comfort 2013). Comfort (2013) also found that where high-severity fire edges that occur as *small* patches dispersed in larger low-severity fire patches, habitat for small mammal prey may be improved by creating openings that allow for regeneration of brush and conifers, thereby increasing spotted owl use at these edges. However, edges that occur adjacent to *large* openings created by high-severity fire that may have improved prey habitat, but are farther from mature forest conditions , and therefore have a reduced level spotted owl use (Comfort 2013).

Comfort (2013) found that spotted owls had a strong negative association with hard edge after accounting for habitat suitability, disturbance severity, and amount of diffuse edge. Hard edge is often measured as the distance between suitable and non-suitable habitat (Comfort 2013). Hard edges may be created by disturbance events such as high-severity fire or logging where the disturbance is adjacent to mature forest. Diffuse edges often occur where less severe disturbance has occurred, or as the hard edges age. In most landscapes edges generally occur as a gradient depending on factors such as the severity of fire/disturbance and the pre-fire vegetation type. Diffuse edges may also create better access for hunting small mammals, in general, while simultaneously providing adjacent closed canopy cover habitat. Shrub fields adjacent to old forests may increase NSO's access to woodrats, who travel between the shrubs fields and openings in the old forest (Sakai and Noon 1997).

The research does not provide a precise distance that an owl may venture from the edge of suitable habitat into high severity burned areas; nor does it provide a way to measure the relative value of a particular edge for NSO, and the subsequent expected use of that edge. This is most likely due to the highly variable conditions present in any given wildfire or similar disturbance and the subsequent inability to make site specific recommendations for such a wide variety of conditions.

In order to incorporate the information described above on NSO use along the edge of habitat in a post fire landscape, the post-fire foraging (PFF) was further refined; using GIS, a 500-foot buffer was applied to areas of currently suitable NRF (greater than 5 acres), and overlaid with PFF. When PFF occurred **within this 500-foot buffer**, it was identified as **PFF1**. When PFF occurred outside this 500-foot buffer, it was identified as PFF2 (see below).

We estimated the most likely maximum distance NSO would venture out from the edge between habitat burned at low severity into habitat burned at high severity to be approximately 500 feet. This distance was derived from a review of recent literature on the use of edge habitat (Comfort 2013; Eyes 2014) and in consultation with Level 1 USFWS biologists, and professional judgment, and is anecdotally supported by our observations from 2015 surveys. Using NSO standard protocol surveys within post-fire habitat within the analysis area, we have consistently found NSO within suitable habitat or within 250 feet from the edge of suitable habitat using daytime and nighttime survey methods. Our 2015 data has 57 NSO daytime and nighttime combined locations and 53 of those detection locations are within NSO habitat or within 250 feet of NSO habitat. We acknowledge that this information is preliminary, but may support the methodology used for our analysis of PFF. Additional information is available below in section called "New information resulting from the 2015 surveys"

Figure G-1: Contiguous areas burned at high severity with the lowest likelihood of NSO use due to a lack of cover and structure.

Figure G-2: Post-fire foraging habitat with limited cover and structure; possible foraging opportunities, but substantially reduced function for NSO.

When the same habitats and burn severities as described for PFF1 occurred **outside** of the 500-foot buffer, it was identified as **PFF2** and was mainly considered in the analysis of critical habitat and the development of future stand conditions rather than areas of likely use by NSO; however, it is acknowledged that use of these areas by foraging NSO is possible but less likely. An analysis of future habitat development was considered in the tracking of the post fire effects to habitat within designated critical habitat.

Within this analysis, when 'PFF' is described, it is in reference to PFF1 unless otherwise specified. PFF2 is described for the critical habitat analysis and for the affected environment to differentiate between habitat types present in the analysis area.

"**Fire-affected nesting/roosting**" (FANR) areas were delineated for this analysis as nesting/roosting habitat that burned at moderate severity (grid code 3) because nesting/roosting habitat that has been affected at this level is not expected to function as nesting/roosting habitat that has been affected by low severity fire or unburned. Because stands of habitat that burn at grid code 3 can result in between 50 to 75% basal area loss, fire severity can result in a wide variety of stand conditions post-fire. If a stand was typed as nesting/roosting prior to the fire, it was comprised of high canopy closure and larger trees, among other variables. Therefore, if a fire burned at the low end of moderate severity (grid code 3, closer to 50% loss of basal area), then the stand may retain more canopy cover and sustained less tree mortality than a stand that burned at the higher end of moderate fire severity (grid code 3, closer to 75% basal area loss). Stands that burned at the higher end of moderate fire severity have more of the appearance of a high-severity burn and lack the characteristics necessary for cover and/or thermoregulation to be used as nesting/roosting or foraging habitat. Fire-affected nesting/roosting is a small portion of the total acres of NRF, PFF and FANR because FANR typically occurs on the fringes of high severity burn patches, in the transition zone between high and low burn severities of pre-fire NR habitat.

In this analysis, nesting/roosting habitat that burned at grid code 3 is categorized separately so that fire effects specific to these areas of habitat can be accounted for in the analysis and the role that this habitat type plays in NSO use of the post-fire landscape can be captured.

Figure G-3: NSO nesting/roosting habitat that burned at moderate severity (FANR) and the remaining structure that may provide foraging opportunities; shown with a small inclusion of lower burn severity.

Figure G-4: Higher levels of cover and structure in this FANR, with an increased potential for foraging for NSO.

Fire-affected nesting/roosting habitat is considered in this analysis as possibly providing foraging opportunity rather than as nesting/roosting because FANR no longer contains adequate cover and structure for nesting but it can contain enough prey habitat and perch structure to allow for effective foraging. When compared to PFF, FANR will generally have larger trees/snags on average that can provide more physical structure that is likely to persist standing for a longer period of time (assuming similar site conditions and disturbance). However, trees/snags in FANR will likely succumb to the eventual effects from the fire as many, but generally not all, of the trees in a stand that have burned at moderate severity will die, and many of these will fall, possibly as soon as 3 to 5 years of this analysis. In the short term, some of the fire-damaged trees will have needles and leaves and these trees may provide some cover for foraging NSO.

Figure G-5: Edge habitat in foreground and background.

Figure G-6: Edge habitat between areas burned at low severity adjacent to moderate and high severity, viewed at a distance.

The exact distance that NSO will forage into burned stands with limited cover is unknown; for this analysis we have assumed that NSO will venture into FANR to forage when these stands are juxtaposed with low severity and unburned stands of habitat. Recent research on NSO use of forest edges has indicated that they will use areas of transition between an opening (or area lacking sufficient cover) and suitable habitat for foraging but the extent of use depends on the amount of diffuse edge versus hard edge (Eyes 2014, Comfort 2013). Both of these studies indicated NSO use of diffuse edge, as would be found in FANR and areas of lower burn severity, but findings differed on the frequency and rate at which NSO will use these areas. We concluded from this research that NSO may use the FANR but to what extent is unknown.

PFF and FANR typing was heavily dependent upon EVEG data as well as the outputs of the post-fire RAVG assessment. However, individual salvage harvest units were visited and field validated for the presence of suitable habitat and the degree of modification or loss resulting from the wildfire. Therefore, assumptions of both habitat suitability and fire effects were made in order to facilitate a practical and timely evaluation of effects. Table 7 describes the outcome of this application and the result of the assumptions made for the effects of each RAVG class on NSO habitat suitability. Assumptions for post-fire habitat suitability derived from RAVG outcomes were agreed upon with the Level 1 consultation team.

Table G-5: Cross walk for assessing the post-fire NSO habitat type based on pre-fire habitat type and RAVG.

Pre-fire Habitat type	***RAVG Basal Area LOSS***			
	Grid code 1 0-25%	*Grid code 2 25-50%*	*Grid code 3 50-75%*	*Grid code 4 >75%*
Nesting/Roosting	Nesting/Roosting	Nesting/Roosting	**Fire-affected N/R****	**Post-Fire Foraging – (PFF1)** when occurring within 500' of *currently* suitable NRF*
Foraging	Foraging	Foraging	**Post-Fire Foraging (PFF1)** when occurring within 500' of *currently* suitable NRF*	**Post-Fire Foraging - (PFF1)** when occurring within 500' of *currently* suitable NRF*
Dispersal	Dispersal	Dispersal	Non-habitat	Non-habitat

*patches of NRF greater than 5 acres in size.

**FANR counts toward baseline amounts of NSO habitat as Foraging.

Methods for Analyzing NSO Habitat, Individual Activity Centers, and Critical Habitat

The northern spotted owl analysis is split into multiple biologically relevant spatial scales to estimate direct and indirect effects to habitat in: 1) the analysis area; 2) the activity center, or home range and core area combined (individual scale); and 3) the critical habitat (landscape scale). The habitat analysis estimates the number of acres of habitat affected by the proposed activities within the analysis area. The home range analysis estimates the effects of the proposed treatment on habitat within the NSO home range and resulting effects to NSO reproduction. The critical habitat analysis estimates the effects to habitat within critical habitat that may occur as a result of the proposed activities.

NSO Habitat Analysis: NSO Habitat was analyzed within the analysis area which encompasses an area larger than the project area.

Direct or indirect effects to habitat were assessed by estimating the level of change from the known existing habitat quality to the anticipated post-treatment habitat condition. Physical attributes such as canopy closure, basal area, and the quadratic mean diameter were used in this analysis. The resulting level of effects to the habitat was determined to be either no effect, degraded, downgraded, maintained/improve, or removed. No effect means that the action will not decrease the quality of habitat. Degrade means the effects are minimal and the habitat remains functional at the same level prior to treatment. Maintain/improve implies that treatments will have no meaningfully measurable negative effect to the quality of the habitat or may potentially increase the quality of the habitat. Downgrade means the habitat has been affected to the point where it will not continue to function at its initial level and it will drop down one level in habitat type. Downgrade to dispersal habitat means that habitat that was once either NR or F receives treatments that remove enough canopy closure of the previous cover and structure to lose function as NR or F but retain enough to function as dispersal habitat rather than a full habitat removal. Removal means the once functional habitat is no longer habitat.

NSO Activity Center Analysis: This analysis focuses on the potential effects to NSO territories by assessing potential effects to habitat at the two spatial scales: 1) home range; and 2) core area.

The core area is a 0.5-mile radius circle (~500 acres) used to delineate the area most heavily used by owls during the nesting season and is centered upon the most biologically relevant point representing (in order of importance) a nest, pair sighting, daytime detection, or individual NSO detection. Because the actual configuration of a home range is rarely known, the estimated mean annual home range of a northern spotted owl pair in the California Klamath Province is represented by a 1.3-mile radius circle (3,340 acres).

It is recognized that spotted owls may adjust the shape of their home ranges to encompass as much older forest habitat as possible (Carey et al. 1992). As such, the use of circles may not correspond exactly with the areas used by spotted owls which may be more defined by other factors such as topographic features (e.g., drainages), abundance and availability of prey species, and the distribution and/or abundance of competitors and predators (USDI 2011).

Temporal bounding for disturbance effects is narrowed to the time during project implementation when the possibility of disturbance is greatest to NSO, if present.

NSO Critical Habitat Analysis: Critical habitat analysis is focused on potential effects to the biologically important features (primary constituent elements) used to identify critical habitat. The areas within critical habitat that burned with moderate and high fire severity were delineated and identified as ‘fire-affected critical habitat’. These areas are made up of previously suitable NRF habitat that burned at moderate and high fire severity (RAVG grid code 3 and 4), and are intended to reflect the effects of the fires on the Primary Constituent Elements of critical habitat. Only changes to the Primary Constituent Elements as a result of proposed activities were analyzed.

Methods for Estimating Snag Retention in Salvage Units

In order to establish effects to overall habitat connectivity and future stand development, snag retention was quantified through an estimate derived from snag plot data samples.

About 70 plots were randomly identified within riparian reserves in salvage harvest units to measure the size and record the species and fate (dead or alive) of each tree within the plot. Plots were focused on riparian reserves because riparian reserves are generally representative of retention areas within salvage units, in terms of tree species and size class, and make up a large

proportion of the areas retained. The remaining retention areas are generally located within topographical features that resemble riparian reserves and consequently may contain similar tree species and size classes. The tree measurements and fate were recorded for each tree within a defined distance from the center of the plot. Although the tree species was recorded, we present the data as conifer and hardwood categories because the physical attributes of the trees and each tree's fate retained in the salvage units are the primary interests. Dead trees were defined as having a 70% or greater probability of mortality.

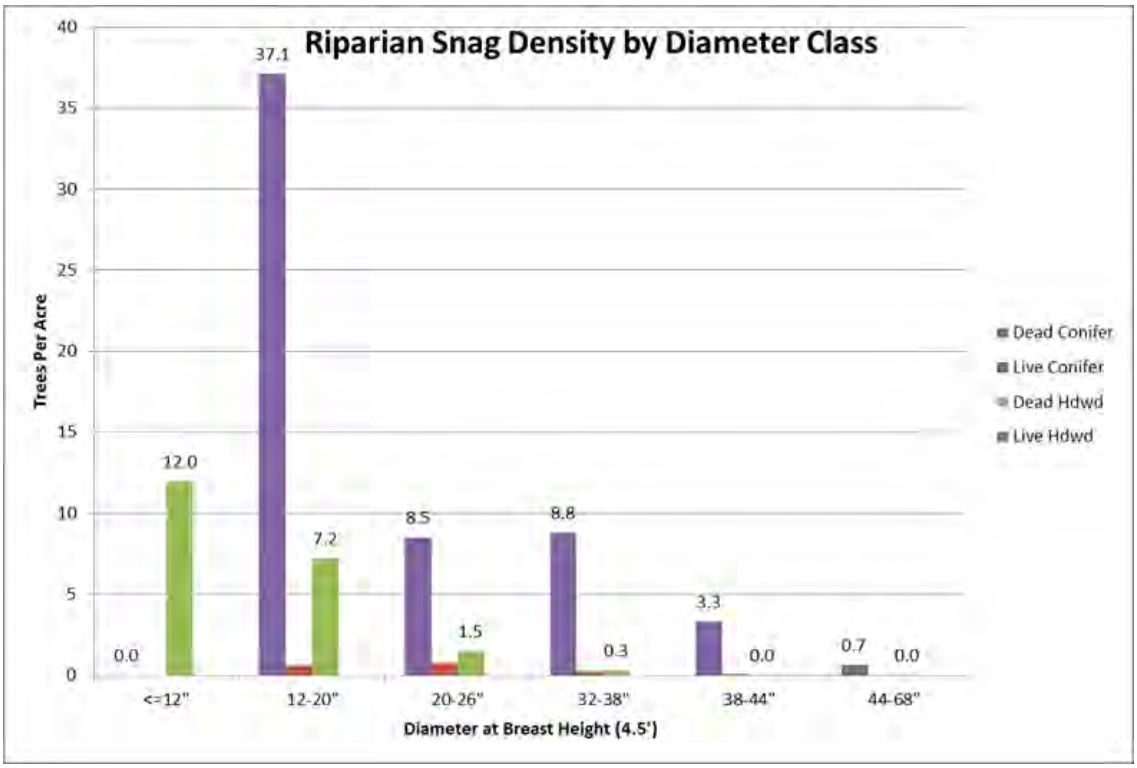

Figure G-7: Summary of tree and snag size class distribution within riparian reserves

Table G-6: Riparian reserves and retention patches occurring in salvage harvest units

Salvage Unit	Salvage Unit size (acres)[1]	Riparian Reserve (RR) in salvage unit (acres)	Retention Patches in salvage unit but outside of RR (acres)[2]	Sum of Retention (acres)[3]
3	31	0	0	0
5	144	4	9	12
21	11	0	0	0
22	115	3	22	25
23	571	31	63	94
32	295	13	59	71
35	16	0	0	0
36	26	0	0	0
39	28	0	0	0
40	34	0	0	0
50	96	0	13	13
51	254	10	53	63
52	84	0	4	4
53	50	1	14	15
54	14	0	0	0
55	193	1	29	30
56	95	18	16	34
57	26	4	0	4
58	563	46	52	98
59	12	6	0	6
60	214	27	17	45
61	170	16	24	40
62	129	57	5	62
64	10	3	1	4
65	50	0	0	0
203	30	0	0	0
204	32	0	0	0
206	14	0	0	0
208	32	0	5	5
209	5	0	0	0
212	45	0	0	0
213	14	0	0	0
224	61	6	0	6
226	73	23	0	23
227	16	0	0	0
228	55	0	9	9
243	151	19	16	35
262	33	0	0	0
263	26	2	0	2
265	35	0	0	0
266	7	0	0	0
268	20	0	0	0
400	15	0	0	0
403	10	0	0	0
406	123	55	0	55
407	16	0	0	0
409	48	8	0	8
410	11	0	0	0
411	30	5	0	5

Salvage Unit	Salvage Unit size (acres)[1]	Riparian Reserve (RR) in salvage unit (acres)	Retention Patches in salvage unit but outside of RR (acres)[2]	Sum of Retention (acres)[3]
414	22	1	0	1
415	171	23	0	23
417	85	24	0	24
423	47	0	0	0
501	41	0	0	0
508	117	0	0	0
510	16	0	0	0
517	25	0	0	0
520	193	85	12	97
521	36	0	0	0
522	32	1	0	1
523	175	11	35	46
524	153	29	0	29
525	238	24	11	35
528	196	0	61	61
530	18	0	0	0
536	15	0	0	0
539	3	0	0	0
540	35	0	0	0
541	21	0	0	0
542	8	0	0	0
543	6	0	0	0
544	2	0	0	0

[1]Salvage unit size does not include roadside hazard which sometimes overlaps salvage harvest.

[2]Retention patches are in addition to riparian reserves and are not overlapping.

[3]The combination of riparian reserves and retention patches represent a minimum of the snag retention within a salvage unit because additional retention areas may be identified for other species or possibly other resources but these additional retention areas haven't been included in these retention estimates.

Methods for Assessing *Habitat Fitness Potential* of Fire-Affected Activity Centers

Recently developed habitat-fitness and landscape models and other publications have demonstrated the validity of using the core area to establish site specific fitness potential and the importance of having sufficient amounts of NRF habitat within spotted owl core areas to adequately provide for spotted owl survival, reproduction, and access to prey (Franklin et al. 2000, Zabel et al. 2003, Dugger et al. 2005, USDI 2014). Research indicates that NSO survival and productivity are associated with large patch sizes of older forest or large forest patches containing a high proportion of older forest (Franklin et al. 2000, Dugger et al. 2005, USDI 2011).

Habitat-based fitness, or habitat fitness potential (HFP), is the "fitness conferred on an individual occupying a territory of certain habitat characteristics" and is a function of both the successful reproduction and persistence of the individuals associated with a given territory (Franklin et al. 2000). As described within the RRP (USDI 2011) and recent research (Dugger et al 2005), there is a high level of habitat fitness potential for a particular site when the core contains at least 50% suitable NRF habitat (Franklin et al. 2000, USDI 2014). Dugger et al. (2005) found that spotted owl fitness potential was positively related to the proportion of NRF in the core area where approximately half of the successful territories had core areas comprised of 50 to 65% NRF.

In consideration of this research, and in response to the negative NSO population trend, Recovery Action 10 within the RRP (USDI 2011) was developed in an attempt to reverse this trend by recommending agencies conserve NSO sites with a high likelihood to contribute to the demographic support of the NSO population. The RA10 recommendation provides interim guidance to prioritize known and historic sites for conservation and/or maintenance of existing levels of habitat. As stated within the interim guidance, for a site to be considered as an 'RA10 site' a specific amount and distribution of suitable habitat must be present in the core area and home range; the core area should be comprised of at least 50% (~250 acres) NRF habitat and the total acres within the core area and home range should be at least 40% NRF (~1,336 ac.).

The intent of Recovery Action 10 is to protect, enhance, or develop habitat in the quantity and distribution necessary to provide for the long term recovery of northern spotted owls, specifically by retaining occupancy and reproduction at established sites. Priorities for conservation are generally based on past occupancy, reproductive status and current levels of suitable habitat.

There are 85 activity centers within the Westside Fire Recovery project analysis area, but not all these activity centers are affected by proposed treatments. Activity centers within the analysis area were assessed with consideration to RA10 recommendations, in an effort to categorize sites both according to whether they contain recommended minimum levels of suitable habitat in the core areas and home ranges described for RA 10 and to assess their relative habitat fitness potential and the likelihood of occupancy post-fire.

To combat the main threats to NSO (competition with barred owls, as well as past and current habitat loss) the 2011 Revised Recovery Plan recommends conserving occupied spotted owl sites and retaining structurally complex or high-quality habitat to provide demographic support and to provide refugia from competition with barred owls. These recommendations are described under Recovery Action 10 and 32.

Prior to the 2015 surveys, only about 40% of the activity centers in the project area had been surveyed since 2005; post-fire habitat estimates in cores and home ranges were used to establish RA 10 priority because these estimates were directly comparable across all sites. In addition, Level 1 biologists made the assumption that as the amount of remaining habitat increases so does the likelihood that a site will contribute meaningfully to demographic support. In addition to RRP recommendations, information and recommendations within the *Biological Opinion for the Douglas Post-Fire Salvage project* (USDI 2014 – Appendix A) influenced and informed our use of habitat minimums and determinations on the likelihood that an activity center/core area may or may not shift due to a loss of habitat from high-severity fire in the core or home range.

An AC "shift" generally occurs when a disturbance results in a loss of habitat (no longer functional habitat)over a large portion of the core but sufficient habitat exists in the home range and/or adjacent habitat to provide sufficient resources to support reproduction. A NSO pair that experiences a large loss of habitat can change their use pattern to encompass better habitat or move ("shift") over to the higher quality habitat.

When a disturbance affects a larger portion of the activity center, the function of the AC may be diminished or lost. In the circumstance of fire, a "loss" of an AC may be a result of a large quantity of suitable habitat being burned at high fire severity which may result in the NSO shifting their use pattern to suitable habitat elsewhere (Gaines et al. 1997,

Clark 2007). Clark (2007) reported NSO returning temporarily to previously occupied territories after a fire removed large portions of the habitat; these observations were likely due to strong site fidelity, but ultimately the NSO looked elsewhere for habitat. The "loss" of an AC can occur when the existing amount of habitat in the core and home range is insufficient to support reproduction and there is a lack of habitat nearby to provide for a potential AC shift.

All known spotted owl activity centers in the analysis area were evaluated based on the amount of suitable habitat remaining post-fire within the 0.5 mile core areas and 1.3 mile home ranges, and were assigned a category of "High", "Moderate", or "Low" fitness potential. Activity centers containing a minimum of approximately 50% suitable NRF (~220 acres6) within the core area and 20% NRF (~665 acres) in the home range (inclusive of the acres in the core area) were classified as having "**high potential**" for the owls associated with that site to remain on site, continue to reproduce, and therefore contribute to the demographic support of the spotted owl population in the area, if present. Recent research on spotted owl reproductive success following high severity fire in their core use areas found that spotted owls tended to occupy sites where they were more likely to replace themselves and had a much lower tendency to be disturbed by natural or anthropogenic sources when they had been reproductively successful at that site (Lee and Bond 2015b). Reproductively successful sites are generally those that contain a large proportion of high quality habitat in the core and home range. Without consistent, current survey data on reproductive success in the analysis area, levels of suitable habitat provide the basis by which to infer high reproductive potential sites.

Activity centers containing *less than* approximately 50% suitable NRF within the core area were evaluated at the 1.3 mile home range scale. Home ranges (including core areas) containing more than 20% NRF were classified as having "**moderate potential**" for the owls associated with that site to remain at the current AC placement, reproduce, and contribute to the demographics of the population in the area. The Level 1 consultation team acknowledged uncertainty in all AC site placement and assumed that shifts in locations could occur in response to the modifications and/or loss of habitat caused by high and moderate severity fire. Those with "moderate potential" may shift away from their original core use area, but may remain within their home range in areas where adequate suitable habitat exists post-fire. Although dispersal is relatively uncommon for adult NSO (Franklin et al 2000, Clark et al 2011), NSO that have experienced high severity fire in a large portion of habitat within their core or home range have an increased likelihood of dispersal (Clark et al. 2011, Clark 2007). However, if a NSO pair stays within a burned home range or core area, they may need an increased amount of habitat and travel farther within that area to successfully forage (Clark 2007).

"Low potential" sites were defined as having less than approximately 20% (less than 665 acres) suitable habitat remaining within the core and home range combined. These sites were assumed much less likely to persist in that location based on significantly reduced levels of available habitat and the deleterious effect that this degree of habitat loss would have on fitness and survival (Franklin et al. 2000, Clark et al. 2011, USDI 2011). The subsequent low level of habitat fitness potential reflects the lack of potential for these sites to contribute to the demographics of the northern spotted owl population. These ACs were evaluated on a case-by-case basis for habitat quality and juxtaposition to suitable habitat, reproductive history, site placement, and past disturbances.

Using a minimum level of 20% NRF for habitat within the core and home range combined for classifying habitat fitness potential per site for this analysis, rather than the higher recommended levels of 40% NRF as described within the Recovery Plan interim guidance, accounts for both uncertainty in the post-fire habitat typing as well as the potential use, within their territory, of

6 50% of a 502 acre core is not 220 acres, but for the purpose of this analysis, we lowered the minimum to account for potential error in the placement of the AC.

fire-affected previously suitable habitat (PFF and FANR). Therefore, ACs with NSO that may be continuing to use habitat that may not otherwise have been typed as suitable habitat would be accounted for in this classification process.

Establishing the "habitat fitness potential" of each activity center to contribute to demographic support of the area (i.e. High, Moderate, or Low) can not only demonstrate consistency with Recover Action 10 but also provide additional information to identify the ACs that are likely more sensitive to project activities. Where the amount of habitat in a home range and core area are well above recommended minimum levels of habitat, proposed management activities have a lower potential for adverse effects to the owls that potentially occupy that site when compared to sites near the recommended habitat minimums. Where habitat levels are at, near, or below the recommended levels described above, a higher potential exists for adverse effects to NSO through loss or degradation of suitable habitat, particularly when actions reduce available habitat below recommended levels. When the quantity of suitable habitat within an owl's home range and/or core area falls below recommended levels, fitness and/or fecundity can be adversely affected, and that site's contribution to the demographic support of the area may be diminished (Franklin et al 2000, USDI 2011). See the Effects discussion below for the list of all ACs in the analysis area and the category to which each AC was assigned.

Methods for Assessing Impacts to Individual Activity Centers

The Westside Fire Recovery Project effects analysis provides a systematic approach of describing the anticipated effects resulting from each proposed activity or activities that occur in each activity center. An AC is typically divided into the core (0 to 0.5 mile from the center of the AC) and home range (0.5 to 1.3 mile from the center of the AC) to represent the anticipated relative use of an activity center by a reproducing NSO pair. The home range is generally defined as an area traversed by NSO for foraging, caring for young and mating. The core area, which is contained within the home range, receives concentrated use, is typically near the nest site, and its use is usually related to foraging, reproduction, and resting activities (Rosenberg and McKelvey 1999).

The quality, distribution, and amount of habitat within the core and home range are important for the function of the activity center to provide enough resources to support an NSO pair and offspring. There are several approaches to evaluating the quality, quantity, and distribution of habitat and the relationship to reproduction (for example: Franklin et al., 2000, Zabel et al. 2003, Olson et al. 2005, and Dugger et al. 2005). Even though several studies have provided various combinations of important habitat components related to NSO reproduction, one common thread runs through the research – NSO are strongly related to older, dense, structurally complex conifer forest (Carey et al. 1992, Hunter et al. 1995, Zabel et al. 2003, and Dugger et al. 2005). This habitat description is very similar to "nesting/roosting" habitat defined for the analysis in this project. Foraging habitat has a broader description than nesting/roosting and is important for nesting success, especially when nesting/roosting habitat may be limited. Foraging habitat has generally less canopy cover, smaller average tree size, absence of nesting platforms, and possibly less stand complexity when compared to nesting/roosting habitat.

The importance of the core area to NSO reproduction is likely indicated by the concentrated use of relatively small area. During nesting, the core provides most of the resources for the NSO pair and any offspring. Dugger et al. (2005) and Franklin et al. (2000) provide evidence that the amount, distribution, and quality of habitat in the core can influence NSO survival and reproduction. The reason for this relationship between cores with greater amounts of high quality habitat and increased survival and reproduction may be a result of a single factor or a combination of factors; however, the relationship between the amount and quality of habitat in the core may be a function of less habitat fragmentation (less low quality habitat or non-habitat) in these cores. Increased habitat fragmentation may result in increased predator (e.g. great horned owl) and competitor (e.g. barred owl) interactions that will negatively affect NSO reproduction.

Abiotic factors such as slope position, elevation, and proximity to water can strongly influence the spatial area used in the core and home range. NSO typically use lower slope positions more frequently than higher slope positions (Irwin et al. 2007). This relationship is likely related to the higher quality habitat that typically grows at lower slope positions with higher humidity and cooler microclimates than compared to the hotter, drier upper slope positions (Skinner et al. 2006). The lower slope positions are also commonly closer to water sources that are also important for prey species. Topography also relates to habitat use patterns for NSO. Even though NSO have been detected on all slope positions7 that contain habitat, an NSO, though capable, is not likely to expend the energy to travel over a prominent ridgeline from its nest to forage in an adjacent drainage.

The USFWS has reviewed the vast amount of NSO literature to suggest a minimum level of habitat within the core and home range (USDI 2009) which is reflected in the determination analysis for this project through the use of the "Intensity Factors" analysis and through site specific review. The Intensity Factor analysis used specific, measurable characteristics related to the amount (acres of habitat), quality (habitat type), and distribution (core and home range) of habitat. Each activity center was evaluated using a filter process that incorporates either a series of biologically relevant factors: 1) "Intensity Factors" which represent important biological minimum recommendations, **or** 2) a site-specific evaluation.

"Intensity Factors" use a systematic numerical approach that relates NSO reproduction and fitness to habitat quantity, quality, and distribution as it may meet the needs of an NSO pair and possible offspring. Using the quality (i.e. nesting/roosting or foraging), quantity (acres of each habitat type), and distribution (core, home range, or both) coupled with relevant research, effects to habitat from the project activities were related to potential effects to fitness and reproduction – see the individual Intensity Factors listed below.

When Intensity Factors could not be used to decisively conclude an effects determination from proposed activities, further evaluation of site specific factors for each AC was needed.

Each AC was given a determination of effect as: 1) "likely to adversely affect" (LAA); 2) "may effect, but not likely to adversely affect" (MANLAA); or 3) "no effect" (NE).

Intensity Factors

Intensity Factors are a series of questions used to evaluate each of the ACs and are described below. These questions factor effects from proposed activities to biologically important minimum levels of habitat and the potential effects to fitness and reproduction. Questions were derived from our understanding of NSO use of post-fire habitat based on recent peer reviewed research, the principle of a minimum level of suitable habitat required for fitness and/or reproduction based past and current research of NSO biology, and our experience in NSO response to management activities in occupied habitat. The purpose of these questions was to identify if sites were *Likely to be Adversely Affected* (LAA) by the proposed activities.

Depending on the existing condition (amount, quality, and distribution of habitat) of the core and home range and the level of anticipated effects resulting from the project, an activity center can accumulate more than one intensity factor. The number of intensity factors accumulated for a particular activity center provides a relative measure of effects anticipated to occur given the proposed activities, however, only one intensity factor is needed for an AC to be given a "likely to adversely affect" (LAA). Any site that wasn't identified to have a LAA determination was further evaluated using site-specific information.

7 There is generally a maximum elevation at which NSO are typically found (around 6,000 feet in the Klamath Province), but for this project, we are not considering an elevation maximum given the relatively low elevation of existing habitat in the analysis area (most of the habitat is below 6,500 feet in elevation).

***Intensity Factor A*:** Will treatments result in the core and home range combined falling below 20% NRF and FANR (665 acres)?

If 'Yes', then the activity center would likely not contain enough habitat to support reproduction. This question also establishes the degree of effect from a loss of habitat to the extent that the loss would result in lower fitness to a possible level where reproduction, and possibly occupancy of site, is no longer expected. This would result in a LAA.

A 'No' answer resulted in a site-specific evaluation that was completed using the location, type, and extent of the treatment(s) relative to habitat affected and likely NSO area of use.

Intensity Factor B: Will treatments result in the core and home range combined falling below 40% NRF and FANR (1,336 acres)?

If 'Yes', the loss of habitat may result in reduced fitness potential by causing the AC to fall below recommended levels of suitable habitat (as described above). This would result in a LAA.

If 'No', and the core and home range combined contain more than 40% NRF and FANR, then there is likely enough habitat to support reproduction and it may be possible to have treatments in the home range and not impact fitness potential. If treatment occurs in the core or home range but it does not result in the core and home range falling below 40% NRF and FANR, then the effect to habitat may not result in the reduction of fitness potential for that site. A site-specific evaluation was then completed using the location, type, and extent of the treatment(s) relative to habitat affected and likely NSO use area.

Intensity Factor C: For core and home range that combined contain more than 20% but up to 40% NRF and FANR prior to treatment, will treatment result in a downgrade or removal of NRF and FANR?

If 'yes', then the treatment will likely affect the reproductive fitness of the activity center by causing the AC to fall below recommended minimum levels of suitable habitat. Activity centers with 40% or more NRF and FANR appear to have more successful reproduction than activity centers with less suitable habitat (as described above) . Therefore, activity centers with less than 40% habitat likely do not have enough habitat to be able to "absorb" the loss of even a small amount of habitat and all NRF and FANR within the core and home range would need to be retained in order to maintain fitness and reproduction. The loss of any suitable habitat for these activity centers will likely affect reproduction. This would result in a "LAA".

A 'No' answer resulted in a site specific evaluation that was completed using the location, type, and extent of the treatment(s) relative to habitat affected and likely NSO area of use.

Intensity Factor D: Will treatment result in >25% of the existing NRF, FANR, and PFF combined in the core and home range receiving treatment that will degrade NRF or remove FANR or PFF? If 'Yes', then treatment will result in degrading NRF and removing FANR and PFF. Although it is difficult to interpret the potential effects of removing FANR and PFF on reproduction, actions affecting more than 25% of an activity center will likely affect reproduction due to disturbance in addition to any effects to NRF.

If 'No', then it may result in a MANLAA, due to the minimal impacts to habitat in an AC that is above recommended levels of suitable habitat; though a site specific evaluation was also completed using the location, type, and extent of the treatment(s) relative to habitat affected and expected NSO use of the area.

Intensity Factor E: Will treatment result in core areas with >220 acres of NRF falling below 220 acres of NRF?

This question establishes whether treatment would be reducing the fitness potential of the NSO associated with the affected core area by causing the core to fall below recommended levels of suitable habitat. A 'Yes' answer would result in a LAA.

A 'No' answer resulted in a site specific evaluation that was completed using the location, type, and extent of the treatment(s) relative to habitat affected and likely NSO area of use.

Intensity Factor F: Will treatment downgrade or remove NRF in the nest stand?

The nest stand is possibly the most highly valued area in the core and home range because nest stands are associated with previous nesting attempts. The nest stand likely holds unique habitat characteristics and the NSO using the core are likely sensitive to changes to that stand. However, some nest stands have been burned through completely with high severity fire and are no longer expected to provide their original function. If this has not occurred, and the nest stand has only been lightly impacted by fire, or unburned, then a 'Yes' answer to this question would result in a LAA.

A 'No' answer resulted in a site specific evaluation that was completed using the location, type, and extent of the treatment(s) relative to habitat affected and likely NSO area of use.

Site Specific Evaluations

Each activity center that was not assigned an "LAA" determination in the Intensity Factor assessment was evaluated using site-specific information. The location, type, and extent of treatment and the resulting potential effect to habitat were assessed at the core and home range scale. The result of the assessment is described in the effects section.

Evaluation of Activity Centers Specific to the Beaver Fire Area

Prior to the Beaver Fire, NSO habitat in the area was patchy in distribution with small pockets of higher quality habitat typically near riparian areas, which generally met the needs of the NSO in the area and some were even able to successfully reproduce. When the Beaver Fire occurred, a large portion of the area burned at moderate and high fire severity and a large portion of the NSO habitat was affected. In addition, a large proportion of the private industrial timber lands that occur within the checkerboard ownership pattern in the area were harvested directly following the fire, causing further fragmentation and loss of habitat. Large areas of private lands across USGS sections (one square mile) have either already been or are likely to be harvested in the near future.

As a result of the Beaver fire, the increased timber harvest on private lands and the patchwork ownership, the remaining habitat within the fire perimeter occurs on national forest land. This series of events has increased the difficulty for NSO to find sufficient habitat to meet the needs for reproduction. In the Beaver fire area, many of the ACs lost most of their suitable habitat and most of the fire affected habitat where it occurred on private land.

The combination of the fire and the estimated harvest of private land resulted in eight ACs (0239, 0283, 0346, 4144, 4145, 4146, 99913, and 99914) with less than 500 acres of suitable habitat remaining in the combined core and home range. Given the combination of the low amount of suitable habitat and patchy distribution of habitat, these ACs are far less likely to have successful reproduction than ACs with more habitat.

Because of the extremely low levels of habitat within activity centers in the Beaver fire area, the process of analyzing individual activity centers using recommended levels of habitat, and the subsequent effect of proposed activities causing further reductions in the amount of habitat per AC as a basis for the effects determinations (as done for the rest of the analysis area) did not fully capture the effects from proposed activities in the Beaver fire area. In other words, the levels of habitat were already so low for each AC that they would not have met the minimum levels used as triggers for adverse effects, even before any activity was proposed. Therefore, each AC was

analyzed using site specific methods that incorporated the already low levels of habitat – see AC analysis for the Beaver fire area below.

VI. Existing Environment

The existing environment refers to the current conditions of the analysis area that would affect listed species. It is a component of the environmental baseline for any listed species, as maintained by the U.S. Fish and Wildlife Service. The environmental baseline includes:

"… the **past and present impacts** of all Federal, State, or private actions and other human activities in an action area, the **anticipated impacts** of all Federal projects in the action area that have already undergone formal or early section 7 consultation, and the **impact** of State or private actions which are contemporaneous with the consultation in process" [50 CFR §402.02].

The past and present impacts of all Federal, State and private activities in the action area, along with the natural disturbance events and the in-growth of vegetation result in the current conditions. These current or existing conditions fully reflect the aggregate impact of all prior human actions and natural events that have affected the environment and have contributed to the environmental baseline. The existing environment also best represents the biological baseline relative to listed species for the analysis of project-related effects. The past and present impacts of Federal, State and private actions are reflected and summarized in the current conditions. For the purposes of this analysis, the existing environment analysis focuses on the habitat and species status for NSO within the analysis area. It will also include other aspects of the existing environment such as the known or possible presence of a competitor or predator like the barred owls, as relevant to species level effects.

Although a litany of past actions in this area is not necessarily informative for purposes of ESA analysis, a list of future foreseeable and ongoing actions in the analysis is provided in Table G-29of Appendix A to further inform this analysis.

Environmental Baseline

Forest-wide, there are 586,487 acres of NSO NRF habitat (188,700 acres of nesting/roosting habitat and 397,787 acres of foraging habitat) as reported for 20148.

The Environmental Baseline conditions for NSO in the analysis area are a product of timber harvest activities of various intensities, several wildfires, and a century of fire suppression on both public and private lands. These acres include the effects of the Beaver, Whites and Happy Camp Complex Fires, fire suppression and suppression repair actions during these fires, all past activities on Federal lands, and all past salvage activities on private lands have been included in the NSO habitat baseline for this project. The total size of each fire area within the analysis area is: Whites fire area = 55,794 acres; Happy Camp fire area = 161,589 acres; Beaver fire area = 74,321 acres, regardless of habitat or vegetation type. Acres of habitat and treatment are described in more detail within the following analysis.

Forest Service projects that were planned in the analysis area (Jess project, Thom Seider, Two Bit, Eagle Springs, McCollins) have been either put on hold, blended into the proposed project, or re-consulted upon with the FWS.

Multiple activities (e.g. road maintenance) have been recently completed using the Forest programmatic Biological Assessments for facilities maintenance and watershed

8 NSO baseline habitat tracking for the Klamath National Forest updated after 2014 fires.

restoration; No suitable nesting/roosting or foraging habitat was removed or downgraded with these activities. Therefore, baseline habitat figures reflect these projects.

General Vegetation with the Analysis Area

Vegetation types within the project area generally consist of mixed conifers, oaks, brush, and grasses. Oaks, brush, and grasses are typically found on low-elevation sites on shallow, rocky soils located on the southerly and westerly aspects. These southerly and westerly aspects exhibit harsher conditions as opposed to the northerly and easterly aspects. Deeper, more developed soils than those at low elevations support mixed conifer stands of Douglas-fir, ponderosa pine, incense cedar, and sugar pine. Higher elevation sites within the project area are favorable conditions for Douglas-fir and white-fir survival and growth, with white fir becoming a substantial component of the mixed conifer type. Hardwood species, including Pacific madrone, California black oak, canyon live oak, Oregon white oak, tanoak, and bigleaf maple are generally a lesser component of mixed conifer stands.

The project area provides complex habitat for many species. The Beaver project area contains checkerboard ownership and has been strongly influenced by land management over the past several decades. Even though the Beaver project area is capable of growing late-successional habitat in isolated pockets, the project area is largely composed of oak woodlands and brush with varying size pockets (about 5 to 100 acres) of mid-seral mixed conifer.

The Happy Camp and Whites Project Area are similar to each other in distribution of habitat. These two project areas are mostly mid to late-successional habitat with pockets of early seral and brush and provided some of the most contiguous conifer habitat on the Forest before the 2014 fires. Overall, these three project areas contained over 60% mid to mature mixed conifer forest habitat[9] and the remaining 40% was made up of oak woodland habitat (5%), early serial forest habitat (20%), and brush habitat (15%) prior to the 2014 fires.

The 2014 fires burned about 40% of the project area at moderate and high severity and reduced two important habitat types on the Forest – oak woodland and mid- to late-successional mixed conifer habitat. The fire resulted in large portions of mid- and late-seral habitat being lost or greatly reduced in habitat quality. About 35% of the pre-fire mid- and late-seral habitat and about half of the pre-fire oak woodland was affected by moderate and high severity fire. These fire affected areas are now set back to an early seral state. Overall, most of the moderate and high severity affected areas will not support the same wildlife species as it did pre-fire for many years while the low severity burned habitat is likely to continue to function similarly to the pre-fire condition and support many of the same wildlife species as it did pre-fire.

2014 Fire Information

Information for the Beaver Fire, Happy Camp Fire, and Whites Fire within the analysis area are presented below. For information on the acres of forest burned within each fire area, see the EIS for the project. The Beaver Fire, Happy Camp Fire, and Whites Fire burned a total of

9 These percentages and habitat descriptions represent wildlife habitat and not necessarily the Project Vegetation Report.

approximately 183,120 acres, including approximately 162,260 acres of National Forest System lands and approximately 20,860 acres of private land[10].

Fires within the Happy Camp Complex were ignited by lightning near the town of Happy Camp, which is located on the middle portion of the Klamath River. Nineteen fires were ignited in this storm and comprised the complex. Due to hot, dry and windy conditions, three of the original 19 fires could not be readily contained, eventually grew together and spread east to the Scott River and south into the Marble Mountain Wilderness over the course of several weeks. This fire burned approximately 116,900 acres. The Beaver Fire occurred on the north side of the Klamath River about 30 miles east of Happy Camp, and eventually burned approximately 32,400 acres. The Whites Fire burned approximately 33,760 acres southeast of Fort Jones. The Whites fire was part of the July Complex which burned both private and National Forest land, ultimately spreading into the Marble Mountain Wilderness and into the North Fork drainage of the Salmon River. Multiple boundaries exist for the fire areas and can create varying acre summaries for each fire depending on the method used for delineating the boundary of the area measured. The fire perimeter boundaries, analysis area delineation, and project area boundaries can create differing reported acres per fire.

All the large fires of the 2014 season burned with mixed severity, meaning there was a mosaic of light, moderate, and severely burned forests within each fire area. Of the approximately 183,000 acres that burned on the western Klamath National Forest, a wide range of fire severities were exhibited, with the overall range that burned at moderate and high burn severity between 5-40%. Within high severity areas, fuel consumption of duff, conifer and hardwood litter, saplings, and small and large dead material occurred within the ground and surface profile. Areas of high severity burns experienced 75 percent or greater vegetation mortality, loss of canopy and understory cover, and loss of duff layers and large woody debris. The stands that burned at high severity ranged in species composition and structure, including shrub/oak stands, single layered conifer plantations, multi-layered mixed conifer stands, and higher elevation stands dominated by true fir. Most trees within high severity burn areas are expected to die in the short term.

Areas characterized by moderate severity burns experienced 50-75 percent vegetation mortality, substantial reduction in canopy and understory cover, as well as duff layers and large woody debris. Moderate severity fire areas generally experienced consumption of surface fuels leaving the canopy structure primarily intact; however, the conifer and hardwood canopies are generally brown needle foliage. A substantial portion of the trees within moderate severity areas have either been killed by fire or are expected to experience high mortality due to intense heating, fire injury, insects, and the effects of prolonged drought. These continuing dry conditions will further decrease the survivability of fire damaged trees, even in areas that burned in lower severity.

Areas characterized by no or low severity burns experienced 0-50 percent vegetation mortality. In low severity burn areas, most of the stand mortality occurred in smaller understory trees. Over time, these smaller trees will fall to the forest floor and contribute to future fuel loading, but in much smaller quantities than in the moderate to high severity burn areas.

For additional information on the fuel loading, as well as the fire history and specific information on the 2014 fires within the project area, see the project Fuels Report.

10 These totals do not include the Man and Log fires.

VII. Species Life History and Status

Species Status refers to the known or likely occurrence of a species within the project area and focuses on those actual or assumed individuals that are likely to be affected by the proposed project. Larger biologic and demographic issues of species status are best summarized by species specialists in cited literature, Recovery Plans and critical habitat designations and will be cited and referenced as appropriate in this document. Aspects of the species biology and ecology that are relevant to the project analysis will be described and cited in the effects analysis section.

The following is a species account summary for the NSO and is not a complete life history. For additional information on the life history of the NSO, including threats to the species and the status of the species' recovery, see the 2011 Revised Recovery Plan for the northern spotted owl. Aspects of the species' biology pertinent to the potential effects to the individual NSO that may occupy the analysis area, in addition to potential impacts to prey or suitable nesting/roosting or foraging habitat, are discussed below. The Revised Recovery Plan also contains a detailed description of threats to the northern spotted owl from West Nile virus, sudden oak death and inbreeding depression, genetic isolation, and reduced genetic diversity. These threats were not applicable to this analysis as the discussion of these issues goes beyond the scope and scale of this analysis.

Spotted owl habitat is generally associated with older, dense forests that provide opportunities for nesting, roosting, and foraging. Nesting/roosting habitat is generally described as a multilayered, multi-species canopy with large overstory trees with various deformities (large cavities, broken tops, mistletoe infections, and other decadence); large snags; large woody debris resulting from fallen trees; and sufficient open space below the canopy for spotted owl flight (Franklin et al. 2000). Foraging habitat generally has attributes similar to those of nesting/roosting habitat but contains less canopy cover, forest structure complexity, and large trees. Dispersal habitat consists of adequate tree size and canopy closure to provide protection from avian predators and minimal foraging opportunities but does not contain sufficient amounts of other essential habitat components for long term NSO occupation, reproduction or survival (USDI 2011).

Nesting/Roosting Habitat

In 2009, the USFWS conducted a thorough review and synthesis of published literature, unpublished data sets and direct communication with NSO researchers to develop guidance for describing NSO habitat and evaluating the effects of habitat management on NSO within the interior Klamath Province. Nesting/roosting habitat for this analysis is generally defined by (1) average crown closure >60%, (2) average diameter at breast height for canopy trees (>18 inches), basal area (>180 square feet per acre), and trees with cavities or platforms.

On the Klamath National Forest, in the California Klamath and Cascade provinces, 41% of 29 nests were in cavities and 59% on platforms, with cavity nests occurring predominantly in Douglas-fir forest and platform nests found mainly in mixed conifer forest. Eighty-six percent of the 29 nests were in Douglas-fir trees. Marshall et al. (2003) noted that approximately 90% of known Spotted Owl nests on the Applegate Ranger District of the Rogue River National Forest (Klamath Province, Oregon, 50 miles northwest of the Project area) were in dwarf mistletoe brooms in Douglas-fir trees.

Foraging Habitat

The 2009 NSO Guidance describes foraging habitat as including a mix of basal areas ranging from 120 to180+ square feet, and ≥ 15 Quadratic Mean Diameter (QMD) with ≥ 5 trees per acre of ≥ 26" DBH and a mix of >40% to 100 % canopy closures. It also recognizes "low quality" foraging habitat as a mix of basal areas ranging from 80-120+ square feet, ≥ 11" QMD and ≥ 40% canopy closure (USDI 2009, Irwin et al. 2004, Irwin et al. 2007).

In recent years, fire exclusion, white fir ingrowth and stand diseases have influenced stand conditions to be denser in canopy on the upper slopes (Silviculture Report). This may have

provided some level of increase in foraging habitat for NSO. Fire histories show that these upper slope stands will not be sustainable under current conditions of wildfires due to the high probability of stand replacing fires on the upper 1/3 of slopes (Fire and Fuels Report).

The quality, quantity and distribution of NSO nesting/roosting and foraging habitat in the analysis area are variable due to the size and scope of the project area. In the Whites and Happy Camp areas, nesting/roosting habitat is located on the lower third of slopes, often on northern aspects and within drainages. The 2014 fires had the largest impact on the habitat in the central portion of the Happy Camp fire area and large amounts of nesting/roosting habitat were lost to high-severity fire. The Whites fire area was less impacted by fire but had patches that burned hundreds of acres at moderate and high severity, surrounded by mixed and low severity fire. The Beaver fire area was already highly fragmented habitat due to past fire and land management and the 2014 fires compounded this fragmentation. NSO nesting/roosting and foraging habitat is limited and low quality where it occurs.

NSO Prey

Northern spotted owls feed mainly on small forest mammals, particularly arboreal and semi-arboreal species (Courtney et al. 2004). Northern flying squirrels and woodrats comprise the bulk of their diet but secondary species such as mice (*Peromyscus sp*.) may be important for survival and reproduction. In portions of the NSO range, deer mice, red-backed voles, and two species of lagomorphs are considered locally and/or seasonally important in their diet (Courtney et al. 2004). Within the analysis area, it is expected that mice, woodrats, and flying squirrels are the most likely prey item based on available habitat.

NSO use of the post-fire landscape

Wildfire can potentially limit foraging resources by reducing prey abundance and essential cover for protection for foraging endeavors, predator avoidance, and thermal protection. These essential habitat elements can be depreciated or lost when high-intensity wildfire moves through a forested stand.

Habitat attributes such as coarse woody debris (CWD) for prey habitat and cover for foraging (multi-layered stands) can be altered drastically and be limiting after severe wildfire until fire-killed trees fall. Replacement woody debris may replenish from falling snags and trees or may remain in areas where fire intensity was less severe. Foraging impacts from direct mortality of prey species due to immediate changes in habitat or direct kill are also associated with wildfires. Additionally, these forested stands that have burned at high severity and lack protection from weather and predators will take many years to re-establish the multi-layered stands necessary to compliment other essential suitable habitat attributes.

Burned forests can influence small mammal populations and distribution (Zwolak and Foresman 2007). Zwolak and Foresman (2007) found small mammal communities differed between burned and unburned forest habitat. Generally, burned areas had a higher proportion of deer mice when compared to other species captured in the study area, but species diversity increased the year following the fire. Generally, deer mice numbers increased in fire affected areas (Zwolak and Foresman 2008). However, red-backed voles, bushy-tailed wood-rats, and flying squirrels avoided burned areas for at least two years after the fire. This avoidance of burned areas was attributed to the possible reduction in food resources, predation, and distance from cover.

The primary prey species associated with NSO in California is the dusky-footed woodrat, northern flying squirrel, red tree vole, and deer mice presented in order of importance (Franklin 1997). The Westside Fire Recovery Project contains all these species except red tree vole. When comparing frequency and biomass, the woodrat and flying squirrel are the most important prey species (Franklin 1997). Woodrats are associated with brush habitat and are in low abundance in

old-growth forests (Sakai and Noon 1993). Northern flying squirrels are associated with mid- and late-seral forests (Carey et al. 1992).

Because high severity fire has affected a large portion of the project area, deer mice are likely present and will likely increase in density. Shrubs are likely to establish within most areas that lack tree canopy cover. After shrubs establish, woodrats should become more abundant and these woodrats may enter the adjacent closed canopy forest where NSO could capture these prey. Prey capture in the brushy areas is difficult for NSO (Franklin 1997). However, until brush covers these fire affected areas, deer mice are likely accessible to NSO as a food source. Northern flying squirrels are not likely present in high severity fire affected areas since these areas lack tree canopy cover. As the forest develops into mid-seral conditions, flying squirrels may return to these areas but this will likely take several decades before flying squirrel habitat may regenerate in high fire severity areas.

Areas burned with high burn severity are no longer considered suitable habitat for NSO nesting, roosting or long term occupation by spotted owls because these areas no longer supply the habitat attributes needed for thermal protection, nesting structure and cover from predators necessary for long term viability (see description of suitable NSO habitat in Affected Environment and Species Account section above). While these stands do not contain the attributes that define NSO habitat, burned forest has been found to be used by NSO, at least in the short-term, particularly if the habitat was nesting/roosting or foraging habitat before the fire.

While spotted owls may use former nesting, roosting, and foraging habitat burned with high- and moderate-severity located within their home range for foraging, the overall importance of these areas to NSO's is still unknown. Results from radio-telemetry studies of spotted owls in post-fire landscapes indicate that spotted owls will use forest stands that have been burned, but many other factors dictate the extent and degree to which this will occur (Bond et al. 2002, Bond et al. 2009, Lee et al. 2013, Lee and Bond 2015).

Current research offers differing perspectives in regards to the use of severely burned coniferous forests by spotted owls (Elliot 1985, Gaines 1997, Bond et al. 2002, Bond et al. 2009, Clark 2007, Clark et al. 2012, Comfort 2013, Eyes 2014, Lee and Bond 2015). Some studies have shown owls to exhibit site fidelity, mate fidelity, and reproductive success after fires have burned a portion of their territories at varying severity levels, including high severity (Bond et al. 2002, Lee et al. 2012). Others studies have shown owls to move completely away from previously occupied areas after high severity burns (Elliot 1985, Gaines 1997) particularly when burns occurred within core areas of resident birds. Bond (2010) reported 30 percent of California spotted owls' nonbreeding-season roost locations were within the fire's perimeter. In another study, radio-telemetry locations demonstrated that the owls selected low-severity burned forests for roosting during the breeding season, and selected low, medium, and high-severity burned forests for foraging within 1.5 km of the nest or roost site (Bond et al. 2009). Irwin et al. (2012) found that NSO in the Klamath region would often forage within more open stands that contained brush or a low basal area of conifer trees, and that the presence of a few scattered trees or snags likely facilitated hunting for prey such as woodrats, citing a particular telemetered pair that made extensive use of a burned area with manzanita shrubs and scattered live trees. This would indicate that, at least under certain circumstances, NSO will venture into more open habitats, such as areas burned at high and moderate severity, when enough structure is present to offer perching or a certain degree of cover, though the exact level of cover is unknown.

Lee et al. (2013) found that California spotted owls in southern California forests had an increased likelihood of site abandonment only when >50ha (124 acres) of their 81 ha (200 acre) core areas burned at high severity. This represents approximately 62% of their core use area, suggesting strong site fidelity. In addition, for spotted owls affected by the Rim Fire, Lee and Bond (2015) concluded that fire severity did not affect pair occupancy, which also suggests strong site fidelity.

Clark (2007) found that severe wildfires in NSO home ranges caused owls to increase their home range size in order to encompass more suitable habitat. He also found that spotted owls with territories located immediately adjacent to moderate- and high-severity burned areas, avoided these areas and had < 5% of their locations fall within the boundaries of the fire. Owls that ventured into the burned areas were typically individuals that were displaced by fire and periodically visited their old territory. According to Clark's study, when given the opportunity, owls focused their activities in unburned habitat. In his study, several owls with territories inside the fire frequently traveled long distances to forage in unburned habitat, supporting his prediction that owls would focus activities in the oldest forest stands with the least amount of fire damage (Clark 2007).

While severely burned coniferous forest is not considered suitable nesting or roosting habitat for NSO (USDI 2011), Clark (2007) study included telemetry detections of NSOs in Oregon within some areas that were burned with high and moderate severity. The condition of the burned stands in Clark's study area, such as the percentage of overstory mortality, the presence or absence of green trees, the ratio of high, moderate and low burn severities, and the juxtaposition of suitable NSO habitat in relation to severely burned areas wasn't reported. While in Clark's study owls were present within severely burned areas, it was not concluded that these areas were suitable habitat for nesting, roosting or long-term occupation by spotted owls. The burned areas may have contained individual features that were providing a short term structure for either roosting or foraging but were not suitable for long-term sustainability of a given owl or owl pair.

It is the spatial context of the overall habitat available for use by spotted owls that is critical for an analysis of habitat suitability. The proportion and arrangement of unburned or low burn severity suitable habitat in relationship to moderate- or high-severity burn areas within an NSO home range is one of the key factors in determining the likelihood of use by NSOs (USDI 2014, USDI 2011). This relationship is important because NSOs will focus their use of burned areas for foraging in areas with adjacent cover. This distance to cover is a key factor influencing use of burned areas (Comfort 2013). Because habitat selection by NSO is strongly influenced by abiotic features such as distance to water, proximity to nest, slope position, and elevation, it is possible that use of the burned habitats by NSO as described by Clark et al. (2013) or Bond et al. (2009) may occur due to the juxtaposition of the burned areas in relation to some other feature, such as a pre-fire nest location or water, rather than based on the "suitability" of the area, particularly if the owls were accustomed to using the area prior to the fire. Factors involved in the NSO's periodic selection of burned areas for foraging are not known at this time, and further research is needed to account for the many other aspects of a burned landscape that would factor into the NSO selection process.

Owl use of burned areas is well documented but links between owl use, fire severity, and intensity of salvage are not clear. Researchers were typically unable to separate effects of pre-fire timber harvest, wildfire, and post-fire salvage harvest. Research results are highly variable, depending on methods, burn severities, proximity of NSO to fire and spatial arrangement of habitat. Research of NSO use of burned areas has also been confounded by small sample sizes. In addition, general terms used in the literature including "moderate severity" and "salvage logging" make comparison to specific conditions found within the proposed project area difficult. Most references to "salvage logging" in the literature refer to clear-cut logging, and do not factor in design features used by the Forest Service such as leave tree groups, legacy tree retention, core area avoidance or even limited operating periods.

Studies noting changes in owl behavior or habitat selection after wildfire and/or salvage harvest have been largely unsuccessful in assigning causal factors. Clark (2007) was unable to separate the potential effects of pre-fire land management, high-severity fire and salvage harvest on NSO. Lee et al. (2012) and Clark et al. (2013) were also unable to distinguish the effects of salvage harvest in comparison to, or in combination with, other variables studied.

Findings from within recent research, including but not limited to, Bond et al. (2009), Clark (2007), Clark et al. (2012), Lee et al. (2012), Lee et al. (2013), Irwin et al. (2012), Eyes (2014), Comfort (2013), pertinent to this analysis include the following:

- NSO appear to display site fidelity by returning to burned areas that were suitable pre-fire, even if they no longer meet the definition of suitable NSO habitat.
- NSO foraging activity in moderate and high severity burned areas is supported in the literature, although the value of this foraging opportunity as it pertains to survival and reproduction is not known.
- NSO select unburned or low fire severity affected habitat for nesting.
- NSO use of burned areas may be influenced by standing snags and surviving green trees as perch sites for foraging, particularly along edges where sufficient cover is available.
- The likelihood of a burned area being used by NSO may be strongly affected by the pre-fire habitat type and distance from suitable forest cover; NSO may be more likely to use the edge between suitable habitat and high fire severity affected areas than the interior portion of a high severity burned area.
- Most studies on NSO use of burned areas examine short term occupancy and use and have been unable to factor in duration or persistence at a site over an extended period time.

Status of the NSO Habitat within the Analysis Area

Recent evaluation of NSO nesting/roosting and foraging habitat reported approximately 586,487 acres of NSO nesting/roosting and foraging habitat (188,700 acres of nesting/roosting habitat and 397,787 acres of foraging habitat) across the entire Forest (excluding Ukonom Ranger District – not administered by the Klamath NF).

See

Table G-8 below for the acres of habitat in the analysis area after the 2014 fires.

Table G-7: Pre-fire and post-fire NSO habitat, FANR, PFF1 and PFF2 within the analysis area after the 2014 fires.

Habitat	Pre-fire Acres	Post-fire Acres	Change in Habitat Acres resulting from 2014 fires
Nesting/Roosting	33,485	26,435	-7,050
Foraging	62,341	50,134	-12,207
Dispersal	67,170	54,504	-12,666
Fire-Affected Nesting/Roosting(FANR)	-----	1,314	----
Post-Fire Foraging (PFF1)*	-----	10,297	----
Post-Fire Foraging (PFF2)**	-----	7,646	----

*Acres of pre-fire NR that burned at grid code 4 (RAVG data) and pre-fire F that burned at grid code 3 and 4 **within** the 500 foot buffer described above in the Methods section.

** Acres of pre-fire NR that burned at grid code 4 (RAVG data) and pre-fire F that burned at grid code 3 and 4 **outside** the 500 foot buffer described above in the Methods section.

Table G-8: Pre-and Post-fire NSO habitat and fire severity in analysis area and associated fire severity after the 2014 fires.

Habitat	Pre-fire Habitat (Acres)	RAVG assessment*				Post-Fire Habitat (acres)
		Very low (grid code 1)	Low (grid code 2)	Moderate (grid code 3)	High (grid code 4)	
Nesting/Roosting	33,485	15,331	1,891	1,314	5,736	26,435
Foraging	62,341	25,390	2,986	2,174	10,033	50,134
Dispersal	67,170	23,313	3,279	2,391	10,275	54,504

* The analysis area contains the fire-affected area plus an area outside the fire perimeter; thus the acres of habitat affected by fire presented in this table will not equal the acres in "Pre-fire Habitat" or "Post-Fire Habitat".

Status of the NSO Activity Centers within the Analysis Area

Eighty-five NSO activity centers (ACs) are included in the analysis area. The degree and intensity of treatment varies considerably, as described below in the discussion of Effects to Individual Activity Centers. See tables A-1 and A-2 in Appendix A for the pre-fire and post-fire acres of NRF habitat within the core areas and home ranges of all 85 activity centers in the analysis area.

As described in the Methods section above, each activity center has been assigned a category that reflects the assessment of the habitat present in each home range and core area following the 2014 fires, and the subsequent "habitat fitness potential" for that activity center as High, Moderate or Low habitat fitness potential. The "habitat fitness potential" categories assigned to each site are not influenced by potential effects from the proposed activities; the categories only reference the likelihood of that site to successfully reproduce and continue to support the demographics of the NSO population in the area based on existing habitat conditions (Table G-9).

Table G-9: All activity centers within the analysis area and the category of habitat fitness potential to which they were assigned* – see Methods section above for the methodology of the categorization process.

Activity Center Number	Category of Habitat Fitness Potential	Activity Center Number	Category of Habitat Fitness Potential
0229	Moderate	1122	Moderate
0239**	Low	1130	Moderate
0241	High	1164	High
0245	Moderate	1202	Low
0247	High	1212	Moderate
0252	Low	1213	High
0254	Low	1214	High
0255	Moderate	1258	Moderate
0257	High	1265	Moderate
0272	High	1266	High
0277	High	2124	Moderate
0283**	Low	4026	Moderate
0284	Moderate	4099	High
0293	Moderate	4128	Moderate
0315	High	4129	Low
0322	High	4133	Moderate
0346	Low	4143	Moderate
0365	Moderate	4144	Low
0380	High	4145**	Low
0381	Moderate	4146	Low
0383	Moderate	9990	Low

Activity Center Number	Category of Habitat Fitness Potential	Activity Center Number	Category of Habitat Fitness Potential
0499	High	9991	High
0567	High	9992	High
1027	Moderate	9993	Low
1028	High	9994	Moderate
1029	High	9995	Moderate
1030B	High	9996	Moderate
1039	High	9998	High
1040	High	9999	Moderate
1041	High	99910	High
1046	High	99912	High
1047B	High	99913**	Low
1100	Moderate	99914	Low
1101	High	99915	Moderate
1109	High	0096A	High
1110	Moderate	0276A	Moderate
1111	Low	0276B	Moderate
1112B	Moderate	0278A	High
1116	High	0278B	Moderate
1117	Moderate	NEW3A	Moderate
1119	High	NEW3B	Low
1121	Moderate	NEW7A	Moderate
		NEW7B	Moderate

*A few activity centers contain slightly less suitable NRF than the minimum levels described for High Fitness Potential but were categorized as High due to the lack of on the ground habitat typing and subsequent lack of exact acres of habitat, in order to err on the side of caution.

**These ACs are being displayed in the table as “low” potential because of the treatment occurring on private land. Although treatment isn’t complete on private land, we are assuming treatment may continue as it has, which may result in the remaining suitable habitat to be reduced in quality to the point that it will not function as suitable habitat. This may be an over estimate of effects.

Without long-term monitoring data, it is very difficult to determine demographic trends within the analysis area. For the purposes of this analysis, it is assumed that not all activity centers are occupied consistently through time, and that “currently” unoccupied activity centers that have been occupied in the past could re-activate at any time, if habitat conditions remain similar over time.

Site occupancy and reproductive rates have been shown to exhibit substantial annual variation that may be influenced by individual’s site fidelity, climatic extremes, shifts in prey availability, or presence of other raptors (Loschl 2008, Olson et al. 2005, Anthony et al. 2006). Activity centers in this analysis area have displayed some of this variation in occupancy and are considered important for current or future NSO demographics; multiple sites have been substantially affected by fire and currently contain well below the recommended habitat minimums.

Survey History and Strategy

Past Survey Summary

The Whites Fire, Beaver Fire, and Happy Camp Fire areas have had a long but intermittent history of NSO surveys since the early 1990s. All three fire areas have had partial coverage due to years of overlapping past project surveys. Most recently, a portion of the Whites Fire area was surveyed to protocol in 2003-2004 and again in 2013-2014, though at least four of the ACs in the fire area were not covered. The Beaver Fire area had approximately 70% survey coverage over the past decade. These surveys were conducted by U.S. Forest Service and private land biologists. The Happy Camp Fire area had recent surveys from past project surveys (2005 or

earlier) covering about 50% of the area. In the Happy Camp Fire, portions of upper Grider Creek watershed and the sub-watersheds north of Tom Martin Peak have had very little or no survey coverage in recent years due to a lack of road access. The Tompkins Creek, Middle Creek, and O'Neil Creek watersheds of the Happy Camp Fire have had recent surveys from 2007 to present. It is important to note that following a landscape level disturbance of the magnitude of the 2014 fires, surveys that occurred prior to this event are not necessarily applicable to the landscape now. Many of the home ranges, core areas and nest stands have likely moved and shifted away from previous locations due to fire effects.

NSO Survey Strategy

Surveys are intended to reduce the possibility of direct harm and/or disturbance that could result from implementing project activities (i.e. felling trees, removing understory fuels) within an area occupied by NSO during the reproductive period when owls are less mobile and therefore less capable of moving away from a source of disturbance.

NSO surveys are planned for six surveys per year for two years. The intent is to survey the project area annually through implementation. Surveys started in the spring of 2015, beginning after March 15th. All first year surveys will be completed prior to implementation.

For the second year of surveys, ***three surveys would be conducted prior to implementation and three surveys conducted concurrently***.

It is important to note that surveys will cover areas of nesting/roosting and foraging habitat that burned with **all** severities, including high severity, so that occupancy and use of potential treatment areas can be determined, in addition to establishing occupancy of core areas or home ranges. Surveying the high and moderately burned previously suitable NRF will help to inform the analysis in regards to the assumptions made about NSO use of post-fire habitat, at least on a site specific level, though additional monitoring would be needed to further our understanding.

Survey strategy for this project is delineated according to the locations of proposed treatments units, roads, and known activity centers. Surveys can be prioritized to cover particular treatment areas first in order to gather as much information as possible prior to implementation. NSO surveys will be comprised of three main components:

1) *Activity Center Searches (ACS)* will be conducted in the majority of historic activity centers in the project area for each year of survey. ACS's will be conducted in all activity centers that have treatment proposed in core areas. Only activity centers that have no treatment in the core area, and very little, or none, in the home range and that lie outside of areas potentially impacted by other project activities (i.e. landings or road construction) may not receive ACS's.

2) *Pre-determined call routes* will be placed along all roads with proposed treatment and/or that are associated with treatment units. The analysis area encompasses the area within a 1.3 mile buffer of all treatment units; therefore, the call routes will be delineated along all roads within this area. The area within 0.25 miles of these roads/call routes will be considered as covered by the survey, though a greater area is often covered due to topography and landscape features.

   Areas with difficult access due to a lack of roads, such as Upper Grider and Tom Martin Peak watersheds, will have daytime walk-in routes to cover portions not reachable via nighttime survey routes.

3) *Stand searches* will be conducted in salvage units that fall outside of 0.25 miles of the designated call routes in order to ensure complete coverage of units that do not have direct road access (i.e. helicopter units) and therefore may not have been within range of the call route.

Unsurveyed Suitable Habitat in the Analysis Area

While much of the analysis area has been surveyed at some point in the past, survey coverage of the area is incomplete and irregular. Activity centers have been placed based on NSO detections, but many of those detections were in the 1990's which elevates the uncertainty of the current home range and core area use by NSO. There are also areas that have either never had a detection or have never been surveyed, and subsequently do not have activity centers designated. These areas are included in the current survey strategy for this project and will receive surveys prior to implementation. If NSO are detected, the FWS will be consulted and if required, the project will be re-assessed for effects to any newly discovered NSO territories.

However, two areas in the project area that are currently being surveyed may not fully meet NSO survey protocol for a landscape with potential barred owls; the Grider Ridge roadless area and the north facing slope of the Klamath River from Tom Martin Peak to Slinkard Peak. No treatments are proposed for the Grider Creek roadless area, but a portion of this area is within 1.3 miles of proposed treatment. The Grider Creek roadless area is being surveyed along the boundary of the roadless area, using existing roads but the interior portion is only accessible on foot. The interior portion is about 5,100 acres and was largely affected by moderate and high severity fire. Nighttime call route surveys from existing roads along the boundary are unlikely to cover this interior, unroaded area. For safety reasons, the interior is being surveyed using daytime walking call routes and will be surveyed three times. The walking call route goes through most of the remaining habitat that occurs within the Grider Creek roadless area. Approximately 1,510 acres of suitable habitat occur in the area covered by daytime surveys, mostly concentrated along Bark Shanty and Grider Creeks. Based on the amount of habitat, this area may support one NSO pair, but with a linear distribution of habitat across about four miles. The southern portion of the roadless area also has habitat which may be part of known ACs further south of the analysis area but without access or surveys, is difficult to establish for certain.

The other portion of the project that will likely not meet survey protocol is the north facing slope of the Klamath River from Tom Martin Peak to Slinkard Peak; and will be surveyed six times as a combination of daytime and nighttime surveys. Nighttime surveys will be completed along the road, but due to the topography, NSO broadcast calls may not carry far enough to fully cover the area. Daytime walking surveys will occur farther up the drainages but access and concerns over surveyor safety may limit the ability of the daytime surveys to reach the entire area needed to fully meet protocol. However, where nighttime surveys are conducted, they are expected to fully meet protocol. No treatments are proposed in any of the habitat occurring in areas with more limited surveys.

New information resulting from the 2015 surveys

As a result of the extensive surveys throughout the analysis area during the 2015 survey season, additional information was discovered regarding NSO locations, activity center placement, and reproductive status of the NSO within the project area. This information resulted in adjusting the location of specific activity centers, the removal and/or reshaping of numerous salvage harvest units, and the assignment of limited operating periods (LOP) to specific treatment units where NSO have been observed nearby.

Since NSO are known to exhibit strong site fidelity, we expected recently active ACs to be occupied in 2015. However, where a high proportion of a core area burned at moderate and high severity, it may not meet the needs of a NSO pair; but areas within the home range may provide sufficient unburned or low severity burned habitat for reproduction and/or survival if the owls were to shift their use patterns within their home range. If a pair does move to a new location, reducing the potential effects to the occupied area is important for current or future nesting potential.

Our 2015 surveys have detected two nest sites (1030 and 1047) and one pair (1112) that appear to be using an area not previously identified as a nest site but still within the core. Whether or not these NSO pairs moved because of effects to the habitat in their AC from the 2014 wildfires is not part of this analysis and would be extremely difficult to establish. NSO surveys are intended to locate activity centers so that effects can be minimized to the extent practicable.

The 2015 NSO surveys also located an NSO pair (0383) in an area not previously recorded in our databases. A new activity center was established and centered on the pair location (0383). Using survey protocol, nesting was not confirmed nesting for this pair. A male NSO has been detected in the core of NEW3A and in the core of NEW3B on separate survey visits; then a pair was found in the area of overlap between each core area, indicating that they are likely from the same activity center. However, without unique identification of each bird, it is difficult to definitively assign these detections to one activity center, though survey results have only found one male and one female NSO per night in a given area, suggesting that there is only one pair for both ACs. However, in order to account for the possibility that this may actually be two occupied ACs, we are analyzing each AC separately.

During 2015 surveys of the project area, multiple observations of NSO, both daytime and nighttime, have been recorded. The 2015 preliminary observation data were reviewed for our analysis to help inform our assumptions on NSO use of assigned activity centers as well as their use of the post-fire habitat. We reviewed locations of daytime detections overlaid with habitat type, including fire affected habitat (PFF1 and FANR) for some anecdotal insight into how NSO in the analysis area may be using the landscape after a disturbance of such large magnitude as the 2014 fires. This information also helps to inform the placement of LOPs.

Nighttime detections of NSO are less informative regarding NSO use of a particular habitat type because these sightings result from an NSO call route that uses vocalizations to elicit a response from an NSO that is usually out foraging, often calling them to the surveyor's location, and would therefore not indicate any particular type of habitat being used by the responding owl. An NSO can be called from over 0.25 miles away to the location of surveyor. For example, several nighttime detections have been made in moderate burn severities, but these were along a road that the birds were called to as part of the call route; in other words, the NSO were not found in the moderate severity burned areas, they were called into these areas from elsewhere. Assumptions about the habitat a particular NSO was using prior to responding to a nighttime surveyor cannot accurately be made without knowing where the bird was prior to having been detected (NSO in the project area are not equipped with location/tracking devices).

Unlike nighttime surveys, daytime surveys can provide more insight into NSO habitat selection because the surveyor has a much greater chance of detecting the owl in the stand that the NSO selected itself (and may be using for nesting or roosting) rather than having been called to it. If an NSO pair is attempting to nest, there is a higher likelihood of finding the bird in the stand being used for nesting when using a daytime survey.

We have 11 daytime NSO detections resulting from the 2015 surveys and 10 of these observations occurred in unburned or very lightly burned (grid code 1) habitat.[11] This supports our original assumptions in this analysis that NSO are less likely to use moderate and high severity burned areas for nesting and/or roosting. The one exception to this was a single male daytime detection in burned (grid code 3) habitat in the Beaver fire area where the private land surrounding the national forest land within the activity center has been heavily harvested this year and is no longer providing any usable habitat or even cover; thereby leaving the NSO in the area very few options for habitat. The extreme situation in Beaver is the anomaly in our observation data. Subsequent surveys have not detected an NSO in this area since the first observation.

[11] Reflects daytime detections within the fire perimeter only

We acknowledge that our information regarding NSO use of post-fire habitat in the project area is anecdotal and preliminary, but it does provide some site specific data that can be used, in conjunction with the most recent available research, to inform our analysis of effects to NSO from project activities.

The following table describes the reproductive status of activity centers where NSO were detected during 2015 surveys and the subsequent measures applied to the project design to account for the new information. The highest level of occupancy, i.e. nest, pair, or single, found for each activity center is listed. Treatment units that were removed from the project due to updated NSO observation information are also listed. Certain treatment units within in the project will have LOPs assigned, and as new information becomes available, LOPs will be applied as necessary.

Table G-10: Summary of active NSO activity centers within the analysis area and the subsequent measures applied during project development.

AC #	Highest Reproductive Status (nest, pair, or single)*	Units dropped in this project alternative as a result of new survey information	Units retained but assigned September 15 LOP	Did AC shift in 2015 from originally analyzed location?	New AC added to system?
0283**	Single	SSP096-1, SPP097-1 and Salvage units were dropped in the core early in project as a result of AC fitness potential analysis	none	No	No
0278B	Single	No salvage units were proposed in the core	none	No	No
0381	Single	SPP220, SPP278, and SPP354	none	No	No
0383	Pair	S242 and S243-2; S243 –Retention patches incorporate portions of the unit that occur in the core so that no salvage is proposed in the core.	none	No (no previous AC location)	Yes
1030B	Nest	No salvage units were proposed in the core	none	Yes	No
1041	Single	SPP031-1 and Salvage units were dropped in the core early in project as a result of AC fitness potential analysis	none	No	No
1047B	Nest	S426	Roadside fuels	Yes	No
1109	Single	SPP051-1 and Salvage units were dropped in the core early in project as a result of AC fitness potential analysis	none	No	No

AC #	Highest Reproductive Status (nest, pair, or single)*	Units dropped in this project alternative as a result of new survey information	Units retained but assigned September 15 LOP	Did AC shift in 2015 from originally analyzed location?	New AC added to system?
1110	Pair	Salvage units were dropped in the core early in project as a result of AC fitness potential analysis	none	No	No
1112B	Pair	SPP003-2	none	Yes	No
1130	Pair	S005, S005-8, and S23-34 Plus, salvage units were dropped in the core early in project as a result of AC fitness potential analysis.	none	No	No
1212	Single	Salvage units were dropped in the core early in project as a result of AC fitness potential analysis.	none	No	No
9991	Single	SPP352, SPP351 and salvage units were dropped in the core early in project as a result of AC fitness potential analysis	none	No	No
9996	Single	S240	none	No	No
9998	Pair	No salvage units were proposed in the core	none	No	No
New3A/3B	Pair	S005-5, S005-7, S57-1, S57-2, S59-1, S59-2, and S23-12; Retention patches incorporate portions of units where NSO detections were made and where prior year's nest stand was located.	23-11 and 23-2	No NSO detections occurred within the core areas of either ACs.	No

* NSO surveys haven't been fully completed at the time of writing this document thus AC status may change as the new information becomes available.

** Our initial analysis of this AC assumed only moderate and high severity affected habitat would be removed on private land, but it appears that this isn't an accurate assumption. The change in this assumption has reduced the fitness potential level for this AC from moderate to low, though salvage harvest will continue to be dropped from the core of this AC to reduce potential effects.

"S" = Salvage unit, "SPP" = site preparation and plant

VIII. Effects of the Proposed Activities

The analysis contained herein uses specific terms that categorize the estimated degree of change (effect) to spotted owl habitat elements. The term **maintain/improve** implies that treatments will have no meaningfully measurable negative effect to the quality of the habitat or may potentially increase the quality of the habitat. The term **degrade** signifies when treatments influence the

quality of habitat by the removal or reduction of habitat elements but not to the degree where existing habitat function is changed. Units may simultaneously degrade certain components of a stand while maintaining or improving other components. The term **downgrade** applies to treatments that reduce habitat elements to the degree the habitat will not function in the capacity that exists pre-treatment, but activities will not remove habitat entirely (e.g., downgrade from nesting/roosting to foraging). Treatments may also downgrade suitable nesting/roosting or foraging habitat to dispersal, in which case the habitat has become no longer suitable for any type of long term occupancy but is still a forested stand that contains enough cover and structure to provide habitat for dispersing NSO. The term **remove** pertains to treatments that reduce habitat elements to the degree that habitat will no longer function as suitable for NSO. For habitat to be removed, a reduction in the abundance and spatial extent of specific habitat elements or conditions must be great enough to result in a change to habitat function. For example, while the construction of new landings might remove virtually all trees in a 0.25 to 0.5 acre area, that small gap in a fairly contiguous forest stand of 10 to 20 acres would be unlikely to change the ways NSOs use that forest stand.

Direct and Indirect Effects of the Proposed Activities

Direct effects are those effects that are caused by or result from proposed activities and take place at the time of implementation. Generally these effects are a result of project implementation acting directly in suitable habitat where individuals may reside. For example, if the smoke from a prescribed burn irritates an individual animal or when noise flushes an individual from its nest, these are both direct effects. Effects that are likely to adversely affect a listed species are not discountable, insignificant or wholly beneficial. A discountable effect would be determined to be extremely unlikely to occur and, based on professional judgment, these effects are not expected to occur. Insignificant effects relate to the size of the impact and the effects would not be expected to reach the scale where take occurs. Using the best available data and professional judgment, a person would not be able to meaningfully measure, detect or evaluate insignificant effects.

Indirect effects are those effects that are caused by or will result from proposed activities and take place later in time but are reasonably certain to occur (50 CFR §402.02). Generally these are effects on resources that act indirectly on the listed species such as when changes to vegetation modify the abundance or availability of prey.

Effects to NSO and NSO habitat from the proposed activities

Direct Effects to NSO

Six NSO surveys and at least one activity center search per AC were completed in the project area in 2015. In 2016, three surveys will be conducted prior to implementation for that year and three surveys will be conducted concurrently with implementation in the project area (same survey area as 2015) unless otherwise agreed upon after site specific evaluation by Level 1 biologists. For 2017 and 2018, three surveys will be completed prior to implementation in that year, but surveys will be focused around the remaining treatment. Surveys are intended to reduce the possibility of direct harm and/or disturbance that could result from implementing project activities (i.e. felling trees, removing understory fuels) within an area occupied by NSO during the reproductive period when owls are less mobile and therefore less capable of moving away from a source of disturbance. If NSO are detected, adverse impacts would be avoided by shifting operations that occur within the core area of the detected bird to after July 10, when both breeding adults and fledgling young are mobile. If nesting is detected or suspected, the operations are

shifted to after September 15, as this time frame is generally accepted among the FWS, the USFS and research biologists as the end of the reproductive period for NSO and is used by the FWS during consultation (based on review of years of research and professional expertise).

Fuels treatments, salvage harvest, site preparation and planting

Project activities associated with fuels treatments, salvage harvest, site preparation and planting may cause noise and smoke levels to rise above ambient levels. If these treatments were to occur within 0.25 miles of suitable nesting/roosting habitat during the NSO breeding season, they have the potential to affect NSO breeding success by causing loud and continuous noise disturbance and/or smoke disturbance to NSO.

Even though the research does not provide a clear relationship between salvage harvest and effects to NSO, for the purposes of this analysis we are assuming that this level of disturbance is likely a negative effect to NSO currently occupying the areas where PFF and FANR occur. However, the application of the LOP described above, in addition to the extensive NSO surveys, is intended to alleviate direct effects to NSO from project activities. See discussion in the Indirect Effects section below for effects to NSO habitat from these activities.

Noise Disturbance

Ground based and cable yarding harvest equipment typically creates noise above ambient levels and at times, the combination of equipment use may create noise levels well above ambient levels. This noise usually occurs during the daytime hours and can last for a few days. For any given acre of tree harvest, the duration of noise generating activity is relatively short (i.e. days). In some situations, the noise could last for a longer duration (i.e. weeks) because of the position of the treatment and the number of acres being treated.

Helicopter based harvesting can create high levels of noise in concentrated areas during the daytime hours. The topography can influence the level of noise, especially in narrow drainages where the sound can resonate. Helicopters will typically fly in short patterns (usually less than 0.25 mile) from within the treatment unit to the landing which is typically on the edge of the treatment unit. The helicopter may move logs for three hours before refueling or maintenance, depending on the type of helicopter and other logistical factors. Helicopter service landings are typically near a main road where fuel and maintenance equipment can be accessed. The flight path from the treatment unit to the service landing will likely cross over NSO habitat, but given the altitude of the flight, the sound will be less than the noise level in the treatment unit and much shorter in duration.

Log trucks and other service vehicles are likely to travel Forest roads frequently during operations. Log trucks are somewhat limited to maintenance level 2 and higher roads. There are maintenance level 1 roads that will be used to access treatment units but these roads will generally be traveled only during the harvest of the units. Specific maintenance level 2 and 3 roads will likely be used at a much higher frequency because there are limited number of roads that enter any given drainage. A typical main road in a drainage may experience up to 20 to 50 truckloads a day.

Roadside Hazard Tree Removal

Dead or fire injured, dying trees that are likely to fall and impact a Forest system road and that have been determined to have a 60 percent or greater chance of mortality within the next 3 to 5 years due to fire damage (as indicated by “Marking Guidelines for Fire Injured Trees”; Smith and

Cluck 2011) will be felled and/or harvested. The vast majority of trees to be harvested occur within areas of high and moderate fire severity (RAVG grid code 3 and 4), and generally within larger blocks of high tree mortality and are therefore not considered NSO nesting/roosting or foraging habitat. Treatments in these areas would remove PFF or FANR or non-habitat. The potential for direct effects to NSO from treatment in these areas is reduced due to the lower likelihood that NSO would be using these areas for anything except occasional foraging and would be capable of moving away from a disturbance.

Areas indicated by RAVG as grid code 2 had lower severity fire and are presumed to contain fewer fire-killed trees; though these areas are indicated as having between 25 to 50 percent basal area lost, and the fire resulted in varying levels of tree mortality. Acres of grid code 2 may be indicated as suitable habitat, due to a lack of fire effects, or they may be included in a roadside hazard unit, due to a small pocket of mortality that may have occurred along the road. Generally, NSO habitat that has burned with grid code 2 continues to serve as habitat and remains within the category to which it was assigned (i.e. nesting/roosting or foraging) post-fire. Treatments in grid code 2 have an increased potential for direct effects due to the increased likelihood that an NSO may occur in areas of suitable NRF in the areas immediately surrounding the treated areas.

Grid code 1 is indicative of a range from 0 to 25 percent basal area lost and so is either unburned or slightly burned to the degree that very minimal change is detected in the overstory canopy or basal area. These areas are less likely to contain fire-killed trees, and as a result, would have very few, if any, trees removed. Within these low severity areas, there is a small chance that an occasional tree (or small pocket of trees) may have been killed by the fire and would therefore be identified as a hazard to the road, but this is expected to be infrequent and only occur sporadically across the project area. Areas that show no sign of having burned, and subsequently contain no fire-killed trees, are not targeted for hazard tree removal and effects to NSO are not expected.

Because RAVG data is modeled as a snap shot at the time relatively soon following the fire, it does not account for delayed tree mortality that may result from site specific conditions such as heat stress, drought stress, or impacts from beetles and may not therefore fully capture all mortality that may occur post fire. Mortality guidelines (Smith and Cluck 2011) do address the chance for delayed tree mortality and the use of these guidelines for marking fire-killed trees along roads is therefore likely to capture the delayed tree mortality alongside roads in the project area that may or may not be indicated with RAVG. So, where RAVG data may indicate that no basal area loss occurred as a result of the fire at the time the RAVG data was gathered (i.e. grid code 0), it is possible that additional mortality may have occurred since that time, resulting in periodic dead/dying trees that would be targeted for removal if in proximity to a road. Therefore, there is potential for delayed mortality to not be fully captured using RAVG grid codes; however, field review has indicated that this circumstance is infrequent and sporadic across the project area and that in general, RAVG data captures areas of hazard tree removal.

Table G-11: Acres of NSO habitat occurring within each fire affected category within roadside hazard treatment unit. Grid code 0 and 1 are not expected to have meaningful effects to NSO; grid code 2 has an increased potential for effects.

Treatment	RAVG Grid Code 0		RAVG Grid Code 1		RAVG Grid Code 2	
	NRF	Dispersal	NRF	Dispersal	NRF	Dispersal
Roadside Hazard	774	379	1,385	789	217	129

Acres of affected habitat are an overestimate of effects to habitat because the exact effects are difficult to evaluate due to the uncertainty as to exactly where, what size, and how many hazard trees will be harvested.

There is a low likelihood that an NSO may be occupying a hazard tree slated for removal because only fire killed trees with a 60 percent chance or higher will be removed; and fire killed trees lack the structural aspects of a nest or roost tree, as green trees that have been killed by fire do not generally contain the decay, defect or heart rot and cavities that a tree/snag that occurred prior to the fire would have. Trees targeted for hazard tree removal generally occur within areas of high and moderate severity fire, whereas discussed above, NSO are unlikely to be nesting or roosting. It is possible that an NSO may be using the areas targeted for removal for foraging, and may use some of the fire killed trees as perches for hunting or resting, and may therefore be disturbed by the activities associated with implementation. However, the act of removing a perch site or sites is unlikely to cause a meaningful level of disturbance to an NSO that may be using the area.

It is possible that an NSO may occupy the area within 0.25 miles of the road, in which case the potential exists for disturbance; however, trees along major roads are less desirable sites for NSO due to the higher volume of traffic and noise associated with major roads.

There are multiple aspects of the design of roadside hazard tree removal treatments that have the potential to reduce potential ***direct*** impacts to NSO.

- all roads targeted for hazard tree removal would receive 3 surveys prior to implementation and 3 more concurrently with implementation (in addition to 6 surveys the prior year) with the exception of hazard removal along major ingress/egress roads described below; if NSO are detected, a Limited Operating Period (LOP) from Feb. 1 to July 9 would be in place for all actions along the segment of road that crosses the occupied core of the detected bird. If NSO are determined or suspected to be using an area for nesting, a Limited Operating Period from February 1 to September 15 will be applied to all treatments within a 0.25 miles of the known or suspected nest stand. Nesting status is typically determined by the end of June using protocol methods or the visual confirmation of offspring so there is no expected gap in the LOP for nesting owls. Because surveys are generally conducted from the road, there is an improved chance of detecting NSO using the targeted road or the area nearby. If NSO are detected, these protective measures would alleviate, though not completely eliminate, disturbance from project activities.
- the vast majority of the hazard tree removal would occur within areas of high and moderate fire severity, and would only remove fire-killed trees, where NSO are least likely to be using trees targeted for removal for nesting or roosting (see description above of NSO use of post-fire landscapes); therefore the potential to directly impact an NSO with hazard tree removal is subsequently reduced. It is more plausible that NSO could be using the burned areas (i.e. PFF or FANR) along roads, particularly lower level roads, for foraging or dispersing, depending in large part on the presence and juxtaposition of nearby suitable, unburned (or lightly burned) habitat that would offer cover to foraging NSO.
- higher maintenance level roads have a lower likelihood of use by NSO due to the higher level of traffic and subsequent disturbance; hazard tree removal along these roads is expected to have a lower level of impact to NSO than treatment on roads with a low level of traffic.

Ingress/Egress Road LOP Exemption

The exception to the LOP described above (Feb 1 - July 9) may apply to hazard tree removal along major ingress and egress roads that are necessary for community access and cannot be blocked by LOPs or an imminent hazard. See Appendix XI for a map of exempted roads. Where suitable unsurveyed NRF occurs within 0.25 miles of roadside hazard tree removal units proposed for harvest before July 9, there is potential for disturbance to NSO. Foraging habitat is included in the estimates because of the uncertainty in using remoted sensed habitat data and the potential for misclassification of suitable habitat into either nesting/roosting or foraging, though the remotely sensed data has demonstrated accuracy in identifying suitable NRF habitat in general. Including foraging habitat into estimates of habitat potentially used by NSO for nesting (and the potential for disturbance therein) increases the tendency for overestimation in this analysis.

NSO are not expected to be using areas burned at moderate and high severity for nesting, as described above, so only grid codes less than 3 are used in this estimate. Higher fire severity (grid code) indicates a *lack* of nesting habitat.

To quantify this impact in terms of acres of suitable NRF affected by noise disturbance, the roadside hazard treatment units[12] along major ingress/egress roads were buffered in GIS by 0.25 miles; where this buffer intersected suitable NRF it was determined that NSO may occur within this habitat and may be disturbed by project activities. Where this habitat occurs within core areas, an increased potential for disturbance exists, and was therefore also quantified (Table G-13). Grid code 3 and 4 are not displayed because habitat burned with this level of severity is not expected to be used by NSO for nesting; NSO reproduction is the focus for the estimate of disturbance.

Acres derived from this process were estimated as having disturbance to potentially nesting NSO as a result of implementation of hazard tree removal along major ingress/egress access roads during the nesting season prior to the completion of surveys. Acres described in the table below are an overestimate of the disturbance from implementation because all habitat would not be occupied, nor would it be impacted to the degree that NSO would be disturbed.

Grid codes are listed in order to display the degree of treatment anticipated. A greater potential for effects to NSO exists as fire effects increase (higher grid codes), due to the higher number of trees likely targeted for removal within a given acre of treatment; so that when grid code 0 or 1 occurs in NRF habitat along a road targeted for hazard tree removal, those acres are not expected to contain a meaningful number of trees targeted for removal and the subsequent effect to NSO from treatment in that habitat is expected to be minimal. Conversely, if grid code 2 occurs in NRF habitat, the increased fire effect is expected to indicate more fire-killed trees and a subsequently higher number of trees would potentially be removed. Where additional treatment occurs, additional disturbance is anticipated. Table G-12 shows 680 acres of NRF habitat that burned at grid code 2 with potential roadside hazard treatment during the reproductive period, across the entire project area. These acres have the most potential for disturbance due to the higher level of fire effects and subsequent amount fire-killed trees targeted for removal, though it is an overestimate of what will actually occur on the ground since not all acres are occupied nor would each acre represent disturbance to a nesting owl. The remaining acres of hazard tree removal

[12] Hazard tree units extend up to 200 feet on either side of the road or may occur only as small pockets of fire killed trees, but since units are not delineated on the ground assumptions are made using fire severity in proximity to roads.

occurring in the least fire-affected habitat, burned at grid code 0 (948 ac) and grid code 1 (7,619 ac.), represent a reduced level of treatment and subsequent reduced level of disturbance.

Table G-12: NSO habitat within 0.25 miles of roadside hazard treatment units that occur along roads designated for major ingress/egress access, where nesting/roosting and foraging (NRF) habitat is estimated for potential disturbance from implementation during the reproductive period.

NSO Habitat	Grid Code 0	Grid Code 1	Grid Code 2	Total
NRF	948	7,619	680	9,247

Table G-13: NSO habitat within cores that overlap Ingress/Egress roadside hazard treatment with the potential to be affected by noise disturbance (0.25 mile buffer) within occupied core areas (as of 2015 surveys).

AC Number	Grid Code 0	Grid Code 1	Grid Code 2
	NRF	NRF	NRF
0241	0	95	20
0380	0	2	1
0383	0	117	20
1027	0	74	2
1039	0	140	0
1040	0	0	0
1041	0	182	14
1046	0	94	3
1100	0	50	5
1109	0	225	4
1110	0	52	4
1122	0	19	1
1130	0	102	24
1213	0	167	4
1214	5	58	1
1258	0	0	3
4133	0	4	4
9990	0	76	12
9991	0	32	1
9992	0	155	13
9996	0	13	2
9998	0	81	8
99912	0	153	11
1047B	111	136	0
NEW3A	0	22	8
NEW3B	0	6	6
NEW7B	13	0	0
TOTAL	129	2,055	173

Indirect Effects

Proposed treatments that have the most potential for indirect effects to NSO habitat in the analysis area are salvage harvest, roadside hazard tree removal, and fuels treatments other than prescribed burning. Areas proposed for site preparation and planting do not generally contain suitable NSO habitat, and this treatment is intended to result in beneficial impacts to the recovering forest. In addition, site prep and plant units would remove only fire killed trees less than 10 inches DBH that display no green branches, and would consequently not affect habitat suitable for NSO. Prescribed burning would generally occur within areas previously burned by the 2014 fires in order to maintain lower levels of fuel loading; NSO habitat would be maintained, as the overall function of the habitat would be retained and the quality of the habitat would either remain the same or be improved by the treatment.

Table G-14 displays the crosswalk with which effects to habitat were established, both for individual treatments and when treatments overlap causing additive impacts to the habitat where they occur. The crosswalk in the table shows the effects resulting from each type of treatment and overlapping hazard tree removal. The affected habitat may be removed, degraded, maintained, downgraded or downgraded to dispersal habitat depending on the type of treatment and the burn severity in which it occurs. Table G-15 displays the acres of NSO habitat affected by the proposed activities and the percent change in the quantity or the change in quality (i.e. downgraded to dispersal) to the habitat affected.

Table G-14: Crosswalk for establishing the effects of treatments individually and in combination with other treatments

Fuels Treatment	No additional Treatment	Roadside Hazard Tree Removal (RAVG grid code 0 & 1)	Roadside Hazard Tree Removal (RAVG grid code 2)	Roadside Hazard Tree Removal (RAVG grid code 3 & 4)
FMZ	Downgrade to Dispersal Habitat*	Downgrade to Dispersal Habitat*	Downgrade to Dispersal Habitat*	Remove PFF/FANR
Roadside Fuels- Modified	Degrade	Degrade	Degrade	Remove PFF/FANR
Roadside Fuels- Complete	Downgrade to Dispersal Habitat*	Downgrade to Dispersal Habitat*	Downgrade to Dispersal Habitat*	Remove PFF/FANR
WUI	Downgrade to Dispersal Habitat*	Downgrade to Dispersal Habitat*	Downgrade to Dispersal Habitat*	Remove PFF/FANR
Underburn	Maintain	Degrade	Degrade	Remove PFF/FANR
No Fuels Treatment	No Effect	Maintain	Degrade	Remove PFF/FANR
Salvage Harvest	Remove PFF/FANR**	N/A	Degrade	Remove PFF/FANR
Site Prep and Plant	N/A	N/A	Degrade	Remove PFF/FANR

*Nesting/roosting and foraging habitat that overlaps this treatment will be downgraded to dispersal habitat. Dispersal habitat will remain dispersal habitat.

**Although salvage harvest is not planned to occur within NRF and dispersal habitat, a combination of unintended impacts during implementation and natural effects (e.g. wind) may degrade habitat features to the point where the habitat may not retain its function. To account for these potential effects, 10% of the NRF and dispersal habitat occurring in the salvage treatment units is reported here as a loss of habitat. This is likely an over estimate of effects since these effects should be incidental and infrequent.

N/A = Treatment would not occur within this grid code or affect habitat.

Table G-15: Percentages of habitat treated across the analysis area and the *proportion* of available habitat treated; displayed as percent change in NSO habitat within the analysis area, by treatment.

Treatment Type	NRF Removed (acres)	NRF Downgraded (acres)	NRF Degraded (acres)	NRF Maintained (acres)	FANR Removed (acres)	PFF 1 Removed (acres)	PFF 2 Removed (acres)	Dispersal Removed (acres)	Dispersal Degraded (acres)	Dispersal Maintained (acres)
%Change in NSO Habitat in Analysis Area	82 (0.1%)	2,222 (3%)	1,671 (2%)	5,463 (7%)	202 (16%)	2,074 (23%)	1,623 (24%)	31 (<0.01 %)	3,050 (6%)	3,368 (6%)

Where roadside hazard tree removal occurs alone, the treatment is anticipated to *degrade* NRF habitat when in mixed severity (grid 2) burned areas and *remove* PFF and FANR when in high or

moderate severity (grid code 3 and 4). Post-fire habitat removal occurs because the high severity areas will receive a more extensive treatment that removes all fire killed trees within 200 feet from the road as identified using the mortality guidelines for salvage (Smith and Cluck 2011); the lower burn severities (or unburned) will have more infrequent, sporadically occurring pockets of mortality along the roads, as described above in Direct Effects section.

Effects to NSO habitat are summarized in Table G-16 below to reflect the process of this crosswalk.

Salvage harvest

In determining which individual trees will be harvested, standing dead trees 14 inches in diameter at breast height or greater will be considered for salvage using the guidelines in Report #RO-11-01 "Marking Guidelines for Fire-Injured Trees in California" (Smith and Cluck, 2011). These guidelines were developed using peer-reviewed scientific literature to evaluate tree species in Northern California for mortality following a fire. The guidelines provide a sliding scale of the probability for tree mortality based on percent volume or length of crown scorched by fire. The responsible official has chosen to salvage trees with a 70 percent or greater chance of dying within the next 3 to 5 years. It is anticipated that a majority of the trees within salvage units will be harvested because most units burned at moderate or high fire severity and consequently most trees have a high probability of mortality.

There are several ways that trees or snags would be retained within salvage units: green tree retention (low fire severity or unburned); retention patches targeting previously suitable NRF habitat burned at high and moderate severity(PFF1); legacy tree retention, and riparian reserves (based on proximity to streams channels or inner gorges).

Green tree retention areas are identified as areas that burned at low fire severity (grid codes 1 or 2) and may be delineated as individual patches of retention or may be located in riparian reserves within the salvage unit boundaries; these patches may contain NSO habitat, but these areas will not be harvested.

Patches of PFF1 (see definition of PFF1 in 'Methods' above) would be retained within salvage units where riparian reserve retention would not provide desired levels of connectivity between unburned or lightly burned suitable habitat. PFF1 was selected in the delineation of retention patches in salvage units because it is assumed to contain not only the larger trees (since it was previously suitable NRF), and subsequent cover and perch sites, but also to contribute to future stand development, so that when the large snags eventually fall, they would become large downed logs. These retention patches are important particularly in the larger salvage units in order to avoid the creation large openings devoid of snags and large downed logs that would be unlikely to be used by NSO.

Riparian reserve retention is based on proximity to stream channels or inner gorges regardless of burn severity or NSO habitat suitability, but often is comprised of larger trees due to improved soil and water conditions near stream channels. Riparian reserves are managed differently than the surrounding uplands to protect the aquatic ecosystem (Forest Plan page 4-107). Riparian reserves are defined on the project scale based on the hillslope, and riparian and channel processes and are consequently divided into several possible categories, but the categories most pertinent to the design of retention areas in the project are: fish bearing streams; permanently flowing non-fish bearing streams; and seasonally flowing/ intermittent streams. The width of the riparian reserves is dependent upon the type of stream (permanent or intermittent) and whether the stream bears fish. Fish bearing streams have a width equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest. Permanently flowing streams have a width equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream

channel), whichever is greatest. Intermittent streams have a width equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest. The project area contains all three of types of riparian reserves in addition to other types described in the Forest Plan.

Legacy trees (as defined in the PDF's above) can be found in any of the retention patches or riparian reserves, or as individual trees anywhere in a unit; their location on the landscape is not predictable.

Patches of snags/trees may help to provide cover for an NSO to move from one patch of unburned habitat to the next. For most salvage units, the combination of low fire severity retention patches, riparian reserves, and legacy tree retention will reduce the size of openings (areas void of snags or trees) which may increase the likelihood of an owl crossing the opening or using the area for foraging.

Retention areas are not part of the salvage harvest treatment and will be avoided during implementation, though a portion of these areas may be affected along the edges when they occur in the unit where harvest operations would occur. Retention areas occur in many different shapes and sizes within the salvage units, but the type most likely to be affected by salvage harvest are inclusions (where salvage may occur around all sides of the retention area) or peninsula shaped retention areas within a salvage unit. These areas may pose implementation challenges that may result in damage to trees within the retention areas. In order to account for these potential effects to habitat within retention areas, it was estimated that 10% of the NRF that occurs within retention areas may be damaged during implementation – as estimated by a professional forester with experience in harvest operations (T. Coughlin personal communication). The level of effect to NSO habitat (i.e. degrade, downgrade, or remove) is difficult to estimate so we assumed that the habitat would be removed even though this is likely an overestimate. This effect to habitat was calculated using the NSO habitat layer (EVEG) and fire severity data (RAVG) and was accounted for within the effects analysis (see Table G-16).

The combination of these retention areas is intended to result in; a reduction in the overall size of openings and an increase in the connectivity between remaining suitable habitat; foraging options within post-fire habitat for NSO; and increased levels of snags and large downed logs for future stand development.

Diffuse edges between habitats is reportedly used by NSO for foraging (Comfort 2013); possibly related to higher prey abundance (Clark 2007, Bond et al. 2009). Woodrats occupy a variety of habitats, but have been reported at high densities in early-seral habitat (brush/sapling) and late-successional forests (Sakai and Noon 1993). Early-seral habitat commonly develops after a high severity burn. Early-seral habitat adjacent to older forest may increase NSO access to woodrats, who travel between early-seral and older forest (Sakai and Noon 1997). Comfort (2013) suggested that a diffuse edge between these habitats could provide additional benefits to NSO for accessing prey. Where salvage harvest units have snag clumps retained, it may create an irregular, diffuse edge if sufficient amounts of low severity or unburned habitat is present. This diffuse edge would be created between the salvage harvest units that will develop into early seral-habitat and older forest (NR or F habitat) thus creating an opportunity for woodrat density increases. Diffuse edges that provide foraging opportunities will also be facilitated by the retention patches.

Areas where fire burned most intensely, especially large patches of continuous moderate- and high- fire severity that do not have nearby cover available, such as the Grider, East Walker, and West Walker Creek drainages are the least likely to be used by NSOs due to the lack of important habitat attributes such as canopy cover and distance from suitable habitat (see figures 1-4 above). These highly fire affected areas have very little NSO habitat or patches of green trees that would provide cover. l. Generally, most of the remaining habitat in these highly fire-affected areas is located in the riparian reserves on the lower third of the slope. Recent research on spotted owls indicated that the amount of forest with high canopy cover (>70%) was the primary driver of

population growth and occupancy of a site at the scale of individual territories (Tempel et. al 2014). Without adequate canopy cover, spotted owls showed a higher probability of territory abandonment; in sites with high canopy cover, adult survival and territory colonization probabilities were high (Tempel et. al 2014).

Salvage harvest units would contain snag retention clumps situated around riparian reserves, drainages, and groups of pre-existing snags that would offer cover adjacent to open areas for prey species. Not every acre within a salvage unit is expected to contain large woody debris after treatment; rather, a mosaic of downed logs of a variety of size and decay classes would provide a heterogeneous layer of cover/habitat for understory regeneration and subsequent prey habitat.

As described above in the discussion of "NSO use of the post-fire landscape," NSO have been observed in high severity burn areas in a variety of settings. In order to capture this aspect of NSO use patterns and foraging behavior and to quantify potential effects of the proposed activities, fire-affected habitat was delineated and analyzed in areas where NSO could be expected to use it. It is difficult to assess the amount of actual use and determine the value of severely burned habitat since precise information about these aspects of NSO habitat and biology is not available. However, these habitat types have been distinguished from other areas of burned forest due to their anticipated, possibly short-term, use by NSO. These habitats are distinguished from each other based on their pre-fire suitability and the severity with which they burned.

As described in the Methods section above, fire-affected nesting/roosting (FANR) was identified separately from unburned or low fire severity affected nesting/roosting habitat to reflect the change in habitat quality that resulted from having burned at moderate severity (grid code 3). FANR is generally found in areas of transition from higher to lower burn severity, and may provide the diffuse edge characterized by some of the recent research (Comfort 2013, Eyes 2014).

Post-fire foraging (PFF1 and PFF2) habitat was also delineated based on pre-fire habitat suitability and burn severity, PFF is comprised of foraging habitat that burned at moderate and high fire severity as well as nesting/roosting habitat that burned at high severity. A large proportion of PFF is pre-fire foraging habitat that burned at the highest severity and subsequently contains minimal amounts of structure or cover; high severity fire usually consumes most of the understory and branches of the trees that makeup the overstory, and removes the majority of the structure and/or cover within a stand, and is therefore considered the least likely to be used by NSO for foraging (see figures 1-4 above).

Due to the lack of cover or structure, it was assumed for this analysis that NSO would not use PFF that was too far from cover to escape possible predation. Although the exact maximum distance an owl might travel from the edge of suitable habitat into PFF to forage is unclear, we are assuming the likelihood that an owl will use PFF decreases as the distance from suitable habitat increases; consequently, the value of PFF for foraging will decrease as the distance from suitable habitat increases. After review of recent literature on the use of edge habitat (Comfort 2013; Eyes 2014) and in consultation with Level 1 FWS biologists, and professional judgment, we assumed that PFF within a 500 foot buffer from existing, currently suitable NRF was the most likely type of PFF used by foraging owls. A minimum patch size of five acres of suitable NRF was used to delineated this buffer. This does not mean that owls would not use areas beyond 500 feet for foraging, but rather that the incidence of this is likely uncommon. The PFF that occurs within the 500 foot buffer was termed PFF1 (as described in the 'Methods' section). PFF2 was termed for PFF habitat that did <u>not</u> fall within the 500 foot buffer but was quantified for the purposes of tracking where burned habitat occurs in the project area and in critical habitat.

As described in the Assumptions section above, NSO are assumed to be using fire-affected habitat for foraging during the short term, possibly a few years, depending on the time it takes for the branches and needles to fall off and/or fire killed trees to fall. PFF and FANR may be used more in areas where unburned habitat types are more common. FANR is expected to contain

more structure and cover than PFF because it was higher quality habitat prior to the fire. FANR is also expected to possibly provide foraging opportunity for a longer period of time because FANR likely contains more snags/trees that are generally larger in diameter on average than the PFF. Larger snags generally tend to remain standing for longer periods of time compared to smaller trees, given similar environmental conditions.

NSO may find patches of unburned or lightly burned suitable habitat within their territories and concentrate their use in these areas, while venturing into the PFF or FANR to forage. The ability of an NSO to remain in their core or home range post fire depends in large part on the availability of these patches of still suitable habitat. The relative amount of suitable NRF habitat remaining post-fire will have a strong influence on the fitness and reproductive potential of the NSO at the affected site. The relative importance of the quantity and distribution of the PFF and/or FANR is unknown. Each activity center that has been affected by fire has a widely differing amount of these habitats.

The proposed salvage harvest will remove post-fire foraging and fire-affected nesting/roosting. Table G-16 shows the removal of 1,031 acres of post-fire foraging habitat (PFF1) and 133 acres of fire-affected nesting/roosting (FANR) through salvage harvest. This habitat may be providing foraging opportunities for NSO in areas where the fire has already reduced the available habitat and the removal of this would further reduce NSO foraging opportunities. See Table G-22 for a list of each activity center that is affected by salvage harvest (and other treatments).

It is unknown how the removal of fire affected habitat will impact NSO that may occupy the affected areas. Each NSO in the analysis area is likely to respond differently to depending on a wide variety of factors, with the primary factor being the current distribution and abundance of suitable habitat in their activity center. Salvage harvest units would contain snag retention clumps situated around riparian reserves, drainages, and groups of pre-existing snags that would offer cover and potential edge habitat between the unit and unburned areas in an attempt to offset the effects from the removal of the fire affected habitat and the creation of large openings. Without knowing the exact role that fire affected habitat plays in NSO fitness and fecundity, it is extremely difficult to establish the full extent of effects to NSO from the removal of this habitat. Inferences can be made, when considering the current research on NSO use of post-fire landscape, that when this habitat is present within core use areas (particularly if recently occupied) that it is likely used to some degree for foraging and its removal would constitute a reduction in foraging opportunity, at least in the short term.

Snags and large downed logs

Large snags and large down logs are considered biological legacies in the post-fire environment and play an important role in the long term growth of the future stand (Lindenmayer et al. 2008). Large snags and large down logs are also essential attributes for the development of the old forest ecosystem and associated species such as the NSO. Snags may stand for decades and in time, may become future nest trees as the regenerating forest nears maturity, although few large snags may be expected to remain intact by that time.

Snag dynamics are complex and depend on many factors (Cluck and Smith 2007). Once recruited into coarse woody debris on the ground, it serves as an important element in owl habitat as part of many aspects in the life cycles of NSO prey (Verner et al. 1992). Thus, decaying wood serves different functional roles overtime, first providing cover for spotted owl prey in the complex early seral stage of the forest, and ultimately decaying and playing a critical role in soil development of older forests.

The removal of dead/dying trees and down woody material through salvage harvest reduces fuel loading, and the reduction in fuel loading may promote the development of old forest habitat. However, the effectiveness of salvage (and fuels) treatments proposed is difficult to predict and there is considerable uncertainty with how salvage logging influences future fire. A review of

recent research on post-wildfire management and the associated controversy can be found in Long et al. (2014). Salvage harvest is controversial because few short-term positive ecological effects and many potential negative effects have been associated with post-fire logging (Long et al. 2014). However, it is known that salvage harvest reduces fuel loading over time (i.e. as snags fall, large surface fuel loadings result) and reduced surface fuel loads may reduce soil and forest regrowth damage in a re-burn. Re-burns in areas of high severity can lengthen the time for establishment of late successional forest needed for the reproductive success of the NSO (USDI 2011). Further, salvage may improve the likelihood of future reforestation that, contingent upon future surface fuels management and treatment at appropriate scales, would re-establish forests with large trees and sufficient canopy cover within shorter time frames (see project Silviculture report).

The effect salvage logging has on re-burn fire severity of future mature forest habitat is highly variable depending on numerous factors including fuels treatments, fire management, climate and drought conditions. However, as stated in the Fuels report, reducing fuel loads, especially activity generated fuels, is expected to reduce flame lengths and fire line intensities. Also, preventing high fuel loadings along roadsides is expected to play an important role in reducing fire severity in the developing mature forest habitat, especially where roads are identified as critical fire management features. Salvage harvest may provide some benefit to NSO in the project area by providing some method for reducing the size and effects of high severity fire that can remove large portions of suitable NSO habitat for extended periods of time, though the degree of effectiveness of treatment is debated in current research.

In summary, according to the physical characteristics associated with NSO habitat, as defined in multiple peer reviewed documents including the NSO Revised Recovery Plan, severely burned habitat does not meet the characteristics of NSO habitat. Therefore, salvage harvest is not expected to represent a meaningful change in the availability of suitable nesting, roosting or foraging habitat. However, salvage harvest will remove substantial amounts of fire-affected habitat, though the degree to which NSO would be affected by this is relatively unknown and will likely be highly variable depending on habitat conditions within individual NSO territories. Based on the current research, we can anticipate some level of negative effects resulting from the removal of PFF or FANR, at least in the short-term. In addition, the effect of salvage harvest on fire behavior and management is controversial and debatable, but it may provide some benefit to NSO through the prevention of habitat loss and the promotion of future habitat.

Roadside Hazard Tree Removal

As described above in the called “Direct Effects”, impacts to suitable NRF habitat are expected to be minimal due to an overall lack of treatment in these habitats. Areas with lower fire severity have substantially fewer fire killed/injured trees and would therefore have less treatment. Where hazard tree removal occurs in suitable NRF, it would degrade 217 acres of NRF habitat by removing elements of the habitat (i.e. snags) that may be used by foraging NSO. NSO are not likely to use areas that have experienced high severity fire for nesting or roosting, and consequently the removal of the fire-killed trees along roads in high fire severity is not expected to remove nesting/roosting habitat, though PFF and FANR is targeted for removal.

Snag density will be largely affected in areas of high and moderate severity burns where all commercial-sized hazard trees that have a 60 percent probability of mortality or greater based on the mortality (salvage) marking guidelines within 200 feet (in rare circumstances, the treatment distance may extend to 250feet) from the road may be removed, and depending on remaining fuel load, understory fuels treatment may occur. Given the uncertainty in the number of trees harvested in treatments in moderate and high severity burn areas, we are assuming that removing all dead or dying trees (≥60 percent probability of mortality) affected by moderate and high fire

severity will remove too many trees for PFF or FANR to provide physical structure for foraging NSO and will result in the removal of FANR and PFF; 31 acres of FANR and 547 acres of PFF would be removed with hazard tree removal. When evaluated across the entire project area, these acres represent a relatively small amount of habitat. In addition, treatments are spread across a wide area, within numerous different watersheds and are not concentrated in specific areas.

Impacts from roadside hazard removal are expected to be essentially the same as those described for salvage harvest, except that roadside hazard removal would more commonly occur in smaller units, since harvest would generally only occur within 200 feet on either side of the road in pockets of moderate and high fire severity. However, these harvest areas differ from salvage harvest in that they would not contain snag retention patches, legacy trees and riparian reserve retention, as these would defeat the purpose of removing hazards from along the road. Retention would only occur where pockets of lower burn severity are interspersed with the high severity and not targeted for treatment.

Many hazard tree removal units occur along roads within core areas and the removal of FANR and PFF may negatively affect the NSO associated with that core if the treatment units were located in areas used by NSO. Impacts to NSO would be dependent on the availability and distribution of habitat within their home range and core areas; so that ACs with sufficient NRF habitat would likely be less affected by the removal of relatively small amounts of FANR and PFF, whereas ACs that were heavily impacted by fire, would be more limited on habitat and the removal of even small amounts of fire-affected habitat may cause negative effects. Impacts to individual ACs are described and tabulated in the discussion on individual activity centers and in the tables in Appendix C.

Felling hazard trees within post fire habitat will make them unavailable as future nest, roost, and perch sites as future stands develop thus nest, roost, or perch sites will not be available until the regenerating trees reach a size where they can be used by NSO. In addition, the large fire killed trees removed in these areas would have been large downed logs if they were not removed through harvest; removing these large snags may have negative impacts to prey species that use downed logs and woody debris during many of their life stages. When hazard tree removal occurs in combination with fuels treatments, there is an additive negative effect to the habitat from treating both the overstory and simplifying the understory structure. The acres where this occurs are tabulated in the summary of effects tables, and will be described below in the fuels treatment discussion.

Fuels treatments – WUI, FMZ, Roadside Fuel Treatments and Underburning

Roadside Fuel Treatments – ‘Complete’ and ‘Modified’ Treatments

Roadside fuel treatment prescriptions are based on an analysis of the solar radiation and the influence this has on fire behavior and vegetation/habitat. Areas with high solar radiation are generally hotter, drier slopes such as south and southwest facing slopes and/or the upper slope positions. These areas generally do not contain high quality NSO habitat, and often lack the basic elements of suitable habitat. Consequently, the fuel treatments in these areas (known as “complete understory” prescription) will have a much lower likelihood of negative effects to NSO, though where treatment occurs in suitable habitat it is expected to downgrade NRF habitat to dispersal habitat.

Areas of low solar radiation generally occur on lower slope position, closer to the bottom of drainages and are the cooler, moister habitat often on north facing slopes and are more likely to

contain suitable and/or high quality NRF habitat. Treatments in these areas (considered "modified understory" prescription) have a higher potential of negative effects to NSO habitat because these treatments can occur in high quality habitat. However, the "modified understory" prescription has been adjusted specifically to reduce the level of negative effects to NSO habitat from treatment by retaining as much of the habitat function as possible while still achieving the fuels objective. The 'modified understory' prescription is expected to degrade habitat as compared to the 'complete understory' treatment that is expected to downgrade nesting/roosting and foraging habitat to dispersal.

Both treatments have short term impacts to habitat with the ultimate goal of long-term benefits in the form of habitat protection and promotion. These fuels treatments are intended to protect the remaining habitat within these areas by creating breaks in the fuel loading and clearing roads that may facilitate fire suppression when another fire occurs in the area.

Wildland Urban Interface (WUI) and Fuel Management Zones (FMZ)

WUI treatments and FMZ fuels treatments result in very similar effects to NSO habitat. These treatments are intended to break up the fuel continuity to provide effective breaks for fire control and suppression, and are therefore more intensive treatments to the understory than the roadside fuels prescriptions described above. These treatments will remove all the small trees and shrubs that provide cover habitat for prey species but the treatment will not target overstory trees except to prune limbs of larger trees. Therefore, these fuels treatments will reduce and simplify the understory to the point that nesting/roosting and foraging habitat will be downgraded to dispersal habitat.

Underburning

Underburning in suitable NRF habitat does not target overstory canopy, though it may somewhat simplify the understory structure. Underburning is tied to specific burn prescriptions that are typically related to fuel moisture content and other weather related conditions that allow for enough control of the timing and conditions as to result in a typically accurately applied burn. Generally, an underburn will consume most of the fine fuels (e.g. leaf litter) in a mosaic pattern, but occasionally a flare-up may occur and consume small trees. In rare occurrences, an underburn may create enough heat to kill a tree that is contributing to canopy cover. Despite these infrequent alternations to the overstory, the overall effect would not result in a degrading or downgrading of suitable NSO habitat. Underburning would occur within areas already burned during the 2014 fires, with the purpose of maintaining the reduced fuel load and create conditions conducive to naturally occurring fire. In addition, underburning would result in the regeneration of new growth in understory herbaceous vegetation and a subsequent increase in the amount of food and cover for NSO prey. It is in this way that underburning is considered to maintain and/or improve NSO habitat.

Site Preparation and Planting

Site preparation will remove small dead trees generally occurring within plantations. Plantations are not typically used by NSO possibly because of the relatively dense pattern of trees that would be difficult for an NSO to fly through for foraging. Given the small size of the trees in the plantations, NSO are not likely to have used these areas for nesting or roosting prior to the fire; and post-fire NSO are even less likely to use these areas for nesting or roosting. There is a

possibility that NSO may use the edges of these areas if prey becomes more accessible after the fire, where openings were created.

The proposed planting prescription of trees is a general minimum spacing of 12 feet between seedlings. The seedlings have an estimated probability of mortality of about 40-50% thus increasing the spacing between seedlings when mortality occurs. The seedlings will be planted after the fuels are reduced to meet desired fuels conditions in the salvage harvest and site preparation and plant units. No herbicide will be used to control shrubs in the project, but proposed treatments may post-pone shrub growth (i.e. fuels treatment) or interrupt shrub growth in small pockets (i.e. possible hand treatment around seedlings). The goal for planted areas is to have a variable spaced conifer stand with a mix of species, densities and distribution. In general, understory brush will naturally regenerate in areas where grubbing around seedlings does not occur.

Release includes manually removing all vegetation within a maximum of a five-foot radius from a planted or naturally regenerated conifer seedling (grubbing). This will result in approximately 40 percent planted of a given acre to be treated (i.e. grubbing and planting), with the remaining 60 percent regenerated naturally in herbaceous and brush vegetation; thereby avoiding the “row crop” appearance of older style plantations.

Treatment units will likely have a variety of stages of early seral vegetation that will likely diversify food sources for foraging for NSO with a wide-range of vegetation conditions. Overall, NSO will have diverse habitat types to forage within and the species and density of which will to reflect the habitat type. Effects to NSO prey are presented in the section below (Effects on prey, competitors, and predators).

Table G-16: Acres of habitat affected by treatment type within NSO analysis area. Overlap occurs within treatment areas that results in the appearance of increased acres of treatment. This overlap was not counted in the Effects Analysis, as each acre was counted only once for the analysis.

NSO habitat within Analysis Area	NRF				FANR	PFF 1	PFF 2	Dispersal		
	74,175				1,259	9,536	6,864	52,554		
Treatment Type	NRF Removed (acres)	NRF Downgraded (acres)	NRF Degraded (acres)	NRF Maintained (acres)	FANR Removed (acres)	PFF 1 Removed (acres)	PFF 2 Removed (acres)	Dispersal Removed (acres)	Dispersal Degraded (acres)	Dispersal Maintained (acres)
Salvage Harvest	58*	0	0	0	133	1,031	1,127	17*	0	0
Roadside Hazard Only	0	0	217	2,163	31	547	353	0	0	1,298
Wildland Urban Interface	0	430 (downgrade to dispersal)	0	0	1	12	5	0	539	0
Fuel Management Zone	0	1,354 (downgrade to dispersal)	0	0	8	105	60	0	1,151	0
Roadside Hazard overlap with complete fuels	0	298 (downgrade to dispersal)	0	0	15	91	61	0	424	0
Roadside Hazard overlap with modified fuels	0	0	849	0	6	20	2	0	294	0
Underburn only1	0	0	0	3,304	0	0	0	0	0	2,070
Site/prep and plant	0	0	0	0	0	0	0	0	0	0
Roadside hazard overlap with underburn	0	0	223	0	5	48	22	0	240	0
Treatment Type	NRF Removed (acres)	NRF Downgraded (acres)	NRF Degraded (acres)	NRF Maintained (acres)	FANR Removed (acres)	PFF 1 Removed (acres)	PFF 2 Removed (acres)	Dispersal Removed (acres)	Dispersal Degraded (acres)	Dispersal Maintained (acres)

NSO habitat	NRF				FANR	PFF 1	PFF 2	Dispersal		
Roadside Complete – Fuels Only	0	118 (downgrade to dispersal)	0	0	1	7	5	0	138	0
Roadside Modified – Fuels Only	0	0	405	0	2	7	2	0	266	0
Landings	24	0	0	0	1	9	9	15	0	0
Temporary Roads	0	0	0	0	0	6	6	0	0	0
	TOTAL									
Acres (% Change in Analysis Area NSO Habitat)	82 (0.1%)	2,200 (3%)	1,694 (2%)	5,467 (7%)	203 (16%)	1,883 (20%)	1,652 (24%)	32 (<0.01%)	3,052 (6%)	3,368 (6%)

* Although salvage harvest is not planned to occur within NRF and dispersal habitat, a combination of unintended impacts during implementation and natural effects (e.g. wind) may degrade habitat features to the point where the habitat may not retain its function. To account for these potential effects, 10% of the NRF and dispersal habitat occurring in the salvage treatment units is reported here as a loss of habitat. This is likely an over estimate of effects since these effects should be incidental and infrequent.

Effects to Individual Activity Centers

The purpose of this analysis is to determine the level of anticipated effects resulting from the proposed activities which will result in a determination: 1) "likely to adversely affect" (LAA); 2) "may affect, but not likely to adversely affect" (MANLAA); or 3) "no effect" (NE). Each activity center was analyzed for effects to habitat from all treatment types individually as well as from the additive impact of overlapping treatments. Some activity centers were affected by only one treatment type while others had many overlapping treatments that impacted large proportions of the home range and core areas. Salvage harvest is not proposed in core areas for ACs identified as "high" or "moderate" "habitat fitness potential" (except four "moderate" ACs) but all other treatments may occur in both home ranges and core areas. In order to determine the level of effects for a large number of activity centers affected by the proposed activities, a systematic numerical process was developed that relates NSO reproduction and fitness to habitat quantity, quality, and distribution as it may meet the needs of an NSO pair and possible offspring. This process was applied to all ACs but resulted in numerous ACs requiring further site specific analysis in order to decisively conclude an effects determination.

The first step in the process was to identify the ACs that are expected to receive treatment that will clearly affect important biologically relevant habitat minimum recommendations. This first step is displayed as a series of statements or "intensity factors" (described in the Methods section above) (Table G-17). Intensity factors were established to determine the potential for adverse effects to activity centers based on amount and degree of treatment, treatment type (whether it removed, downgraded or degraded habitat), in addition to the amount of existing suitable NRF in the core area and home range (and the relative impact of high severity fire to that habitat).

Each activity center was evaluated using "intensity factors" (Table G-17); if the treatment(s) resulted in effects as described in each of the intensity factors, then that AC was identified with a letter ("A", "B", "C", "D", "E", or "F") to match the intensity factor (Table 16). All ACs that were assigned a letter will receive the determination of "likely to adversely affect" (LAA). Of the 85 activity centers evaluated for this project, 30 have LAA determinations resulting from the intensity factor analysis. However, the other activity centers that did not receive a LAA determination using the intensity factor process received further site-specific evaluation, as described below.

Table G-17: Intensity factors used to evaluate activity centers for adverse effects and subsequent determinations.

Category	Intensity Factors for LAA Determinations
A	Treatment will result in the core and home range falling below 20% of NRF and FANR.
B	Treatment will result in the core and home range falling below 40% of NRF and FANR.
C	For core and home range with 20% – 40% NRF and FANR, treatment will result in a downgrade or removal of NRF and FANR.
D	Treatment will result in >25% of the existing NRF, FANR, and PFF combined in the core and home range to receive treatment that will degrade NRF or remove FANR or PFF.
E	Treatment will result in cores with >220 acres of NRF falling below 220 acres of NRF.
F	Treatment will downgrade or remove NRF in the nest stand.

Table G-18: The activity center determinations based on the intensity factors described above. LAA = Likely to Adversely Affect.

Activity Center Number	Intensity Factor	Determination	Activity Center Number	Intensity Factor	Determination
0241	C	LAA	1258	B	LAA
0277	C	LAA	1265	C, F	LAA
0293	C	LAA	1266	C	LAA
0380	C	LAA	4099	C	LAA
0381	C	LAA	4143	C	LAA
0383*	C	LAA	9991*	B, E	LAA
1046	C	LAA	9992	A, C, E	LAA
1109*	C	LAA	9994	A	LAA
1112b*	C	LAA	9996*	C	LAA
1121	C	LAA	9998*	C	LAA
1122	C	LAA	0276A	C	LAA
1130*	C	LAA	0276B	C	LAA
1212*	C	LAA	NEW3A	A, C, D	LAA
1213	C, F	LAA	NEW3B*	D	LAA
1214	C	LAA	NEW7A	C	LAA
			NEW7B	C	LAA

*Indicates an occupied AC as of 2015 surveys.

Following the analysis of intensity factors, the remaining ACs either did not warrant a LAA determination or they required further site specific evaluation to establish the magnitude and intensity of effects of the proposed activities. These determinations were made based on a variety of conditions that extended beyond the analysis of intensity factors in order to incorporate finer details, such as potential noise disturbance from project activities nearby, as well as treatments occurring within the core or home range.

Several ACs have treatments proposed that would trigger both an Intensity Factor and additional site specific disturbance due to actions that would occur before the first three surveys are complete and would not occur within the LOP described in the project design features. Activity centers 4133, 1265, 1202 and NEW3A have salvage treatment proposed within their core and/or home range that may occur prior to July 9 and completion of the first 3 surveys. Effects from this action to NSO are expected to be minimal because the harvest would occur within extensive high severity burned areas that do not contain, and are not adjacent to, patches of suitable habitat and NSO are not expected to be occupying these areas. Units without LOPs have been evaluated for their location in relation to areas of suitable habitat, topography, NSO detections and overall probability that an NSO would occur in or near the area. Where it was deemed extremely unlikely that an NSO would use the area, or the even lower probability that they would nest in the area, the necessity for an LOP was evaluated and lifted as appropriate. If year of action surveys indicate NSO within or near the designated units, then LOPs would be re-evaluated and potentially re-assigned.

In addition, the ACs within the Beaver fire area had extenuating circumstances as a result of the patchwork ownership and extensive harvest on private lands where suitable NRF is being removed within many of the ACs. Therefore, the ACs in the Beaver fire area were evaluated separately to distinguish the effects from the proposed activities on national forest lands from the currently ongoing effects from private land harvest and the subsequently reduced amount of

baseline habitat present within each AC. The determinations and rationale for each determination are shown in the tables below.

Table G-19: Activity Center determinations for the remaining ACs where further site specific evaluation was needed following the analysis of intensity factors. LAA = Likely to Adversely Affect; MANLAA = May Affect, Not Likely to Adversely Affect; NE = No Effect. Where a MANLAA determination is made, the assumption is that *no meaningfully measurable negative effects are expected to NSO habitat or to NSO that may occupy this AC from the proposed treatments.* Where the determination is made for NE*, the assumption is that No effects, including beneficial effects, would occur as a result of the proposed activities.* Where a LAA determination is made, the assumption is that effects from the proposed treatments are *not insignificant or discountable* and may cause adverse effects to that AC[13].

Determinations for Activity Centers in the Happy Camp and Whites fire areas		
Activity Center	Determination	Rationale for Determination
0229	MANLAA	FMZ proposed along outer portion of home range but does not overlap suitable NRF. No appreciable increase in the level of noise disturbance. Roads present in core and home range would not receive hazard tree treatment.
0245	MANLAA	FMZ proposed along outer portion of home range but does not overlap suitable NRF. No anticipated increase in noise disturbance from project activities.
0247	MANLAA	Small amount of habitat (11 ac.) is affected in the home range, but the habitat will be 'maintained' with treatment. No anticipated increase in noise disturbance from project activities.
0252	MANLAA	Very small amount of roadside fuels treatment on outer portion of home range but does not overlap suitable NRF. No anticipated increase in noise disturbance from project activities. Roads present in core and home range would not receive hazard tree removal treatment.
0255	MANLAA	Roadside modified treatment along outer edge of home range, not within suitable NRF. Possible noise disturbance in outer portion of home range from helicopter landing located outside of home range. Disturbance may occur in portion of home range where NSO use is less likely due to topographic features and limited amounts of habitat.
0257	MANLAA	FMZ treatment proposed along prominent ridgeline at approximately 7,000 ft. elevation. Treatment may downgrade 31 ac of foraging habitat along this ridgeline, though this habitat is less likely to be used by NSO due to the high elevation so effects are not anticipated. Site prep and plant (SPP) units and a very small amount of hazard tree removal are located on the opposite side of the prominent ridgeline away from core and are unlikely to impact NSO.
0272	LAA	Low certainty of AC placement due to a lack of access for surveys and adequate levels of habitat across activity center allowing for multiple options for concentrated use areas. Two salvage units and a portion of another unit are located along the outer edge of home range, but situated amongst suitable NRF, thereby increasing potential for effects to NSO that may be using the suitable NRF. Also, noise disturbance from helicopter landings along outer edge of home range adjacent to suitable NRF will raise noise levels above ambient levels due to topography. Duration will likely be approximately 5 days and possibly within reproductive period.

[13] "Likely to adversely affect" determination is appropriate when the biological assessment finds any "adverse effect to listed species that may occur as a direct or indirect result of the proposed activities or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or wholly beneficial.

Determinations for Activity Centers in the Happy Camp and Whites fire areas		
0322	MANLAA	FMZ treatment proposed would affect 1 ac of NRF along outer edge of home range along southwest facing slope and ridgeline; remaining acres of FMZ treatment not within suitable NRF.
0365	MANLAA	FMZ treatment along ridgeline, small WUI treatment, Complete roadside fuels treatment and a portion of a prescribed burn would downgrade or maintain a small amount of NRF in a home range with adequate levels of suitable NRF; therefore no meaningful impacts are anticipated. No appreciable increase in the level of noise disturbance.
0567	MANLAA	AC located on outer edge of project area with very small amount of habitat (2 ac) affected by WUI treatment on the outer edge of home range, opposite side of Klamath River, along a high use road.
1027	LAA	Degrading habitat in a deficit core and removal of PFF and FANR in a home range that is below threshold, in addition to the disturbance caused by hauling through a core area and hazard tree removal along a major ingress/egress road that crisscrosses the core and home range. Helicopter landings in core and home range will likely increase noise disturbance in the area. All combined to result in a LAA.
1028	MANLAA	FMZ treatment along ridgeline road would downgrade 22 ac of foraging habitat in an AC that contains above recommended minimum levels of suitable habitat. Habitat located along a prominent ridgeline is less likely to be used by NSO. Therefore, the downgrading of this amount of foraging habitat along a ridgeline in the outer edge of a home range that contains adequate levels of NRF is not expected to cause appreciable impacts NSO that may occupy this AC. Ingress/Egress road along outer edge of home range only and occurs along a prominent ridgeline that may require hazard tree removal during reproductive season; but NSO are unlikely to be nesting along a ridgeline and most of treatment would occur around 6,000 feet elevation.
1029	LAA	FMZ and roadside hazard, would downgrade and degrade NRF as well as remove PFF in home range; potentially abundant roadside hazard in core area, some of which occurs along an ingress/egress road in the home range; resulted in LAA.
1030b	MANLAA	FMZ proposed along ridgeline would downgrade a small amount (17 ac) of foraging habitat in an area that NSO are unlikely to use due topography and marginal quality of habitat affected. Roadside hazard would only impact a few small pockets of moderate and high severity (totaling 14 ac of PFF and FANR) generally outside the core area. Underburning will maintain and promote habitat and is therefore not considered to have negative impacts to NSO. Site prep is planned for a few areas within the home range but habitat will not be affected. Timing was an important factor in the determination of effects from these activities because they are highly unlikely to occur at the same time and will not occur in the same place and therefore no overlap in time and space for each action. The minimal effects from each action will be spread across a period of approximately 10 years, further reducing effects to NSO.
1039	LAA	Modified roadside fuels (NRF degraded) in core, and downgraded and degraded in home range as well as roadside hazard along ingress/egress road in both core and home range. Combined effects to habitat as well as disturbance resulted in LAA.

Determinations for Activity Centers in the Happy Camp and Whites fire areas		
1040	LAA	NRF removed (3ac) in home range, and substantial amounts downgraded and degraded in home range. Roadside hazard along two ingress/egress roads in home range. Salvage in home range with PFF removal. Roadside hazard, fuels treatments, and SPP in core area (not ingress/egress). Combined effects to habitat as well as disturbance resulted in LAA.
1041*	LAA	PFF, FANR and NRF removed and degraded in home range. Roadside hazard along ingress/egress road in an Active AC. Core would have LOP, but not all of home range would. Combined effects to habitat as well as disturbance resulted in LAA.
1047b*	LAA	Roadside hazard along main county road that crosses the core and home range that would remove hazard trees in small pockets of fire-killed trees within otherwise suitable high quality NRF; treatment will degrade a small amount of habitat, but is not insignificant or discountable due to its location in the core of an active AC. No other activities proposed that would negatively affect NSO or habitat.
1100	LAA	Disturbance from salvage and helicopter landings added to the removal of PFF and FANR from an AC that is already well below recommended habitat minimums caused this to be a LAA determination.
1101	MANLAA	Relative level of habitat was factored into this determination. This AC is well above recommended levels of habitat (2,576 ac NRF). One salvage unit occurs in outer portion of home range would remove 39 ac of PFF1. Although 27 ac of roadside hazard occurs home range, suitable habitat would not be affected. A negligible level of disturbance would be expected from the harvest of one unit in the outer portion of the home range on the opposite side of a drainage amongst unsuitable habitat, when abundant NRF occurs well away from the salvage unit on the other end of the home range and is likely the area of NSO use in this AC.
1110*	LAA	Degrading a small amount NRF and removing a small amount of PFF in an AC that is already below habitat minimums (less than 20%). In addition, potential for disturbance from a major haul route and ingress/egress road through core and home range.
1111	MANLAA	AC is unlikely to persist in this location due to extremely low levels and patchily distributed habitat in both the core and home range (much less than 20%) ,with only 29ac of foraging habitat remaining in the core and minimal opportunity to shift (very limited habitat) within the home range. FMZ and roadside complete fuels treatment generally occur above 6,000 ft. elevation and on opposite side (from core) of a prominent ridgeline. Treatments may affect this AC but are unlikely to have adverse impacts particularly due to the very low likelihood that NSO occur in this location.
1116	LAA	NRF downgraded and substantial PFF removed in home range. Potential disturbance from haul route and landings in home range. Combined effects to habitat as well as disturbance resulted in LAA.
1117	NE	Very small amount of site prep and plant on outer edge of the home range within less than 1 ac of suitable habitat affected. No other treatment or disturbance is anticipated; therefore, no effects are expected to NSO habitat or to NSO that may occupy this AC.

Determinations for Activity Centers in the Happy Camp and Whites fire areas		
1119	MANLAA	Small amount of FMZ on outer edge of the home range, with 2 ac. of foraging habitat affected along a very prominent ridgeline (Grider Ridge). No other treatment or disturbance is anticipated; therefore, no meaningfully measurable negative effects are expected to NSO habitat or to NSO that may occupy this AC.
1164	NE	Activity center is located on outer edge of analysis area; with only less than 1 acre of habitat downgraded from roadside fuels on very outer edge of home range and remaining AC is outside of fire perimeter. No other treatment or disturbance is anticipated; therefore, no effects are expected to NSO habitat or to NSO that may occupy this AC.
1202	LAA	Core and home range highly impacted by moderate and high severity fire and is not expected to have persisted at this site as positioned. AC is likely to have shifted to suitable habitat within and outside home range. However, substantial removal of PFF and FANR through salvage in core and home range, as well as NRF downgraded in home range. Multiple landings adjacent to habitat that did not burn at high severity as well as roadside hazard and concentrated haul routes will increase disturbance in the area. Disturbance will also come from the salvage harvest of units where no LOPs will be applied. Harvest will occur in high severity burned areas where no suitable habitat occurs, so no habitat modification will occur but disturbance to NRF within 0.25 miles may occur. No expectation of direct harm, but possible noise disturbance during implementation. Combined effects to habitat as well as disturbance resulted in LAA.
2124	MANLAA	AC is below recommended levels of habitat. WUI treatment would downgrade 14 ac of foraging habitat along outer edge of home range. But, treatment occurs in habitat that occurs adjacent to Highway 96 and this habitat is less likely to be used by NSO due to increased levels of noise disturbance from traffic. Therefore, treatment to this habitat is less likely to have meaningful impacts to NSO that may occupy this site.
4026	MANLAA	FMZ treatment occurs along outer edge of home range in small amount of habitat (3 ac downgraded); very minimal roadside hazard would occur due to low fire effects in the area and would not impact suitable habitat. No other treatment or disturbance is anticipated; therefore, no meaningfully measurable negative effects are expected to NSO habitat or to NSO that may occupy this AC.
4133	LAA	Core and home range highly impacted by moderate and high severity fire and is not expected to have persisted at this site as positioned. AC is likely to have shifted to suitable habitat within and outside home range. However, substantial removal of PFF through salvage in core and home range, as well as NRF downgraded in core and home range. Multiple landings located near habitat that did not burn at high severity. Roadside hazard and concentrated haul routes through core and home range and salvage in units without the July 9 LOP will increase disturbance in the area (see Project Design Features for list of units that do not have LOPs). Roadside hazard along ingress/egress road through core and home range. Combined effects to habitat as well as disturbance resulted in LAA.

Determinations for Activity Centers in the Happy Camp and Whites fire areas		
9990	LAA	Core and home range highly impacted by moderate and high severity fire and is well below recommended habitat minimums. AC is not expected to have persisted at this site as positioned and is likely to have shifted away from currently delineated position. However, salvage units, landings and roadside hazard are juxtaposed amongst foraging habitat that did not burn with high severity and may therefore cause disturbance if habitat is used. Roadside hazard in core and home range as well as along ingress/egress road. Combined effects to habitat as well as potential for disturbance resulted in LAA.
999314	MANLAA	FMZ is proposed for an existing road and dozerline used during the 2014 fires that follows a ridgeline within the home range and would be maintained with fuels treatment extended off the dozerline using understory treatments. FMZ treatment would downgrade a minor amount of habitat in the home range to dispersal habitat, but would not preclude use of the habitat. Treatment occurs along a mid-level topographic feature between patches of suitable NRF but would not result in a condition where NSO would no longer be able to disperse across it to other areas within the home range.
9995	LAA	Moderate amount of PFF removed and NRF downgraded and degraded in home range that is slightly below minimum habitat levels. Potential disturbance from roadside hazard along ingress/egress roads in home range with no LOP.
9999	MANLAA	No suitable NRF would be affected in the core or home range. Salvage (~50 ac) occurs in contiguous patch of high severity in the outer home range, with only 1 acre of PFF1 removed. Site prep and plant occurs in the home range but would not affect suitable habitat. No other treatment or disturbance is anticipated; therefore, no meaningfully measurable negative effects are expected to NSO habitat or to NSO that may occupy this AC.
99910	LAA	Moderate amount of PFF removed and NRF downgraded and degraded in a home range that is above minimum habitat levels. Potential disturbance from roadside hazard along ingress/egress road in home range that has treatment of moderate and high severity juxtaposed amongst suitable NRF.
99912	LAA	Moderate amount of PFF removed and NRF downgraded and degraded in a home range that is above minimum habitat levels. Potential disturbance from roadside hazard in home range along ingress/egress road that has treatment of moderate and high severity juxtaposed amongst suitable NRF in core area and home range. One landing in home range may also contribute to disturbance.

[14] Patches of suitable NRF in the home range of this AC overlap the core areas of three other ACs; these patches of NRF are less likely to be used by the NSO associated with 9993 because they comprise the core areas of these three other ACs. FMZ treatments are more likely to affect the ACs where treatment crosses their core areas rather than this AC where treatment crosses the parts of the home range that are less likely to be used by the NSO associated with 9993. NSO in this AC are unlikely to shift away from their core areas because the remaining habitat in their home range is not available to them if these other ACs are occupied and defending their territory. This AC is below the recommended levels of habitat (less than 20%) and is categorized as Low Fitness Potential, and is therefore unlikely to persist and contribute to demographics as currently positioned. The currently small amount of habitat in this AC is not a result of the 2014 fires, but is a result of having burned three times in the last 30 years

Determinations for Activity Centers in the Happy Camp and Whites fire areas		
0096A	NE	Very small piece of site prep and plant unit on outer portion of home range that does not occur in suitable habitat. No increase in noise disturbance is anticipated from project activities due to AC's location on outer edge of project area. No effects are anticipated.
0278A	MANLAA	FMZ is proposed for an existing road (ML2) and dozerline used during the 2014 fires that follows a ridgeline within the core area and home range, and would be maintained with fuels treatment extended off the dozerline using understory treatments. FMZ treatment would downgrade some habitat to dispersal habitat, but would not preclude use of the habitat. Treatment occurs along a mid-level topographic feature adjacent to suitable NRF and would downgrade 26 acres but would not result in a condition where NSO would no longer be able to disperse across the treated areas to other areas within the home range. No other activities are proposed and no increase in noise disturbance is anticipated from project activities due to AC's location on outer edge of project area.
0278B*	MANLAA	Effects to this AC are the same as described above for 0278A, except that additional treatments would occur in this home range in suitable NRF with WUI and Modified roadside fuels treatment. So that FMZ and WUI treatments described in the AC Effects Table are not expected to appreciably affect this AC because the vast majority of these treatments have already been completed with 2014 fire suppression actions and these treatments would maintain desired fuels condition already present in the treatment units. Therefore, only the Modified roadside fuels treatment would have the potential for effects to NSO in this AC by degrading 35 acres of NRF in the home range but ultimately benefitting the habitat in the AC by reducing the risk of habitat loss from high severity fire. No treatments (other than FMZ described above) are proposed for the core area. No noise disturbance is anticipated; surveys will be completed prior to implementation and an LOP will be applied if the AC is determined to be active.

Determinations for the Beaver Fire Area

The Beaver Fire area experienced extensive amounts of high and moderate fire severity followed by a large proportion of salvage harvest on private land. As described in an earlier section ("evaluation of activity centers specifically in the Beaver Fire area"), multiple ACs were highly impacted by the fire and salvage harvest on private land and subsequently have very low levels of habitat remaining in the core and home range. Given the extremely low levels of available habitat due to high severity fire in combination with patchwork land ownership and associated salvage harvest, it would be very difficult for NSO to shift (described in the earlier section called "methods of assessing habitat fitness potential of fire affected activity centers") their location and still find sufficient resources to reproduce. There are eight ACs that are currently in this situation (0239, 0283, 0346, 4144, 4145, 4146, 99913, and 99914) in the Beaver fire area. These eight ACs may contain only between 106 to 485 acres of suitable habitat in home range and core areas combined, as a result of salvage harvest and high severity fire on the private land within the AC - far below the recommended habitat minimums (1,336 acres of NRF). Because timber harvest on private land is ongoing, it is difficult to predict exactly where suitable habitat will be removed and where it may remain unharvested. Private land harvest in the Beaver fire area does not appear to be based on effects from high fire severity, so that green trees (i.e. suitable NRF) and fire affected trees are being removed. Because of the uncertainty in the location and extent of private land harvest, we estimated a range of acres of habitat that may be present in ACs where suitable habitat on private land may or may not be harvested within the core and/or home range.

Given the uncertainty of the NSO habitat use patterns in this area after such large scale disturbances, we were unable to establish whether these ACs would be able to persist in this landscape with such low levels of suitable habitat remaining. For the purposes of this analysis, we made the assumption that the ACs that existed in the Beaver fire area prior to the 2014 fires would still be present, until we are able to establish a lack of occupancy with more certainty, even though we suspect that suitable habitat is so limited that it is highly unlikely that many of these ACs are currently occupied or will become occupied in the foreseeable future.

Surveys of the area in 2015 have had only one NSO observation (a single male in KL0283) in the entire Beaver fire area after 6 survey efforts. During the 2015 NSO surveys a single male in AC 0283 was detected in a nighttime survey and daytime follow up; this male was detected early in the survey effort during implementation of harvest on private land and was not detected in any subsequent visits. Given the current condition of AC 0283 (about 342 acres of suitable habitat in entire AC) and no nearby habitat to provide for a shift, this AC is even less likely to persist than other ACs that have more habitat or nearby habitat that would allow for an AC shift.

Any actions within this AC were deemed as adverse, since the AC was already extremely limited on habitat, though it is acknowledged that this AC is already highly unlikely to persist regardless of the proposed activities on national forest land.

Table G-20: Comparison of activity centers affected by the Beaver Fire[1] within the analysis area that contain potential salvage harvest on private land[1].

AC Number[2]	NSO habitat within core and home range prior to salvage harvest on private lands within Beaver Fire area			NSO habitat within core and home range with the habitat on private land REMOVED within the Beaver Fire area		
	NRF (acres)	FANR (acres)	PFF1 (acres)	NRF (acres)	FANR (acres)	PFF1 (acres)
0239[3]	535	0	0	485	0	0
0254	406	0	4	380	0	0
0283	606	11	301	342	9	189
0284	868	0	0	861	0	0
0315	1,868	0	32	1,804	0	3
0346	257	11	194	106	6	84
0499	1,522	0	1	1,519	0	0
4128[3]	742	0	0	742	0	0
4129[3]	449	0	0	449	0	0
4143	1,308	19	171	709	7	33
4144	313	8	48	247	6	22
4145	750	34	207	285	15	65
4146	438	11	292	216	6	140
99913	872	8	133	410	3	43
99914	387	10	55	259	7	27
99915	1,197	7	86	783	1	10

[1]At the time of writing this document we received an estimated portion of private land harvested in the Beaver fire, but we have not confirmed the exact distribution completed on-the-ground thus we are assuming these data are correct.

[2]There are two ACs (0322 and 2124) analyzed in this project that are adjacent to the Beaver Fire perimeter and don't overlap any portion of the fire thus these ACs are not included in this table.

Table G-21: Determinations of Effect specific to the Beaver Fire area; separated from other ACs due to extenuating circumstances resulting from combined effects of wildfire and salvage harvest on private industrial timber lands in the area.

Determinations for Activity Centers in the Beaver Fire area

Determinations for Activity Centers in the Beaver Fire area		
Activity Center	Determination	Rationale for Determination
02393	LAA	FMZ treatment in core and WUI, SPP and roadside hazard in home range; activities would downgrade a small amount of NRF in an AC that is already substantially below habitat minimums.
0254	MANLAA	FMZ treatment occurs in core, but within unsuitable habitat along south facing slope; and in home range in foraging habitat (13 ac.) directly along ridgeline.
0283	LAA	AC has extremely low levels of habitat; WUI, SPP and roadside hazard in the home range and roadside hazard in core, in some of the last remaining habitat on national forest land in the Beaver fire area. WUI and SPP may have shorter term effects but may provide long term benefit if this AC were to persist. This AC is likely combined with 99913, or 0346 and/or 4146 due to limited amounts of patchily distributed habitat.
0284	MANLAA	Roadside hazard treatment is indicated to maintain 12 ac of NRF but this area is unlikely to be targeted for hazard removal due to a lack of fire effects.
0315	MANLAA	Roadside hazard treatment is indicated but this area is unlikely to be targeted for hazard removal due to a lack of fire effects. Fuels treatment is proposed to downgrade 3 ac of NRF along outer edge of home range that contains adequate levels of NRF. No appreciable increase in the level of noise disturbance.
0346	LAA	AC has extremely low levels of habitat. Small amount of FMZ proposed, but any activities proposed are deemed adverse; though it is acknowledged that this AC is highly unlikely to persist due to a lack of habitat, regardless of activities proposed on national forest land. This AC is likely combined with 4146 and/or 0283 due to limited amounts of patchily distributed habitat.
0499	MANLAA	FMZ treatment along ridgeline affecting 1 ac of NRF in an AC with adequate levels of suitable habitat, effects are expected to be very minimal, but may not be insignificant or discountable. No appreciable increase in the level of noise disturbance.
41283	NE	No suitable habitat is affected. FMZ occurs within home range but does not overlap suitable habitat and no suitable habitat is nearby. No other treatment or disturbance is anticipated; therefore, no meaningfully measurable negative effects are expected to NSO habitat or to NSO that may occupy this AC.
41293	MANLAA	FMZ treatment occurs along outer edge of home range in small amount of foraging habitat (3 ac downgraded) along south facing slope; habitat is not likely to be favored by any NSO that may occupy the area. No other treatment or disturbance is anticipated.
4143	LAA	Analyzed using the Intensity Factors analysis above.
4144	LAA	FMZ, roadside hazard and WUI proposed in home range, but AC has extremely low levels of habitat. Small amount of FMZ and WUI proposed, but any activities proposed are deemed adverse; though it is acknowledged that this AC is highly unlikely to persist due to a lack of habitat, regardless of activities proposed on national forest land.
4145	LAA	Modified fuels treatment, SPP, and roadside hazard in core. FMZ, WUI and Complete fuels treatment in home range; treatment in suitable NRF in an AC that is well below habitat minimums.

Determinations for Activity Centers in the Beaver Fire area		
4146	LAA	AC has extremely low levels of habitat. FMZ and roadside hazard is proposed in NRF; any activities proposed in NRF are deemed adverse due to currently low levels of habitat; though it is acknowledged that this AC is highly unlikely to persist due to a lack of habitat, regardless of activities proposed on national forest land. This AC is likely combined with 0346 and/or 0283.
99913	LAA	AC has extremely low levels of habitat; FMZ and roadside hazard is proposed in the outer portion of the home range in a small amount of NRF; any activities proposed in NRF are deemed adverse due to currently low levels of habitat; though it is acknowledged that this AC is highly unlikely to persist due to a lack of habitat, regardless of activities proposed on national forest land. This AC is likely combined with 4145 and/or 0283 since current levels of habitat in this AC are too low to support an AC.
99914	LAA	Prescribed burning, WUI, FMZ and roadside hazard in the home range affect a small amount of NRF, but AC has extremely low levels of habitat and is likely combined with 4144, since levels of habitat are too low to support an AC.
99915	MANLAA	Treatments would occur within the outer portion of the home range, AC may become isolated and highly fragmented as a result of salvage harvest occurring on private land within the home range. If harvest occurs, NSO use patterns within this AC would be altered. Habitat on national forest land where treatments are proposed would become too isolated, and NSO would need to cross the large openings created by private land salvage in order to access this habitat. Given that this is unlikely, particularly due to the available habitat in the opposite direction (away from proposed treatment areas), proposed treatments are not expected to result in negative effects to the NSO.

[3]Three home ranges (0239, 4128, and 4129) overlap private land in the Beaver Fire perimeter but no known salvage harvest is scheduled for this portion of private land.

Summary of Effects to Individual Activity Centers

In summary, of the 85 ACs in the analysis area, there are 55 'LAA' determinations, 26 'MANLAA' determinations, and 4 'NE' determinations. On the west side of the Forest[15], there is a total of about 306 activity centers (from NRIS database and CNDDB combined with overlapping cores counted only once). Overall, 18 % of all activity centers on the west side of the KNF will be adversely affected by the proposed activities.

[15] Happy Camp/Oak Knoll and Salmon/Scott River Ranger Districts, excluding the Ukonom Ranger District

Table G-22: Summary of NSO habitat within the core and home range and the effects to habitat resulting from the proposed treatments - acres cannot be totaled at the bottom of columns due to overlapping activity centers (AC)

AC#	Pre-Implementation Habitat within Core			Pre-Implementation Habitat within Home Range			Acres Removed						Acres Downgraded		Acres Degraded		Acres Maintained		Post-Implementation Habitat within Core			Post-Implementation Habitat within Home Range		
	0 - 0.5 mile			0.5 - 1.3 mile			0 - 0.5 mile			0.5-1.3 mile			0 - 0.5 mile	0.5 - 1.3 mile	0 - 0.5 mile	0.5 - 1.3 mile	0 - 0.5 mile	0.5 - 1.3 mile	0 - 0.5 mile			0.5 - 1.3 mile		
	NRF	FANR1	PFF11	NRF	FANR	PFF1	NRF*	FANR	PFF1	NRF*	FANR	PFF1	NRF	NRF	NRF	NRF	NRF	NRF	NRF	FANR	PFF1	NRF	FANR	PFF1
0229	181	0	0	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181	0	0	714	0	0
02393	138	0	0	347	0	0	0	0	0	0	0	0	3	4	0	0	0	3	136	0	0	342	0	0
02412	270	3	64	1,001	21	137	0	1	16	4	5	80	42	65	13	62	59	136	227	2	48	932	15	57
0245	48	0	0	679	6	13	0	0	0	0	0	0	0	0	0	0	0	0	48	0	0	679	6	13
02472	299	0	0	678	0	40	0	0	0	0	0	0	0	0	0	0	0	11	299	0	0	678	0	40
0252	67	0	0	347	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	0	0	347	0	0
02543	214	0	0	166	0	0	0	0	0	0	0	0	0	13	0	0	0	0	214	0	0	153	0	0
02552	110	0	0	861	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110	0	0	861	0	0
0257	445	0	0	1,407	0	57	0	0	0	0	0	10	0	31	0	0	0	43	445	0	0	1,376	0	47
02722	202	32	159	1,176	81	535	0	0	0	2	0	36	0	0	0	0	0	0	202	32	159	1,173	81	499
0277	261	0	0	857	0	0	0	0	0	0	0	0	0	24	0	14	0	0	261	0	0	833	0	0
02833	143	3	109	199	6	80	0	0	13	0	4	28	0	53	0	0	49	42	143	3	96	147	2	52
02843	76	0	0	785	0	0	0	0	0	0	0	0	0	0	0	0	0	12	76	0	0	785	0	0
02932	138	0	0	983	0	5	0	0	0	0	0	0	0	26	0	19	0	72	138	0	0	957	0	5
03153	327	0	0	1,477	0	3	0	0	0	0	0	3	0	3	0	0	0	35	327	0	0	1,475	0	0
0322	356	0	0	1,190	0	0	0	0	0	0	0	0	0	1	0	0	0	0	356	0	0	1,189	0	0
03463	73	4	54	33	2	30	0	0	1	0	1	7	0	4	0	0	17	11	73	4	53	29	1	23
0365	151	0	0	1,145	0	0	0	0	0	0	0	0	0	4	0	0	0	12	151	0	0	1,140	0	0
0380	306	3	38	826	21	47	0	0	0	0	0	0	0	65	0	11	1	5	306	3	38	760	21	47
03812	175	4	11	820	4	45	0	0	1	0	0	2	5	9	25	43	6	6	169	4	9	811	4	43
03835	193	9	29	863	19	126	0	0	0	2	4	35	21	54	0	8	0	13	172	9	29	807	15	91
04993	340	0	0	1,179	0	0	0	0	0	0	0	0	0	1	0	0	0	0	340	0	0	1,178	0	0
0567	241	0	0	735	0	0	0	0	0	0	0	0	0	2	0	0	0	0	241	0	0	733	0	0
10272	117	2	6	1,300	33	173	0	0	2	1	7	55	0	41	15	89	102	874	117	2	5	1,259	27	118
1028	247	0	0	1,269	0	1	0	0	0	0	0	1	0	22	0	3	0	17	247	0	0	1,247	0	0
1029	286	3	36	1,649	21	280	0	1	6	0	0	13	0	49	0	5	94	583	286	2	30	1,600	21	267
1030B4	385	3	18	1,003	26	361	0	0	0	0	1	13	0	17	0	0	15	293	385	3	18	986	25	347
1039	243	19	66	1,481	44	226	0	0	1	3	6	28	0	76	0	60	10	49	243	19	65	1,401	38	198
10402	278	3	30	1,096	7	243	0	1	4	2	4	47	0	0	0	52	42	73	278	2	26	1,094	4	196
10412	229	8	36	924	18	200	0	0	0	3	7	11	0	25	37	125	27	134	229	8	36	897	11	189
10462	181	0	0	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181	0	0	714	0	0
1047B2, 4	331	0	0	1,123	7	49	0	0	0	0	0	0	0	0	85	153	182	258	331	0	0	1,123	6	48
1100	199	3	23	634	3	88	0	0	0	0	1	27	0	0	0	0	0	93	199	3	23	634	1	60
1101	458	6	8	2,118	25	245	0	0	0	2	0	39	0	0	0	0	0	27	458	6	8	2,116	25	206
1109	282	0	2	898	2	82	0	0	0	0	1	43	0	20	0	0	46	116	282	0	2	878	1	40
1110	200	0	14	664	4	26	0	0	4	0	0	2	0	14	0	0	29	76	200	0	10	650	4	25
1111	29	0	9	368	5	25	0	0	0	0	0	3	0	15	0	21	0	29	29	0	9	353	4	22
1112B4	189	2	5	698	41	274	0	0	0	1	11	105	0	27	0	0	15	68	189	1	5	670	30	169
1116	401	18	64	2,168	50	342	0	0	0	3	9	124	0	22	0	0	1	220	401	18	64	2,142	40	218
11172	145	18	113	490	79	367	0	0	0	0	0	0	0	0	0	0	0	0	145	18	113	490	79	367
11192	220	33	123	552	98	457	0	0	0	0	0	0	0	2	0	0	0	0	220	33	123	550	98	457
1121	193	22	177	670	72	439	0	0	4	2	8	112	3	31	0	0	0	11	191	22	174	637	65	327
1122	117	0	69	1,014	28	214	0	0	2	0	0	13	4	41	2	76	2	34	113	0	67	973	27	200
1130	208	13	69	1,006	72	370	0	2	21	2	16	185	0	103	16	32	39	95	208	11	48	901	56	185
1164	283	0	0	1,309	0	0	0	0	0	0	0	0	0	1	0	0	0	0	283	0	0	1,308	0	0
1202	14	1	23	639	8	210	0	0	20	4	2	69	0	16	0	0	6	62	13	1	3	619	7	141
12122	197	0	9	1,059	0	102	0	0	0	0	0	20	0	4	0	9	5	128	197	0	9	1,055	0	82
1213	233	0	4	816	10	210	0	0	0	0	0	14	12	35	35	54	13	56	221	0	4	781	10	196
12142	271	0	12	1,019	0	80	0	0	1	1	0	39	0	5	6	52	82	169	271	0	11	1,013	0	41
1258	211	17	100	1,045	66	263	0	2	11	2	10	46	0	44	0	15	5	146	211	16	89	998	56	216
1265	50	12	115	1,025	87	502	2	6	75	3	12	174	0	31	0	0	12	40	48	5	39	991	75	328
1266	243	35	105	729	109	496	0	0	0	14	42	260	0	30	0	3	0	43	243	35	105	685	67	236
2124	113	0	0	735	0	0	0	0	0	0	0	0	0	14	0	0	0	0	113	0	0	721	0	0

AC#	Pre-Implementation Habitat within Core			Pre-Implementation Habitat within Home Range			Acres Removed						Acres Downgraded		Acres Degraded		Acres Maintained		Post-Implementation Habitat within Core			Post-Implementation Habitat within Home Range		
	0 - 0.5 mile			0.5 - 1.3 mile			0 - 0.5 mile			0.5-1.3 mile			0 - 0.5 mile	0.5 - 1.3 mile	0 - 0.5 mile	0.5 - 1.3 mile	0 - 0.5 mile	0.5 - 1.3 mile	0 - 0.5 mile			0.5 - 1.3 mile		
	NRF	FANR1	PFF11	NRF	FANR	PFF1	NRF*	FANR	PFF1	NRF*	FANR	PFF1	NRF	NRF	NRF	NRF	NRF	NRF	NRF	FANR	PFF1	NRF	FANR	PFF1
4026	150	0	0	1,294	0	0	0	0	0	0	0	0	0	3	0	0	0	13	150	0	0	1,291	0	0
4099	283	0	37	842	12	279	0	0	1	3	2	54	0	7	0	0	50	39	283	0	36	832	11	225
41283	205	0	0	536	0	0	0	0	0	0	0	0	0	0	0	0	0	0	205	0	0	536	0	0
41293	69	0	0	380	0	0	0	0	0	0	0	0	0	3	0	0	0	0	69	0	0	377	0	0
41332	24	12	53	563	81	263	1	5	30	3	28	152	4	32	0	48	1	0	20	7	23	528	52	110
41433	121	3	19	588	4	16	0	1	12	0	0	6	20	23	0	0	24	56	101	2	7	565	3	9
41443	74	0	1	173	6	21	0	0	0	0	0	1	0	17	0	0	0	0	74	0	1	156	6	20
41453	102	11	51	184	4	15	0	1	7	0	1	2	6	15	10	21	0	1	96	10	44	168	3	12
41463	33	2	22	182	4	118	0	1	3	0	0	18	0	15	0	0	9	39	33	1	18	167	4	101
9990	151	0	80	415	2	208	0	0	19	1	0	78	0	3	0	0	37	45	151	0	60	411	2	130
9991	239	0	77	1,110	6	77	0	0	12	0	0	12	0	20	0	79	59	86	239	0	65	1,090	5	64
99922	240	0	5	539	1	11	0	0	2	0	1	4	69	121	0	20	140	123	171	0	3	418	0	7
9993	169	0	0	431	1	3	0	0	0	0	0	0	0	23	0	0	0	0	169	0	0	407	1	3
9994	174	1	6	504	5	27	0	0	0	0	0	0	10	19	0	0	0	0	164	1	6	485	5	27
99952	196	0	42	1,225	1	82	0	0	15	1	0	21	0	7	0	47	56	207	196	0	27	1,217	1	61
9996	160	0	4	795	1	64	0	0	1	1	1	31	0	78	12	11	119	94	160	0	3	716	0	33
9998	269	8	27	737	12	101	0	0	0	0	1	20	5	15	54	135	0	36	264	8	27	722	12	82
9999	100	31	76	1,169	43	363	0	0	0	0	0	1	0	0	0	0	0	6	100	31	76	1,169	43	362
99910	328	0	68	1,337	6	113	0	0	0	0	0	1	0	23	0	49	0	61	328	0	68	1,314	6	112
999122	278	5	53	1,562	10	110	0	1	15	2	5	62	5	89	47	48	227	740	274	4	38	1,471	5	48
999133	33	1	4	377	2	39	0	0	2	0	1	10	0	54	0	0	5	36	33	0	3	323	1	29
999143	17	1	4	242	7	23	0	0	0	0	0	1	0	25	0	0	0	1	17	1	4	217	7	22
999153	119	0	0	664	1	11	0	0	0	0	0	7	0	5	0	0	0	9	119	0	0	659	1	4
0096A	279	0	0	1,077	3	50	0	0	0	0	0	0	0	0	0	0	0	0	279	0	0	1,077	3	50
0276A2	203	0	0	745	1	0	0	0	0	0	0	0	24	31	5	36	0	0	180	0	0	714	1	0
0276B2	120	0	0	864	1	5	0	0	0	0	0	0	18	51	18	36	0	0	102	0	0	814	1	5
0278A	282	1	13	552	5	32	0	0	0	0	0	0	11	15	0	0	0	0	271	1	13	537	5	32
0278B2	219	0	0	556	4	32	0	0	0	0	0	0	20	24	11	24	0	0	199	0	0	532	4	32
NEW3A	55	13	34	551	109	409	0	4	7	4	41	182	2	37	15	37	9	60	53	8	27	510	68	227
NEW3B	31	20	47	402	67	311	0	3	5	4	41	223	0	45	2	31	12	60	31	17	42	353	25	89
NEW7A2	139	0	0	944	0	12	0	0	0	0	0	0	1	38	33	48	0	101	138	0	0	906	0	12
NEW7B	97	0	0	1,122	8	128	0	0	0	4	5	74	3	95	12	76	1	161	94	0	0	1,023	3	54

*Although salvage harvest is not planned to occur within NRF and dispersal habitat, a combination of implementation and natural effects (e.g. wind) may degrade habitat features to the point where the habitat may not retain its' function. To account for these potential effects, 10% of the NRF and dispersal habitat occurring in the salvage treatment units (outside of riparian reserves) is reported here as a loss of habitat but this is likely an overestimate.

[1]FANR or fire-affected nesting/roosting is pre-fire nesting/roosting habitat that burned at moderate severity. PFF1 or post-fire foraging is pre-fire foraging habitat that burned at moderate and high severity and also includes nesting/roosting habitat that burned at high severity.

[2]Assumption: private land that burned at moderate and high severity may be harvested in the Whites and Happy Camp fire areas and these areas were removed from the existing acres of PFF and FANR.

[3]Most of the private land that occurs in the Beaver Fire area is owned by commercial timber companies and is currently being harvested. We assumed that all the FANR and PFF on private land will be removed and all NRFD on private land has been reduced in quality to the point that this NRFD will not likely function as habitat.

[4]NSO surveys in 2015 have detected a pair in close proximity (overlapping cores) to a known activity center. Although this pair may or may not be from the adjacent activity center, it is represented here as a possible "shift" and will be analyzed in its "shifted" location.

[5]NSO pair and single was detected on multiple occasions in the same drainage thus this analysis will analyze this as a new activity center.

Interdependent and Interrelated Actions

Roads

There will be no roads added to the National Forest Transportation System as a result of this project; about 3.3 miles of new temporary roads will be constructed and about 4.6 miles of temporary roads on existing roadbeds will be used for project access. Of those roads, 4.8 miles of previously decommissioned roads are proposed for reopening.

Landings

Existing landings will be used where possible. Landing size will be commensurate with operational safety. There will be 59 new helicopter landings and 25 existing helicopter landings used for the project, up to 2 acres in size. There will be 26 new skyline landings. New skyline landings off the road system and ground-based landings will average one acre in size but will not exceed 1.5 acres in size and will use roads wherever possible. There will be 15 new and 15 existing landings used for ground based operations. Both new and existing landings will be hydrologically stabilized after use. All landings will be implemented according to the project design features in chapter 2 of the EIS.

Activity Generated Fuels Treatments

Treatment of fuels generated by project activities will be necessary in areas where the proposed activities create hazardous fuels conditions. Where activity-created fuels exceed targeted levels of fuels, hand piling with or without burning, burning of concentrations, mastication, and/or chipping to reduce flashy fuel loads may occur. All treatments within suitable NSO habitat will be subject to limited operating periods. Treatment of concentrations of small-diameter surface fuels is not expected to have negative effects to the NSO or their habitat.

Traffic

As a result of the increased level of activity associated with project implementation, a subsequent increase in the amount of traffic on Forest System roads is anticipated across the project area. Higher than normal level of traffic and the associated noise has the potential to disrupt the normal behaviors of wildlife in the analysis area, including NSO. Where roads occur near or adjacent to areas used by NSO, there is also an increased chance for a vehicle to collide with an NSO (logging truck, heavy equipment transport, water tenders, personnel vehicles, etc.) likely resulting in mortality. The chance of this occurring is somewhat reduced, though not eliminated, by the generally nocturnal behavior of NSO and the typically diurnal nature of project implementation.

Effects on Prey, Competitors or Predators

Prey Species

Habitat that supports prey for NSO is an important component for the survival of owls and their offspring. Woodrats are one of the two more important prey species for NSO on the Forest, the other being northern flying squirrels. Snags are an important habitat component for flying squirrels. High quality woodrat habitat includes the shrubby vegetation that is essential for providing cover and food in forest habitat. In addition to brushy vegetation, components associated with NSO habitat such as downed logs, hardwoods and other woody material appear to be important components of woodrat habitat (Sakai and Noon 1993).

Fire consumes, alters, and creates snags used by nesting spotted owls and coarse woody debris used by spotted owl prey (USDI 2014). Because the proposed salvage is in post fire forest that is

likely no longer functioning in any meaningful way as flying squirrel habitat, it is not expected to further reduce flying squirrels or their habitat. However, fire increases the abundance of shrubby vegetation used by woodrats, and other prey species such as mice and vole species. Edge ecotones created from fire can be areas of increased woodrat abundance and exposure to foraging spotted owls (Zabel 1995). Research suggests that diffuse edges created by fire may be good habitat for woodrats (Sakai and Noon 1997), which are more likely to occur at high densities in areas with a mix of early seral conifer stands and late-successional forest habitat (Sakai and Noon 1993).

Salvage harvest removes some of the potential large woody debris that may have become habitat for prey species in the future as the stand canopy develops and cover from above becomes more readily available. In areas where salvage and roadside hazard tree removal is occurring, these areas will have reduced quality of habitat for prey species that rely on abundant large downed wood. However, snag retention areas and riparian reserves will contribute to an overall mosaic of areas with variable amounts of large woody debris, such that some areas will contain more large woody debris for use by NSO prey than others.

Site prep and planting will have a somewhat reduced amount of brush directly around conifer seedlings where up vegetation up to 5 feet around the planted seedling will be scraped away (grubbed) in order to allow the seedling to receive as much of the available nutrients and sunlight as possible when it is first established (see discussion above on Site Prep and Planting). This is a temporary loss of brush in small patches within planted areas but the remaining areas of the unit will contain regenerating brush throughout the unit. These areas are not expected to be limited on brush, and cover for NSO prey. However, site prep and plant units may not contain large amounts of large woody debris because many are located in previous plantations where the pre-fire stand contained only mid to early seral conifers and very little size and age class diversity.

The proposed project may have localized impacts to flying squirrels, woodrats, or other prey species in the analysis area due to the removal of potential large woody debris across an extensive area and a loss of connectivity and concealment cover in affected areas. Salvage harvest targets standing fire-killed trees which would have provided future potential large woody debris, though in areas outside the salvage harvest areas where there will be abundant large woody debris. Areas that sustained high severity fire provide more open conditions which can accelerate the development of the brush and hardwood understory and thus provide more palatable/nutritious forage and cover for prey species. Shrubs will quickly re-sprout (e.g., the following spring) and provide forage and habitat.

Barred Owl / Spotted Owl Interactions

Many studies have found negative correlations between NSOs and barred owls where they co-occur but the effect of forest management on barred and spotted owl interactions is not well documented. Limited habitat availability combined with negative influences of barred owls may compound effects to NSO (Dugger 2005, Dugger 2011, Kelly and Forsman 2003, Wiens 2014). The analysis area contains NSO habitat that is well distributed with most occurring on the lower 2/3 of slopes except the drainages that contain a large portion of high severity fire such as Walker Creek, Lower Grider Creek, Rancheria Creek, Tom Martin Creek, Buckhorn Gulch, and Kohl Creek.

Barred owls are known to occur within portions of the action area within the Horse Creek drainage. Available evidence suggests that the presence and distribution of barred owls may affect habitat quality for spotted owls (Wiens 2014, Yackulic et al. 2012). Additionally, many studies suggest that the two species compete for resources and maintaining older, high quality forest habitat may help spotted owls persist, at least in the short-term (USDI 2014).

To date, there are no known forest conditions, including post-fire landscapes, where spotted owls have a competitive advantage over barred owls. It is also not known if forest habitat removal directly results in a local range expansion of barred owls (USDI 2014).

In the absence of information on barred owl use of post-fire landscapes and because best available information indicates that barred owls are a forest habitat generalist but select pre-fire spotted owl NRF habitat similar to spotted owls (Hamer et al. 2007 and Wiens et al. 2014), it can reasonably be assumed that barred owls could also make use of PFF habitat (USDI 2014).

If there is similar use of this type of habitat, the competitive interactions between the two species may not be exacerbated. However, because there is relatively less overall habitat on the landscape, post-fire, and barred owls are generally the dominant species, it is possible that competitive interactions between the two species may occur where they overlap in post fire habitat.

The long-term trend of barred owl and spotted owl interactions in this area is not known. The proposed treatments are intended to aid in the re-establishment of suitable NSO habitat and reduce fuels accumulations that would put high quality NSO habitat at risk during another high severity wildfire.

Cumulative Effects

Under the Endangered Species Act, cumulative effects on the environment are “those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation” (50 CFR 402.02). Cumulative effects on the environment result from the anticipated additive effects of future State and private actions that are reasonably certain to occur along with the likely effects of the proposed Federal action. This should be distinguished from effects that may accumulate when small, incremental amounts of habitat are lost over time through a variety of management activities and natural events that occur across a landscape. These kinds of effects are addressed in the environmental baseline.

The analysis area includes Federal lands administrated by the Klamath National Forest. There is also private land within the project area, predominantly industrial timber lands.

Temporal bounding for this analysis is defined by the timeframe for actions that are proposed and may occur in the reasonably foreseeable future. To determine future forest management actions on private lands within the analysis area, the timber harvest plan database was reviewed to determine if there were any proposed projects within the analysis area that have been submitted for approval.

There are no State lands within the analysis area; consequently no future actions will occur on State lands.

Private lands within the analysis area are predominately industrial timber lands. Future actions on private lands are likely to involve active forest management. In order to evaluate future actions on private lands within the analysis area, the Timber Harvest Plan database was accessed to determine if future forest management actions were planned within the analysis area (Table G-23).

The Beaver project area is comprised of checkerboard ownership, with the majority of the private land held by industrial timber companies. The private land was also burned during the Beaver fire and is currently undergoing salvage harvest operations on at least 75% of the land burned during the fire. Fire severity does not appear to influence the areas chosen for salvage. For the purposes of this analysis, we are assuming that harvest operations that have not yet happened will continue in the same manner as those that have already occurred. Therefore, the land will be cleared of the vast majority of the trees with very few snags retained; consequently the current and future condition is not considered as suitable habitat for NSO. See Table G-30of Appendix A for a list of the future foreseeable or ongoing projects on national forest lands in the analysis area.

The Whites and Happy Camp project areas are more contiguous ownership, with the vast majority comprised of national forest system lands. The private lands in these project areas were also affected by the 2014 fires in varying amounts and may be harvested, but currently do not have any timber harvest plans filed.

Table G-23: Current and future projects proposed within the analysis area on private lands

Project Name	Acres of Activity in Analysis Area	Current or Future Projects
Timber Harvest Plan No. 17	70	Unknown
Timber Harvest Plan No. 27	550	Unknown
Timber Harvest Plan No. 41	1,290	Unknown
Timber Harvest Plan No. 85	130	Unknown
Timber Harvest Plan No. 87	200	Unknown

IX. Effects on Designated Critical Habitat

The USFWS revised previous designations of NSO critical habitat in 2012. The final rule was published on December 4, 2012 and went into effect on January 3, 2013.

Physical or Biological Features

For the northern spotted owl, the physical or biological features (PBFs) essential to the conservation of the species are forested areas that are used or likely to be used for nesting, roosting, foraging, or dispersing. PBFs are made up of primary constituent elements that provide one or more of the following life-history requirements:

- Space for individual and population growth and for normal behavior;
- Food, water, air, light, minerals, or other nutritional or physiological requirements;
- Cover or shelter;
- Sites for breeding, reproduction, or rearing (or development) of offspring; and

Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species.

The 2012 ruling addressed several influences on these PBFs, including:

- climate;
- elevation;
- topography;
- disturbance regimes;
- the pattern and distribution of habitat;
- forest community type (composition); and
- population spatial requirements.

Generally, typical Forest Service management actions such as the one proposed cannot alter the first three influences: climate, elevation and topography. These are hard features of the landscape or global system that are not modified by the relatively small scale of single management actions. However, the following four influences addressed in the Revised Recovery Plan may be modified, at least locally, by management actions.

Disturbance Regimes

Generally management actions do not affect the larger influences of disturbance regimes such as climate and climate patterns but may affect the severity or frequency of events on the local landscape. For example, the overall fire regime of an area is not modified by a single management action but the likely results of an event may be modified by management.

Excess hazardous fuels that are generated by project activities will be treated through a variety of methods including hand piling with/without burning, burning of concentrations, mastication, and/or chipping to reduce fuel loads. The goal of these treatments is to reduce surface fuels to levels that would allow any future fires in the project area to burn within the historic range of fire severity and intensity. In other words, these treatments would attempt to maintain conditions that allow for historic levels of fire severity.

The Pattern and Distribution of Habitat

Suitable forest types in the drier parts of the range (interior northern California, Klamath region, interior southern Oregon, and east of the Cascade crest in Oregon and Washington) occur in a mosaic pattern interspersed with infrequently used vegetation types such as open forests, shrubby areas, and grasslands. As described in the final ruling, natural disturbance processes in these drier regions likely contributed to a pattern in which patches of habitat in various stages of suitability shifted positions on the landscape through time. In the Klamath Mountains Provinces of Oregon and California, and to a lesser extent in the Coast and Cascade Provinces of California, large areas of serpentine soils exist that are typically not capable of supporting northern spotted owl habitat.

The proposed project is not expected to affect the larger scale mosaic pattern of habitat within the analysis area.

Forest Community Type (Composition)

Landscape-level patterns in tree species composition and topography influence the distribution and density of northern spotted owls. Even when different forest types have similar structural attributes, these differences in northern spotted owl distribution occur. This suggests that northern spotted owls may prefer specific plant associations or tree species. NSO infrequently use some forest types, such as pine-dominated and subalpine forests, regardless of their structural attributes. NSO select forests with high proportions of Douglas-fir trees in areas east of the Cascade Crest.

The effects of tree species composition on habitat selection also extend to hardwoods within conifer-dominated forests. For example, the USFWS habitat modeling showed that the proportion of hardwoods present negatively affected the habitat value in the central Western Cascades. At the home range and core area scales, locations occupied by northern spotted owls consistently have greater amounts of mature and old-growth forest compared to random locations or unused areas. The proportion of older or structurally complex forest within the home range varies greatly by geographical region but typically falls between 30 and 78 percent (Blakesley et al. 2004). Differences between northern spotted owl sites and random locations diminished as circles of increasing size were evaluated suggesting habitat selection is stronger at the core area scale than at the home range and landscape scales. The proposed project is not expected to influence landscape level patterns of forest community type or tree composition.

Population Spatial Requirements

Areas that contain the physical or biological features described in the Final Ruling must provide habitat in an amount and distribution sufficient to support persistent populations. This includes metapopulations of reproductive pairs, and opportunities for nonbreeding and dispersing owls to move among populations are considered essential to the conservation of the northern spotted owl.

Northern spotted owls maintain large home ranges that vary in size across nearly an order of magnitude across the species range, from about 1,400 to 14,000 acres (570 to 5,700 hectares), depending on geographic latitude and prey resources. Overlap occurs among adjoining territories, but the large size of territories nonetheless means that populations of northern spotted owls require landscapes with large areas of habitat suitable for nesting, roosting, and foraging. For example, in the northern parts of the subspecies ‘range where territories are largest, a population of 20 resident pairs would require at least 100,000 acres (about 40,500 hectares) of habitat that is relatively densely distributed and of high quality.

When the northern spotted owl was listed as threatened in 1990 (55 FR 26114; June 26, 1990), habitat loss and fragmentation of old-growth forest were identified as major factors contributing to declines in northern spotted owl populations. As older forests were reduced to smaller and more isolated patches, the ability of northern spotted owls to successfully disperse and establish territories was likely reduced. The effects of the proposed project will not alter the spatial requirements required for population viability.

Primary Constituent Elements

Primary constituent elements are those specific elements of the physical or biological features that provide for a species’ life-history processes and are essential to the conservation of the species.

In the critical habitat rule the Primary Constituent Elements (PCEs) focus on four components, the first of which must be included along with one of the last three. The four elements are:

- Forest types that may be in early-, mid-, or late-seral stages and that support the northern spotted owl across its geographical range,
- Nesting and roosting habitat,
- Foraging habitat (subdivided into four ecological zones, two of which apply to the Klamath NF) , and
- Dispersal habitat (subdivided into transience and colonization phases of dispersal).

These PCEs are quoted from the critical habitat rule. In the following analysis, we will refer to these PCE categories as PCEs 1, 2, 3 and 4 with subdivisions discussed as appropriate. This document only evaluates project effects in relation to the 2012 critical habitat ruling and supersedes as appropriate any previous analysis of critical habitat effects.

PCE 1, Forest Type:

These activities can occur in early-, mid-, or late-seral forest types identified in the PCEs in the final rule. On the Forest, this includes the mixed conifer and mixed evergreen type, the Douglas-fir type, the Shasta red fir type and a small amount of the moist end of the ponderosa pine, coniferous forest zones.

PCE 2, Nesting and Roosting habitat:

Sufficient foraging habitat to meet the home range needs of territorial pairs of northern spotted owls throughout the year.

Stands for nesting and roosting that are generally characterized by:

- Moderate to high canopy closure (60 to over 80 percent):
- Multilayered, multispecies canopies with large (20 to 30 inches or greater dbh) overstory trees;
- High basal area (greater than 240 square feet/acre);
- High diversity of different diameters of trees;
- High incidence of large live trees with various deformities (e.g., large cavities, broken tops, mistletoe infections, and other evidence of decadence);
- Large snags and large accumulations of fallen trees and other woody debris on the ground; and
- Sufficient open space below the canopy for northern spotted owls to fly.

PCE 3, Foraging habitat in the Klamath/Northern California Interior Coast Ranges Ecological Zones [West Cascades and Redwood sections not considered].

(b) Klamath and Northern California Interior Coast Ranges

(i) Stands of nesting and roosting habitat; in addition, other forest types with mature and old-forest characteristics;

(ii) Presence of the conifer species, incense-cedar, sugar pine, Douglas-fir, and hardwood species such as bigleaf maple, black oak, live oaks, and madrone, as well as shrubs;

(iii) Forest patches within riparian zones of low-order streams and edges between conifer and hardwood forest stands;

(iv) Brushy openings and dense young stands or low-density forest patches within a mosaic of mature and older forest habitat;

(v) High canopy cover (87 percent at frequently used sites);

(vi) Multiple canopy layers;

(vii) Mean stand diameter greater than 21 inches;

(viii) Increasing mean stand diameter and densities of trees greater than 26 inches increases foraging habitat quality;

(ix) Large accumulations of fallen trees and other woody debris on the ground; and

(x) Sufficient open space below the canopy for northern spotted owls to fly.

PCE 4, Habitat supporting the transience and colonization phases of dispersal:

(a) Habitat supporting the transience phase of dispersal, which includes:

(i) Stands with adequate tree size and canopy cover to provide protection from avian predators and minimal foraging opportunities; in general this may include, but is not limited to, trees with at least 11 inches dbh and a minimum 40 percent canopy cover; and

(ii) Younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, if such stands contain some roosting structures and foraging habitat to allow for temporary resting and feeding during the transience phase.

(b) Habitat supporting the colonization phase of dispersal, which is generally equivalent to nesting, roosting, and foraging habitat as described in PCEs (2) and (3), but may be smaller in area than that needed to support nesting pairs.

Threats to Critical Habitat

One of the primary threats to NSO is identified as past and current habitat loss. While loss due to timber harvest has slowed considerably since the time of listing, loss due to high severity fires in some portions of the range remains high. Recent information pertaining to habitat lost to wildfire in the relatively dry East Cascades and Klamath Provinces suggests that fire may be more of a threat than was previously thought. Specific to the California Klamath Province, approximately 40,000 acres of NSO nesting and roosting habitat has been lost to fires between 1996 and 2006, most of which is in reserved land allocations (Davis et al. 2011).

Effects to PCE's

The proposed project will affect PCEs 2, 3, and 4. Nesting/roosting, foraging and dispersal habitat types will be both removed and degraded by proposed activities. The scope and scale of the project causes increased and additive impacts to critical habitat, particularly where treatments overlap each other. Hazard tree removal and salvage harvest will remove large snags and future downed logs across a wide expanse of the landscape; where salvage occurs in concentrated areas it will create large openings with little structure or cover. High severity fire created openings in many of these areas. Salvage harvest and hazard tree removal will remove many of the snags that would provide for future stand development, though snag retention areas and riparian reserves will alleviate this effect. **Effects expected to occur from each treatment type are described above in the Effects to NSO Habitat discussion.**

The analysis area is located within four subunits; KLW7, KLW8, KLE6, and KLE7. These subunits were established to function as NSO demographic support (USDI 2012 page 71933); resource agencies are encouraged to work toward maintaining or enhancing the characteristics of older forest and providing large habitat blocks and associated forest conditions. Regional

variations should be taken into account; in the Klamath Province this means providing mosaics of interior habitats and edges to provide for the diversity of prey. Management activities that contribute to recovery goals through risk reduction such as the removal of ground and ladder fuels, and the restoration of ecosystem processes that lead to the development or replacement of spotted owl habitat, are recommended. The current number of acres for PCE 2, 3, and 4 are presented in the following tables. The proportion of habitat within each subunit that is affected by the proposed activities is described in the following tables.

The following tables describe the effects from each treatment type to the critical habitat subunit in which the treatment occurs and summarizes the habitats affected. As described above, the analysis area for critical habitat is the suitable habitat (NRFD) within a subunit that falls within a 1.3 mile buffer around all treatment types. For this analysis, FANR, PFF1 and PFF2 are components of future habitat and are presented separately to display the same categories across analyses.

Table G-24: Acres of Pre- and Post-Fire NSO Critical Habitat in the critical habitat analysis area

NSO Critical Habitat Subunit	Acres of CH subunit in analysis area	Pre-Fire Critical Habitat			Post-Fire Critical Habitat and FANR and PFF					
		Nesting/ roosting (acres)	Foraging (acres)	Dispersal (acres)	Nesting/ roosting (acres)	Foraging (acres)	Dispersal (acres)	Fire Affected Nesting/ Roosting	PFF1	PFF2
KLE6	4,918	952	972	1,293	887	808	1,097	12	118	99
KLE7	34,860	10,636	9,088	8,637	6,884	5,887	5,656	656	3,552	2,744
KLW7	26,754	2,341	8,304	7,255	2,220	7,593	6,655	66	643	123
KLW8	27,601	7,300	7,687	7,241	6,324	6,447	5,656	215	1,598	402
Total	94,133	21,229	26,050	24,426	16,315	20,735	19,065	950	5,911	3,368

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Table G-25: Treatment effects in the portion of the critical habitat subunits that overlap the critical habitat analysis area - each subunit has a separate table

Critical Habitat Subunit Klamath East 6														
NSO habitat within Critical Habitat Analysis Area	Nesting/Roosting (PCE 2) (acres)				Foraging (PCE 3) (acres)				Dispersal (PCE 4) (acres)			Fire Affected Nesting/ Roosting (acres)	Post-Fire Foraging 1 (acres)	Post-Fire Foraging 2 (acres)
	887				808				1,097			12	118	99
Habitat Type and Effect	Nest/Roost Removed (acres)	Nest/Roost Downgraded (acres)	Nest/Roost Degraded (acres)	Nest/Roost Maintained (acres)	Foraging Removed (acres)	Foraging Downgraded (acres)	Foraging Degraded (acres)	Foraging Maintained (acres)	Dispersal Removed (acres)	Dispersal Degrade (acres)	Dispersal Maintained (acres)	Fire Affected Nesting/ Roosting Removed 1 (acres)	Post-Fire Foraging 1 Removed (acres)	Post-Fire Foraging 2 Removed (acres)
Salvage Harvest	0*	0	0	0	0*	0	0	0	0	0	0	0	0	0
Roadside Hazard	0	0	3	101	0	0	7	63	0	6	62	2	30	15
Wildland Urban Interface	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Management Zone	0	67 (downgrade to dispersal)	0	0	0	59 (downgrade to dispersal)	0	0	0	0	0	1	22	16
Roadside Hazard overlap with complete fuels	0	0	0	0	0	1 (downgrade to dispersal)	0	0	0	0	0	0	0	0
Roadside Hazard overlap with modified fuels	0	0	0	0	0	0	17	0	0	22	0	0	0	0
Underburn only	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Site/prep and plant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roadside hazard overlap with underburn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roadside Complete – Fuels Only	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roadside Modified – Fuels Only	0	0	0	0	0	0	5	0	0	0	0	0	0	0
Landings2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Roads	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acres (% Change in PCEs within Critical Habitat Analysis Area)	0 (0%)	67 (8%)	3 (0.3%)	101 (11%)	0 (0%)	60 (7%)	29 (4%)	63 (8%)	0 (0%)	28 (26%)	62 (6%)	3 (25%)	52 (44%)	31 (31%)

Critical Habitat Subunit Klamath East 7														
NSO habitat within Critical Habitat Analysis Area	Nesting/Roosting (PCE 2) (acres)				Foraging (PCE 3) (acres)				Dispersal (PCE 4) (acres)			Fire Affected Nesting/ Roosting (acres)	Post-Fire Foraging 1 (acres)	Post-Fire Foraging 2 (acres)
	6,884				5,887				5,656			656	3,552	2,744
Habitat Type and Effect	Nest/Roost Removed (acres)	Nest/Roost Downgraded (acres)	Nest/Roost Degraded (acres)	Nest/Roost Maintained (acres)	Foraging Removed (acres)	Foraging Downgraded (acres)	Foraging Degraded (acres)	Foraging Maintained (acres)	Dispersal Removed (acres)	Dispersal Degrade (acres)	Dispersal Maintained (acres)	Fire Affected Nesting/ Roosting Removed 1 (acres)	Post-Fire Foraging 1 Removed (acres)	Post-Fire Foraging 2 Removed (acres)
Salvage Harvest	8*	0	0	0	12*	0	0	0	5*	0	0	49	478	604
Roadside Hazard	0	0	24	126	0	0	40	380	0	29	239	18	233	232
Wildland Urban Interface	0	42 (downgrade to dispersal)	0	0	0	24 (downgrade to dispersal)	0	0	40	0	0	0	0	0
Fuel Management Zone	0	35 (downgrade to dispersal)	0	0	0	125 (downgrade to dispersal)	0	0	54	0	0	4	32	7
Roadside Hazard overlap with complete fuels	0	14 (downgrade to dispersal)	0	0	0	45 (downgrade to dispersal)	0	0	20	0	0	12	66	48
Roadside Hazard overlap with modified fuels	0	0	46	0	0	0	41	0	0	43	0	4	8	1
Underburn only	0	0	0	25	0	0	0	82	0	0	74	0	0	0
Site/prep and plant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roadside hazard overlap with underburn	0	0	6	0	0	0	11	0	0	26	0	0	2	0
Roadside Complete – Fuels Only	0	4 (downgrade to dispersal)	0	0	0	9 (downgrade to dispersal)	0	0	9	0	0	0	3	3
Roadside Modified – Fuels Only	0	0	26	0	0	0	31	0	0	16	0	1	4	1
Landings2	3	0	0	0	5	0	0	0	5	0	0	0	3	3
Temporary Roads	0	0	0	0	0	0	0	0	0	0	0	6	6	0
Acres (% Change in PCEs within Critical Habitat Analysis Area)	11 (0.2%)	95 (1%)	102 (2%)	151 (2%)	17 (0.3%)	203 (3%)	123 (2%)	462 (8%)	133 (2%)	114 (2%)	313 (6%)	94 (14%)	835 (24%)	899 (33%)

Critical Habitat Subunit Klamath West 7														
NSO habitat within Critical Habitat Analysis Area	Nesting/Roosting (PCE 2) (acres)				Foraging (PCE 3) (acres)				Dispersal (PCE 4) (acres)			Fire Affected Nesting/ Roosting (acres)	Post-Fire Foraging 1 (acres)	Post-Fire Foraging 2 (acres)
	2,220				7,593				6,655			66	643	123
Habitat Type and Effect	Nest/Roost Removed (acres)	Nest/Roost Downgraded (acres)	Nest/Roost Degraded (acres)	Nest/Roost Maintained (acres)	Foraging Removed (acres)	Foraging Downgraded (acres)	Foraging Degraded (acres)	Foraging Maintained (acres)	Dispersal Removed (acres)	Dispersal Degrade (acres)	Dispersal Maintained (acres)	Fire Affected Nesting/ Roosting Removed 1 (acres)	Post-Fire Foraging 1 Removed (acres)	Post-Fire Foraging 2 Removed (acres)
Salvage Harvest	1*	0	0	0	3*	0	0	0	1*	0	0	8	61	39
Roadside Hazard	0	0	2	46	0	0	43	469	0	22	237	0	57	10
Wildland Urban Interface	0	6 (downgrade to dispersal)	0	0	0	39 (downgrade to dispersal)	0	0	58	0	0	0	0	0
Fuel Management Zone	0	47 (downgrade to dispersal)	0	0	0	155 (downgrade to dispersal)	0	0	174	0	0	0	4	0
Roadside Hazard overlap with complete fuels	0	8	0	0	0	86 (downgrade to dispersal)	0	0	144	0	0	0	0	2
Roadside Hazard overlap with modified fuels	0	0	83	0	0	0	180	0	0	103	0	1	4	1
Underburn only	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Site/prep and plant	0	0	0	0	0	0	0	0	0	0	0	11	96	11
Roadside hazard overlap with underburn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roadside Complete – Fuels Only	0	5	0	0	0	41	0	0	32	0	0	0	0	1
Roadside Modified – Fuels Only	0	0	37	0	0	0	181	0	0	121	0	1	1	0
Landings2	3	0	0	0	5	0	0	0	5	0	0	0	3	0
Temporary Roads	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acres (% Change in PCEs within Critical Habitat Analysis Area)	4 (0.2%)	66 (3%)	122 (5%)	46 (2%)	8 (0.1%)	321 (4%)	404 (5%)	470 (7%)	414 (6%)	246 (4%)	237 (4%)	21 (32%)	226 (35%)	64 (52%)

Critical Habitat Subunit Klamath West 8														
NSO habitat within Critical Habitat Analysis Area	Nesting/Roosting (PCE 2) (acres)				Foraging (PCE 3) (acres)				Dispersal (PCE 4) (acres)			Fire Affected Nesting/ Roosting (acres)	Post-Fire Foraging 1 (acres)	Post-Fire Foraging 2 (acres)
	6,324				6,447				5,656			215	1,598	402
Habitat Type and Effect	Nest/Roost Removed (acres)	Nest/Roost Downgraded (acres)	Nest/Roost Degraded (acres)	Nest/Roost Maintained (acres)	Foraging Removed (acres)	Foraging Downgraded (acres)	Foraging Degraded (acres)	Foraging Maintained (acres)	Dispersal Removed (acres)	Dispersal Degrade (acres)	Dispersal Maintained (acres)	Fire Affected Nesting/ Roosting Removed 1 (acres)	Post-Fire Foraging 1 Removed (acres)	Post-Fire Foraging 2 Removed (acres)
Salvage Harvest	7*	0	0	0	2*	0	0	0	2*	0	0	19	74	44
Roadside Hazard	0	0	7	131	0	0	8	106	0	6	64	5	25	3
Wildland Urban Interface	0	24 (downgrade to dispersal)	0	0	0	61 (downgrade to dispersal)	0	0	125	0	0	0	11	0
Fuel Management Zone	0	71 (downgrade to dispersal)	0	0	0	90 (downgrade to dispersal)	0	0	177	0	0	0	0	0
Roadside Hazard overlap with complete fuels	0	25 (downgrade to dispersal)	0	0	0	35 (downgrade to dispersal)	0	0	115	0	0	0	8	0
Roadside Hazard overlap with modified fuels	0	0	193	0	0	0	102	0	0	59	0	0	1	0
Underburn only	0	0	0	1,327	0	0	0	1,140	0	0	1,391	0	0	0
Site/prep and plant	0	0	0	0	0	0	0	0	0	0	0	0	8	0
Roadside hazard overlap with underburn	0	0	53	0	0	0	72	0	0	146	0	4	37	22
Roadside Complete – Fuels Only	0	6	0	0	0	5	0	0	8	9	0	0	1	0
Roadside Modified – Fuels Only	0	0	48	0	0	0	16	0	0	16	0	0	0	0
Landings2	3	0	0	0	5	0	0	0	5	0	0	0	3	0
Temporary Roads	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acres (% Change in PCEs within Critical Habitat Analysis Area)	10 (<0.01)	126 (2%)	301 (5%)	1,458 (23%)	7 (0.1%)	191 (3%)	198 (3%)	1,246 (20%)	432 (8%)	236 (4%)	1,455 (26%)	28 (13%)	168 (10%)	69 (17%)

[1] Fire affected critical habitat is defined as PFF1, PFF2, and FANR, but for clarity, FANR is separated from PFF1 and PFF2. * Represents 10% of NRF in salvage units. [2] Habitat affected by landing construction is an overestimate of effects.

For PCE 2 Nesting and Roosting Habitat, the project will affect the habitat components: *Large snags and large accumulations of fallen trees and other woody debris on the ground*. The felling of hazard trees will reduce potential nest and roost sites from nesting and roosting habitat, though in general this activity would not occur within currently suitable nesting/roosting habitat. Salvage harvest may affect the future development of the stand by removing the large snags that would fall and become large downed logs.

The "*large snags"* element of PCE 2 would be affected, and potential nest, roost and perch sites would be reduced, the impacts would affect the function of the fire-affected habitat, and the suitable nesting/roosting habitat where it occurs within hazard tree removal areas.

The element of PCE 2 that includes *"large accumulations of fallen trees and other woody debris on the ground"* will also be affected by the proposed project. For the portion of critical habitat that will have salvage activities, fire-killed trees that are over 14" dbh will be removed. In addition, fuel treatments will remove or re-arrange concentrations of woody debris. However, the salvage units will not be void of trees, snags, or woody debris. Between the low fire severity affected areas, additional snag retention, legacy tree retention, and retention of pre-fire existing snags, plus snags left within the units that could not be harvested do to implementation constraints, most, if not all, of the salvage units will have trees and/or snags retained in the unit.

For PCE 3 Foraging Habitat, the project will affect the habitat component: *large accumulations of fallen trees and other woody debris on the ground.* For the portion of critical habitat that will have salvage activities and hazard tree removal, salvage harvest and felling of hazard trees will affect the future development of the stand by removing the large snags that would fall and become large downed logs. In addition, fuel treatments targeting small diameter project-generated fuels will remove or re-arrange some concentrations of woody debris.

Areas of fire impacted habitat that will remain untreated, will provide an alternative supply of woody debris in some areas.

For PCE 4 Dispersal Habitat, the project will affect the habitat components *some roosting structures and foraging habitat to allow for temporary resting and feeding during the transience phase*. Felling of fire-killed trees will reduce potential perch sites from within foraging and dispersal habitat. In addition, it will reduce these habitat features from within non-suitable NSO habitat, making them unavailable as future stands develop.

Future Beneficial Effects for NSO and its Habitat

Since the mid-1980s, the frequency and intensity high severity wildfire in the range of the NSO has increased (Miller et al. 2009, Schwind 2008, Westerling et al, 2006 cited in Davis et al. 2011). Moeur (2011) noted similar findings related to the loss of late-successional and old-growth forests favored by northern spotted owls.

The fifteen year monitoring report for the Northwest Forest Plan (Davis et al. 2011) noted that:

Although the relationship between wildfire frequency and severity on owl demography is not fully understood, habitat loss is the primary reason for the owl's decline and subsequent listing as "threatened" under the Endangered Species Act (USDI 1990). The habitat monitoring results presented in chapter 3 (this report) identified wildfire as the leading cause of current spotted owl nesting and roosting habitat loss (3.4 percent) and its future recruitment on federal lands. This was also the finding in the 10-yearmonitoring report (Davis and Lint 2005), and since completion of that report, several more large wildfires have occurred within the owl's range and more nesting/roosting habitat has been lost. Thus, loss of habitat to wildfire remains a significant concern for the management and conservation of the spotted owl.

The 2011 Recovery Plan for the northern spotted owl also noted habitat loss or degradation from stand-replacing wildfire as one of the most important range-wide threats to the northern spotted owl (USFWS 2011). Davis et al. (2012) mapped areas prone to future large stand-replacing fires, noting the Klamath Province as one of the geographic areas most likely to experience large (>1,000 acres) stand-replacing fires in the future. Verifying this trend, in the wildfires that occurred in the 2014 Westside Fire Recovery Project area (Beaver, Whites, and Happy Camp fires) over 7,000 acres of functioning nesting-roosting habitat and 9,600 acres of foraging habitat were lost to stand-replacement fire. Thus, it is well established that stand-replacing, high intensity wildfire negatively affects NSO habitat within the Klamath Province and that the potential for future habitat losses in the Klamath Province is high. Given probable climate change scenarios, the rate of habitat loss from stand-replacement fire is likely to increase.

Recovery Action 10 in the NSO Recovery Plan directs agencies to consider both the short-term adverse impacts of fuels treatments and other activities, and long-term benefits (USFWS 2011). Long-term benefits include reducing the risk of future habitat loss from stand-replacing fire and actions that accelerate the development of regenerating habitat.

Although the previous sections of this document identify the more clearly discernible effects of the project on NSO and its habitat, there are several other potential beneficial effects that are difficult to estimate given the unpredictable nature of fire. The following project activities may have long-term benefits to NSO habitat because these treatments can reduce fire intensity and severity and enhance future fire management activities, including fire suppression, managing unplanned ignitions, and implementation of prescribed fire.

Salvage Harvest: This action reduces heavy fuel loading that contributes to future resistance to control, and increased fire severity (Peterson 2014). The lack of salvage can increase the amount of fuels in areas of high severity fire, especially after the dead trees fall to the ground. These accumulated fuels could contribute to the intensity of fire and promote the spread of the fire into adjacent habitat.

Fuel Management Zones (FMZ): This action reduces the probability of large stand replacement fire spreading from one drainage to another by providing pre-constructed zones in strategic locations. These pre-constructed zones provide locations for rapid fire-line construction and burnout operations that would otherwise consume limited fire management resources and time during a fire. FMZs play a critical role in contributing to fire suppression success.

Roadside Fuels Reduction: In combination with FMZs which typically occur on the ridgeline, roadside fuels reduction can provide fuel breaks at multiple slope positions before fire reaches the ridgeline. This action reduces the spread of large stand replacement fires by providing wide fuel-breaks associated with roads. In addition, roadside fuels reduction helps maintain ingress and egress for suppression efforts and, similar to Fuels Management Zones, provides pre-treated areas where fuels have been reduced. This contributes to reduced fire intensity along the treated roads and increases the probability of successful suppression.

Understory Prescribed Fire: Underburning consumes surface fuels and reduces fuel-ladders that contribute to crown fires. Crown fires are typically responsible for removing the upper canopy, thus resulting in a loss of NSO habitat. Future fires are less likely to become high-intensity, stand-replacing events where surface and ladder fuels have been reduced, thus avoiding the loss of suitable NSO habitat.

Roadside Hazard Removal: Maintaining access is a key element of effective fire suppression. Roadside hazard removal on strategic roads reduces hazards along roads for ingress and egress for fire suppression access, which benefits NSO habitat through more effective and timely suppression of high severity, stand replacing fire.

Site Preparation and Planting: This action provides additional seed source for areas with large patches of high severity burn. It is possible for conifer forests that experience high severity fire to provide seedlings, however, this isn't necessarily a guarantee. Likewise, planting isn't necessarily a guarantee, but the combination of reducing fuels and planting seedlings of a variety of species will likely increase the chance that planted seedlings and natural regeneration may reach maturity.

X. Determinations of Effects

Species Not Affected by the Proposed Project

As stated in the Introduction, the following species were considered and found to either not occur within the project area (no available suitable habitat) or not be affected because their habitat lays outside the affected units or the project will not occur within the range of the species. The following species will not be affected by the proposed project (Table G-26) for the reasons listed:

Table G-26: Species Not Affected by the Proposed Project

Species	**Reason for** No Effect **Determination**
Gray wolf (*Canis lupus*)	Based on the best available scientific and commercial information, this species is not known to occur on the analysis area.
Shasta crayfish (Pacifastacus fortis)	Based on the best available scientific and commercial information, this species' range is outside of the analysis area.
Oregon spotted frog (*Rana pretiosa)*	Based on the best available scientific and commercial information, this species' range is outside of the analysis area.
Marbled Murrelet **(***Brachyramphus marmoratus)*	Based on the best available scientific and commercial information, this species' range is outside of the analysis area.

Northern Spotted Owl

The proposed activities are ***likely to adversely affect*** the northern spotted owl for the following reasons:

The analysis area contains 85 activity centers, or 28 % of the ACs on the west side of the Forest. Of these 85 ACs, 55 of these have "Likely to Adversely Affect" determinations. Therefore, a total of about 65% of the ACs in the analysis area, and 18 % of all activity centers on the west side of the KNF[16,] will be adversely affected by the proposed activities.

There are 26 activity centers with "*May Affect, Not Likely to Adversely Affect*", or 31% of the ACs in the analysis area, and 4 activity centers with "*No Effect*" determinations.

Northern Spotted Owl Critical Habitat

The PCEs of northern spotted owl critical habitat are ***Likely to be Adversely Affected*** by the proposed project. The removal of large snags across a widely affected area of critical habitat, impacting four subunits, of a magnitude and scale that is not insignificant or discountable.

[16] On the west side of the Forest there are about 306 activity centers (from NRIS database and CNDDB combined with overlapping cores counted only once), excluding the Ukonom district.

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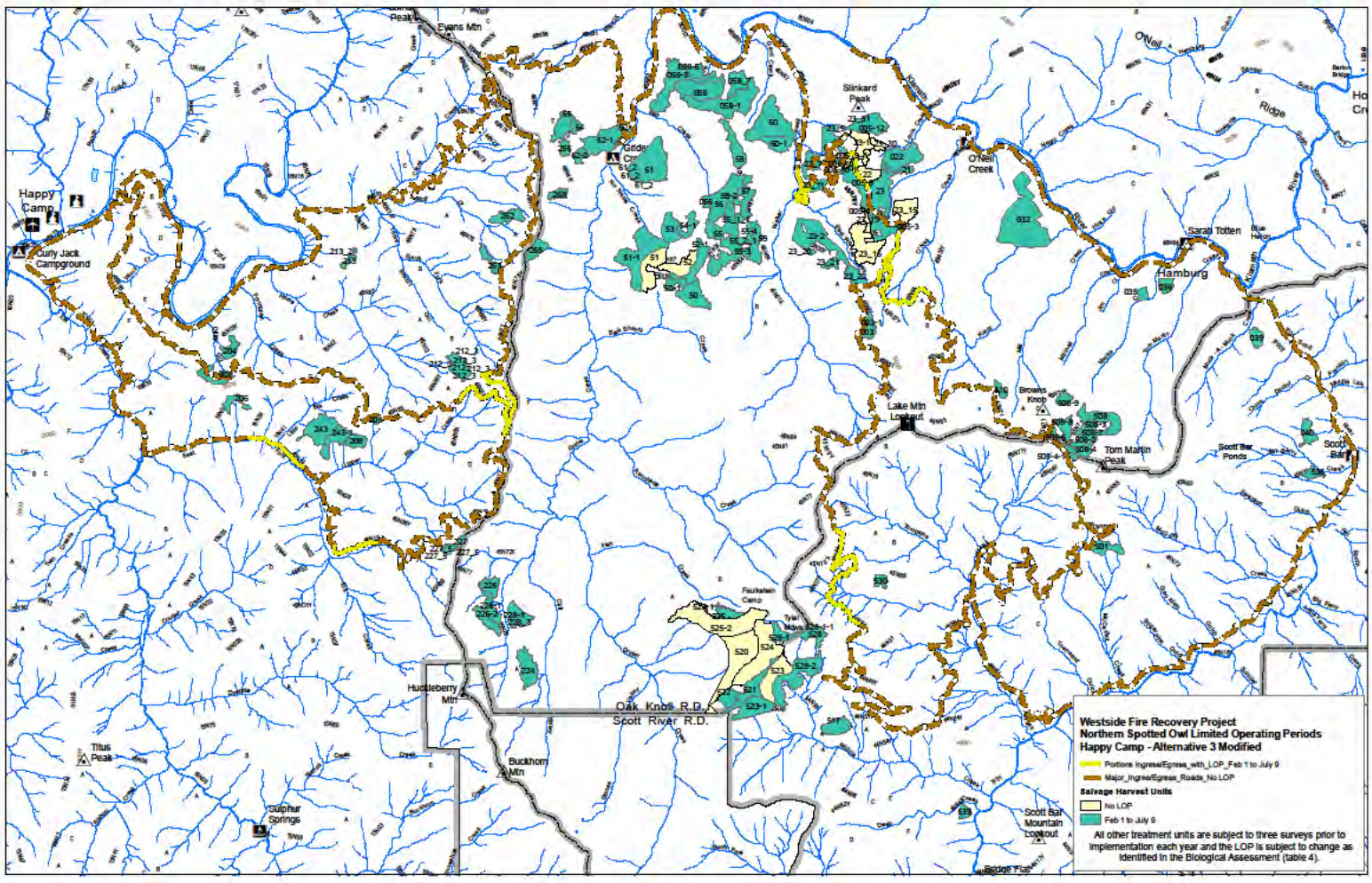
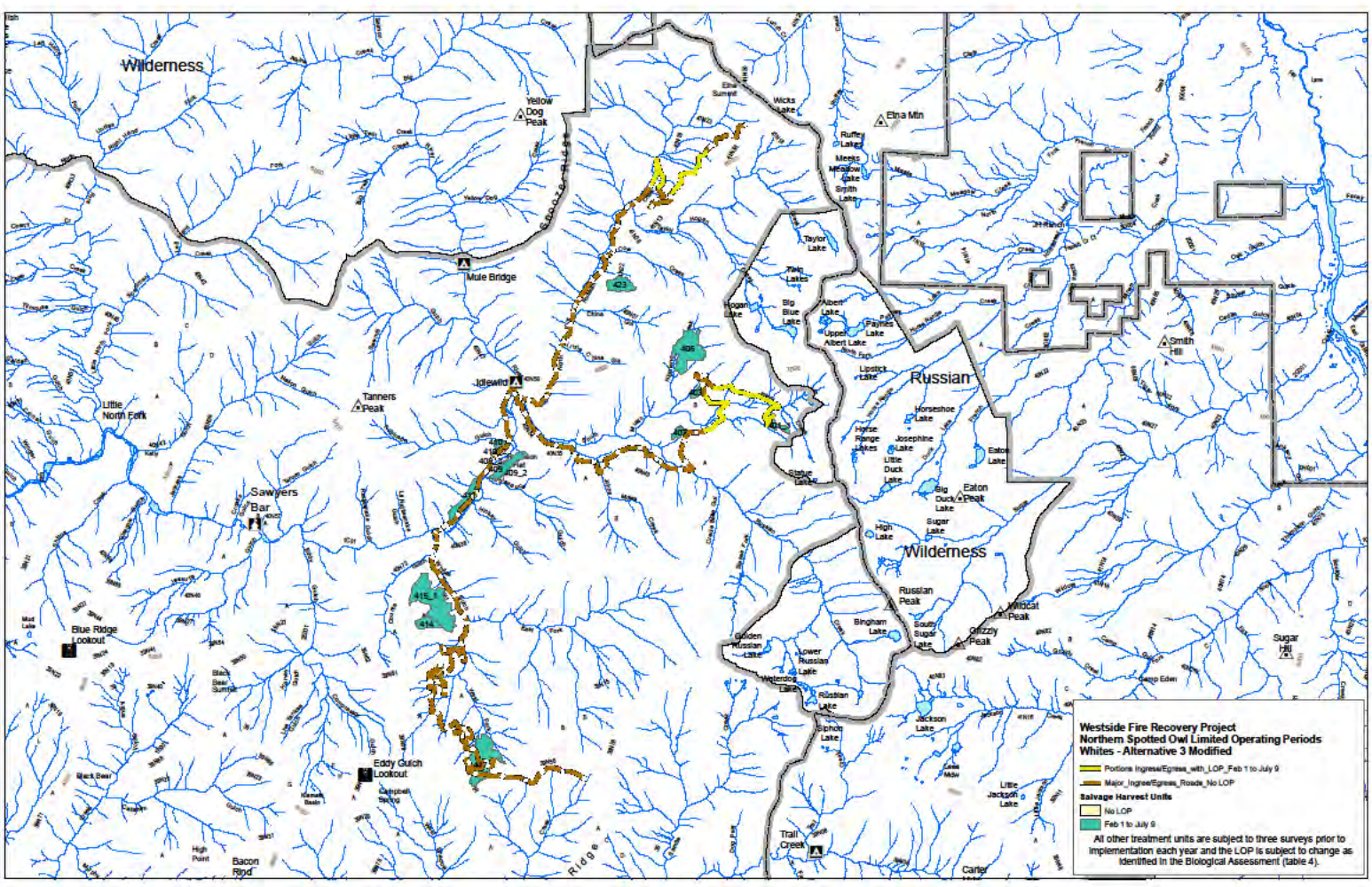

Happy Camp
Curly Jack Campground
Evans Mtn
Stinkard Peak
O'Neil Creek
Garati Totten
Hamburg
Lake Mtn Lookout
Browns Knob
Tom Martin Peak
Scott Bar Ponds
Scott Bar
Huckleberry Mtn
Oak Knob R.D.
Scott River R.D.
Titus Peak
Buckhorn Mtn
Sulphur Springs
Scott Bar Mountain Lookout
Westside Fire Recovery Project
Northern Spotted Owl Limited Operating Periods
Happy Camp - Alternative 3 Modified
Portions Ingress/Egress_with_LOP_Feb 1 to July 9
Major_Ingress/Egress_Roads_No LOP
Salvage Harvest Units
No LOP
Feb 1 to July 9
All other treatment units are subject to three surveys prior to implementation each year and the LOP is subject to change as identified in the Biological Assessment (table 4).


Wilderness
Yellow Dog Peak
Etna Mtn
Mule Bridge
Idlewild
Tanners Peak
Little North Fork
Sawyers Bar
Blue Ridge Lookout
Eddy Gulch Lookout
Bacon Ridge
Russian
Wilderness
Smith Hill
Sugar Hill
Trail Creek
Westside Fire Recovery Project
Northern Spotted Owl Limited Operating Periods
Whites - Alternative 3 Modified
Portions Ingress/Egress_with_LOP_Feb 1 to July 9
Major_Ingress/Egress_Roads_No LOP
Salvage Harvest Units
No LOP
Feb 1 to July 9
All other treatment units are subject to three surveys prior to implementation each year and the LOP is subject to change as identified in the Biological Assessment (table 4).

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Appendix A

Table G-27: Pre-fire NSO habitat within the core and home range (Originally Table A-1 in the Wildlife BA)

Activity Center Number	0 - 0.5 mi Radius		0.5- 1.3 mi Radius Total		Total NRF (0 - 1.3 mile)
	NRF	D	NRF	D	
0229	181	86	714	514	895
0239	138	123	399	470	537
0241	348	112	1,222	1,105	1,570
0245	48	14	699	239	747
0247	299	106	722	992	1,021
0252	67	275	347	1,525	414
0254	214	79	197	738	411
0255	110	222	865	1,172	975
0257	445	19	1,470	540	1,914
0272	450	32	2,076	696	2,526
0277	261	180	857	953	1,118
0283	372	57	781	791	1,153
0284	76	249	793	1,026	868
0293	138	100	988	1,000	1,126
0315	327	93	1,580	528	1,907
0322	356	24	1,190	504	1,546
0346	144	203	574	948	719
0365	151	210	1,145	1,177	1,296
0380	348	102	904	658	1,251
0381	189	190	878	733	1,067
0383	239	109	1,064	755	1,302
0499	340	62	1,185	494	1,525
0567	241	132	735	689	976
1027	129	193	1,561	935	1,690
1028	247	207	1,271	1,355	1,517
1029	324	35	1,999	437	2,323
1030B	406	80	1,493	827	1,899
1039	411	31	1,775	610	2,186
1040	329	114	1,776	730	2,105
1041	311	43	1,657	429	1,968
1046	274	131	1,202	875	1,475
1047B	331	88	1,195	849	1,525
1100	225	131	771	1,148	996
1101	473	9	2,401	170	2,874
1109	284	120	1,032	1,017	1,315
1110	215	201	698	1,121	912
1111	38	174	402	1,111	440
1112B	196	158	1,314	992	1,510
1116	491	6	2,589	180	3,080
1117	349	122	2,026	607	2,375
1119	422	56	1,813	787	2,236
1121	395	77	1,602	761	1,997
1122	194	160	1,336	902	1,530
1130	331	71	1,892	611	2,223
1164	283	58	1,309	657	1,592
1202	344	82	1,439	729	1,783
1212	207	136	1,174	803	1,380
1213	238	74	1,216	816	1,454
1214	284	44	1,112	848	1,396

Activity Center Number	0 - 0.5 mi Radius		0.5- 1.3 mi Radius Total		Total NRF
1258	334	84	1,461	1,084	1,795
1265	337	91	1,852	870	2,189
1266	387	112	1,644	1,050	2,031
2124	113	169	735	1,184	849
4026	150	300	1,294	1,452	1,443
4099	320	65	1,310	682	1,630
4128	205	203	536	1,131	742
4129	69	42	380	776	449
4133	229	204	1,282	1,064	1,511
4143	303	106	1,240	888	1,542
4144	100	76	301	688	401
4145	262	90	827	697	1,089
4146	257	122	770	1,005	1,028
9990	231	74	771	712	1,002
9991	319	29	1,203	611	1,522
9992	244	109	552	1,010	796
9993	169	103	435	417	604
9994	181	94	539	360	720
9995	246	73	1,315	523	1,560
9996	164	149	864	1,104	1,028
9998	303	103	874	764	1,177
9999	333	151	2,073	483	2,406
99910	396	27	1,540	755	1,936
99912	339	68	1,710	711	2,049
99913	214	105	924	1,001	1,138
99914	105	135	394	830	499
99915	160	283	1,143	958	1,303
0096A	279	127	1,130	961	1,409
0276A	203	217	746	1,199	949
0276B	120	222	870	1,243	990
0278A	295	139	593	764	888
0278B	219	82	593	926	812
NEW3A	139	272	1,598	1,061	1,737
NEW3B	326	49	1,309	983	1,636
NEW7A	139	226	962	832	1,101
NEW7B	97	75	1,279	715	1,376

Table G-28: Post-fire NSO habitat within the core and home range of activity centers in the analysis area (Originally Table A-2 from the Wildlife BA)

Activity Center Number	0 - 0.5 mile Radius					0.5- 1.3 mile Radius				
	NRF (acres)	D (acres)	FANR (acres)	PFF 1 (acres)	PFF 2 (acres)	NRF (acres)	D (acres)	FANR (acres)	PFF 1 (acres)	PFF 2 (acres)
0229	181	86	0	0	0	714	428	0	0	0
0239	138	123	0	0	0	347	236	0	0	0
0241	270	67	3	64	11	1,001	694	21	137	63
0245	48	14	0	0	0	679	214	6	13	0
0247	299	106	0	0	0	678	847	0	40	4
0252	67	275	0	0	0	347	1,250	0	0	0
0254	214	79	0	0	0	166	514	0	0	0
0255	110	222	0	0	0	861	940	0	0	0
0257	445	19	0	0	0	1,407	483	0	57	6
0272	202	30	32	159	58	1,176	343	81	535	283
0277	261	180	0	0	0	857	773	0	0	0
0283	143	15	3	109	35	199	50	6	80	47

Activity	0 - 0.5 mile Radius					0.5- 1.3 mile Radius				
0284	76	249	0	0	0	785	776	0	0	0
0293	138	100	0	0	0	983	899	0	5	0
0315	327	93	0	0	0	1,477	419	0	3	2
0322	356	24	0	0	0	1,190	481	0	0	0
0346	73	91	4	54	5	33	39	2	30	84
0365	151	210	0	0	0	1,145	967	0	0	0
0380	306	92	3	38	0	826	480	21	47	10
0381	175	184	4	11	0	820	482	4	45	9
0383	193	97	9	29	8	863	480	19	126	55
0499	340	62	0	0	0	1,179	430	0	0	0
0567	241	132	0	0	0	735	557	0	0	0
1027	117	183	2	6	3	1,300	582	33	173	54
1028	247	207	0	0	0	1,269	1,144	0	1	0
1029	286	32	3	36	0	1,649	296	21	280	49
1030B	385	72	3	18	0	1,387	512	28	379	103
1039	400	26	0	12	0	1,514	371	7	215	39
1040	243	63	19	66	2	1,481	461	44	226	25
1041	278	31	3	30	0	1,096	262	7	243	283
1046	229	62	8	36	0	924	512	18	200	30
1047B	331	88	0	0	0	1,123	645	7	49	15
1100	199	118	3	23	0	634	868	3	88	46
1101	458	9	6	8	0	2,118	121	25	245	12
1109	282	109	0	2	0	898	789	2	82	49
1110	200	189	0	14	0	664	835	4	26	3
1111	29	123	0	9	1	368	823	5	25	4
1112B	185	166	1	5	0	717	563	39	283	282
1116	401	3	18	64	9	2,168	140	50	342	29
1117	145	61	18	113	72	490	104	79	366	1,081
1119	220	11	33	123	37	552	239	98	457	706
1121	193	54	22	177	2	670	375	72	439	421
1122	117	113	0	69	9	1,014	441	28	214	80
1130	208	38	13	69	40	1,006	320	72	370	444
1164	283	58	0	0	0	1,309	599	0	0	0
1202	14	15	1	23	306	639	394	8	210	582
1212	197	117	0	9	0	1,059	583	0	102	13
1213	233	54	0	4	1	816	402	10	210	180
1214	271	40	0	12	1	1,019	766	0	80	7
1258	211	68	17	100	6	1,045	504	66	263	88
1265	50	16	12	115	161	1,025	402	87	502	238
1266	243	86	35	105	4	729	377	109	496	311
2124	113	169	0	0	0	735	1,015	0	0	0
4026	150	300	0	0	0	1,294	1,152	0	0	0
4099	283	47	0	37	0	842	334	12	279	177
4128	205	203	0	0	0	536	928	0	0	0
4129	69	42	0	0	0	380	708	0	0	0
4133	24	36	12	53	139	563	557	81	263	375
4143	121	28	3	19	0	588	384	4	16	0
4144	74	29	0	1	0	173	325	6	21	4
4145	102	29	11	51	8	184	76	4	15	19
4146	33	8	2	22	8	182	188	4	118	44
9990	151	50	0	80	1	415	324	2	208	146
9991	239	26	0	77	3	1,110	471	6	77	11
9992	240	99	0	5	0	539	880	1	11	0
9993	169	103	0	0	0	431	314	1	3	0

Activity	0 - 0.5 mile Radius					0.5- 1.3 mile Radius				
9994	174	91	1	6	0	504	246	5	27	4
9995	196	67	0	42	8	1,225	398	1	82	1
9996	160	144	0	4	0	795	910	1	64	4
9998	269	99	8	27	0	737	462	12	101	23
9999	100	29	31	76	127	1,169	156	43	363	499
99910	328	22	0	68	0	1,337	457	6	113	84
99912	278	49	5	53	3	1,562	623	10	110	28
99913	33	16	1	4	0	377	360	2	39	26
99914	17	16	1	4	0	242	355	7	23	12
99915	119	207	0	0	0	664	379	1	11	0
0096A	279	127	0	0	0	1,077	821	3	50	0
0276A	203	217	0	0	0	745	976	1	0	0
0276B	120	220	0	0	0	864	1,016	1	5	0
0278A	282	135	1	13	0	552	554	5	32	4
0278B	219	82	0	0	0	556	821	4	32	1
NEW3A	55	105	13	34	38	551	344	109	409	530
NEW3B	31	4	20	47	228	402	445	67	311	530
NEW7A	139	226	0	0	0	944	597	0	12	0
NEW7B	97	75	0	0	0	1,122	545	8	128	15

Table G-29: List of future foreseeable or ongoing actions on national forest lands in the analysis area (Originally Table A-4 from Appendix of the Wildlife BA

Project Name	Acres of Activity in Analysis Area	Current or Future Projects
Klamath National Forest Projects		
Eddy LSR	14,160	Current
Elk Thin	700	Current
Glassups	440	Current
Goff Fuels Reduction	125	Current
Happy Camp Fire Protection Phase 2	4,680	Current
Jess	570	Future
Lovers Canyon	1,400	Future
McCollins	1,160	Future
Sawyers Bar Fuels Reduction	2,550	Current
Scott Bar Mountain underburn	1,670	Current
Thom Seider	18,700	Current

Appendix B: Consistency of Project with NSO Recovery Plan

WESTSIDE FIRE RECOVERY PROJECT COMPLIANCE WITH RECOVERY ACTIONS IN THE *2011 REVISED RECOVERY PLAN FOR THE NORTHERN SPOTTED OWL*

Recovery Action 1: For each State, the FWS will designate offices that will coordinate implementation of the spotted owl recovery plan. These offices will work with local and regional partners to best ensure actions taken within that management jurisdiction are meeting the intention of the recovery plan while taking local context and variation into account. The Oregon Fish and Wildlife Office will remain the overall lead for the species and provide technical assistance and oversight to the other FWS offices as needed. We have established and lead an interagency and interorganizational Northern Spotted Owl Implementation Team (NSOIT) designed to help coordinate implementation of this Revised Recovery Plan throughout the range of the species.

- This RA is not applicable at the project analysis level.

Recovery Action 2: Continue annual monitoring of the population trend of spotted owls to determine if the population is decreasing, stationary or increasing. Monitoring in demographic study areas is currently the primary method to assess the status of populations of spotted owls. Other statistically valid monitoring methods (*i.e.*, analytically robust and representative of the entire province and range) may be possible and could potentially fulfill this recovery action.

- This RA is not applicable at the project analysis level.

Recovery Action 3: Conduct occupancy inventory or predictive modeling needed to determine if Recovery Criteria 1 and 2 have been met. It is expected this inventory will begin when it appears the spotted owl is close to meeting Recovery Criterion 1. Modeling techniques have improved recently, so predictive modeling may be part of the methodology for estimating spotted owl occupancy across the range.

- This RA is not applicable at the project analysis level because it refers primarily to the demographic monitoring areas.

Recovery Action 4: Use the habitat modeling process described above and in Appendix C to identify and implement recovery actions and conservation measures that would contribute to spotted owl recovery, including testing the efficacy of various habitat conservation network scenarios at conserving spotted owl habitat. Use the results from this effort to inform decisions concerning the possible development of habitat conservation networks.

- This RA is not applicable at the project analysis level.

Recovery Action 5: – Consistent with Executive Order 3226, as amended, the Service will consider, analyze and incorporate as appropriate potential climate change impacts in long-range planning, setting priorities for scientific research and investigations, and/or when making major decisions affecting the spotted owl.

- This RA is not applicable at the project analysis level.

Recovery Action 6: In moist forests managed for spotted owl habitat, land managers should implement silvicultural techniques in plantations, overstocked stands and modified younger stands to accelerate the development of structural complexity and biological diversity that will benefit spotted owl recovery.

- This RA is not applicable because the project lies outside Regions that the Recovery Plan considers as including “moist forests”.

Recovery Action 7: Create an interagency Dry Cascades Work Group that is available to assist land managers in developing and evaluating landscape-level recovery strategies for the Eastern Washington, Eastern Oregon, and California Cascades Provinces, including monitoring and adaptive management actions.

- This RA is not applicable at the project analysis level.

Recovery Action 8: In Eastern Washington, Eastern Oregon and California Cascades Provinces, analyze existing data on spotted owl occupancy pre- and post-fire and establish a consistent database to track owl occupancy response to fires across the dry Cascades provinces.

- This RA is not applicable at the project analysis level.

Recovery Action 9: Create an interagency Klamath Province Work Group that is available to assist land managers in developing and evaluating landscape-level recovery strategies for the

Oregon and California Klamath physiographic province, which include monitoring and adaptive management actions.

- This RA is not applicable at the project analysis level.

Recovery Action 10: - Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population.

- This addressed in the body of the document above in Table G-2.

Recovery Action 11: When vegetation management treatments are proposed to restore or enhance habitat for spotted owls (e.g., thinnings, restoration projects, prescribed fire, etc.), consider designing and conducting experiments to better understand how these different actions influence the development of spotted owl habitat, spotted owl prey abundance and distribution, and spotted owl demographic performance at local and regional scales.

- The Westside Fire Recovery project addresses this RA by proposing treatments such as planting conifer species in areas burned at high severity in order to accelerate the development of the overstory. In addition, fuels treatments are designed to protect the surrounding unburned habitat by providing breaks in the fuels where suppression actions can be undertaken more quickly and effectively during the next fire event. Removing hazard trees along roads that are the main ingress and egress during suppression actions also serves to accelerate the response time and increase the safety for fire fighters. Salvage harvest removes high fuel loading in order to allow the forest to regenerate as conifer rather than reverting to a brush stand with each fire that occurs in the area.

Recovery Action 12: In lands where management is focused on development of spotted owl habitat, post-fire silvicultural activities should concentrate on conserving and restoring habitat elements that take a long time to develop (e.g., large trees, medium and large snags, downed wood). Examples of areas where we believe this recovery action would greatly benefit future spotted owl habitat development include such fire-affected areas as the Biscuit fire, the Davis fire and the B&B complex.

- This RA is addressed in the body of the document above in Table G-2.

Recovery Action 13: Standardize province-specific habitat definitions across the range of the spotted owl using a collaborative process.

- This RA is not applicable at the project analysis level. However, the KNF is eager to cooperate in establishing habitat definitions for provinces that occur on the Forest.

Recovery Action 14: Encourage applicants to develop Habitat Conservation Plans and Safe Harbor Agreements that are consistent with the recovery objectives.

- This RA is not applicable because it applies to Private Property owners and the U.S. Fish and Wildlife Service.

Recovery Action 15: The Service will solicit individual recommendations from stakeholders to develop a comprehensive set of tools and business and economic incentives that facilitate creative opportunities for nonfederal landowners to engage in management strategies consistent with the recovery objectives.

- This RA is not applicable because it applies to Private Property owners and the U.S. Fish and Wildlife Service.

Recovery Action 16: Federal, State, and local managers should consider long-term maintenance of local forest management infrastructure as a priority in planning and land management decisions.

- This RA is not applicable because it applies to Private Property owners and the U.S. Fish and Wildlife Service.

Recovery Action 17: Monitor for sudden oak death and avian diseases (e.g., WNV, avian flu, Plasmodium spp.) and address as necessary.

- This RA is not applicable at the project analysis level. Nonetheless, the KNF is eager to cooperate in monitoring sudden oak death and avian diseases as related to the spotted owl.

Recovery Action 18: The Washington State Forest Practices Board (Board) should use the final recovery plan and the habitat modeling tool to inform the process currently underway to identify areas on non-federal lands in Washington that can make strategic contributions to spotted owl conservation over time. The Service encourages timely completion of the Board's efforts and will be available to assist as necessary.

- This RA is not applicable because it applies to Private Property owners, the Washington State Forest Practices Board, and the U.S. Fish and Wildlife Service.

Recovery Action 19: The Service will request the cooperation of Oregon Department of Forestry in a scientific evaluation of: (1) the potential role of State and private lands in Oregon to contribute to spotted owl recovery; and (2) the effectiveness of current Oregon Forest Practices in conserving spotted owl habitat and meeting the recovery goals identified in this Revised Recovery Plan. Based on this scientific evaluation, the Service will work with the Oregon Department of Forestry and other individual stakeholders to provide specific recommendations for how best to address spotted owl conservation needs on Oregon's non-federal lands.

- This RA is not applicable because it applies to the Oregon Department of Forestry, Private Property owners, and the U.S. Fish and Wildlife Service.

Recovery Action 20: The Service will request the cooperation of CAL FIRE and individual stakeholders in an evaluation of: (1) the potential recovery role of spotted owl sites and high-quality habitat on nonfederal lands in California, and (2) evaluation and implementation of appropriate conservation tools (e.g., carbon sequestration, Habitat Conservation Plans, Safe Harbor Agreements) to assist with supporting spotted owl recovery actions outlined in this Recovery Plan.

- This RA is not applicable because it applies to CAL FIRE and the U.S. Fish and Wildlife Service.

Recovery Action 21: The Service will provide technical assistance to the California Board of Forestry and Fire Protection and CAL FIRE to develop scientifically based and contemporary Forest Practice Rules to provide for the breeding, feeding and sheltering of spotted owls.

- This RA is not applicable because it applies to the California Board of Forestry and Fire Protection, CAL FIRE, and the U.S. Fish and Wildlife Service.

Recovery Action 22: If barred owl removal is determined to be effective, work with the State of California to explore options for managing barred owls using lethal means.

- This RA is not applicable because it applies to the State of California and the U.S. Fish and Wildlife Service.

Recovery Action 23: Analyze existing data sets from the demographic study areas relative to the effects of barred owls on spotted owl site occupancy, reproduction, and survival.

- This RA is not applicable at the project analysis level. Nonetheless, the KNF is eager to cooperate with any analyses of existing data sets.

Recovery Action 24: Establish protocols to detect barred owls and document barred owl site status and reproduction.

- This RA is not applicable at the project analysis level. Nonetheless, the KNF is eager to cooperate in barred owl detection protocols.

Recovery Action 25: Ensure that protocols adequately detect spotted owls in areas with barred owls.

- This RA is not applicable at the project analysis level.

Recovery Action 26: Analyze resource partitioning of sympatric barred owls and spotted owls.

- This RA is not applicable at the project analysis level. Nonetheless, the KNF is eager to cooperate in the study of spotted owl and barred owl resource partitioning.

Recovery Action 27: Create and implement an outreach strategy to educate the public about the threat of barred owls to spotted owls.

- This RA is not applicable at the project analysis level. Nonetheless, the KNF is eager to cooperate in outreach to the public concerning all forest management issues.

Recovery Action 28: Expedite permitting of experimental removal of barred owls.

- This RA is not applicable at the project analysis level. The removal of barred owls is an issue between the U.S. Fish and Wildlife Service and the State of California.

Recovery Action 29: Design and implement large-scale control experiments to assess the effects of barred owl removal on spotted owl site occupancy, reproduction, and survival.

- This RA is not applicable at the project analysis level. Nonetheless, the KNF is eager to cooperate in experiments to assess the effects of barred owl removal on spotted owl site occupancy, reproduction, and survival.

Recovery Action 30: Manage to reduce the negative effects of barred owls on spotted owls so that Recovery Criterion 1 can be met.

- The Project is consistent with this RA because habitat features that benefit the spotted owl will be maintained. Actions that influence the barred owl are not a part of this project.

Recovery Action 31: Develop mechanisms for landowners and land managers to support barred owl management using a collaborative process.

- The Project is consistent with this RA because, during the consultation process related to the Endangered Species Act, the KNF collaborates with the U.S. Fish and Wildlife Service on all projects that could potentially impact the spotted owl.

Recovery Action 32: Because spotted owl recovery requires well distributed, older and more structurally complex multi-layered conifer forests on Federal and non-federal lands across its range, land managers should work with the Service as described below to maintain and restore such habitat while allowing for other threats, such as fire and insects, to be addressed by restoration management actions. These high-quality spotted owl habitat stands are characterized as having large diameter trees, high amounts of canopy cover, and decadence components such as broken-topped live trees, mistletoe, cavities, large snags, and fallen trees.

- This RA is addressed in the body of the document above in Table G-2.

Recovery Action 33: Develop a post-delisting monitoring plan ready for implementation with the States of Washington, Oregon, and California (ESA 4(g)(1)). Such a plan is necessary to meet the requirements of the ESA.

- This RA is not applicable at the project analysis level. Nonetheless, the KNF is eager to cooperate in the development of a post-delisting monitoring plan.

Appendix C: Summary of Survey Data for the Westside Fire Recovery Project Analysis Area

Table G-30: Summary Table of Survey Data for the Westside Fire Recovery Project Analysis Area

Site Name	AC number	Basis for AC Creation	Last Year of Detection	Best Status for Site	Last Nest	Status in 2013 or 2014	Barred Owl Detected 17	NRIS Data	CNDDB Data
Lower South Fork Kelsey Creek	0096	Pair 1991	1997	Pair 1997	Unknown	Not Surveyed	No	Yes	Yes
Buckhorn Creek	0239	Repro 1991	1991	Repro 1991	1991	Not Surveyed	No	Yes	Yes
Grider Campground	0241	Pair 1988	1991	Repro 1991	1991	Not Surveyed	No	Yes	Yes
Bear Creek	0245	Pair 1991	1996	Repro 1992	1992	Not Surveyed	No	Yes	Yes
Kelsey Creek	0247	Repro 1991	2012	Repro 1995	1995	Not Surveyed	No	Yes	Yes
Negro Creek	0252	Single 1983	2003	Pair 2003	Unknown	Not Surveyed	No	Yes	Yes
Woodchopper Gulch	0254	Pair 1991	1998	Repro 1994	1994	Not Surveyed	No	Yes	Yes
Pat Ford Creek	0255	Single 1981	2001	Single 2001	Unknown	Not Surveyed	Yes	Yes	Yes
Upper West Fork Sixmile Creek	0257	Single 1990	2008	Repro 1991	1991	Not Surveyed	No	Yes	Yes
Tom Martin	0272	Pair 1992	1992	Pair 1992	Unknown	Not Surveyed	No	Yes	Yes
Malone Creek 1	0276A	Pair 1992	1999	Pair 1999	Unknown	Not Surveyed	No	Yes	Yes
Malone Creek 2	0276B	Pair 1992	1992	Pair 1992	Unknown	Not Surveyed	No	No	Yes
Bishop Creek/Titus Peak	0277	Single 1992	2003	Repro 1999	1999	Not Surveyed	No	Yes	Yes
Doolittle Elk 1	0278A	Pair 1981	2002	Pair 1996	Unknown	Not Surveyed	No	Yes	Yes
Doolittle Elk 2	0278B	Pair 1992	1992	Pair 1992	Unknown	Not Surveyed	No	Yes	Yes
Wesf Fork Doggett Creek	0283	Single 1989	2010	Repro 2002	2002	Not Surveyed	No	Yes	Yes
Bear Creek	0284	Pair 1990	2009	Repro 1991	1991	Not Surveyed	No	Yes	Yes
Stanza Creek	0293	Single 1981	2003	Pair 1992	Unknown	Not Surveyed	No	No	Yes
West Fork Beaver	0315	Pair 1993	1998	Repro 1997	1997	Not Surveyed	No	Yes	Yes
Windy Camp	0322	Pair 1997	1997	Pair 1997	Unknown	Not Surveyed	No	No	Yes
Kohl Creek (Lower)	0346	Single 1974	2010	Pair 1995	Unknown	Not Surveyed	No	Yes	Yes
Trail Gulch	0350	Pair 1994	1996	Repro 1996	1996	Not Surveyed	No	Yes	Yes
Cougar Creek	0381	Single 1981	2007	Repro 2003	2003	Not Surveyed.	Yes	Yes	Yes
Dead Cow Creek	0499	Pair 1997	1997	Pair 1997	Unknown	Not Surveyed	No	No	Yes

[17] Barred owls surveys were not conducted in the project area, but during NSO surveys, barred owls may be incidentally detected. This column represents the incidental detections of barred owls.

Site Name	AC number	Basis for AC Creation	Last Year of Detection	Best Status for Site	Last Nest	Status in 2013 or 2014	Barred Owl Detected 17	NRIS Data	CNDDB Data
Cade Creek	0567	Single 1996	2006	Single 2006	Unknown	No Response	Yes	Yes	Yes
West Whites	1027	Single 2007	2010	Single 2010	Unknown	Not Surveyed	No	Yes	Yes
Shadow Creek	1028	Single 1987	2008	Pair 1991	Unknown	Not Surveyed	No	Yes	Yes
Lower East Fork Whites Gulch	1029	Single 1989	1992	Single 1992	Unknown	Not Surveyed	No	No	Yes
Upper East Fork Whites Gulch	1030	Single 1981	2007	Repro 1986	2007	Not Surveyed	No	Yes	Yes
Russian Creek	1039	Pair 1989	1995	Repro 1991	1995	No Response	No	Yes	Yes
Applesauce Gulch	1040	Pair 1981	1999	Pair 1988	1999	No Response	No	Yes.	Yes
Music Creek	1041	Pair 1983	2014	Repro 2013	2013	Repro 2013. Pair 2014	No	Yes.	Yes
Cow Creek	1046	Repro 1985	2009	Repro 1985	1985	No Response	No	Yes	Yes
Etna Summit	1047	Pair 1986	2013	Repro 20013	2013	Repro 2013. Active 2014	No	Yes	Yes
Lower West Fork Tomkins Creek	1100	Single 1980	1997	Repro 1996	1996	Not Surveyed	No	Yes	Yes
Cliff Valley	1101	Single 1980	1994	Repro 1990	1990	Not Surveyed	No	Yes	Yes
West Fork Tomkins Creek	1109	Pair 1985	1997	Pair 1997	Unknown	Not Surveyed	No	Yes	Yes
Tomkins Creek	1110	Single 1980	1991	Repro 1988	1988	Not Surveyed	No	Yes	Yes
East Fork Tomkins Creek	1111	Repro Pair 1980	1989	Repro 1985	1985	Not Surveyed	No	Yes	Yes
Walker Creek	1112	Pair 1986	2008	Repro 1988	1988	Not Surveyed	No	Yes	Yes
Fish Creek (Grider)	1116	Single 1988	1990	Pair 1990	Unknown	Not Surveyed	No	Yes	Yes
Rancheria Creek	1117	Single 1980	1990	Repro 1989	1989	Not Surveyed	No	No	Yes
North Fork Rancheria Creek	1119	Pair 1989	1989	Pair 1989	Unknown	Not Surveyed	No	Yes	No
Bark Shanty	1121	Single 1981	1992	Repro 1992	1992	Not Surveyed	No	Yes	Yes
Limestone Bluffs	1122	Pair 1985	1989	Pair 1989	Unknown	Not Surveyed	No	Yes	Yes
O'Neil Creek	1130	Single 1988	2012	Repro 2012	2012	Not Surveyed	No	Yes	Yes
Tyler Meadows	1202	Single 1980	1996	Pair 1996	Unknown	Not Surveyed	No	Yes	Yes
Happy Horse	1212	Single 1982	2014	Repro 2007	2007	Single	Yes	Yes	Yes
Upper Elk Creek	1213	Single 1980	1995	Repro 1990	1990	Not Surveyed	No	Yes	Yes

Site Name	AC number	Basis for AC Creation	Last Year of Detection	Best Status for Site	Last Nest	Status in 2013 or 2014	Barred Owl Detected 17	NRIS Data	CNDDB Data
Lower Three Biscuit	1214	Pair 2007	2014	Repro 2009	2009	Single	No	Yes	Yes
Hickey Gulch	1258	Single 1981	1991	Pair 1991	Unknown	No Response	No	Yes	Yes
No Name Creek	1265	Pair 1992	2007	Pair 1992	Unknown	Not Surveyed	No	Yes	Yes
Salt Creek Grider	1266	Single 1992	2012	Repro 2012	2012	Not Surveyed	No	Yes	Yes
Dona Creek	2124	Repro 1990	2003	Repro 1991	1991	No Response	No	Yes	Yes
Lower West Fork Sixmile Creek	4026	Pair 1990	1991	Pair 1990	Unknown	Not Surveyed	No	Yes	Yes
Middle Creek (Scott)	4099	Pair 1985	2001	Pair 2001	Unknown	Not Surveyed	No	Yes	Yes
Lime Gulch	4128	Single 1980	2011	Pair 1991	Unknown	Surveyed but not to six visit protocol due to illegal activity in area; however ACS and four SC yielded No Response	No	Yes	Yes
Cherry Flat	4129	Pair 1991	1991	Pair 1991	Unknown	No Response	No	Yes	Yes
Louie Creek	4133	Pair 1980	2007	Repro 1980	Unknown	Not Surveyed	No	Yes	Yes
Fish Trap Creek	4143	Pair 1990	1995	Repro 1991	1991	Not Surveyed	No	Yes	Yes
Miller Gulch	4144	Pair 1992	1995	Repro 1994	1995	Not Surveyed	No	Yes	Yes
Doggett Creek	4145	Pair 1993	2004	Repro 1999	1999	Not Surveyed	No	Yes	Yes
Kohl Creek 1 (Upper)	4146	Pair 1986 CNDDB Data.	2010	Repro 2010	2010	Not Surveyed	No	Yes	Yes
McGuffy Creek	9990	Single 1990	1990	Single 1990	Unknown	Not Surveyed	No	Yes	Yes
Horse Creek	9991	Repro 2013	2013	Repro 2013	2013	Repro	Yes	Yes	No
Wood Creek	9992	2002 Single	2002	Single 2002	Unknown	No Response	No	Yes	Yes
Stanza Creek	9993	1981 Single	1991	Single 1991	Unknown	Not Surveyed	No	Yes	Yes
Huckleberry	9994	Pair 1992	1992	Pair 1992	Unknown	Not Surveyed	No	Yes	Yes
Upper Three Biscuit	9995	Repro 2011	2013	Repro 2013	2013	Repro	No	Yes	Yes
Elk Creek	9996	Single 1990	2003	Single 2003	Unknown	Not Surveyed	No	Yes	Yes
East Fork Elk	9998	Pair 1980	2002	Single 2002	Unknown	Not Surveyed	No	Yes	Yes

Site Name	AC number	Basis for AC Creation	Last Year of Detection	Best Status for Site	Last Nest	Status in 2013 or 2014	Barred Owl Detected 17	NRIS Data	CNDDB Data
Fish Creek	9999	Pair 1989	1990	Pair 1990	Unknown	Not Surveyed	No	Yes	Yes
Johns Meadows Creek	99910	Single 1991	1991	Single 1991	Unknown	Not Surveyed	No	No	Yes
Eddy Lookout	99912	Pair 1989	2009	Pair 1989	Unknown	No Response	Yes	Yes	Yes
Deer Camp Meadows	99913	Pair 1992	1999	Pair 1998	1994	Not Surveyed	No	Yes	Yes
Buckhorn	99914	Pair 1992	2003	Repro 1998	1998	Not Surveyed	No	No	Yes
Lumgrey Creek	99915	Pair 1994	1994	Pair 1994	1994	Not Surveyed	No	No	Yes
Walker 1	New 3A	Single 1992	2014	Repro 2013	2013	Repro 2013, Single 2014	No	Yes	Yes
Walker 2	New 3B	Pair 1988	2009	Pair 2009	Unknown	No Response	No	Yes	Yes
China Creek 1	New 7A	Pair 2009	2011	Pair 2009	Unknown	No Response	Yes	Yes	Yes
China Creek 2	New 7B	Single 2008	2011	Single 2011	Unknown	No Response	No	Yes	No

Appendix H: Fisheries Biological Assessment and Amendment

Fisheries Biological Assessment Submitted April 13, 2015

Biological Assessment
For
Threatened, Endangered, and Proposed Fish Species
That May be Affected by the
Westside Fire Recovery Project

Happy Camp, Oak Knoll, Salmon River and Scott River Ranger Districts

Prepared and finalized by: _____ Date: 4/13/15
Alice Berg, Consulting Fisheries Biologist
Bobbie DiMonte Miller, KNF Fisheries Program Manager

Approved by: _____ Date: 4.13.15
Patricia A. Grantham, Forest Supervisor

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PROJECT NAME: Westside Fire Recovery Project
ADMINISTRATIVE UNIT: Klamath National Forest; Happy Camp, Oak Knoll, Salmon River and Scott River Ranger Districts

FOURTH FIELD WATERSHEDS: Upper Klamath River, Scott River, Salmon River, and Lower Klamath River

FIFTH FIELD WATERSHEDS:

- Beaver Creek
- Elk Creek
- Horse Creek-Klamath River
- Humbug Creek-Klamath River
- Indian Creek
- Lower Scott River
- North Fork Salmon River
- Seiad Creek-Klamath River
- South Fork Salmon
- Thompson Creek-Klamath River
- Ukonom Creek-Klamath River

SEVENTH FIELD WATERSHEDS: See list in Appendix B and D

WATERSHED ANALYSES: See list in References

NEPA DOCUMENTATION: Westside Fire Recovery Project EIS (in progress)

ESA LISTED SPECIES: Southern Oregon/Northern California Coasts Coho salmon (*Oncorhynchus kisutch)*

ESA CRITICAL HABITAT: Southern Oregon/Northern California Coasts Coho salmon CH

ESA DETERMINATIONS: May affect, but not likely to adversely affect Southern Oregon/Northern California Coasts Coho salmon ESU or their designated CH.

ESSENTIAL FISH HABITAT (EFH): The Westside Fire Recovery Project may adversely affect EFH for Coho and Chinook salmon, specifically EFH for Southern Oregon/Northern California Coasts Coho salmon and Upper Klamath-Trinity Rivers Chinook salmon.

I. Introduction

The purpose of this biological assessment (BA) is to determine effects of the Klamath National Forest's (KNF) Westside Fire Recovery (WSFR) Project (the Project) on Coho salmon, the only anadromous fish species listed under the Endangered Species Act (ESA) within the Project Analysis Area and on designated Critical Habitat (CH) for Coho salmon. Also considered are effects on Coho and Chinook salmon Essential Fish Habitat (EFH) designated under Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA). Species listed as "sensitive" by the Pacific Southwest Region of the USDA Forest Service are analyzed in the WSFR Project Aquatic Resources Report (WSFR Project EIS, in progress).

The WSFR Project EIS includes 4 action alternatives for salvage of burned trees within three areas burned by wildfires in 2014: Beaver Fire, Happy Camp Complex and Whites Fire. Alternative 2, the proposed action, was designed to meet the purpose and need for action and will treat a total of about 63,900 acres within the 218,000 acre project boundary. As a result of public input and streamlined consultation with USFWS and NMFS, the proposed action has been changed and reduced in scope and potential environmental impact. This modified Alternative 2 is the action analyzed in this BA and is referred to as the Consultation Action.

The Analysis Area is the following 5th-field watersheds (and 7th field subwatersheds) within the three major burn areas that were affected by the 2014 fires that have proposed activities:

- Beaver Creek
- Elk Creek
- Horse Creek-Klamath River
- Humbug Creek-Klamath River
- Indian Creek
- Lower Scott River
- North Fork Salmon River
- Seiad Creek-Klamath River

- South Fork Salmon
- Thompson Creek-Klamath River
- Ukonom Creek-Klamath River

This BA is prepared in accordance with legal requirements set forth under Section 7 of the ESA of 1973, as amended, [16 U.S.C. 1531 et. seq. 50CFR 402], EFH consultation under 305 (b) (4) (A) of MSFCMA and is consistent with standards established in Forest Service Manual direction (FSM 2672.42; USFS 1991). The BA analyzes effects to the following Evolutionary Significant Units (ESUs) and EFH of anadromous fish and their habitat:

Endangered: None
Threatened: Southern Oregon / Northern California Coasts (SONCC) ESU Coho salmon
(*Oncorhynchus kisutch*) (70 FR 37160, June 28, 2005), and it's designated CH (64 FR 24049, May 5, 1999)
Proposed: None
Candidate: None
EFH: SONCC Coho salmon
Upper Klamath-Trinity (UKT) Rivers Chinook salmon (*O. tshawytscha*)

APPENDICES: Supporting documents to this BA are located in the following appendices:
Appendix A. Project maps
Appendix B Detailed tables of proposed activities and CWE model outputs
Appendix C. KNF Table of Population and Habitat Indicators
Appendix D. Environmental Baseline and Effects Checklists, 5th and 7th field watersheds
Appendix E. Project Design Features, Best Management Practices and Wet Weather Operation Standards
Appendix F. Life history and biological requirements of Pacific Salmonids
Appendix G. Summary of Project Element Effects to Coho Salmon, and Critical Habitat, by 2014 Fire Area

II. Consultation to Date

A list of Threatened, Endangered, and Candidate species was obtained online from the Arcata FWS office website on January 21, 2014 (FWS 2014). This list was used as a basis for determining which species listed under the ESA would be included in this BA.

A NMFS representative (Don Flickinger) attended field reviews with US Forest Service personnel on: 10/27/14, 12/3/14, 1/8/15, 3/5/15, and 4/3/15. The WSFR Project was discussed with D. Flickinger in detail (including map and project design feature review) at Level 1 meeting on 1/7/15 and Project interdisciplinary team meetings on 1/9/15 and 3/20/15. Information sharing and incorporation of minimization measures to protect Coho salmon continued with D. Flickinger as the project developed (from October 2014 to present). A draft BA was submitted to D. Flickinger on 4/1/15. Comments from D. Flickinger were received on 4/9/15 and 4/11/15. Comments were reviewed and discussed together on 4/10/15 and 4/13/15. The BA was finalized on 4/13/15.

III. Proposed Action

The proposed action includes five Project Elements (PEs):

- Salvage and Reforestation
- Fuels Reduction
- Hazard Tree Removal
- Temporary Roads, Landings and Water Drafting
- Legacy Site Treatments

Maps showing the locations of all PEs and Coho salmon CH are provided in Appendix A; Appendix B has detailed tables of proposed actions and Cumulative Watershed Effects modelling by 7th field watershed. Watershed Project Design Features (PDFs) were developed by watershed specialists during project development to minimize potential impacts to soils and riparian/aquatic resources; these PDFs are included in Appendix E (and the full list of PDFs is in the project FEIS).

Project Summary

Type of Project: Post-fire Salvage Harvest

PE Information (all acres are approximate):

1) Salvage and Reforestation

The WSFR Project proposes salvage harvest on about 7,829 acres within the three areas burned by the 2014 fires (Beaver Fire, Happy Camp Complex and Whites Fire). See Table 1 and 2 for acres of salvage harvest proposed by 5th field watershed). The following criteria were used to establish the areas for salvage harvest treatments: No salvage harvest within Wilderness, Backcountry, Research Natural Areas, Designated or Recommended Wild Rivers, Inventoried Roadless Areas, or RRs associated with stream channels (hydrologic RRs); areas proposed for treatment include only 1) Areas of moderate to high severity vegetation mortality (i.e. greater than 50 percent of trees fire-killed on a unit level, based on Rapid Assessment of Vegetation Condition after Wildfire (RAVG)); 2) Areas determined to be feasible in terms of logging systems, accessibility, and economics; and 3) Areas with more than 10 contiguous acres of medium to high severity vegetation mortality. Land allocations are defined in the KNF's Land and Resource Management Plan (LRMP) (USFS 1995a). In determining what individual trees will be harvested, standing dead trees 14 inches in diameter at breast height or greater will be considered for salvage using the guidelines in Report #RO-11-01 "*Marking Guidelines for Fire-Injured Trees in California*" (Smith & Cluck, 2011) to identify trees for removal. These guidelines were developed using peer reviewed scientific literature to evaluate tree species in Northern California for mortality. Treatment of slash/activity fuels associated with salvage logging may include jackpot burning, heli-torch burning, pile or windrow burning, and/or lop and scatter, as necessary. All skid trails and yarding corridors will be rehabilitated at Project conclusion, including installation of water bars, scattering slash, and other measures deemed necessary to control soil erosion and minimize potential impacts to water quality (as per BMPs and Watershed PDFs).

Salvage harvest would be accomplished using ground-based [tractor/end line], skylining, and helicopter methods. All salvage units will be reforested with the need for site-preparation evaluated per criteria outlined in site-preparation section below.

Reforestation includes site-preparation, planting, and release over approximately 7,873 acres to increase the likelihood and speed by which burned areas are reforested and will

include: manual site preparation, skyline yarding, mastication, mechanical yarding and slash piling of dead trees. Treatments within RRs are proposed within the plantation site-preparation and planting units in the Whites Fire and Happy Camp Complex to achieve ground cover and encourage natural recovery of vegetation and soils. Treatment will be focused in areas of high and moderate vegetation mortality and where the overhead hazards can be mitigated without equipment entry into RRs. Trees up to 16 inches diameter at breast height in RR may be cut and felled. Treatment will include hand-work only (no ground-based equipment) and lop-and-scatter or other fuels reduction will be implemented if fuel loading is above seven tons per acre; fuels may be hand-piled or windrowed and burned.

Table H-1. 2014 fire areas wtih acres of salvage harvest by method, acres of site preparation, and relevant minimization measures (PDFs).

	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Site Prep and Plant	1,782	5,437	654	7,873
Logging System				
Ground-based	243	595	41	879
Skyline	106	4,234	238	4,579
Helicopter	0	3,899	462	4,361
Total	**350**	**8,728**	**741**	**9,819**
Watershed PDFs	Wet weather operations PDF-1; Skid trail and erosion control: PDFs 2, 7, 8, 10, 27, 28, 29, 30 and 32; Tractor harvest limitations: PDFs 3,4,7,9,12,14 and 26; Cable harvest limitations PDFs 3, 6 and 31.			
Total Acres of RRs within Harvest Units	**1,990**			

Table H-2. Acres of salvage harvest by 5th field watershed.

Watershed	Acres
Beaver Creek	129
Elk Creek	651
Horse Creek-Klamath River	221
Humbug Creek-Klamath River	0
Lower Scott River	1619
Indian Creek	0
North Fork Salmon River	741
Lower Scott River	0
North Fork Salmon River	0
Seiad Creek-Klamath River	6107
South Fork Salmon River	0
Thompson Creek-Klamath River	350
Ukonom Creek-Klamath River	0

2) Fuels Reduction

Fuels treatments will occur on approximately 22,307 acres (Table 3) across the three burn areas and will include hand work, mechanical thinning, mastication, lop and scattering, chipping, broadcast burning, jackpot burning, and pile burning. Table 4 shows fuels treatments proposed, by 5th field watershed.

Table H-3. Summary of fuels treatment and acres.

	WSFR Project
Acres of Fuels Treatment	22,307
Acres of RRs in Units	6,206
Watershed PDFs	Prescribed fire limitations: 33, 35 and 36 Handpiling and burning limitations: 34

Table H-4. Acres of fuels treatment by type within 5th field watersheds.

Watershed	Fuels Management Zone (acres)	Roadside (acres)	Understory Prescribed Fire (acres)	WUI (acres)	Total Acres of Fuels Treatment (acres)
Beaver Creek	325	204	0	196	725
Elk Creek	800	1,426	888	224	3,336
French Creek-Scott River	0	0	0	0	0
Horse Creek-Klamath River	487	340	0	276	1,104
Humbug Creek-Klamath River	141	65	0	141	348
Indian Creek	0	0	0	0	0
Lower Scott River	637	0	59	400	1,096
North Fork Salmon River	625	807	8,979	413	10,824
Seiad Creek-Klamath River	1,186	847	278	220	2,530
South Fork Salmon River	293	0	230	0	523
Thompson Creek-Klamath River	388	736	296	246	1,666
Ukonom Creek-Klamath River	13	0	35	108	156
Total Acres	**4,895**	**4,424**	**10,765**	**2,223**	**22,307**

3) Hazard Tree Removal

Hazard tree removal will occur along an estimated 678 miles of roads (or within ~21,000 acres), including Forest Service system roads, County Roads, and State Highways to provide for public and forest worker safety and future fire suppression efforts. Both the mileage and acres of treatment proposed are a maximum; the numbers are representative of the entire length and area being evaluated for hazard tree identification and removal. Hazard trees will be identified, felled, and removed in compliance with Region 5 Hazard Tree Guidelines (USFS 2012). All trees within 250 feet of road systems will be evaluated as to hazard, regardless of burn severity. Additional guidance will be used for burned trees to determine mortality potential and, thus, need for removal (USFS 2011a). To be considered a hazard, burned trees must have a 60% or greater chance of dying. Treatment of slash associated with hazard tree abatement may include jackpot burning, pile and

windrow burning, chipping, and/or lop and scatter, as necessary. Project design features require retaining hazard trees greater than 26 inches DBH on site when they are within one site tree height distance from fish-bearing streams.

Table H-5. Acres of hazard tree removal.

	WSFR Project
Acres of Hazard Tree Removal	21,000
Miles of Road Treated	678
Acres of RR within Units	5,600
Watershed PDFs	Equipment exclusion within RRs: PDFs 4 and 13 Maintain large wood, leave felled trees: PDF 14 Maintain soil stability near streams: PDF 15 and 16

Table H-6. Acres of hazard tree removal by 5th field watershed.

Hazard Tree Removal Acres	20499
Beaver Creek	1319
Elk Creek	3772
Horse Creek-Klamath River	1388
Humbug Creek-Klamath River	410
Indian Creek	1
Lower Scott River	3811
North Fork Salmon River	2484
Seiad Creek-Klamath River	4570
South Fork Salmon River	232
Thompson Creek-Klamath River	2448
Ukonom Creek-Klamath River	65

4) Temporary Roads, Stream Crossings, Landings and Water Drafting

About 16.4 miles of temporary road actions are proposed; which involves nine stream crossings. About 3.4 miles of new temporary road would be constructed. Seven of the nine crossings are over intermittent channels: none of the stream crossings are within anadromous salmonid habitat (or resident trout habitat).

Table H-7. Summary of miles of temporary roads and number of stream crossings.

	WSFR Project Road Elements
Miles New Temp. Road	3.4
Miles Temp. Road Existing Alignment	7.3
Miles Reopened Decomm. Roads	5.6
Total Miles of Temporary Road Construction	**16.4**
# of Temp Road Stream Crossings	9
# of Temp Road Stream Crossings in anadromous salmonid habitat	0
Watershed PDFs	New temporary roads: PDFs 5, 23, 24 Watering roads: PDFS 18 Culvert replacements 20 Water drafting 37, 38.

Table H-8. Summary of temporary road miles by 5th field watershed.

5TH-FIELD	Reopen Decomm. Road	Temp. Roads Existing Roadbed	Temp. Roads New	Total Miles
Beaver Creek	0	0.8	0	0.8
Elk Creek	0.7	1.5	0.2	2.4
Horse Creek-Klamath River	0	0.4	0	0.4
Humbug Creek-Klamath River	0	0	0	0
Indian Creek	0	0	0	0
Lower Scott River	0	1.1	0.2	1.4
North Fork Salmon River	0	0.6	0.1	0.7
Seiad Creek-Klamath River	4.0	2.0	2.9	8.9
South Fork Salmon River	0	0.1	0.0	0.1
Thompson Creek-Klamath River	0.9	0.8	0	1.8
Ukonom Creek-Klamath River	0	0	0	0
Total Miles	**5.6**	**7.3**	**3.4**	**16.4**

A maximum of 75 existing landings will be used and 135 new landings will be constructed. Maps in Appendix A show locations of landings. Landing size will be commensurate with operational safety. Helicopter landings will be up to two acres in size. Skyline landings will use roads where ever possible. New skyline landings off the road system and ground-based landings will average one acre in size but will not be larger than 1.5 acres in size. Both new and existing landings will be hydrologically stabilized after use.

Table H-9. Number and type of landings within 5th field watersheds.

5th-field Watershed	Existing Landings	New Landings	Total
Ground Based Landing			
Beaver Creek	11	7	18
Horse Creek-Klamath River	14	12	26
Lower Scott River	4	3	7
North Fork Salmon River	0	0	0
Seiad-Creek-Klamath River	12	6	18
Thompson Creek-Klamath River	0	12	12
Total	**41**	**40**	**81**
Helicopter Landing			
Elk Creek		6	6
Lower Scott River	15	10	25
North Fork Salmon River	5	1	6
Seiad-Creek-Klamath River	14	29	43
Thompson Creek-Klamath River		6	6
Total	**34**	**52**	**86**
Skyline Landings			
Elk Creek		12	12
Lower Scott River		8	8
North Fork Salmon River		7	7
Seiad-Creek-Klamath River		11	11
South Fork Salmon River		1	1
Thompson Creek-Klamath River		4	4
Total		**43**	**43**
Total number of landings	**75**	**135**	**210**

5th-field Watershed	Existing Landings	New Landings	Total
New Landings in RRs	Landings # DZ03, DZ10, DZ23, L043, L044, and L090.		
Watershed PDFs	Use of existing landings: PDF 26 Expansion of landings: PDF 26 Erosion control on landings: PDF 26 Restoration of soil cover: PDF 26		

During project planning watershed specialists worked with logging systems specialists to minimize any proposed new landings in RR. Several were proposed, and not approved for use by watershed specialists who are directed to shape projects to meet direction to *maintain and restore* aquatic ecosystems. Several new landings within RR were approved for use (PDF Watershed-5). Variables that provided for field-surveyed landings to be approved for use by watershed specialists included if they were on stable landforms and slope positions, were in the outer zone of the Riparian Reserve, and/or were separated from perennial streams by existing, stable road segments. Landings in RR were not approved for use if they would require removal of mature green vegetation or significant earthwork or fill (several initially proposed landings near Walker Creek, Grider Creek, and Whites Gulch were dropped for these reasons). The following new landings in RR were approved as exceptions to PDF Watershed-5 (shown on project maps in Appendix A):

- Proposed landings **L043, L044, and DZ23** occur in RR above the 46N66 road as it heads up the hill near Grider Creek Campground. These three landings would be used to facilitate helicopter logging systems in the Grider Creek watershed.
- Proposed landing **DZ03** is within RR of the Klamath River on a barren mine tailing area about 300 feet north of the river. It would be used to facilitate helicopter logging systems in the Gard and Caroline Creek area between Walker and Grider creek confluences with the Klamath River.
- Proposed landing **L090** is within RR of upper Cliff Valley Creek. It would be used to facilitate skyline logging systems.
- Proposed landing **DZ10** is within RR of lower Scott River. It would be used to facilitate helicopter logging systems.

Water drafting will occur at existing water drafting sites (locations are shown on maps in Appendix A). The number of sites needed and locations of use are not known at this time, therefore Table 10 lists all existing sites in each 5th-field watershed that could potentially be used. Watershed PDFs (37 and 38) will be implemented to minimize effects of water drafting on sediment and aquatic species including the following: draft water only at designated water drafting sites; coordinate with KNF fisheries biologists so effects to thermal refugia are avoided; when drafting from waters designated as Coho salmon CH, implement NOAA Fisheries Water Drafting Specifications (2001) and implement Forest Service BMPs outside of CH.

Table H-10: Number of existing water drafting sites in 5th field watersheds.

5th-field Watershed	Number of Water Drafting Sites
Beaver Creek	64
Elk Creek	39

5th-field Watershed	Number of Water Drafting Sites
Horse Creek-Klamath River	108
Humbug Creek-Klamath River	27
Indian Creek	71
Lower Scott River	29
North Fork Salmon River	32
Seiad Creek-Klamath River	87
South Fork Salmon River	34
Thompson Creek-Klamath River	42
Ukonom Creek-Klamath River	41

5) Legacy Sediment Site Treatments

Legacy sediment site treatments are considered connected actions. Restoration actions would occur at existing legacy sediment sites, scheduled for treatment in compliance with the Clean Water Act as a condition of the North Coast Regional Water Quality Control Board waiver of waste discharge requirements (Order No. R1-2010-0029). Most legacy site treatments are proposed within the Elk Creek watershed, per agreements made during Clean Water Act consultation. However, project use of temporary roads would also require treatment of existing legacy sites at several sites in lower Grider Creek, Kuntz Creek, and O'Neil Creek drainages.

The portion of Elk Creek within the project area contains about 148 legacy sites and most sites are located on or adjacent to the Forest transportation system. Other legacy sites are located on historical landings or roadbeds (historic roads, abandoned temporary roads, or decommissioned roads). In lower Grider Creek drainage, an existing legacy sediment site at a perennial stream crossing on 46N41YA would be properly hydrologically stabilized after use by the project. In lower Kuntz and O'Neil creeks, project use of existing non-system roadbeds would require proper hydrologic stabilization of these areas; fixing road drainage problems would address potential risks to water quality from these roads.

Table H-11. Legacy sediment site treatments in Elk Creek Watershed.

Legacy Site Type	# of Sites
Culvert Upgrades to accommodate 100 year event	45
Diversion Prevention	51
Replace Culvert with Bottomless Arched Culvert	3
Retaining Wall	7
Fill Reduction	16
Fill Removal from stream channels, swales, shoulders on Closed Roads	27
Repair Culvert: clean and repair; place rip rap to reduced erosion	16
Road Storm Proofing	33 miles: Forest system roads (15N02, 15N75, 16N05, 16N39 and 45N19)

Legacy Site Type	# of Sites
# of Legacy Sites within CH	0

Project Timing: Project implementation is planned to begin in the summer/fall of 2015. The Project duration for salvage harvest and hazard tree abatement is anticipated to be two years, in 2015 and 2016. Fuels treatments would occur within 10 years after the WSFR Project Decision. Because burning activities are dependent upon weather conditions and staff availability, it may continue for several years following completion of the rest of the project. The schedule for legacy repair actions in Elk Creek watershed is projected to start in 2017, and will be determined through consultation with the North Coast Water Quality Control Board and funding availability.

Resource Protection Measures: The proposed action includes project design features (PDFs) designed to avoid and/or minimize potential environmental effects. Fisheries biologists and other watershed specialists developed PDFs specifically for watershed protection, and implementation of these measures is critical in avoiding adverse effects to aquatic habitat and Coho salmon in both the short and long term. Watershed PDFs are in Appendix E (see also Project EIS, Chapter 2 for the comprehensive list of PDFs).

Best Management Practices (BMPs): These practices were developed in coordination with the State of California Water Quality Control Board to protect water quality (see Appendix E).

Wet Weather Operation Standards (USFS 2002) are included within BMPs and PDFs will be used to guide operations during periods of wet weather (see Appendix E).

IV. Description of the Action Area

The WSFR Project Analysis Area includes the ~214,000 acres burned in 2014 by the Beaver Fire, Happy Camp Complex and Whites Fire. The Beaver Fire area is located north of the Klamath River near Oak Knoll, the Happy Camp Complex is south of the Klamath River between Scott Bar and Happy Camp, and the Whites Fire is upstream of Sawyers Bar, in the North Fork Salmon River basin.

The ESA Action Area is the 5th-field watersheds (and their 7th field subwatersheds or drainages) that provide habitat for Coho or Chinook salmon within the three major burn areas that have proposed activities:

- Beaver Creek
- Elk Creek
- Horse Creek-Klamath River
- Humbug Creek-Klamath River
- Lower Scott River
- North Fork Salmon River
- South Fork Salmon River
- Seiad Creek-Klamath River
- Thompson Creek-Klamath River
- Ukonom Creek-Klamath River

The Project Action Area extends downstream to the confluence of the Klamath and Salmon Rivers. The Action Area provides habitat for Southern Oregon/Northern California Coasts Coho salmon (*Oncorhynchus kisutch;* Coho salmon), listed as Threatened under the ESA, and their designated CH. EFH for Coho and Chinook salmon occurs within the Action Area, and is identical to the distribution of Coho salmon CH as shown on maps in Appendix A.

The distribution of anadromous fish and their habitat within the Action Area is based on existing stream survey information collected by or verified by KNF fisheries biologists. The status and general life history of Coho salmon and Chinook salmon is provided in Appendix F.

V. Analysis Methods

Special Status Species. A list of Threatened, Endangered, and Candidate species was obtained online from the NMFS website at http://www.nmfs.noaa.gov/pr/species/esa/listed.htm#fish

Habitat information came from the KNF LRMP, watershed analyses conducted by the KNF, existing stream survey data and reports and other environmental analyses completed for projects within the Analysis Area.

The Analytical Process. This analysis uses habitat indicators from the Analytical Process for Developing Biological Assessments for Federal Actions Affecting Fish Within the Northwest Forest Plan Area (USDA-USDOC-USDI 2004). The Analytical Process (AP) utilizes key indicators of habitat quality (habitat indicators) and was formulated to standardize evaluations of actions and effects for conferencing/consultations under Section (§) 7(a)(2) of the ESA, focusing on salmonid fishes within the Northwest Forest Plan (NFP) area. The information developed through the AP generally also satisfies the information requirements for EFH consultation for Pacific salmon under the MSFCMA and its implementing regulations (50 CFR Part 600).

1. The AP involves several steps including assembling and presenting the best available scientific and commercial information (from a variety of sources, including watershed analysis, NEPA analysis, and other analyses used to implement land and resource management plans) and, developing a BA using analytical procedures that are based upon requirements specified in 50 CFR § 402.12(f) and described in the ESA consultation handbook (USDI and USDC 1998).

2. The AP includes use of the "USFWS/NOAA Fisheries Table of Population and Habitat Indicators" (the Table), which is a tool to characterize baseline habitat and populations for salmonids in the NFP Area. Habitat indicators are evaluated in the Table, and the AP allows for criteria values to be adjusted for local watershed conditions given supportive documentation. Consistent with the Matrix of Pathways and Indicators (NMFS 1996) the Table provides values and ranges of conditions to determine whether baseline conditions are *Properly Functioning*, *At Risk*, or *Not Properly Functioning*. The KNF has developed criteria for the mid-Klamath region using values from streams that are considered pristine and as supported by the data contained in the environmental impact statement for the Klamath LRMP. The Klamath tributaries matrix (Appendix D) serves as the basis to identify relative baseline conditions, including existing conditions for the WSFR Project.

This information, as well as watershed assessments, reports, and field reviews were used to rate and describe existing conditions, and to evaluate effects.

3. The environmental baseline for the full suite of habitat indicators provided in the AP, by 5th and 7th field watershed, are included as part of this analysis via summary in "Checklists for Documenting Environmental Baseline and Effects of Proposed Actions on Relevant Indicators" (see Appendix D). Each indicator is analyzed at the watershed and drainage scale, including the pre-project, post-fire environmental baseline and effects of the proposed action. Table 12 lists the suite of habitat indicators from the AP.

Table H-12. Analytical Process habitat indicators by category.

Indicator	Habitat: (non-watershed condition indicators)	Habitat: (watershed condition indicators)
Temperature	■	
Suspended sediment-intergravel dissolved oxygen/turbidity	■	
Chemical contaminants/nutrients	■	
Physical barriers	■	
Substrate character and embeddedness	■	
Large woody debris	■	
Pool frequency and quality	■	
Large pools	■	
Off-channel habitat	■	
Refugia	■	
Average wetted width/maximum depth ratio in scour pools in a reach	■	
Streambank condition	■	
Floodplain connectivity	■	
Change in peak/base flows	■	
Increase in drainage network	■	
Road density and location		■
Disturbance history		■
RRs		■
Disturbance regime		■
Summary/integration of all species and habitat indicators		

The BA effects analysis uses the following steps provided in the AP: Step 1-Identify all PEs; Step 2-Evaluate all of the PEs for each habitat indicator by eight factors in relation to the Environmental Baseline; Step 3-Provide a summary statement for each PE; Step 4-Combine the element summaries for each indicator into a single indicator summary; Step

5-Evaluate Watershed Condition Indicators for potential effects; and Step 6-Answer the questions in the Project Effects Determination Key for all indicator summaries.

Non-WCI Analysis Indicators. This BA groups the non-WCI habitat indicators into three major headings or divisions as follows, based on the pathways for potential effects and, in turn, the potential for impacts on anadromous salmonids and their habitat:

1. Sediment

- Suspended sediment-intergravel dissolved oxygen/turbidity
- Physical barriers
- Substrate character and embeddedness
- Pools - frequency and quality, large pools, average wetted width/maximum depth ratio in scour pools in a reach
- Off-channel habitat
- Change in peak/base flows
- Increase in drainage network -roads.

2. Water Quality

- Water Temperature
- Turbidity
- Chemical contaminants/nutrients
- Physical barriers
- Pool quality
- Refugia
- Change in peak/base flows

3. Riparian Function

- Water Temperature - Stream Shade
- Large woody debris and pool quality
- Off-channel habitat
- Streambank condition
- Floodplain connectivity'

Habitat indicators will be addressed under each of the above three divisions. Effects of each PE will first be discussed, then summarized using the AP factors of Proximity, Probability and Magnitude. Consistent with the AP, PEs with insignificant, discountable, or no effects will not receive further factor analysis (Distribution, Frequency, Duration, Timing, and Nature**)**.

Intensity of Effects. "Intensity" refers to the severity of effects or the degree to which an action may adversely or beneficially affect a species or its habitat. The intensity definitions used throughout this analysis are described below.

Habitat Indicators. Effects to habitat Indicators and anadromous salmonid habitat are described using the following terms:

- Neutral Effect. The action has no effect.
- Beneficial Effect. Effect is contemporaneous positive effects without any adverse effect to the species.

- Discountable Effect. Effect is extremely unlikely to occur and based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects.
- Insignificant Effect. Effect may occur but is not to a level that can be meaningfully measured or detected.
- Significant Effect. Effect is detectable, and may be meaningfully measured.

Species. Effects to Coho salmon are described using the following terms:

- Neutral Effect. The action has no effect.
- Beneficial Effect. Effects are contemporaneous positive effects without any adverse effects to the species.

Insignificant Effect. Effect may occur but is not to a level that can be meaningfully measured or detected.

- Minor Effect. Effects would result in detectable effects to an individual/s of a listed species or its CH, but they would not be expected to result in substantial population fluctuations and would not be expected to have any measurable long-term effects on species, habitats, or natural processes sustaining them; minor effects equate with a "*May Affect/Not Likely to Adversely Affect*" determination.
- Moderate Effect. Effects would result in detectable impacts on individuals or population of a listed species, its CH, or the natural processes sustaining them and key ecosystem processes may experience disruptions that may result in population or habitat condition fluctuations that would be outside the range of natural variation, but would return to natural conditions; moderate level adverse effects would equate with a "*May Affect/Likely to Adversely Affect"* determination.
- Major Effect. Individuals or population of a listed species, its CH, or the natural processes sustaining them would be measurably affected and key ecosystem processes might be permanently altered resulting in long-term changes in population numbers and permanently modifying CH; major effects may result in jeopardy to the continued existence of a population unit, ESU, or species.

Spatial and Temporal Bounding. The Action Area is the 5th-field subwatersheds of the Middle Klamath River and their 7th field drainages that provide habitat for Coho or Chinook salmon that were affected by the 2014 fires and have proposed activities. Upstream extent of the Action Area is defined as Beaver Creek in the Klamath River, Kelsey Creek in Scott River, and North Russian Creek in Salmon River. Downstream the Action Area extends to the confluence of Salmon and Klamath Rivers.

The temporal bounding of the analysis includes short-term effects (during implementation or within one year of implementation) and long-term effect (chronic effect that persists longer than one year after implementation).

VI. Environmental Baseline and Biological Requirements

The Action Area provides habitat for Southern Oregon/Northern California Coasts Coho salmon (*Oncorhynchus kisutch*), listed as Threatened under the ESA, and their designated CH. Forest Service Sensitive fish species that may occur within the Analysis Area

include Upper Klamath-Trinity Rivers Chinook (*Oncorhynchus tshawytscha*), Klamath Mountains Province Steelhead (*Oncorhynchus mykiss*), Klamath River lamprey (*Entosphenus similis*), and Pacific lamprey (*Entosphenus tridentatus*). Both steelhead and resident rainbow trout (*Oncorhynchus mykiss*) are management indicator species under the KNF Forest Plan. EFH for Coho and Chinook salmon occur within the Action Area, and is considered identical to the distribution of Coho salmon CH in this document.

The biological requirements of Coho and Chinook salmon are given in Appendix F. The environmental baseline is given as a narrative below for each fire area and is focused on 5th-field watersheds. The Environmental baseline for HUC 7 watersheds in the Action Area is summarized in tables in Appendix D.

Overall, the water quality in the Klamath River is impaired and is on the 303(d) Clean Water Act list due to temperature and other constituents (Table 13). Use of mainstem habitat by salmonids is most limited by water quality during the summer months (June through September) when water temperatures are high throughout the day. Juveniles must utilize tributaries and other off-channel thermal refugial areas where cooler water can be found.

Table H-13. Clean Water Act 303(d) listed reaches of the Middle Klamath River (NCRWQCB 2008).

Waterbody	Pollutant
Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Nutrients, Organic Enrichment/Low Dissolved Oxygen, Temperature
Middle Klamath River HA, Iron Gate Dam to Scott River Reach, mainstem Klamath	Microcystin
Middle Klamath River HA, Beaver Creek, Cow Creek, Deer Creek, Humgry Creek, West Fork Beaver Creek	Sediment
Middle & Lower Klamath River HAs, Scott River to Trinity River Reach	Nutrients, Organic Enrichment/Low Dissolved Oxygen, Temperature
Middle & Lower Klamath River HAs, Scott River to Trinity River Reach, mainstem Klamath River	Microcystin
Middle & Lower Klamath River HAs, China Creek, Fort Goff Creek, Grider Creek, Portuguese Creek, Thompson Creek, Walker Creek	Sediment
Salmon River HA	Temperature
Scott River HA	Sedimentation/Siltation, Temperature

Beaver Fire

The 2014 Beaver Fire burned approximately 43,327 acres in the following 5th-field watersheds:

- Beaver Creek (16,303 acres burned)
- Horse Creek-Klamath River (21,244 acres burned)

- Humbug Creek-Klamath River (5,780 acres burned)

Aquatic Resources

Beaver Creek is tributary to the Klamath River and the watershed provides approximately 31 miles of CH for SONCC Coho salmon, habitat for winter and summer-run KMP steelhead, and EFH for spring and fall-run UKT Chinook salmon. Tables in Appendix B list the HUC 7 drainages and miles of anadromous salmonid habitat in each. Beaver Creek also provides habitat for Pacific lamprey and other native aquatic species. The Beaver Creek Ecosystem Analysis (USFS 1996) contains more detailed watershed information. Natural barriers exist in tributaries to Beaver Creek: anadromous salmonids cannot access many tributaries including Smokey Creek, Deer Creek and Upper West Fork Beaver Creeks. KNF Chinook spawning surveys indicate that approximately 77% of fall Chinook salmon utilize the lower five miles of Beaver Creek between the mouth and Beaver Creek campground, 22% utilize a four mile reach upstream of the campground, and 1% utilize a reach 9-15 miles upstream of the mouth (USFS 1996). Most of the stream channels in this watershed drain forested mountainous areas. At the present time, there are no known runs of spring Chinook or summer steelhead in Beaver Creek. SONCC Coho salmon CH overlaps with fall Chinook salmon distribution in the Beaver Creek watershed, while also including the lower four miles of Grouse Creek. SONCC coho salmon CH is also found in the Klamath River adjacent to the the watersheds affected by the Beaver Fire, including the lower reaches and confluence zones of Doggett and Kohl Creeks with the Klamath River, and in the lower two miles and seven miles of Buckhorn and Horse Creeks, respectively.

Table H-14. Beaver Fire 7th field watersheds, burn acres and miles of Coho CH.

Beaver Fire HUC 7 Watersheds	Beaver Fire Burned Acres	Total Miles of Anadromous Salmonid Habitat/Miles Within Analysis Area
Bear Creek	0.9	1.7/0
Buckhorn Creek	3,028.9	2/0
Buckhorn Gulch-Beaver Creek	8,233.8	5.7/5.7
Collins Creek-Klamath River	2,301.2	5.6/1.9
Doggett Creek	6,317.0	1.2/0.9
Dona Creek-Klamath River	2,129.9	2.8/2.6
Dutch Creek	3,789.5	0.3/0.3
Jaynes Canyon	229.8	1.5/0
Kohl Creek	4,053.4	0.9/0.9
Little Humbug Creek	3.3	0/0
Lower West Fork Beaver Creek	1,334.3	1.9/1.7
Lumgrey Creek	1,787.1	2.0/0
McKinney Creek	3.6	1.6/0.1
Miller Gulch-Klamath River	3,965.4	5.0/4.7
Quigleys Cove-Klamath River	3,406.3	6.5/3.4
Soda Creek-Beaver Creek	2,715.2	4.4/2.3
Vesa Creek	27.5	0/0
Grand Total	**43,327.1**	**43.1/24.5**

Bear Creek, Collins Creek, Little Humbug, Lumgrey Creek, McKinney Creek, Vesa Creek have no proposed activities and will not be discussed further.

Sediment

The Beaver Creek watershed is on the 303(d) Clean Water Act list as impaired for Sediment (Table 13). Approximately 36% of the watershed is privately owned and managed. Intensive management on private lands and high road density contributes to the high risk ratios in the Beaver Creek 5th-field watershed. In addition, Long John, Grouse Creek and Hungry Creek subwatersheds all have large proportions of granitic soils.

The 2014 fires burned at high severity over 6% of this watershed and 28% burned at moderate severity (Table 15) resulting in significant watershed disturbance in the Beaver Creek 5th-field subwatersheds.

Table 16 provides summary CWE modeling results from Mondry's (2015) WSFR Hydrology Report. This report also includes CWE modeling results for Beaver Fire 7th field subwatersheds, some of which exceed TOC, both before and after 2104 fire effects were modeled. See Appendix B for CWE modeling of effects of this project by 5th and 7th field watershed.

Table H-15. Summary of watershed burn severity for the 2014 Beaver Fire.

Fire Area	Amount of Very Low Severity Acres (%)	Amount of Low Severity Acres (%)	Amount of Moderate Severity Acres (%)	Amount of High Severity Acres (%)	Total Burned (Acres)
Beaver Fire	5,131 (16%)	16,138 (50%)	9,208 (28%)	1,989 (6%)	32,466

Table H-16. Beaver Creek CWE model results at the 5th field watershed scale comparing pre- and post-fire conditions.

5th-field **Watershed**	**Watershed Area (Acres)**	**Pre-Fire (2012)**	**Post-Fire, No Action**	**2014 Fire Area**
Beaver Creek	69,610	0.7	1.0	Beaver Fire
ERA		1.1	1.2	
USLE		0.8	1.1	
GEO				
Horse Creek-Klamath River	98,625	0.7	0.7	
ERA		0.7	0.8	
USLE		0.7	0.9	
GEO				
Humbug Creek-Klamath River	68,023	0.6	0.3	
ERA		0.6	0.5	
USLE		0.8	0.8	
GEO				

Lower Beaver Creek is lower gradient and less confined than upper reaches. Pulses of sediment have overloaded the system during extreme storm events (e.g. 1997 flood) and originate from road failures and washouts. Road density in general is high in this watershed and chronic sediment delivery is a result. Road density within RRs is also high: 4.1 miles per square mile. Grouse Creek and Hungary Creek are recognized as heavy sediment contributors to Beaver Creek and the quality of spawning gravels has been reduced due to sedimentation from roads.

Wildfires result in increased runoff and sediment yield commensurate with burn severity. KNF BAER teams reported that, post-fire, about two thirds of the fire area had low or very low levels of soil burn severity and that the rate of water infiltration into the soil in these areas was not greatly affected. Dutch Creek was the most severely affected tributary: approximately 93% of this subwatershed was burned and had a large area of moderate to high soil burn intensity. BAER teams reported the following information: the highest changes in peak runoff potential are in the Dutch Creek, and Kohl Creek. The Kohl Creek watershed had almost half of its acreages in the fire and is at risk for flooding and sedimentation; many of the intermittent and ephemeral channels in the affected watersheds in the Beaver fire area are full of sediment; and, a significant storm event will mobilize this sediment sending it downhill onto forest roads and downstream to perennial streams such as Beaver, Doggett and Kohl Creeks affecting water quality. Much of the moderate and high soil burn severity areas of the fire was on steep terrain in a checkerboard area of ownership with alternating sections of private land with federal land. These conditions have and will continue to make it very difficult to implement effective hillslope treatments. The most effective action taken post-fire to reduce increased runoff and sedimentation was stormproofing the road system. However, BAER teams observed sediment stored in intermittent and ephemeral channels post-fire. These fine sediments will flush downstream during winter storm events.

The Beaver Creek 5th-field watershed is at or exceeds the threshold of concern (TOC; risk ratios greater than 1.0). KNF CWE assessments model disturbances and land sensitivity and results fall on a continuum. As disturbances increase (and recover) over time and space, at some point, the risk of initiating or contributing to existing adverse cumulative watershed impacts becomes a cause for concern. These model-specific levels are called “inference points” (or “thresholds of concern” - TOC) and are used to inform land management decisions. Ecologically, a transition exists from lower to higher risk of adverse effects to beneficial uses – from insignificant to potentially significant. From a management perspective, inference points are intended to represent the center of that transition zone. Inference points do not represent the exact point at which cumulative watershed effects will occur. Rather, they serve as “yellow flag” indicators of increasing susceptibility for significant adverse effects occurring within a watershed. The USLE model assumes 10% of mobilized hillslope sediment is delivered to stream channels during the first winter season post-disturbance, and the GEO model requires a storm event with a 10-year recurrence interval (10% chance of annual occurrence) to produce mass wasting.

In addition to CWE modelling, the KNF is actively monitoring stream channel sediment as part of a program to meet North Coast Water Quality Control Board waiver requirements. A primary goal of this monitoring program is to determine *reference conditions* for stream sediment (Laurie and Elder, 2012). KNF watersheds were stratified in to *managed* and *reference* types (primarily at the 6th-field HUC scale), with the reference watersheds used to define desired conditions in the managed basins. A total of 20 reference streams were established, and sampling of reference stream fine sediment (filled pool volume, surface fines, subsurface fines) was used to define thresholds (75th percentile of reference + survey error) for evaluation of conditions in managed streams (Laurie and Elder, 2012). Prior to the 2014 fires, Beaver Creek mainstem met the

sediment reference conditions for all measures of fine sediment (V* and surface and subsurface sediment). The West Fork of Beaver Creek exceeded reference conditions for V* (the fraction of pool volume that is filled with fine sediment).

Decreased interception of rainfall as a result of wildfire as well as increased sediment and runoff delivered to streams, can lead to an increased debris flow probability in the affected watersheds compared to pre-fire conditions. Post-fire debris flow events can degrade or aggrade stream channels and remove riparian vegetation. BAER teams reported that the probability of aquatic habitat being damaged by debris flow is likely and there is a moderate risk of damage to the quality of habitat (for about the next 10-years).

Fire intensity and extent of area burned within RRs is also an indicator of the potential for sedimentation to streams and adverse effects to riparian function. Areas that burned at moderate to high intensity experienced an almost complete loss of soil cover. Where this occurred, the magnitude of impacts would be strongly influenced by the amount of area impacted and the severity of winter storms immediately following the fire and prior to re-establishment of grasses, forbes and shrubs. The duration of impacts would likely be intermediate between short- and long-duration as regrowth of vegetation covers soils and high gradient channels flush stored sediments, dependent on the magnitude of winter runoff.

Table H-17. Burn severity along intermittent and perennial streams in the three project fire areas (data from 2014 BAER assessment reports and derived from BARC data).

Stream Channel Burn Severity						
		Very Low miles (%)	**Low miles (%)**	**Moderate miles (%)**	**High miles (%)**	**Total (miles)**
Happy Camp Complex	Intermittent	23 (9%)	196 (72%)	50 (18%)	2 (0.8%)	271
	Perennial	31 (13%)	188 (76%)	27 (11%)	0.4 (0.2%)	246
Beaver Fire	Intermittent	20 (15%)	66 (50%)	37 (28%)	10 (8%)	133
	Perennial	12 (34%)	18 (51%)	5 (14%)	<1 (<3%)	35
Whites Fire	Intermittent	18 (21%)	43 (50%)	21 (24%)	4 (5%)	86
	Perennial	16 (25%)	36 (57%)	9 (14%)	2 (3%)	63

Post-fire, the Sediment habitat indicator in the Beaver Creek watershed is considered as “at risk” or “not properly functioning” based on modeled risk ratios and expected impacts from the 2014 fires.

Water Quality

Tributaries and upper reaches of Beaver Creek have low summer water temperatures. Although lower reaches of the mainstem Beaver Creek are warmer and diversions exist, temperatures are far cooler than in the Middle Klamath River and are considered “Properly Functioning.” Thus, Beaver Creek provides thermal refugia for anadromous salmonids. However, pool habitat is lacking in Lower Beaver Creek, which limits available space for salmonid rearing.

Table H-18. 2013 water temperature data for Beaver Creek (USFS 2014h).

Location	Date of Maximum MWMT	MWMT (◦C)

Location	Date of Maximum MWMT	MWMT (◦C)
Beaver Creek upstream from West Fork Beaver	7/23/13	18.4
Beaver Creek 1/4 mile upstream of Klamath River	7/27/13	21.2

Riparian Function

RRs in Beaver Creek have a high density of medium to small conifers and other vegetation. The continuity of RRs along Beaver Creek is impacted by the main road and other disturbed sites including recovering mine sites and flood deposits. The Beaver Creek watershed has a large proportion of private industrial timberlands that are managed under the California Forest Practice Rules, which has included harvest within RRs.

The percent of stream channel burned is used herein as indication of the impacts from the 2014 fires to riparian function. Streamside areas that burned at high severity will provide little to no function with respect to sediment retention, stream shade, microclimate moderation and future large wood recruitment immediately post-fire. Moderate severity burn areas will provide reduced function as an estimated 50% of the streamside vegetation was burned.

Pre-fire wood loading in Beaver Creek was determined to be "properly functioning." The 2014 fires had no effect on instream wood levels in the mainstem but will increase short-term wood loading in some areas and reduce large wood available for recruitment in the long-term, especially in areas burned at moderate or high severity.

The Happy Camp Complex Fire Project Area

The Happy Camp Complex Fire burned approximately 131,313 acres within the following 5th-field watersheds (and their HUC 7 subwatersheds):

- Lower Scott River (30,600 acres)
- Elk Creek (34,633 acres)
- Seiad Creek-Klamath River (50,897 acres)
- Thompson Creek-Klamath River (11,243 acres)

Approximately 1% of the area burned at high severity, and 22% at moderate severity.

Table H-19. Summary of watershed burn severity for the 2014 Happy Camp Complex.

Fire Area	Amount of Very Low Acres (%)	Amount of Low Acres (%)	Amount of Moderate Acres (%)	Amount of High Acres (%)	Total (Acres)
Happy Camp Complex	12,472 (10%)	86,814 (67%)	28,182 (22%)	1,439 (1%)	128,907

The WSFR Hydrology Report (Mondry 2015) contains a complete CWE analysis, and model results by 7th field watershed are in Appendix B of this BA. Table 20 summarizes the results of the CWE modeling. ERA post-fire values are relatively low for 5th-field watersheds in the Happy Camp Complex. Numerous 7th field watersheds in the project area exceed the TOC when 2014 fire effects were modeled (see Appendix B tables for post-fire existing condition and effects of the Project CWE values by 5th and 7th field watershed).

Table H-20. Modeled pre- and post-fire CWE, USLE and Mass Wasting (GEO) risk ratios for 5th field watersheds within the 2014 Happy Camp Complex.

5th-field Watershed Name	Pre-Fire (2012)	Post-Fire, No Action
Elk Creek		
ERA	0.5	0.5
USLE	0.1	0.3
GEO	1.0	1.0
Lower Scott River		
	0.1	0.5
ERA	0.1	0.5
USLE	0.3	0.6
GEO		
Seiad Creek-Klamath River	0.6	0.6
	0.3	0.7
ERA	0.5	0.8
USLE		
GEO		
Thompson Creek-Klamath River	0.1	0.4
ERA	0.4	0.3
USLE	0.4	0.5
GEO		

Numerous 7th field watersheds were affected by the Happy Camp Complex and have proposed activities under the WSFR Project.

Table H-21. Happy Camp Complex 7th field watersheds, burned acres and miles of Coho CH.

Happy Camp Complex HUC 7 Watersheds	Happy Camp Complex Burned Acres	Total Miles of Anadromous Salmonid Habitat/Miles Within Project Area
Bear Creek	5,139.0	1.7/0
Benjamin Creek-Klamath River	249.9	8.4/0.8
Big Ferry-Swanson	2,400.7	4.9/1.8
Bishop Creek-Elk Creek	701.4	4.5/0.5
Caroline Creek-Klamath River	1,374.6	3.3/2.3
China Creek	4,298.0	1.7/1.6
Cliff Valley Creek	3,952.5	0/0
Cougar Creek-Elk Creek	3,764.5	5.6/5.6
Deep Creek-Scott River	1,951.5	4.4/3.4
Doolittle Creek	3,735.6	0/0
Franklin Gulch-Scott River	2,858.9	4.8/3.7
Fryingpan Creek-Klamath River	4,407.9	11.6/6.5
Granite Creek	221.4	0/0
Headwaters Elk Creek	2,531.6	0/0
Hoop &Devil-Elk Creek	1,937.2	4.4/3.9
Horse Creek	2,537.3	0/0
Lower East Fork Elk Creek	3,430.0	2.2/2.2
Lower Grider Creek	10,765.2	9.3/9.2
Lower Seiad Creek	2.9	2.9/0
McCarthy Creek-Scott River	6,112.8	5.4/4.5
Middle Creek	4,495.6	1.2/1.2
Middle Elk Creek	1,189.6	2.4/1.4

Happy Camp Complex HUC 7 Watersheds	Happy Camp Complex Burned Acres	Total Miles of Anadromous Salmonid Habitat/Miles Within Project Area
Negro Creek	11.2	0/0
North Fork Kelsey Creek	5,176.6	0.9/0.9
O'Neil Creek	2,429.2	0.9/0.9
Perkins Gulch-Indian Creek	23.6	2.2/0.2
Rainy Valley Creek	1,486.5	0/0
Rancheria Creek	4,374.5	0/0
Sambo Gulch-Klamath River	27.3	4.9/0.3
Schutts Gulch-Klamath River	2,176.2	5.2/4.0
South Fork Kelsey Creek	1,787.8	1.1/1.1
Tom Martin Creek-Klamath River	8,759.5	6.1/5.4
Tompkins Creek	9,327.2	5.2/5.2
Toms Valley Creek-Elk Creek	3,598.4	2.1/2.1
Upper Canyon Creek	127.9	0/0
Upper East Fork Elk Creek	3,873.3	0/0
Upper Elk Creek	3,024.6	0/0
Upper Grider Creek	8,467.5	3.0/3.0
Walker Creek	7,592.7	4.2/4.0
West Grider Creek-Klamath River	991.0	4.5/1.1
Grand Total	131,313	119/76.8

Both the Whites Fire and Happy Camp Complex burned within the Lower Scott River. The Happy Camp Complex affected tributaries to the Scott River including 34,239 acres within the Canyon Creek watershed and 9,327 acres in the Tompkins Creek watershed. The Whites Fire burned 1,542 acres within the French Creek watershed. These streams provide important habitat for anadromous salmonids and other native species. The Lower Scott River Ecosystem Analysis (USFS 2000) and the Callahan Ecosystem Analysis (USFS 1997a) contain more detailed information on watershed conditions. For the Scott River, this discussion is focused on areas affected by the fires and that will have proposed activities: the mainstem Scott River from Kelsey Creek downstream, and Tompkins Creek.

Aquatic Resources

The Scott River provides habitat for fall-run Chinook, steelhead, Coho salmon, Pacific lamprey and other native species. Fall Chinook are usually not able to access historical spawning habitat in the upper mainstem Scott River or in the East Fork of South Fork Scott River due to low late summer/early fall flows. Juvenile Coho salmon have been observed in the South Fork Scott River, Boulder Creek, French Creek and Sugar Creeks.

In recent times, and especially since 2001, spawning and/or redds of Coho salmon have been observed in the mainstem Scott River and its tributaries, including: East Fork Scott River, South Fork Scott River, Sugar Creek, French Creek, Miners Creek, Etna Creek, Kidder Creek, Patterson Creek, Shackleford Creek, Mill Creek, Canyon Creek, Kelsey Creek, Tompkins Creek, and Scott Bar Mill Creek (Soil Conservation Service 1972, CDFG 1974, Maurer 2005, Yokel 2007-2011, Calfish 2013 *In* NMFS 2014).

The South Fork Scott River provides approximately 4.7 miles of habitat for anadromous salmonids. KNF stream surveys document that the upper extent of Coho spawning in the South Fork Scott River appears to be limited by a natural barrier in the gorge at mile 4.7.

Tompkins Creek is a third-order perennial of the Scott River. Flowing south, it drains the western flanks of Tom Martin Peak, the south side of Lake Mountain Peak, and much of the east side of the ridge south of Lake Mountain Peak to the Tyler Meadows area. Past and present influences within the drainage include timber harvests, roads, grazing, mining, water diversion, wildfire, and flood. Coho, steelhead, and rainbow trout are present in the creek, with the upstream limits of each species (e.g., approx. three miles upstream from the mouth of Tompkins Creek for SONCC Coho salmon) restricted by gradient, discharge, stream size, and/or barriers.

O'Neil Creek is a second-order perennial tributary to the Middle Klamath and drains the ridgeline between Tom Martin Peak and Lake Mountain Peak. O'Neil Creek provides habitat for rainbow trout, and Coho and Chinook salmon in the lower reaches near or downstream of Highway 96. Due to restoration at Highway 96, SONCC Coho salmon can now ascend O'Neil Creek above the bridge crossing, but suitable habitat is limited above here by progressively steepening gradients.

Elk Creek provides about 51.6 miles of fish-bearing streams and provides habitat for SONCC Coho salmon, Chinook salmon, steelhead, Pacific lamprey, Klamath smallscale sucker and other native fishes. Steelhead are found in the mainstem as well as Bear, Cougar and the East Fork of Elk Creek. Fall-run Chinook salmon are found in the lower 14 miles of Elk Creek. Coho salmon utilize habitat in mainstem Elk Creek and the lower section of East Fork Elk Creek up to Little Elk Creek.

Thompson, Walker and Grider creek watersheds provide spawning, rearing and holding habitat for fall and spring-run Chinook salmon, winter and summer run steelhead and Coho salmon. In addition, these streams provide habitat for Pacific lamprey and other native species. Based on stream survey data anadromous salmonids can access the lower reaches of Grider and West Grider creeks, and Walker Creek. The other smaller, steep, bedrock-dominated, stream systems found within these subwatersheds are generally more suited to resident trout populations than to anadromous species. However, these streams are critical as thermal refugia to anadromous populations because of the high quality, cool water they provide downstream to the Middle Klamath River system.

Grider Creek is a Key watershed and a domestic water source for private landowners. There are approximately 18.4 miles of fish-bearing streams in the Grider Creek watershed. Coho salmon are found in the lower 8.0 miles of the mainstem of Grider Creek. CH for Coho salmon is considered to be the same as steelhead, that is, the lower 12 miles of the mainstem of Grider Creek. There are no Coho salmon or CH in any of the tributaries to the mainstem of Grider Creek. Steelhead are found within approximately lower 12 miles of the mainstem. Fall-run Chinook salmon are found within the lower 7.5 miles of the mainstem of Grider Creek. Spring-run Chinook salmon are not known to be present in Grider Creek. There is no EFH for Coho salmon or Chinook salmon in any of the tributaries to the mainstem of Grider Creek. Resident trout occupy Rancheria, Fish, and Cliff Valley creeks.

Rancheria Creek is a third order stream that flows west draining the ridgeline south of Lake Mountain Peak to the Marble Mountain Wilderness boundary. This stream supports resident rainbow trout and steelhead in the lower reach, as there is a barrier to upstream salmonid migration about 0.5 miles upstream from the mouth.

Sediment

The Scott River is a 303(d) Clean Water Act listed reach (Sediment; Table 13). Excessive sediment loads and elevated water temperatures in the Scott River and its tributaries have resulted in degraded water quality conditions that impair anadromous fish production. Sediment yield from some Lower Scott River tributaries increased as a result of the 1997 flood and many reaches of the East Fork Scott, Moffett Creek and Shackleford Creek also suffered flood damage.

Sommerstrom (2001) measured fine sediment at many different locations on the mainstem Scott River and also on some tributaries. McNeil samples of fine sediment in the mainstem Scott showed sand size particles (<6.3 mm) to comprise more than 90% of the bed at some locations. Optimal levels of fine sediment of this size would be less than 20%. Sommerstrom (2001 noted that the principle source of fines was watersheds with granitic terrain and more specifically from road surfaces, road cuts and road fills. Following the sediment study, a French Creek Watershed Advisory Group was formed to help coordinate activities in this highly erodible Scott River sub-basin. The U.S. Forest Service, private timber landowners, ranchers, the County of Siskiyou and the Scott Valley CRMP (later to become the Scott Valley Watershed Coucil) all contributed to erosion control projects in French Creek. Studies to determine fine sediment in pools (V*) were conducted by the U.S. Forest Service in French Creek to determine the progress of restoration. The volume of fine sediment in pools decreased from approximately 30% in 1992 to nearer 10% in the following three years. The 1997 high water seemed to shift a great deal of fine sediment to reaches of the Scott River just above its convergence with the Klamath. These reaches are often the most important for spawning, particularly in drought years. However, the flows in fall of 1997 allowed fish access to reaches further upstream that had lower levels of fine sediment. Sediment yield increased in Lower Scott River tributaries on USFS lands as a result of the January 1997 storm event. The U.S. Forest Service repaired some of the flood damage to roads and other infrastructure from the 1997 storms. The most intensive area of activity for road repair after the 1997 flood was in the Canyon Creek, Kelsey Creek, and Tompkins Creek watersheds. The Klamath National Forest improved drainage structures and stream crossings in these watersheds so that future flood damage is much less likely. Even during moderate flows, Moffett Creek has such high turbidity levels that it discolors the Scott River down to its convergence with the Klamath.

Altered sediment supply occurring in the Scott River imposes a medium stress to juvenile and smolt, high stress to adults, and a very high stress to the egg and fry Coho salmon life history stages (NMFS 2014). The movement of fine sediment into streams can cause substrate embeddedness, preventing spawning and smothering eggs in redds. Additionally, excessive levels of fine sediment in pools and low gradient reaches of the Scott River and its tributaries also reduce the amount of rearing habitat available for juvenile Coho salmon (USFS 2000, NCRWQCB 2006, CDFG 2009, Cramer Fish Sciences et al. 2010 *In* NMFS 2014). While unaltered background levels of sediment

were around 10 percent volumetrically, monitoring in the French Creek watershed has shown large fluctuations in the percentages of fine sediment occurring in this watershed (Sommarstrom et al. 2001). Data from the early 1990s indicate a high of approximately 32 percent fine sediment occurring in French Creek in 1992, decreasing to approximately 7.5 percent by 1994 (Power and Hilton 2003), and then reaching a dynamic level of approximately 14 percent in 2012 (Farber and Nicolls 2012). More recent monitoring indicates that there is still a large percentage of fine sediment in the channel substrate in the upper portions of French Creek, which is one of the two most productive spawning and rearing tributaries in the Scott River basin.

Tompkins Creek is considered to be "At Risk" for sediment. A 2011 survey documented elevated fines in pools and substrates relative to reference conditions (USFS 2013). Erosion of streambanks was identified as a primary source of sediment and is a result of past flooding.

The Lower Scott River 5th-field watershed post-fire ERA risk ratios are at 0.48, well below 1.0, and indicating that disturbance resulting from roads, vegetation management, and wildfire is sufficiently below the watershed TOC. This is interpreted to mean that effects on increased peak flow will not be significant at this scale. However, channel change would be expected along reaches that convey debris flows. The Lower Scott post-fire Mass Wasting (GEO) risk ratio is at 0.6, below the TOC and indicates increased hillslope sediment production is not expected to be significant at this scale.

Elk Creek is characterized by having good water quality and serves as a domestic water supply for Happy Camp. Except for broad, coarse alluvial deposits in Elk Creek upstream from its confluence with East Fork Elk, little sediment is stored in stream channels. Most of the coarse sediment in stream channels is delivered by landsliding. Streams in the Elk Creek basin are high gradient, coarse bedded and erosion dominated. Channels run through steep, narrow gorges. This watershed was extensively burned in 1987 and subsequently salvage logged. The January 1, 1997 storm initiated debris torrents at the headwaters of Elk Creek and major channel changes occurred to over 80% of the channel of Elk Creek (De La Fuente 1998). Significant quantities of big wood were entrained by floodwaters and major bed aggradation also occurred.

In 2014, the Happy Camp Complex Fire burned 34,633 acres in the Elk Creek watershed. KNF BAER teams reported that many of the intermittent and ephemeral channels in the affected watersheds are full of sediment and that a significant storm event will mobilize this sediment and send it downstream to perennial streams. BAER teams predicted that the primary watershed responses are expected to include: 1) an initial flush of ash, 2) rill and gully erosion in drainages and on steep slopes within the burned area, and 3) flash floods with increase peak flows and sediment deposition. The BAER teams expected that these responses would be greatest within initial storm events. Field observations after the first larger rain event in November 2014 confirmed that there was an initial flush of sediment and ash. The disturbances will become less evident as vegetation is reestablished, providing ground cover and increasing surface roughness. Soils will also become stabilized and the infiltration capacity of the soils will improve.

The Elk Creek 5th-field watershed ERA risk ratios are at 0.5, well below 1.0 indicating that disturbance resulting from road, vegetation management, and wildfire is sufficiently below the watershed threshold of concern (TOC), and interpreted to mean that effects on

increased peak flow will not be significant at this scale. However, channel change would be expected along reaches that conveyed debris flows. At the HUC 7 scale, Middle Elk Creek watershed exceeds the TOC based on post-fire ERA modelling. Middle Elk Creek HUC 7 also exceeds the Mass Wasting (GEO) threshold of concern indicating a risk for increased hillslope sediment production.

Fire intensity and extent burned within RRs are also an indicator for potential sedimentation to streams and adverse effects to riparian function. Sediment impacts are likely to be minor to moderate because of the relatively low amounts (0.2-0.8%) of intermittent and perennial RRs burned at high severity. These high burn severity areas experienced a nearly complete loss of soil cover. Where this occurred, the magnitude of impacts would be strongly influenced by the severity of winter storms immediately following the fire and prior to re-establishment of grasses, forbes and shrubs. The duration of impacts would be likely to be intermediate between short- and long-duration as regrowth of vegetation reduces sediment source areas and high gradient channels flush stored sediments, dependent on the magnitude of winter runoff.

Thompson, Walker and Grider creeks are high-gradient, coarse-bedded and, due to uplift of the region, erosion dominated. Channels typically run in steep, narrow gorges. Although influenced by large landslides and bedrock structure and composition, channel patterns are dendritic. Except for broad, coarse alluvial deposits in the vicinity of the mouth of Seiad and Grider Creeks, relatively little sediment is stored in stream channels. Channels are typically cut in bedrock. Most of the coarse sediment generated to stream channels is delivered by landsliding. Fine sediment is generated by surface erosion of disturbed areas, as well as landsliding. Conditions within these watersheds are influenced by various watershed disturbances in combination with a large percentage of unstable or easily eroded land types. Large portions of these watershed were impacted by wildfires in 1987 and the January, 1997 flood event, which contributed large amounts of sediment to streams, especially to Walker Creek. Large amounts of coarse sediment were deposited at the mouth of Thompson, Seiad and Walker Creeks as a result of the 1997 flood event. These deposits occur as a result of channel widening where the streams enter the broad Klamath River channel. Such deposits cause wandering of the stream channels and channel-bank erosion. Some areas have received extensive timber harvest and have high road densities. The land types of the watershed include easily eroded granitic soils and both dormant and active landslides.

In the Thompson Creek, China Creek, and upper Walker Creek basins, extensive deposits of the Dormant Landslide and Residual Soil Terrane exist, and many large, active earthflow landslides are found in this terrane. Movement of some of the landslides that produced large quantities of sediment to these streams in the Flood of 1997 is associated with roads. Extensive Granitic Terrane is found in Grider and Walker Creek basins. Some of the sandy, low cohesion soils that form on granitic rocks make road fill that is difficult to stabilize. Refer to the KNF (1999b) Thompson/Seiad/Grider Ecosystem Analysis for more detailed information on watershed disturbance. Watershed impacts include high road densities, wildfires and past timber harvest. From 1922-1997, this area has had a total of 1,026 fires, 67% started by lightning. Extensive areas in these watersheds have been burned in past fires including as recent as 1987, which increased susceptibility to erosion. In the twelve years since these fires, ground fuels have increased. Road erosion

in these watersheds is triggered by intense seasonal thunderstorms, however severe erosion problems associated with roads may be chronic, and generally can be traced to one or more causes (e.g. geometric design of the road, road grades, surface type, soil type, road location, steepness of terrain, inadequate drainage structures, road location, lack of maintenance, or vehicle use during wet weather conditions). In addition, numerous road failures occurred in the Rancheria Creek sub-basin which had been logged. The rain-on-snow event in January 1997 triggered over 63 landslides and 15 road failures. The lowest reaches of Grider Creek widened substantially and water temperatures increased.

Water quality monitoring conducted by the Forest Service documented that Walker Creek V* values (pre-2014 fires) exceed reference conditions. A cause of impairment has been attributed to legacy sediment sites from past management.

KNF BAER teams documented conditions in these watersheds after the 2014 fires. Fire intensities in Grider Creek were as follows: 60% low; 30% moderate and 1.2% high (9% unburned). Fire intensities in Walker Creek were as follows: 58% low; 27% moderate and 3% high (11% unburned). The Happy Camp Complex BAER Hydrologic Response Report (USDA-KNF 2014) contains more detailed information on these and other watersheds in the burn area. Post-fire, hydrologists noted that many of the intermittent and ephemeral channels in the affected watersheds in the Happy Camp Complex fire area were full of sediment. A significant storm event was expected to mobilize this sediment and send it downstream including to Tompkins, Walker, Grider, and East Fork Elk Creek.

Thompson Creek-Klamath River post-fire 5th -field watershed risk ratios are at 0.3, well below 1.0 indicating that disturbance resulting from road, vegetation management, and wildfire is sufficiently below the watershed TOC, and interpreted to mean that effects on increased peak flow will not be significant at this scale. However, channel change would be expected along reaches that conveyed debris flows. The Walker Creek HUC 7 watershed exceeds the TOC based on post-fire ERA modelling. Risk ratios are at 1.03 indicating increased susceptibility for significant adverse effects. The Walker Creek 7th field watershed post-fire Mass Wasting (GEO) risk ratio is at 1.89, exceeding the Mass Wasting (GEO) threshold of concern and indicating a risk for increased hillslope sediment production. The Lower Grider Creek 7th field watershed risk ratio does not exceed TOC. The Lower Grider Creek 7th field watershed post-fire Mass Wasting (GEO) risk ratio is at 1.09, exceeding the Mass Wasting (GEO) threshold of concern and indicating a risk for increased hillslope sediment production.

KNF fisheries biologists conducted Chinook salmon spawning surveys post-fire and observed large quantities of post-fire sediment in the mainstem Grider Creek (Figure 1).

Figure 8. Post-fire sediment slug in Grider Creek.

Water Quality

Anthropogenic processes that influence water temperature include changes to: stream shade, stream flow via changes in groundwater accretion/reduction, stream flow via surface water use, microclimate, and channel geometry. The primary factor affecting stream temperatures in the Scott River watershed is increased solar radiation resulting from reductions of shade provided by near-stream vegetation. Changes in groundwater accretion also impact water temperatures in Scott Valley. Diversions of surface water lead to relatively small temperature impacts in the mainstem Scott River, but have the potential to affect temperatures in smaller tributaries where the volume of water diverted is relatively large compared to the total stream flow. Microclimate alterations resulting from near-stream vegetation removal increase temperatures, where microclimates exist. Changes in channel geometry from natural conditions may also negatively affect water temperatures.

Water temperatures in the Scott River can be limiting for salmonids, particularly in dry years. Flow depletion tends to contribute to temperature problems. Comprehensive temperature monitoring on the Scott and its tributaries has provided a greater understanding of how varying water years can affect temperature. The Scott River can exceed stressful conditions for salmonids in low gradient valley reaches in dry years, but remains below stressful on average in wet years. The warmest reaches of the Scott mainstem in the valley are at Highway 3 and Jones Beach. The Lower Scott River flows in a gorge which is completely open to the full arc of the summer sun and very subject to warming. Cold water tributaries flowing from USFS lands in the Marble Mountains moderate mainstem Scott River temperatures in this reach and provide substantialthermal refugia at their mouths. Channel scour in other Lower Scott River tributaries may also contribute to temperature increases. Loss of cold water contributions from these lower tributaries may have profound impact on ecosystem function in the Lower Scott River. Long-term trends show that periods of critically low flow have tended to increase since 1942, when flow records began to be monitored consistently on the Scott River.

Where passage is possible, juvenile fish can reach thermal refugia pools along both the mainstem Scott River and west-side tributaries, where the water temperature can be

several degrees cooler than in adjacent channels. NMFS (2014) lists the following areas as thermal refugia: French Creek, Patterson Creek, Kidder Creek, Shakleford/Mill Creek, Scott River from Boulder Creek to Tompkins Creek, Canyon Creek, Kelsey Creek and Tompkins Creek.

The WSFR Project is within the Lower Scott River 5th-field watershed, which includes the mainstem from the mouth to about one mile east of Jones Beach or Isinglass Creek area, and all the subwatersheds and other land areas that drain to this section of mainstem. While the mainstem Scott River stream temperatures are "not properly functioning", French, Tomkins and Canyon creeks are all considered "Properly Functioning" relative to stream temperatures (see Table 13) and provide important thermal input and refugia to aquatic species in this watershed.

Table H-22. 2013 water temperature data for Lower Scott River (USFS 2014h).

Location	Date of Maximum MWMT	Maximum Weekly Maximum Temperature ºC (MWMT)
Scott River at Sugarpine Gulch	7/26/13	26.6
Scott River downstream of Bridge Flat CG	7/27/13	23.7
Scott R downstream from Townsends GL	7/27/13	24.6
Scott River near 7F01Bridge	7/26/13	27.9
French Creek upstream of NF French Creek	7/26/13	19.7
Tompkins Creek at USFS property line Sec. 3	7/27/13	17.4
Canyon Creek (Scott) just upstream from mouth	7/27/13	16.3

Figure 9. Burned RR in Grider Creek, fall 2014.

The percent of streamside areas that burned in the 2014 fires is an indication of impacts to riparian function, including stream shade along perennial streams. Approximately 0.2% of perennial streamside areas burned at high severity and will provide little to no shade post-fire and until trees re-establish. Approximately 11% of perennial streamside areas burned at moderate severity and, based on field observations, experienced an estimated 50% loss of vegetation. The percent of impact from 2014 Happy Camp Complex fires to streamside areas is relatively low, and is not expected to result in measurable changes to stream temperatures.

Table H-23. Summary of stream channel burn severity data from BAER reports (USFS 2014a-2014f) for the 2014 Happy Camp Complex.

Fire Area	Stream Type	Very Low miles (%)	Low Miles (%)	Moderate miles (%)	High miles (%)	Total (miles)
Happy Camp Complex	Intermittent	23 (9%)	196 (72%)	50 (18%)	2 (0.8%)	271
	Perennial	31 (13%)	188 (76%)	27 (11%)	0.4 (0.2%)	246

Peak summer temperatures have been higher than optimal for fish in the lower mainstem reaches of Elk Creek. However, habitat in Elk Creek provides some of the highest quality spawning and rearing habitat for Coho salmon in the Middle Klamath River (Mid Klamath Restoration Partnership 2010) and Elk Creek is considered thermal refugia (MKWC 2006, NCRWQCB 2010). Recent temperature monitoring data collected by the KNF indicates that Elk Creek stream temperatures range from “Properly Functioning” to “At Risk.”

Table H-24. 2013 water temperature data for Elk Creek (USFS 2014h).

Location	Date of Maximum MWMT	Maximum Weekly Maximum Temperature ºC (MWMT)
Elk Creek at 7C001 Bridge	7/27/13	23.0
Elk Creek upstream of mouth ~0.5 mile	7/27/13	23.2
Elk Creek upstream of Bear Creek	7/27/13	20.5
East Fork Elk Creek upstream from mouth	7/27/13	20.0

Thompson, Walker and Grider creeks are rainfall dominated. Streamflows and the maintenance of cool water during the hot dry season are sustained primarily by groundwater inputs. Large areas of dormant landslide terrain, typically composed of deep red soils, function as a sponge in storing and slowly releasing large quantities of water. Most of the subwatersheds generally have streams that flow dependably all year long, with relatively high baseflows and good water quality. Most named creeks support fish in their lower reaches before the channel gradient gets too high and upstream passage becomes restricted by waterfalls or debris jams in constricted channels.

The mouth of Grider Creek formerly produced one of the most important large, cold water refuge areas on the mainstem Klamath (Belchik and Turo, 2002), but the flood effects of the 1997 storm raised temperatures and reduced the benefit of this area as a refugia. However, Grider Creek provides CH for Coho salmon and stream temperatures are rated as “Properly Functioning” relative to salmonid criteria.

Walker Creek suffered the worst flood damage in 1997 of any stream on the KNF and its stream channel and floodplains were scoured from headwaters to the mouth. One reach of Walker Creek went from approximately 50 feet wide to over 200 feet wide. It will be decades before this tributary recovers. It had provided a medium sized refuge area of cold water at its convergence with the Klamath according (Belchik and Turo, 2002). Walker, Grider and Thompson creeks provide important water quality to the Middle Klamath River and these tributaries may provide thermal refugia for anadromous salmonids during warm periods.

Table H-25. 2013 water temperature data for Walker, Grider, and Thompson creeks (USFS 2014h).

Location	Date of Maximum MWMT	Maximum Weekly Maximum Temperature ºC (MWMT)
Grider Creek near 46N66 Bridge	7/27/13	19.1
Walker Creek at ~RM 1.1	7/27/13	18.9
Thompson Creek near 18N02 Bridge	7/27/13	17.3
Thompson Creek upstream from Cedar Creek	7/30/13	15.4

Riparian Function

The Lower Scott River flows through a canyon with intermediate gradient and faster current, when there is sufficient flows. A majority of the Lower Scott River basin is USFS lands and the mid- and upper valley portions are mostly privately owned.

The 2014 fires had no effect on instream wood levels in the mainstem Scott River but will affect short-term wood loading, and large wood available for recruitment in the long-term. Fire intensity and extent of area burned within RRs is used herein as to update available large wood information collected prior to the 2014 fires. High burn severity areas along perennial streams will experience an increase in wood loading in the short-term and a reduction in large wood available for recruitment to streams in the long-term. The percent of perennial stream channels that burned at high severity during the 2014 fires is limited (<0.2 percent), indicating that fire effects to the large wood loading and recruitment baseline were insignificant. Approximately 11% of perennial stream RRs were burned at moderate severity in the Happy Camp Complex, and an estimated 50 percent of the vegetation was burned in these areas. Thus, in the moderate severity areas, an increase in large wood loading is expected in the near term, and a reduction in large wood available for recruitment is expected in the long-term. Collectively, these high and moderate burn severity areas will increase large wood loading in the near term and reduce the available sources of large wood recruitment in the long-term.

The Happy Camp Complex burned approximately 34,633 acres within the Elk Creek watershed. Elk Creek is a tributary of the Klamath River and a “Key” watershed. Its’ confluence with the Klamath River is just downstream of the town of Happy Camp. Over 99% of the lands in the Elk Creek watershed are federal lands. The Elk Creek Ecosystem Analysis contains more detailed watershed information (USFS 1995d).

The Happy Camp Complex burned 11,243 acres in the Thompson Creek-Klamath River 5th-field watershed, 7,593 acres in the Walker Creek watershed, and 20,223 acres in the Grider Creek watershed. Walker and Grider creeks are included here because they are important 6th-field Klamath River tributaries that provide habitat, including non-natal rearing habitat, for anadromous salmonids and other native species, and have proposed Project activities. For more detailed information on these watersheds see the Thompson/Seiad/Grider Ecosystem Analysis (USFS 1999).

RRs in the Elk Creek basin are predominately forested and comprised of conifers and hardwoods. Current levels of large woody debris are considered “at risk”. Large wood was removed from Elk Creek in the 1960s and 1970s to prevent damage to downstream infrastructure and floods have since removed shallow-rooted vegetation, such as alders, in patches immediately adjacent to the mainstem. Large wood is delivered to stream channels via debris flows in Elk Creek. The Elk Creek Mass Wasting Risk Ration is at 0.98, bumping up against the Mass Wasting (GEO) threshold of concern, indicating an

increasing risk for debris flows, which would increase large wood loading to streams as well as sedimentation. Debris slides and floodwaters from the 1997 storms contributed large wood, which subsequently added to habitat complexity in Lower Elk Creek.

The 2014 fires had no effect on instream wood levels in the mainstem Elk Creek but will increase wood loading in the near-term, and reduce large wood available for recruitment in burned areas in the long-term. Fire intensity and extent of area burned within RRs is used here to update available large wood information collected prior to the 2014 fires. High burn severity areas along perennial streams will experience an increase in wood loading in the short-term and a reduction in large wood available for recruitment to streams in the long-term. The percent of perennial stream channels that burned during the 2014 firees at high severity is limited (<0.2 percent) indicating that effects to large wood loading and recruitment will be minor. Approximately 11% of perennial stream RRs were burned at moderate severity in the Happy Camp Complex, and an estimated 50 percent of the vegetation was burned in these areas. Thus, in the moderate severity areas, an increase in large wood loading is expected in the near term, and a reduction in large wood available for recruitment is expected in the long-term.

The Whites Fire Project Area

The Whites Fire burned a total of 38,916 acres in the North Fork Salmon River. Amount of burned area, and total miles of CH, within the 7th field watersheds of the Whites Fire are shown in Table 26. USFS ecosystem analyses (USFS 1995b; USFS1995c; USFS 1997b and c) contain more detailed watershed information. Current environmental baseline information for habitat indicators in fish-bearing 7th field watersheds is provided in Appendix D.

Table H-26. Whites Fire 7th field watersheds, burned acres and miles of Coho CH.

Whites Fire HUC 7 Watersheds	Whites Fire Burned Acres	Total Miles of Anadromous Salmonid Habitat/Miles Within the Analysis Area	Total Miles of Fish-Bearing Streams/Miles of Habitat Within the Analysis Area
Big Creek	104.2	1.1/0	1.1/0
Eddy Gulch	178.3	2.7/0.2	2.7/0.2
Jackass Gulch	384.3	2.5/0	2.8/0
Jessups Gulch-North Fork Salmon River	328.2	2.6/0.2	2.6/0.2
Lower North Russian Creek	4,501.2	4.6/4.6	4.7/4.7
Lower South Russian Creek	2,137.9	2.1/2.1	2.2/2.2
Music Creek	3,285.8	0	0
Robinson Gulch-North Fork Salmon River	5,038.0	4.6/4.6	4.6/4.6
Shadow Creek	693.7	1.9/0	1.9/0
Sixmile Creek	885.9		2.5/0
Specimen Creek	164.1	2.2/0	3.2/0
Sugar Creek	234.6	4.0/0	9.2/0
Taylor Creek	2,973.2	0/0	0/0
Upper French Creek	1,307.8	8.5/0	15./0.5
Upper North Russian Creek	1,346.8	1.2/1.1	1.2/1.1
Upper South Russian Creek	5,142.4	1.0/1.0	8.0/5.9

Whites Fire HUC 7 Watersheds	Whites Fire Burned Acres	Total Miles of Anadromous Salmonid Habitat/Miles Within the Analysis Area	Total Miles of Fish-Bearing Streams/Miles of Habitat Within the Analysis Area
Whites Gulch	8,308.2	1.6/1.6	3.6/3.6
Yellow Dog Creek-North Fork Salmon River	5,023.1	6.0/3.5	6.1/3.5
Grand Total	**42,037.9**	**46.6/18.9**	**71.4/26.5**

Aquatic Resources

The Salmon River is a Key Watershed. This basin provides approximately 175 miles of anadromous fish habitat (Elder et al. 2002), distributed within the main stem, Wooley Creek, and North Fork and South Fork Salmon River, including for spring and fall run UKT Chinook salmon, summer and winter run KMP steelhead, and SONCC Coho salmon.

The Salmon River spring-run Chinook salmon are one of the last and largest populations in the Klamath River system (Elder et al. 2002). Spring Chinook use the mainstem Salmon River, Nordheimer Creek, and Wooley Creek (Brucker 2004 *In* NCRWQCB 2005; Barnhart 1994, USFS 1995c, West 1991) and apparently use the mainstem North Fork up to the confluence with Right Hand Fork, as well as the Little North Fork and South Russian Creek (Brucker 2004, USFS 1995c). Spring Chinook use the South Fork mainstem at least to the Little South Fork and to Shadow Creek in the East Fork of the South Fork, as well as several tributaries, particularly Knownothing Creek and Methodist Creek (Brucker 2004, Elder et al. 2002, USFS 1997c).

Fall Chinook use much of the same habitat (except for holding) as the spring Chinook, though generally do not go as far up the streams. Barnhart (1994) stated that fall Chinook use in the mainstem, North Fork, and South Fork, and Moyle (2002) indicated Wooley Creek as a spawning stream as well. Use in the North Fork occurs at least up to Russian Creek USFS (1995c), and in the South Fork up to French Creek (Barnhart 1994). Spawning occurs in Nordheimer Creek, a mainstem tributary, as well as in a number of tributaries to the South and North forks. Brucker (2004) reports observations of late fall/winter run Chinook in the Lower Salmon River watershed below Knownothing Creek.

Steelhead are the most widely distributed of anadromous salmonids in the Salmon River system (Elder, et al 2002). Summer steelhead adults use summer holding areas with spring Chinook. Snorkel counts of summer steelhead indicate about 50% hold in the South Fork, the remainder split equally between Wooley Creek, the North Fork and the mainstem (USFS 1997b).

The North Fork Salmon River (5th-field watershed) is one of two major forks of the Salmon River and is part of the National Wild and Scenic River System. The North Fork Salmon River provides habitat for the Klamath River's largest wild run of spring Chinook, as well as KMP summer-run steelhead. These wild Salmon River runs are unaffected by hatchery-produced salmonids because there are no fish hatcheries in the Salmon River basin. Coho and Chinook are present in the North Fork Salmon River. Spawning and dive surveys document spring- and fall-run Chinook and summer steelhead.

A comprehensive review of datasets originating from multiple agencies/entities was conducted by CDFW, with the conclusion that Coho presence in the North Fork Salmon River has been substantiated (Garwood 2012). Coho spawning surveys in the North Fork Salmon River are not conducted due to dangerous discharge conditions and poor water visibility, therefore observations of rearing juveniles during summer and fall is used to indicate Coho presence. A 2005 survey of thermal refugia in the North Fork Salmon River found Coho juveniles at the mouth of the following tributaries: Big Creek, Olsen Gulch, Jones Gulch, Little North Fork Salmon River, Shiltos Creek, and Jackass Gulch (SRRC 2005). Coho, Chinook and steelhead presence in Big Creek is expected to be limited to the mouth area only due to the small size of this drainage, low discharge, steep gradient, and lack of adequate spawning substrate. The culvert, just above the mouth of Big Creek, is considered to be a barrier to anadromous fish. Coho or Chinook surveys have not been conducted in Jackass Gulch; suitability of the system for these species is unknown. Spawning surveys were performed in 1991 and 1999, but no live fish, carcasses, or redds were found. The upstream limit of anadromy is considered to be a waterfall located ~0.2 miles above the mouth. This barrier was noted by KNF biologists in 1975, 1983, and 1988. The falls were modified in 1990 by the installation of two log and rock weirs to allow steelhead access to upstream habitat, however, the structures are no longer functioning as designed. No surveys specifically targeting Coho or Chinook salmon have been completed in the Specimen Creek drainage. This situation is largely due to difficulty of road access and/or unsafe discharge conditions when Coho would be expected to be spawning. Habitat surveys which included snorkeling to identify fish occurred in 1991, but did not observe Coho. Resident rainbow trout and presumed steelhead juveniles have been observed in the mainstem Specimen Creek to 1.5 miles up from the mouth, with resident trout present for an additional mile upstream; and both are found on Left Hand Fork to a distance of 0.75 miles up from the mouth. Fish (fry) have also been recorded as present in the King Creek tributary to a distance of ~1000 feet. Additionally, spawning surveys conducted in 1981, 1988, 1990-1996, and 1999 were positive all years, except 1993, for live steelhead and redds. Although Garwood (2012) stated Coho occupancy in Specimen Creek to be unsubstantiated, this conclusion was based from limited records. The 1995 Klamath National Forest North Fork watershed analysis did identify Specimen Creek as potentially supporting Coho salmon (USFS 1995).

Sediment

In addition to fire effects, landsliding is a significant watershed process of concern in the North Fork Salmon River. Roads and harvest in granitic soils, road density, and fire are concerns relative to increasing landslide potential in this watershed. During the Twentieth Century, 75 percent of the landslide-derived sediment, which entered the stream, was associated with flood and storm events that occurred from 1964 to 1975. Roads produced landslides at a rate much higher than undisturbed lands. Harvested or burned areas produced landslides at a rate much lower than roads but higher than undisturbed lands.

The 2014 wildfires affected tributaries to the North Fork Salmon River that provide habitat for anadromous salmonids (Cow Creek, North Russian, South Russian and Whites Gulch) as well as tributaries that provide habitat for resident steelhead trout (Highland Creek, Hogan Creek, Johns Meadows Creek, Music Creek, Sawmill Gulch and Taylor

Creek). Several other small, unnamed drainages that drain the east side of Tanners Peak towards the North Fork Salmon River between Idlewild Campground and Mule Bridge were also burned but do not have connectivity to the North Fork Salmon. Redd mapping (2011 through 2013) has documented Chinook redds scattered throughout anadromous streams in the 2014 fire-affected area. Although fire and its effects are a part of the natural disturbance regime in a watershed, a primary concern is the potential for excessive fine sediment, which can result in pool filling, impacts to spawning substrate, food production and thermal refugia. Several accessible tributaries to the North Fork Salmon River within the wildfire area function as thermal refugia when the mainstem North Fork Salmon River temperatures increase. The extent of damage to RRs and the potential for impacts to stream shade is also a concern.

Post-fire BAER field reviews were focused on identifying the necessary treatments to minimize both road failure and general mobilization of post-fire road-related sediment, such as installation of critical dips and cleaning of culverts and cross-drains. Treatments were identified for Whites Gulch as multiple culverts were found to be partially blocked with debris, with a few completely buried such that the inlet could not be found. Post-fire mapping indicated that burn intensity along fish-bearing streams was predominantly low, or unburned. The primary exception was East Fork Whites Gulch, as well as a small segment of the North Fork Salmon River in the Hickey/Applesauce Gulch area. Additionally, the riparian area of many of the larger fishless perennial streams within the fire boundary exhibit relatively low burn severity. Field observation confirmed mapping results.

Table H-27. Summary of watershed burn severity for 2014 Whites Fire.

Fire Area	Amount of Very Low Acres (%)	Amount of Low Acres (%)	Amount of Moderate Acres (%)	Amount of High Acres (%)	Total (Acres)
Whites Fire	5,612 (17%)	16,497 (49%)	10,007 (30%)	1,637 (5%)	33,753

The North Fork Salmon River post-fire 5th-field watershed risk ratio is at 0.33, well below 1 indicating that disturbance resulting from road, vegetation management, and wildfire is sufficiently below the watershed TOC, and interpreted to mean that effects on increased peak flow will not be significant at this scale. However, channel change would be expected along streams/reaches that conveyed debris flows. The North Fork Salmon River 5th-field watershed post-fire Mass Wasting (GEO) risk ratio is at 0.73 and does not exceed the Mass Wasting (GEO) threshold of concern.

Table H-28. Modeled post-fire CWE, USLE, and Mass Wasting (GEO) risk ratios for Whites Fire 5th field watersheds.

5th-field Watershed	Area (Acres)	Pre-Fire (2012)	Post-Fire, No Action	2014 Fire Area
ERA Risk Ratios				
North Fork Salmon River	130,545	0.17	0.34	Whites Fire
USLE Risk Ratios				
North Fork Salmon River	130,545	0.05	0.33	Whites Fire

5th-field Watershed	Area (Acres)	Pre-Fire (2012)	Post-Fire, No Action	2014 Fire Area
GEO Risk Ratios				
North Fork Salmon River	130,545	0.53	0.73	Whites Fire

Water Quality

The Salmon River is impaired and is listed under the 303(d) Clean Water Act for temperature (Table 13). Water temperatures stressful to salmonids occur in the Lower Salmon River annually, but the extent and duration changes in different flow years. Cool, deep pools in the Lower Salmon River are critical for summer holding and rearing salmonids. Spawning occurs in the mainstem Salmon River in gravels located in pool tail-outs.

Shade is lacking along the entire North Fork of the Salmon, with the exception of the upper-most reaches. Tributary temperatures are typically below lethal levels and provide thermal refugia. The Little North Fork has the largest cooling effect on the North Fork of the Salmon River due to its significant flow contribution. High water temperatures have resulted in fish kills of spring-run Chinook salmon and summer steelhead during warm low-flow drought conditions of some summer seasons, such as in 1994 and 2014.

The KNF collected water temperature data in 2013 (Table 29). Temperatures ranged from “properly functioning” to “at risk” to “not properly functioning.”

Table H-29. 2013 water temperature data for NF Salmon River (USFS 2014h).

Location	Date of Maximum MWMT	Maximum Weekly Maximum Temperature ºC (MWMT)
NF Salmon River upstream of Mule Bridge	7/27/13	21.9
NF Salmon River upstream of Right Hand Fork	7/27/13	19.5
NF Salmon River just upstream of Forks	7/27/13	26.2
NF Salmon R upstream of Little NF	7/30/13	25.6

The percent of stream channel burned in 2014 is an indication of the impacts to riparian function, including stream shade along perennial streams. Approximately 3% of streamside areas were burned at high severity and these areas will provide little to no shade to stream channels post-fire until trees re-establish. Approximately 14% of streamside areas burned at moderate severity, and these areas experienced an estimated 50% reduction in streamside vegetation. The relative percentages of reduction in vegetation along streams is low, and are not expected to measurably increase stream temperatures.

Table H-30. Summary of stream channel burn severity data from BAER reports (USFS 2014a-2014f) for the 2014 Whites Fire.

Fire Area	Stream Type	Very Low Severity Miles (%)	Low Severity Miles (%)	Moderate Severity Miles (%)	High Severity Miles (%)	Total (miles)

Fire Area	Stream Type	Very Low Severity Miles (%)	Low Severity Miles (%)	Moderate Severity Miles (%)	High Severity Miles (%)	Total (miles)
Whites Fire	Intermittent	18 (21%)	43 (50%)	21 (24%)	4 (5%)	86
	Perennial	16 (25%)	36 (57%)	9 (14%)	2 (3%)	63

Riparian Function

Approximately 29 percent of the watershed is designated as RRs, which includes unstable or potentially unstable lands and stream buffers. Current conditions in RRs have been impacted by historic grazing, roads, stream crossings, and mining. Analysis of the 1944 air photos showed that at that time, most stream channels were fully vegetated with a mixture of conifer and hardwood species. The 1964 flood resulted in major changes to the stream channel in that the channel widened and long segments were scoured out. The entire length of the North Fork of the Salmon River was modified and stripped of riparian vegetation. For context, there were 8 miles of freshly scoured channels visible on the 1944 air photos, 40 miles of freshly scoured channels on the 1965 photos, and 12 miles of freshly scoured channels on the 1975 photos. Recovery from debris and other scour events occur in stages and along variable timelines. Full recovery of large conifers may take 100 years or more, although initial recovery of short-lived riparian species that also provide bank stability and integrity can occur in a decade or two. In 1995 the Klamath National Forest estimated that the mainstem North Fork of the Salmon River showed 20 percent initial recovery since the 1964 flood. This may be because, in general, larger streams recover more slowly than smaller streams (the KNF also studied recovery of smaller streams) due to larger surface areas affected by scour and larger streamflows acting on this surface. Unstable areas and disturbed streams that have poorly defined primary channels may recover slowly due to frequent re-disturbance by subsequent high flow events.

Significant portions of RRs were burned in the past with moderate to high severity by the Hog, Yellow, and Specimen fires. Riparian vegetation recovery to a mature state within granitic terrains takes approximately 80 years (to re-establish large conifers). As described above, post-2014 fire mapping indicated that burn intensity along fish-bearing streams was predominantly low, or unburned. The primary exception was East Fork Whites Gulch, as well as a small segment of the North Fork Salmon River in the Hickey/Applesauce Gulch area. Additionally, the riparian area of many of the larger fishless perennial streams within the fire boundary exhibit relatively low burn severity. Field observation confirmed mapping results.

The 2014 fires had no effect on instream wood levels in the mainstem but will affect tributaries that burned relative to short-term wood loading and large wood available for recruitment in the long-term. Fire intensity and extent of area burned within RRs is used herein to update the large wood information collected prior to the 2014 fires. High burn severity areas along perennial streams will experience an increase in wood loading in the short-term and a reduction in large wood available for recruitment to streams in the long-term. The percent of perennial stream channels that burned in the Whites Fire at high severity is limited (3%) indicating that effects to large wood loading and recruitment will be minor. Approximately 14% of perennial stream RRs were burned at moderate severity in the Whites Fire, and an estimated 50 percent of the vegetation was burned in these

areas. Collectively, these high and moderate burn severity areas will increase large wood loading in the near term and reduce the available sources of large wood available for recruitment in the long-term.

VII. Effects of the Action

The following effects analysis is based upon project data as of 03/31/15. Since that date, field review has continued to provide information that leads to minor modifications in project design such as trimming or dropping of treatment units based on feasibility or economic (cost/benefit) considerations; or changes to logging systems and temporary roads and landings. During this consultation process, potential changes to the following roads were discussed: roads 46N78, 46N41YA, 15N75A, 40N61A and 46N30Y. The potential changes to project design for these roads would reduce potential impacts to riparian/aquatic resources including SONCC Coho salmon and CH (roads may be dropped prior to decision and not used in the Project). The analysis presented in this biological assessment, however, includes actions on these roads as described herein and displayed on maps in Appendix A.

Direct Effects

The potential for direct effects to Coho salmon and anadromous salmonid habitat is associated with actions that occur within active stream channels. The only PEs proposed within active stream channels are water drafting and road stream crossing work, the latter related to both temporary road use and Legacy sediment site restoration.

Water Drafting. Direct effects to Coho salmon and anadromous salmonid habitat can result from water drafting activities. Numerous water drafting sites may be used for the WSFR Project, and some are within Coho salmon CH (see locations in Appendix A).

Drafting operations can disturb holding or spawning adult fish, as well as impinge or entrain juveniles (Sicking 2003). Additionally, water drafting operations can mobilize suspended sediment to nearby downstream aquatic habitat. Suspended sediment increases turbidity, exposing juvenile fish to gill damage and reduced oxygen uptake, and/or reduced vision and compromised feeding effectiveness. If water drafting were to occur with eggs present in adjacent redds, it is possible that deposition of suspended sediment could fill interstices of stream bottom substrate, depriving incubating eggs of dissolved oxygen and resulting in their mortality.

While screening intakes can reduce effects to fingerlings and fry, minimization of impingement requires the use of specific mesh sizes, pumping rates, and sufficiently large screen areas, as outlined in the *NOAA Fisheries Water Drafting Specifications* (NOAA 2001). NOAA drafting specifications will be implemented during water drafting at all sites within Coho salmon CH. There is a very low probability of impingement given that fish have been routinely observed to temporarily move away from a drafting pump site when a truck or hose is detected. An important minimization measure is Watershed PDF-5, which requires that decisions regarding which drafting sites to use in a given area be coordinated with KNF fisheries biologists. Based on observations, it is anticipated that fish temporarily avoiding water drafting activities are not likely to experience reduced feeding success, nor be exposed to a significantly higher probability of exposure to prey.

Proximity. Numerous water drafting sites are within anadromous salmonid habitat (CH). Numerous drafting sites have been identified for use to provide greater flexibility in choosing the best source during Project implementation, and to minimize exposure of fish and particularly SONCC Coho salmon to water drafting. Not all sites mapped for potential use during the Project will be used. The timing of water drafting limits the potential for direct impacts to Coho salmo;: adults or eggs are not typically present, but juveniles may be present. Chinook and Coho egg incubation period is generally October through March, during the winter period. Therefore likelihood of water drafting having any effect on the reproduction of Chinook or Coho salmon is low. However, the potential for effects to rearing juvenile Coho salmon ranges from low to high, dependent upon the drafting site location and other localized conditions such as drought and/or other nearby water withdrawals related to wildfire suppression or private land activities.

Probability. Rearing juvenile Coho salmon would be expected to move away from drafting sites when a truck approaches or a hose is dropped. If an individual fish did not flee, there is a probability of impacts. Therefore the magnitude of potential effects is discussed below. Project design feature Watershed-5 further reduces the probability that Coho salmon would be present or affected by project water drafting, by requiring that KNF fisheries biologists help determine where drafting will occur. Sites that are not likely to have rearing Coho salmon present will be prioritized for use, such as mainstem sites on the Klamath, Scott, and Salmon rivers. Priority will also be given to sites that involve drafting relatively warmer waters in mainstem rivers; drafting from tributaries and colder water sources, especially in their lower reaches, will be avoided particularly during late summer and early fall (when fish survival is dependent upon thermal refugia). Water storage facilities such as foldable tanks are encouraged and will be assessed for sites with moderate flows that simultaneously support rearing SONCC coho salmon, and may be subject to high drafting use (e. g., Walker Creek). Project-related water drafting will be monitored, and shifted away from streams if their baseflows will no longer sustain drafting-related water withdrawal consistent with PDFs. The following creeks will be avoided, due to their small size, small summer base flows, and consistent presence of rearing SONCC Coho salmon - Tom Martin Cr, O'Neil Cr, Little Horse Cr, and China Cr.

PDFs eliminate any drafting site alterations within CH, such as deepening pools or removing , vegetation. Due to implementation of Forest Service BMPs and PDFs specific to water drafting, effects on anadromous salmonid habitat will be insignificant.

Magnitude. While screening intakes can reduce effects to fingerlings and fry, minimization of impingement requires the use of specific mesh sizes, pumping rates, and screen areas, as outlined in the *NOAA Fisheries Water Drafting Specifications* (NOAA 2001). NOAA drafting specifications will be implemented during project water drafting within Coho salmon CH (see maps in Appendix A for locations). Forest Service BMPs which require screening for aquatic species present, will be implemented at water drafting sites outside of CH. As described above, there is a very low probability of impacts, especially impingement on screens, given that fish routinely move away when a truck or hose is detected. It is anticipated that fish temporarily fleeing or avoiding water drafting activities are not likely to experience measurable reductions in feeding success, nor result in a high probability of exposure to prey, due to the limited extent of drafting

sites relative to other available and suitable habitat located adjacent to where drafting will occur.

The frequency of effects from water drafting is limited to dry months, during operations, and when those operations overlap with juvenile rearing (summer months). Drafting will be done in accordance to the NOAA *Fisheries Water Drafting Specifications* (NOAA 2001) and appropriate Project PDFs (Appendix E) and BMPs. By following these specifications and considering the mobility and likely behavioral response of Coho salmon to move out of the area when a truck approaches or hose is dropped, the effects of water drafting will have minor and insignificant direct effects on Coho salmon.

The direct effects of water drafting will be limited to periods of project implementation (short-term) and are likely to result in only minor effects on Coho salmon, and insignificant effects to anadromous salmonid habitat (including CH/EFH). Direct effects will be neutral in the long-term.

Stream Crossings. Installation of temporary stream crossings on proposed temporary roads will mostly occur in dry intermittent and ephemeral stream channels. Proposed temporary road actions that include stream crossings are: 46N41YA in Lower Grider Creek drainage, 46N78 in China Creek drainage, and 46N77 in Cliff Valley Creek drainage. None of the stream crossings are within fish-bearing habitat and stream crossings will not directly affect anadromous salmonids. Indirect effects are discussed below. Methods and minimization measures for stream crossings, including for culvert installation and dewatering/rewatering, were analyzed in the Facilities Maintenance and Watershed Restoration BA (USFS 2004) and these methods and measures will be implemented as part of this project to minimize direct and indirect effects. Due to the location of temporary stream crossing work upslope and at least 0.5 mile away from SONCC Coho salmon CH, and the localized nature of impacts from project stream crossing work, direct effects on Coho salmon are expected to be discountable, while effects on anadromous salmonid habitat at least 0.5 mile downstream are expected to be insignificantly small.

Legacy sediment site repair will include work at stream crossings to address sediment sources or to provide improved passage for aquatic species (see Appendix A for map of legacy sediment site repair in Elk Creek watershed). The proposed legacy sites are in the Elk Creek watershed (and one site in Lower Grider Cr drainage, if 46N41YA is used in the Project) but are not within anadromous salmonid habitat. PDFs and BMPs will be implemented to minimize short term effects. Because legacy sites are not within accessible habitat (at least 300 feet upstream), direct effects from legacy site repairs to Coho salmon are expected to be discountable, and effects to anadromous salmonid habitat will be insignificant. Indirect effects are discussed below.

Proximity. None of the legacy sediment site treatments or temporary stream crossing work will occur in habitat accessible to Coho salmon or other anadromous salmonids. None of the three temporary road actions that involve stream crossings are within CH. Proximity of these crossings to CH are as follows: 46N41YA, face drainage just over ½ mile upstream of CH in Grider Cr; 46N77 Cliff Valley Cr about 3 miles upstream of CH in Grider Cr; 46N78 South Fork Three Biscuit Cr about 2.5 miles upstream of CH in China Cr.

Six of the proposed culvert upgrade sites in Elk Creek Watershed are approximately 300 feet upstream of CH. Stream crossing work will occur in a dry channel wherever possible; and BMPs and PDFs will be implemented to minimize effects to aquatic species and habitat present. Because work will occur on existing roads and at existing crossings that have been previously disturbed, direct effects to anadromous salmonid habitat downstream (CH) are expected to be insignificant.

In summary, Project water drafting which would occur during 2015 and 2016, have the potential to affect Coho salmon juveniles from the 2014 and 2015 brood years that are rearing in the Project Action Area. Along with legacy sediment site restoration treatments on roads and crossings, which may occur over serveral years, these activites are: located outside of SONCC coho salmon CH; or, in the case of water drafting, will occur in a manner that complies with NOAA's Water Drafting Specifications, and will result in only localized, low impact, short-duration, and insignificant effects to salmonids, including SONCC Coho salmon. Other PEs will not result in direct impacts to Coho salmon as work will not occur within CH or within active stream channels.

Indirect Effects

Sediment

The following discussion is organized by PE, and includes an analysis of effects to the Sediment habitat Indicator group listed below, based on the potential for indirect effects associated with each PE:

- **Suspended sediment-intergravel DO/turbidity**: the risk of increased soil disturbance then sediment supply and delivery associated with all of the PEs.
- **Physical barriers**: the risk of increased soil disturbance then sediment supply and delivery associated with all of the PEs.
- **Substrate character and embeddedness**: the risk of increased soil disturbance then sediment supply and delivery associated with all of the PEs
- **Pools - frequency and quality, large pools, average wetted width/maximum depth ratio in scour pools in a reach**: the risk of increased soil disturbance then sediment supply and delivery associated with all of the PEs.
- **Off-channel habitat**: the risk of disturbance and increased peak flows and resulting channel changes associated with all of the PEs.
- **Change in peak flows**: the risk of disturbance and then increased peak flows associated with all PEs.
- **Increase in drainage network –roads**: increased disturbance and changes to the road drainage network associated with temporary roads and landings.

The Sediment habitat Indicator group is discussed collectively below under PE headings, including at the site- and watershed scale. The watershed scale effects analysis relies on the WSFR Hydrology Report (Mondry 2015) analysis and the interpretation of CWE modeling and results that compare pre-fire disturbance with post-fire and post-Project disturbance, at both the 5th-field and 7th field watershed scales. The mass-wasting (GEO) model was used to assess potential risk of channel changes from landslides and debris flows, which have a high likelihood of causing: channel morphological changes including channel bed aggradation (affecting fish passage, especially at lower flows within response reaches); reduced pool frequency and quality; and changes to channel

width/depth ratios. The ERA model was used to assess the potential for increased peak flows, including for temporary roads and landings.

The assessment of potential effects to the Sediment habitat Indicator group at the site-scale relies on field review of the proposed treatment units/areas, predictions of action effects based on past projects, literature reviews, and discussions with relevant interdisciplinary team members (geologist, hydrologist, silviculturist, wildlife biologist, and fire behavior specialist). The potential for Project-related sediment mobilization to affect aquatic resources downstream is based on site conditions (including unit-specific slope stability, soil types, disturbance potential, and effects minimization measures that are to be implemented).

1) Salvage Harvest and Reforestation

Salvage harvest will occur on about 7,829 acres. Areas proposed for treatment include 1) Areas of moderate to high severity vegetation mortality; 2) Areas determined to be feasible in terms of logging systems, accessibility, and economic viability; and 3) Areas with more than 10 contiguous acres of medium to high severity vegetation mortality. Only standing dead trees 14 inches in diameter at breast height or greater will be considered for commercial salvage harvest. Salvage logging will be accomplished by ground-based, skyline, and/or helicopter logging systems. All salvage units will be reforested with the need for site-preparation (site prep) evaluated prior to planting. Stream course Riparian Reserves, as well as inner gorges and active landslides, are excluded from salvage harvest units. Tractors and mechanical harvesters are excluded from all RRs associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits (Watershed-4 PDF, Appendix E).

Figure 3 below displays an example of how these features overlap treatment units, and the first cut at what specific areas will be excluded from, salvage harvest units in the lower Grider Creek drainage. Precise lay out of RR and inner gorge features are determined in the field during unit layout when the site specific slopes and distances are determined. These features are identified on the ground using flagging and GPS points, and the excluded areas are identified on timber sale area maps. Proper implementation of these design features is critical to ensuring that the environmental effects forecast in Project documentation, including this BA, are representative of conditions on the ground. The Forest Service is responsible for laying out salvage units consistent with this Project description, as well as closely monitoring implementation throughout the Project.

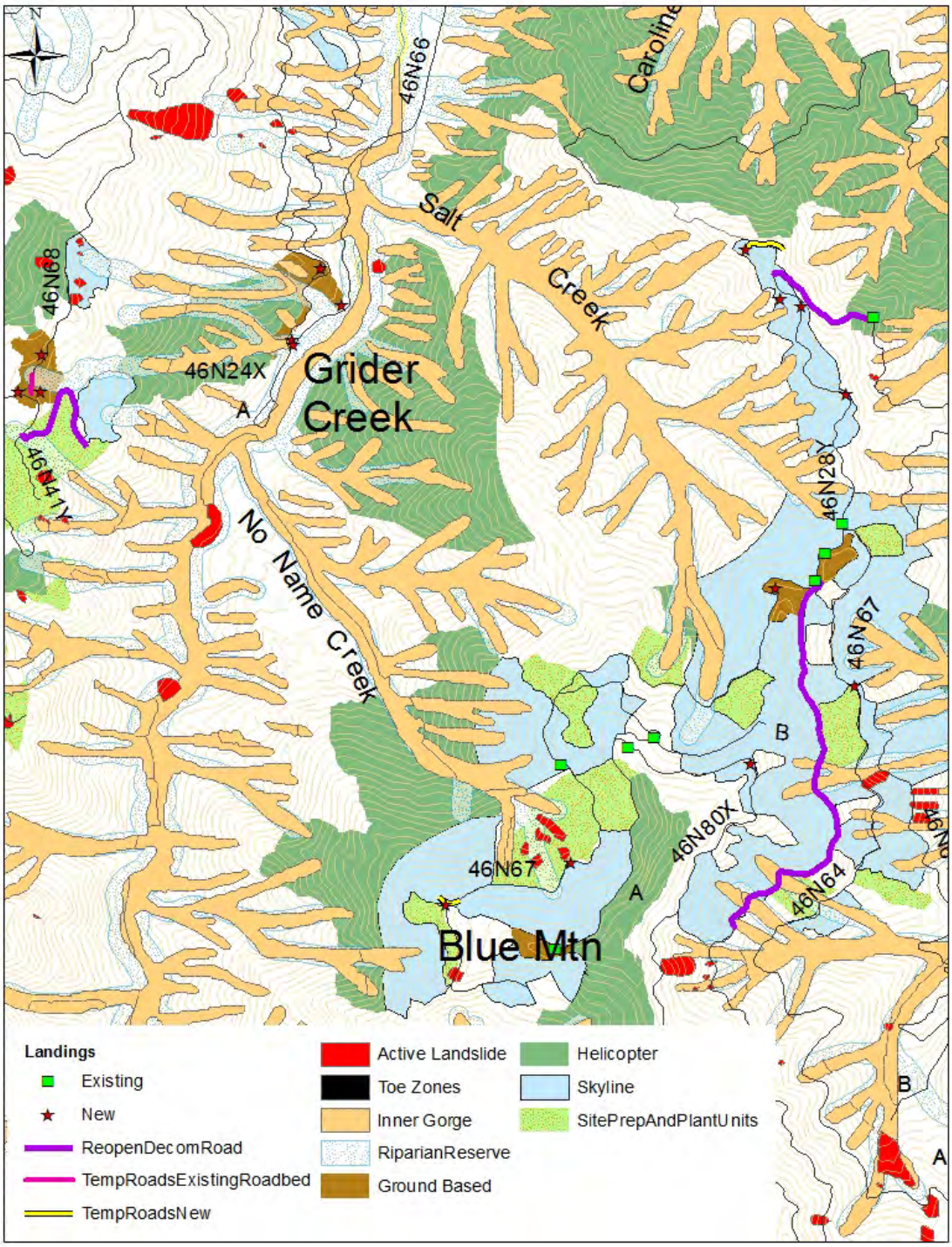

Figure 10. Proposed activities in lower Grider Creek displaying how RR, inner gorge, and active landslides will be excluded from units across the Action Area.

Reforestation includes site-preparation, planting, and release on approximately 7,873 acres, in addition to salvage harvest units, to increase the likelihood and speed at which burned areas are reforested. Like salvage harvest, all site prep and plant activities were planned to exclude Riparian Reserves. Methods for treatment may include: manual site

preparation, skyline yarding, mastication, mechanical yarding, and slash piling of dead trees.

Due to concerns from watershed specialists about the currently impaired function of heavily burned RRs, lop and scatter treatments, done by hand, are proposed within RRs where they overlap site prep and plant units. These activities would occur where safety of forest workers can be ensured. This treatment is proposed for RRs within plantations within the Happy Camp Complex and Whites Fire that burned with moderate to high severity: approximately 1,100 acres in the Happy Camp Complex and 127 acres in Whites Fire may be treated. These RRs hand treatment areas are scattered across the landscape and will be costly to implement. For those reasons, it is not clear at this time where these treatments will actually occur on the ground. Where they occur, these RRs hand treatments will increase near term soil cover and sediment filtering capacity in burned RRs. They are designed to reduce erosion and sedimentation at the site, and to encourage natural recovery of soils and vegetation. Detailed tables showing acres of RRs hand treatment proposed by 7th field watershed are in Appendix B.

Timber harvesting, including skid trails, landing and road construction, can increase soil disturbance, erosion, and sediment delivery to streams. Soil disturbance and loss of cover exposes soil to raindrop impact and subsequent erosion. Eroded soil moves from hillslope to stream channel via surface runoff, and occasionally via landslides. In sufficient quantities, fine sediment can reduce the abundance and quality of aquatic habitat. This is an indirect effect in that sediment movement is driven by winter storms or snowmelt events that occur following disturbance and effects can occur far downstream from sites of disturbance.

Altered sediment supply poses a stress to salmonids and other aquatic species. The AP Sediment habitat Indicator group includes key elements of anadromous salmonid habitat that can be adversely affected by an increase in sediment supply and delivery to streams, as well as mechanisms that can increase sedimentation including the following: suspended sediment/intergravel dissolved oxygen/turbidity, physical barriers, substrate character and embeddedness, pools frequency and quality, average wetted width/maximum depth ratio in scour pools in a reach, change in peak flows and increase in drainage network. Effects to sediment supply and delivery to streams are also analyzed at the site-scale and any aggregated effect is then inferred to affect the sediment-related indicators listed above.

Stream temperature (discussed below under the Water Quality Indicator) may also be indirectly affected through changes in sediment supply and delivery to streams via changes in channel morphology (pool depths or increases in width-to-depth ratio), which can facilitate heat exchange (Poole and Berman, 1999). In addition, fine sediment may block exchange between surface waters and intragravel flows, also contributing to warming. This discussion focuses on effects to sediment, and where those effects are determined to have a measurable or significant impact on temperature through the pathways described above.

Measurable changes in watershed sediment supply and delivery are particularly important relative to the Physical Barrier habitat Indicator because this may mediate access to tributary rearing habitat and refugia within Actions Area streams. Access to some

refugial areas from the mainstem Klamath River is currently blocked in some locations by alluvial barriers resulting from sediment loads flushing out of watersheds.

In addition, excessive fine sediment reduces habitat diversity, embeds spawning gravel, and reduces channel stability. Soils in the Action Area in some watersheds are highly erodible, and in combination with the steep terrain, recent fires, and a legacy of past timber harvest and road-building, fine sediment loading has contributed to impaired aquatic habitat conditions in some areas. This impairment is indicated by the pre- and post-fire CWE modeling data.. This discussion focuses on effects to sediment, and where those effects are determined to have a measurable or significant impact on barriers through the pathways described above.

The method of salvage harvest used affects the extent of watershed disturbance. Chase (2006) compared sediment production rates from sites burned at high severity and subjected to helicopter, cable or tractor logging and found that cable- and tractor-logged sites have significantly more ground disturbance than sites logged by helicopter (Chase 2006). The effect of different salvage logging methods on percent ground disturbance was studied by Klock (1975) who reported that the mean percent ground disturbance for tractor skidding over bare ground was 36%, 32% for cable logging without full suspension, 2.8% for cable logging with full suspension and less than 1% for helicopter. Chou et al. (1994a; 1994b) also measured disturbance after salvage logging on the 1987 Stanislaus National Forest fire and reported the mean ground disturbance for tractor logging was 35% versus 18% for cable-logged sites. Some studies have argued that salvage logging may reduce post-fire sediment production by breaking up soil water repellency and increasing infiltration rates by disturbing sealed soil surfaces (Bautista et al. 1996). Slash from salvage logging can increase percent cover and surface roughness, thereby reducing overland flow velocities and surface erosion (Shakesby et al. 1996; Poff 2002).

Wagenbrenner et al. (2014) found that skidder and feller-buncher plots generally had greater compaction, less soil water repellency, and slower vegetation regrowth than untreated control plots. Adding slash to skid trails increased total ground cover and reduced sediment yields by 5-50 times compared to untreated plots. Vegetative regrowth and sediment production varied widely among the study areas due to differences in rainfall and soil properties, however, susceptibility to surface runoff and erosion after high severity fire suggests that areas disturbed by ground-based salvage logging need additional mitigation.

Table 31 shows modeled CWE results pre-fire, post-fire and post-Project. Disturbance from the 2014 fires was high in some watersheds, increasing risk ratios in Beaver Creek, Lower Scott River, Thompson Creek and North Fork Salmon. Disturbance associated with implementation of salvage harvest and all associated actions was modeled against the post-fire baseline. At the 5th-field watershed scale, the proposed action including salvage harvest and reforestation does not add any incremental increase in disturbance beyond the 2014 fires to runoff (ERA), mass wasting (GEO) or sedimentation (USLE). Similarly, the project will have insignificant effects to sediment and anadromous salmonid habitat, and by extension, insignificantly small effects to SONCC Coho salmon at the 5th field watershed scale.

Table H-31. CWE model results at 5th field watershed scale comparing pre-fire conditions, no action, and effects of Consultation Action.

5th-field Watershed Name	Area (Acres)	Pre-Fire (2012)	Post-Fire, No Action	Consultation Action	2014 Fire Area
Beaver Creek	69,610	0.7	1.0	1.0	Beaver Fire
ERA		1.1	1.2	1.1	
USLE		0.8	1.1	1.0	
GEO					
Horse Creek-Klamath River	98,625	0.7	0.7	0.7	
ERA		0.7	0.8	0.8	
USLE		0.7	0.9	0.9	
GEO					
Humbug Creek-Klamath River	68,023	0.6	0.3	0.3	
ERA		0.6	0.5	0.6	
USLE		0.8	0.8	0.9	
GEO					
Elk Creek	60,829	0.5	0.5	0.5	Happy Camp Complex
ERA		0.1	0.3	0.5	
USLE		1.0	1.0	0.5	
GEO					
Lower Scott River	98,016	0.1	0.5	0.6	
ERA		0.1	0.5	0.4	
USLE		0.3	0.6	0.6	
GEO					
Seiad Creek-Klamath River	81,706	0.6	0.6	0.6	
ERA		0.3	0.7	0.3	
USLE		0.5	0.8	0.7	
GEO					
Thompson Creek-Klamath River	67,301	0.1	0.4	0.4	
		0.4	0.3	0.2	
ERA		0.4	0.5	0.6	
USLE					
GEO					
North Fork Salmon River	130,545	0.2	0.3	0.3	Whites Fire
ERA		0.1	0.3	0.3	
USLE		0.5	0.7	0.7	
GEO					

In addition to the assessment of watershed-scale effects to sediment at the 5th-field watershed scale, the hydrology assessment modelled and interpreted past and predicted disturbance at the 7th field watershed scale. The WSFR Hydrology Report (Mondry 2015) and Appendix B to this BA include more detailed CWE modelling results, summarized here.

For the ERA model, which is used to assess relative effects to watershed sediment regimes and peak flows, the following 7th field watersheds are at or above the 1.0 risk ratio threshold of concern pre- and post-Project: Buckhorn Gul-Beaver Creek, Doggett Creek, Dutch Creek, Jaynes Canyon, Kohl Creek, Lower West Fork Beaver Creek, Soda Creek-Beaver Creek, Big Ferry-Swanson, Middle Elk Creek, Walker Creek, and Music Creek. The incremental increase to ERA risk ratio added by this Project is small, with a maximum increase of 0.3. The 7th field watershed with the lowest overall impact of the Project, as reflected by ERA risk ratio, is Lower East Fork Elk Creek and Cougar Creek-Elk Creek drainages which both have zero change due to the Project. The lack of increase

in post-Project ERA risk ratio is because the Project includes substantial legacy sediment site treatments (which are assigned negative ERA values), and a relatively small amount of ground disturbing and road-related actions in these drainages (see Appendix B tables for ERA accounting by 7th field watershed). The 7th field watersheds with the highest overall impact of the Project, as reflected by ERA risk ratio, are Whites Gulch and Upper North Russian Creek at 0.3 increase. This increase is expected to have only insignificant effects on sediment production and anadromous salmonid habitat, including SONCC Coho salmon CH, in the Salmon River Watershed. The Beaver Fire area drainages were the most disturbed pre-Project as reflected by CWE values. Project activities in the Beaver Fire area are limited to 350 acres of salvage, scattered in several units across Kohl, Doggett and Beaver Creek drainages, and 0.8 miles of temporary road on existing road bed. Approximately 1,700 acres may receive site prep and plant treatments, dependent on funding availability. These activities constitute a minor level of ground disturbance scattered across drainages and Project actions will help recover late seral forests more quickly in treated areas.

For the GEO model, which is used to assess landslide risk and potential resulting channel changes, the following 7th field watersheds are at or above the 1.0 risk ratio threshold of concern pre- and post-Project (driven largely by 2014 fire effects): Bishop Cr-Elk Cr, Lower West Fork Beaver Cr, Lumgrey Cr, McKinney Cr, Soda Cr-Beaver Cr, Bear Cr, Granite Cr, Middle Elk Cr, Schutts Gulch-Klamath River, Deep Cr-Scott River, Music Cr, O'Neil Cr, Doggett Cr, Caroline Cr-Klamath River, Dona Cr-Klamath River, Buckhorn Gul-Beaver Cr, Walker Cr, Lower Grider Cr, Kohl Cr, and Middle Cr. The incremental increase to GEO model risk ratio added by this Project is small, only up to 0.1. GEO model risk ratios are reduced post-Project in Elk Creek drainages due to proposed legacy sediment site fixes.

As described in the Project Geology Report, the proposed action would reduce the duration of elevated landslide risk for nine 7th field watersheds as compared to no action. The 7th field watersheds with a high landslide risk that will have a reduced duration of elevated risk are Upper Grider Creek, Cliff Valley, Lower Grider Creek, O'Neil Creek, Walker Creek, and Caroline Creek. These watersheds have a high percentage of steep, weathered granitic lands so the project will benefit this Riparian Reserve landform in the long-term by decreasing the duration of elevated risk of landslide events. The reduction in duration of elevated risk will benefit natural resources and infrastruction in the long-term. Middle Creek, Horse Creek, and Upper Elk Creek have a moderate landslide risk and will have a duration of elevated risk of 30 years with the proposed action. Lower Grider and Walker Creek have very high landslide risk due to the potential to impact private land – so the reduction of elevated risk from more than 80 years to 30 years is of great benefit for protecting human safety and private property as well as fish habitat in these drainages. Rancheria Creek drainage, which also has a very high landslide risk, will continue to have a greater than 80 year duration of elevated risk because there is less than 25% of the high and moderate vegetation burn severity areas being planted. See the Project Geology Report for detailed analysis of landslide risk and the project's expected influence on it.

CWE modelling estimates of watershed disturbance caused by the Project are relatively small when compared to projects that harvest live trees over the same acreage; the reason for this is that dead/dying trees do not provide the same essential functions on the

landscape as live forests. As described in detail in the Project Geology Report (Bell 2015), after trees die, root support begins to decline immediately and provides almost no support/soil stability after about a decade. In addition, mature conifers affect site hydrology and soil moisture through interception and transpiration, and these functions are lost after trees die. As reflected in the CWE model coefficients and outputs, the disturbance related to salvage harvest that drives potential impacts to mass wasting and hillslope processes is ground based harvest and infrastructure development such as roads and landings. The Project is comprised largely of skyline and helicopter logging systems, and is designed to avoid unstable features such as active landslides, inner gorges, and stream course RRs (as depicted in Figure 3). Therefore, the project involves a relatively low level of watershed-scale disturbance in the context of existing conditions; however there remains potential for site level impacts, especially where infrastructure would be constructed or developed.

In addition to a review of the CWE modelling results at the 5th- and 7th field watershed scale, potential impacts to sediment at the site scale were assessed, to identify appropriate impact avoidance and minimization measures. At the site-scale, salvage harvest and reforestation effects will be minimized through project design (excluding RR, inner gorges and active geologic features) and implementation of Watershed PDFs and BMPs (listed in Appendix E and Project FEIS).

RRs have been established along all streams to protect riparian function (see PDF Watershed-3) including sediment retention capacity. Trees will not be cut or removed from RRs as part of salvage harvest under all methods of removal/harvest (tractor, skyline and helicopter). The sediment retention function of RRs will not be impacted by salvage harvest. There would be benefits to sediment retention function in RRs that receive lop and scatter hand treatments to achieve near term ground cover; approximately 1227 acres within site prep and plant units scattered across the Happy Camp Complex and Whites fire areas may receive this treatment. At the site level, this treatment would reduce sediment inputs to streams and speed the recovery of soils and vegetation within RR. Upper reaches of East Fork Elk, Middle, and Tompkins are the creeks that stand to benefit the most from hand lop and scatter treatment in RR.

Salvage harvest will remove dead trees and contribute to a timely restoration of burned stands. Without capturing the value of dead trees via timber salvage, site restoration would likely be unsafe and/or cost prohibitive. Planting without site preparation would likely result in the loss of conifer plantations to fire before they mature, given the median 5-25 year fire return interval predicted within the Analysis Area.

Summary of Indirect Effects. At the watershed scale (5th- and 7th field watersheds), the 2014 fires resulted in measurable impacts to sediment supply and delivery in some watersheds as described above, and observed during 2014-2015 fall/winter storm events. However, the proposed action does not add any increase to modelled disturbance at the 5th-field watershed scale, and only a slight incremental increase to post-fire disturbance at the 7th field scale in some watersheds, as described above and displayed in Appendix B tables. The proposed action will remove burned trees and conduct reforestation which are likely to restore forested areas quicker than if no action were taken. Project designs, Watershed PDFs, and BMPs minimize effects through avoiding unstable areas,

minimizing ground disturbance and requiring erosion control. Based on these factors, salvage harvest and site preparation will have insignificant effects on the Sediment habitat Indicator group and anadromous salmonid habitat, and minor effects on SONCC Coho salmon. Activities proposed within RR of site prep and plant units (lop and scatter hand treatments) may have insignificant beneficial effects on the Sediment habitat Indicator group at the site, with insignificant or neutral effects to Coho salmon and CH.

Proximity and Probability. Maps in Appendix A show that units are within proximity to anadromous salmonid habitat. Because salvage harvest will not occur within stream course RR, it will occur greater than 300 feet from any stream with SONCC Coho salmon CH. The probability of effects to the Sediment habitat Indicator group and Coho salmon is insignificant, as described above.

2. Fuels Reduction Treatments

The proposed action includes treatment of hazardous fuels on about 22,307 acres and will include the following: hand work, mechanical thinning, mastication, lop and scattering, chipping, broadcast burning (including use of helicopters for ignition), jackpot burning, and pile burning. Fuels reduction activities near streams can increase the potential for sediment-related impacts to aquatic habitat. The proposed action includes fuels reduction within RRs within fuels management zones, roadside hazard reduction units, WUI's and underburn units (locations are shown on maps in Appendix A). Small diameter trees would be removed using a masticator and hand work, and fuels would be piled and burned.

Mastication using low ground pressure tracked or wheeled machines with a masticator head would be used to grind slash produced from mechanical thinning and existing ground fuels where feasible. Masticated material would be left scattered in treatment areas. Secondary treatment is required to dispose of activity-generated ground fuels and existing ground fuels to significantly decrease the potential for future stand-replacing fire effects. Secondary treatments would include mastication and prescribed burning, which includes burning piles of slash and underburning. The track-mounted excavator with masticator arm is restricted to slopes of 45% or less and when soil moistures are less than 18%. Masticators will cover their tracks/traces with masticated slash upon exiting fuels treatment units/areas, thereby reducing the potential of surface erosion from masticator-treated units (Blessing 2015). Therefore, insignificant amounts of rutting will occur when using this machine. In addition, the 30" track produces ground pressures of up to six psi, therefore chances of any soil compaction occurring is also insignificant. RRs in treatment areas could be treated with a masticator where feasible. The 50-foot treatment buffer on small perennial and intermittent streams and 100 foot buffer on larger perennials (> 1' wetted width) reduces the possibility of sediment reaching these streams to an insignificant risk. Indirect effects to sediment and anadromous salmonid habitat from mechanical and hand fuels treatments will be insignificant, while they will have minor effects on SONCC Coho salmon.

Burning under prescription can result in localized loss of protective soil cover. This effect would occur as a result of unforeseen prescribed burn flare-ups in fuel accumulations. Indirect effects involve the movement of sediment from areas with significantly reduced soil cover to stream channels and then downstream, to be deposited in pools and riffles. Such events are expected to be few in number and limited in size by the fact that burn

plans will be designed for retention of cover in burn areas in conformance with LRMP guidance, project-specific effects minimization measures (PDFs, RR Standards and Guidelines, Best Management Practices), and experience from decades of KNF prescribed burning. Should flare-ups occur, loss of soil cover would be localized and short-term as regrowth and adjacent unburned stands contribute to the rapid re-establishment of soil cover. Indirect effects from burning under prescription to sediment and anadromous habitat will be insignificant, while they will have minor effects on SONCC Coho salmon. Beneficial effects are expected in terms of less severe future fire effects, particularly when/if fire occurs in this area greater than 5 years in the future.

Project design standards, BMPs and PDFs will be implemented to minimize potential effects at the site-scale including the following (PDFs 33, 34, 35, and 36): prescribed fire effects will mimic a low intensity backing fire, except for handpiles/windrows where localized higher intensity may occur in consuming pile material; ignition of underburns will generally not occur in RRs; handpile and windrows in RRs will be placed in a checkerboard pattern whenever possible (not piled directly above one another); handpiles will be less than 6 feet in diameter and will be more than 15 feet away from intermittent streams and 30 feet away from perennial streams; for underburning, handline construction in riparian vegetation shall be avoided where practical but will be farther than 25 feet from any channel, if necessary; handlines will be mitigated (waterbarred and covered with organic material) immediately following prescribed burning, when safe to do so; When underburning in RRs, at least 90% of the large woody debris will not be consumed, both standing and on the ground; tractors and mechanical harvesters will be excluded from all RRs associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits; and refueling will not take place within any RR. A spill containment kit will be in place where refueling and servicing take place. Indirect effects from prescribed fire/burning treatments, including within RRs, to sediment will be insignificant, while they will have minor effects on SONCC Coho salmon.

The risk of impacts to the Sediment habitat Indicator group at the site-scale is associated with soil disturbance within RRs. Watershed PDFs (as listed above) will be implemented to minimize effects of all project fuels reduction work.

At the 5th-field watershed scale, the proposed action including fuels reduction does not add any incremental increase in disturbance beyond the 2014 fires [to runoff (ERA), mass wasting (GEO) or sedimentation (USLE)]. At the 7th field watershed scale, the proposed action including fuels reduction is expected to add only an insignificant increment to disturbance beyond the 2014 fires: an amount that is predicted to have insignificantly small effects on sediment and anadromous salmonid habitat, while they will have minor effects on SONCC Coho salmon.

Summary of Indirect Effects. Handpiling and pile burning, heli-torch burning and underburning, may occur in RRs, comprising approximately 8,000 acres across the project area. These activities will remove soil cover in some areas and therefore has the potential to increase sedimentation. Project design, Watershed PDFs and BMPs will be implemented to minimize and mitigate effects including PDF 34, 35, 36 and 37, which require that piles not be stacked near each other, and that piles be small (<6 ft.). These

measures will limit disturbance and result in a low potential for erosion and sedimentation, and piles will be interspersed with undisturbed areas that will retain and.or intercept sediment. Treating hazardous fuels in RRs will mimic the effects of a low intensity fire and will likely reduce the effects of a future wildfire by reducing fuels, particularly when fire occurs greater than 5 years in the future. Given the minimization measures that will be implemented, indirect effects from handpiling and burning to Sediment and anadromous salmonid habitat will be insignificant, while they will have minor effects on SONCC Coho salmon, as defined on page 16 above.

Proximity and Probability. Maps in Appendix A show that treatment units are within proximity to anadromous salmonid habitat. However, the probability of effects to the Sediment habitat Indicator group and, by extenstion, to SONCC Coho salmon and their CH is insignificant, as described above.

3. Hazard Tree Abatement

The proposed action includes hazard tree removal along most Forest Service system roads, County Roads, and State Highways within the project boundary, and is estimated at 678 miles of roads (over a maximum of 20,499 acres). This is to be done to provide for public and Forest worker safety and future fire suppression efforts. Both the mileage and acres of treatment proposed are a maximum; the numbers are representative of the entire length and area being evaluated for hazard tree identification and removal. Trees determined to be a hazard to the roadway will be felled, this includes within RRs where roads intersect and/or parallel stream channels. Project design features require retaining hazard trees greater than 26 inches DBH on site when they are within one site tree height distance from fish-bearing stream, unless they continue to pose a hazard to safety or accessibility.

At the 5th-field watershed scale, the proposed action including hazard tree removal does not add any incremental increase in disturbance beyond the 2014 fires [to runoff (ERA), mass wasting (GEO) or sedimentation (USLE)]. At the 7th field watershed scale, the proposed action including hazard tree felling/removal only adds a slight incremental increase to disturbance beyond the 2014 fires, a level that is predicted to have insignificant effects on sediment and anadromous salmonid habitat, while they will have minor effects on SONCC Coho salmon.

The risk of impacts to the Sediment habitat Indicator group at the site-scale is associated with soil disturbance within RRs. Watershed PDFs (Watershed 4 and 13) will be implemented to minimize the effects of soil disturbance associated with hazard tree felling/removal, including the following: equipment will be excluded from the inner 50 feet of the non-fish bearing RR and one site tree height/distance for fish bearing streams; all hazard trees cut within 25 feet of a stream channel will be left on site; in fish-bearing stream reaches, all hazard trees greater than 26 inches in diameter at breast height within the first site tree (150-170 feet) will be left on site unless they continue to pose a hazard to safety or accessibility; live trees directly rooted into the banks or otherwise integral to the stability of the channel bank will not be felled unless they pose an overhead hazard and, if felled, will be left on site unless this poses a hazard on the ground per OSHA requirements; directional felling will be used to protect streambanks where hazard trees need to be felled/removed for public or employee safety; refueling will not take place

within RRs and a spill containment kit will be in place where refueling and servicing take place.

Summary of Indirect Effects. Based on implementation of the Watershed PDFs for hazard tree removal that require trees to be felled and left on site in near-stream zones, and field review of hazard tree removal areas, hazard tree removal along roadsides will have insignificant effects to the Sediment habitat Indicator group and anadromous salmonid habitat, and minor effects to SONCC Coho salmon.

Proximity and Probability. Maps in Appendix A and tables in Appendix C show that treatment units are within proximity to anadromous salmonid habitat. However, the probability of effects to the Sediment habitat Indicator group and Coho salmon is insignificant, as described above.

4. Temporary Roads, Landings and Water Drafting

The proposed action includes approximately 16.4 miles of temporary road segments to access harvest units: 1.2 miles in the Beaver Fire; 14.3 miles in the Happy Camp Complex; and 0.8 miles in the Whites Fire. New temporary roads are proposed on a total of 3.4 miles; 13 miles are proposed temporary roads on existing roadbeds, of which 5.6 miles are decommissioned road beds proposed for opening/use/re-decommissiong. The total road mileage is divided among several short segments designed for temporary use, and dispersed among numerous 7th field subwatersdeds (Appendix B, Table 1). After use, all project temporary roads will be hydrologically stabilized, which includes constructing waterbars, outsloping road prisms if appropriate, removing crossings and obliterating access to the road.

Roads can have a major impact on sediment and the drainage network. Disturbance associated with temporary roads and crossings were modelled in the CWE analysis. At the 5th-field watershed scale, the proposed action including these PEs, does not add any incremental increase in disturbance risk. At the 7th field watershed scale, the proposed action including these PEs adds only a slight increase in risk beyond the baseline, and only in some watersheds. Effects to sediment at the watershed scale are expected to be insignificant and undetectable downstream.

Project design, Watershed PDFs and BMPs will be implemented to avoid unstable areas and to minimize potential adverse effects at the site-scale *during project implementation*, including the following: fill materials generated from road treatments will be reincorporated back into subgrade to the extent possible; all excess fill materials will be spoiled outside of RRs; all project-related temporary structures, materials and debris will be removed from riparian areas and stream channels prior to winter shutdown; activities which require culvert replacement or removal will occur during the least critical periods for water and aquatic resources: when streams are dry or during base flow conditions, and in compliance with spawning and breeding seasonal restrictions; upgrades or improvements to stream crossings will be built to Forest Plan standards; new temporary roads or landings will not be constructed in any RR associated with stream channels, on toe zones of landslides, active landslides or inner gorges.

Watershed PDFs and BMPs will be implemented post-project to minimize adverse effects at the site-scale *until vegetative recovery can occur*, including the following: following

harvest activities, maintain at least 50 percent slash on temporary roads and block them after the harvest season (prior to the first winter after use); temporary roads will be sub-soiled; all temporary roads will have their takeoffs from system roads obliterated or blocked to avoid unauthorized use; hydrologic stabilizations, which may include removal of culverts and fills at stream crossings, out-sloping of road surfaces and/or obliteration of temporary road segments; erosion and sedimentation control structures will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.

Figure 11. Stream crossing proposed for re-opening in Cliff Valley Creek.

Even with implementation of BMPs and PDFs, watershed specialists were concerned about temporary road construction exacerbating currently at risk watershed processes related sediment supply and delivery. Temporary roads, both re-opened and new, that are hydrologically linked via stream crossings were of greatest concern, as were log landings (re-opened and new) in RRs, and unstable areas crossed by roads. The proposed action includes nine temporary road stream crossings. These features were analyzed by watershed specialists on a site-specific basis using GIS data and field surveys. A total of 3.4 miles of new temporary roads are proposed, 3.3 miles in Happy Camp Complex and 0.1 miles in the Whites Fire. These new temporary roads consist of multiple short segments of road on ridgetops designed to facilitate skyline logging systems. They are all outside of RR and disconnected from the drainage network so there is not any meaningful risk of effects to downstream fish habitat as a result of these short ridge top new alignments.

Temporary road actions include nine stream crossings (2 perennial and 7 intermittent streams) that are above the range of fish (greater than ½ mile above CH) in Lower Grider Creek, Cliff Valley Creek, and China Creek. Temporary road actions proposed in Lower Grider, Kuntz and O'Neil creeks will require restoration actions to address existing erosion related concerns. Field surveys determined if reopened roads, crossings, and landing sites were actively eroding or at risk for erosion pre-project. If the project uses these roads that have existing erosion problems, they will have to be appropriately hydrolgically restored according to current standards which would yield post-project hydrologic benefits in these watersheds. For example, the temporary road proposed for use in lower O'Neil Creek is in the outer portion of O'Neil Creek RR but currently captures an intermittent stream channel along several stretches of the road. If the project

uses this road, the drainage features will be fixed so the road can be used and appropriately hydrologically stabilized post-project. In this case, project use of the road poses only a low short term risk to aquatic habitat and a long term benefit would be expected due to appropriate hydrologic stabilization of this existing road bed. The temporary road actions in lower Kuntz Creek involve a similar low short term risk of effects due to use of the road, and long term benefits from fixing existing erosion problems on the road.

Crossings on decommissioned roads in Cliff Valley and China creeks proposed for reopening have been, for the most part, appropriately hydrologically stabilized. Project use and re-closing of these roads and crossings involves a low to moderate short term risk to aquatic habitat and no long term benefit. Temporary stream (perennial and intermittent) crossings would likely have short duration effects to sediment production limited to the first winter after use. Due to implementation of effects minimization measures (BMPs and PDFs) effects are expected to be site-scale and limited to the immediate area downstream of work.

Watershed specialists identified all potential stream crossings on temporary roads and reviewed them in the field to determine what actions would be taken and what effects to downstream fish habitat may occur. Table 32 lists the sites that remain in the Consultation Action. There were several other potential crossing sites initially included in the proposed action and reviewed in the field. These sites are not listed in Table 32 as they were found to not have channel crossings or were dropped from the project (comprehensive list of crossings reviewed is available in project record).

Table H-32. Temporary roads/stream crossings.

Receiving Stream Name	Road Type	Confirmed Stream Type	Comments
Grider Creek	Decomm. Road 46N41YA	2 perennial	One crossing is legacy site; the Project will reduce sediment long term
Walker Creek	Decomm. Road 46N63	No crossing	No crossing features; old road bed cut in bedrock
Cliff Valley Creek	Decomm. Road 46N77	1 Intermittent	Stable, moderate risk
China Creek	Decomm. Road 46N78	5 Intermittent	Stable, low risk
Kuntz Creek	New Temporary Road	No crossing involved in road (except crossing of private diversion ditch)	Road has drainage problems; use of road is low risk; the Project will reduce sediment long term
O'Neil Creek	Existing Temporary Road #2 and #3	1 intermittent	Road has drainage problems; intermittent channel captured by road prism; use of road is low risk; the Project will reduce sediment long term

The effects on unstable lands related to re-opening temporary roads on existing roadbeds and decommissioned roads or building new temporary roads is incorporated into the project landslide risk assessment. The main effect on landslide risk from road crossings is

the increase in debris flow volume when and if the debris flow removes the crossing, incorporating crossing material into the debris flow. Debris flow volume is directly correlated with the probability of damage to structures, infrastructure (roads, power corridors, water lines, etc.) and natural resources. The more crossings in a watershed, the more likely that if a debris flow should occur the volume will be increased. Crossings built on new temporary roads or re-constructed on decommissioned or existing temporary roads will be removed before the rainy season (see Chapter 2 of DEIS). The excess material will be removed before debris flow events are likely, making the increase in risk small.

Based on site reviews and proper implementation of BMPS and PDFS, the intensity of effects would be low for individual crossings. Further, it was determined during site reviews that sediment sources on some of the roads would be remediated, resulting in a long-term reduction in sedimentation. Construction of new temporary roads outside of RRs and use of existing road alignments and temporary crossings will have insignificant effects to the Sediment habitat Indicator group and anadromous salmonid habitat, and minor effects to SONCC Coho salmon.

The proposed action includes use of existing landings where available, and construction of new landings. A maximum of 75 existing landings and 135 new landings are proposed for use. Proposed landing locations are on maps in Appendix A. A maximum number is proposed to allow flexibility for contractors during implementation of the Project, however, far fewer landings will actually be used. Landing size will be commensurate with operational safety. Helicopter landings will be up to two acres in size. Skyline landings will use roads where ever possible. New skyline landings off the road system and ground-based landings will average one acre in size, but will not be larger than 1.5 acres in size. Both new and existing landings will be hydrologically stabilized after use.

The project includes PDF Watershed-5 that restricts new landings in RR to only those that have been reviewed and approved for use by watershed specialists. Conditions that provided for field-surveyed log landings to be approved for use included: on stable landforms and slope positions; in the outer zone of the RR; or separated from perennial streams by existing, stable road segments. Landings were not approved for use if they required removal of mature vegetation or significant earthwork or fill manipulation.

Site-scale effects to sediment from log landings would depend on landing location, existing condition, and size/use. A new landing within a site-tree distance of Coho CH represents a high risk of affecting sediment in CH. These effects could be of moderate duration and low to moderate intensity, depending on the volume of potentially unstable material and occurrence of stochastic weather-related events. However, only a limited number of new landings in RRs were approved (landings #DZ03, DZ10, DZ23, L043, L044 and L090) and only if they were on stable/already compacted landforms and slope positions, were in the outer zone of the RR, or were separated from stream channels by existing, stable road segments. Landings were not approved for use if they would require removal of mature vegetation or significant earthwork or fill. Landing L072 was proposed in RR within Whites Gulch, but a new location has recently been identified that is outside of RR.

Table H-33. New landings in RR, approved for use.

7th field Watershed	Landing ID	Type	Comments

7th field Watershed	Landing ID	Type	Comments
Caroline Creek-Klamath River	DZ03	Heli	In outer site tree of RR associated with Klamath River (CH). Trees that provide shade to the Klamath River would not be removed and ground disturbance would occur in an area of mine tailings and already compacted ground.
Cliff Valley Creek	L090	Skyline	In RR associated with non fish bearing tributary, over 3 miles above CH. Old stable and outsloped road bed within heavily burned and steep intermittent drainage. Strict implementation of Watershed PDFs and BMPs are critical during use and hydrologic stabilization actions. Detectable impacts to downstream fish habitat are not likely.
Franklin Gulch-Scott River	DZ10	Heli	In RR associated with lower Scott River (CH). The area is a flat already-compacted terrace above the Scott River. Trees that provide shade to the river would not be removed. Earthwork to expand the area would not occur.
Lower Grider Creek	DZ23 L043 L044	Heli	In outer site tree of RR associated with Grider Creek (CH). These landings are proposed in a heavily burned area between high use roads (switchback near Grider Campground) and within gound based salvage units. There are several intermittent stream channels that drain through the area but landing locations are rocky and relatively flat. No trees that provide shade to Grider Creek would be removed and post project hydrologic stabilization treatments, potentially including planting, would help recover this area to a forested condition.

Watershed PDFs and BMPs will be implemented to minimize impacts to sediment from existing and new landings in RRs including the following: new landings will not be constructed in any RR associated with stream channels (exceptions to this project design feature are landings #DZ03, DZ10, DZ23, L043, L044, and L090), on toe zones of landslides, active landslides or inner gorges; existing landings will be used to the extent possible; existing landings in stream-course RRs will not be expanded towards stream channels, or on to active landslides, or where vegetation that provides shade to a stream would need to be cut; existing landings in RRs will be shaped and treated for erosion control at the end of each season of use, and hydrologically restored at project completion (including subsoiling and covering with slash/mulch as needed); reused landings in RRs will have site specific erosion control measures to reduce risk of sediment delivery into streams; refueling will not take place within the RR; a spill containment kit will be in place where refueling and servicing take place; at project conclusion, landings will be configured for long-term drainage and stability by reestablishing natural runoff patterns; all landings will be covered with at least 50 percent effective soil cover; use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient; identified (selected) landings will be subsoiled, then covered with at least 50 percent effective soil cover. Use of existing landings and construction and restoration of new landings will have insignificant effects to the Sediment habitat Indicator group and anadromous salmonid habitat, and minor effects to Coho salmon.

Water drafting (locations are shown on maps in Appendix A) can result in indirect effects through short term and localized increases in turbidity when substrates are disturbed as the water hose is set into and pulled from the water. Watershed PDFs (37 and 38) will be implemented to minimize effects of water drafting on sediment supply and delivery including the following: draft water only at designated water drafting sites;

when drafting from waters designated as Coho salmon CH, implement NOAA Fisheries Water Drafting Specifications (2001) and implement Forest Service Best Management Practices. Existing water drafting sites will be used to avoid new streamside disturbance associated with construction of drafting sites. Turbidity that may result during water hose sets and removals will be localized, limited to pre-designated sites (see Appendix A), and fish are expected to temporarily move away from these areas once they sense a water truck approaching. A measurable increase in turbidity is not expected beyond the immediate drafting area. This conclusion is based on field observations that indicate turbidity is diluted to background water clarity conditions within a few seconds of placement/removal of water drafting hardware. Thus, water drafting will result in insignificant effects to the Sediment habitat Indicator group and anadromous salmonid habitat, and minor effects to Coho salmon.

Summary of Indirect Effects. At the 5th-field watershed scale, the proposed action, including roads and stream crossings, does not add any incremental increase in disturbance. At the 7th field watershed scale, the proposed action including roads, landings, stream crossings and water drafting add only a slight increase to post-fire disturbance, in some watersheds. At the watershed scale, the proposed action will have insignificant effects to sediment and anadromous salmonid habitat, and minor effects to Coho salmon. At the site-scale, roads, stream crossings and landings in RRs represent a high risk for effects and were reviewed by watershed specialists in the field to determine if BMPs and PDFs would effectively minimize impacts. There is potential for site-scale impacts to sediment particularly at road stream crossings. In some areas determined to be legacy sediment sites, conditions will be improved by the project therefore site scale long term benefits are expected. None of the temporary road crossings are within anadromous salmonid habitat, they are all greater than ½ mile from SONCC Coho salmon CH. Temporary roads with stream crossings are expected to have site-scale, short-term adverse effects to sediment and minor effects to Coho salmon.

Proximity and Probability. Maps in Appendix A show that temporary roads and stream crossings are not within proximity to fish-bearing streams. Watershed specialists confirmed locations and conditions in the field at all proposed road/stream crossing sites. At the watershed-scale, roads and stream crossings have a low probability of effects on the Sediment Indicator group, anadromous salmonid habitat and Coho salmon. At the site scale, there may be short term negative effects to aquatic habitat due to temporary road crossing actions. Watershed specialists confirmed that a fewof the crossings were existing sediment legacy sites that are currently contributing sediment to drainages, and that the project will reduce sediment at these sites in the long term. At the site-scale, the probability of effects from landings in RRs is not insignificant (there is a risk of adverse effects). Thus, the magnitude of effects from landings in RRs will be discussed further below.

Magnitude: All proposed new landings in RRs were reviewed in the field. Watershed specialists determined that that soil disturbance would be minimized and that BMPs and Watershed PDFs will effectively minimize impacts. The magnitude of effects is limited in scope to landing #DZ03, DZ10, DZ23, L043, L044, and L090 and potential impacts will be minimized through implementation of BMPs and PDFs. The magnitude of effects to the Sediment habitat Indicator group is insignificant. New landings in RRs will have

insignificant effects on sediment and anadromous salmonid habitat, and minor effects on Coho salmon.

5. Legacy Sediment Site Treatments

Legacy sediment site treatments are proposed to reduce sediment supply and delivery through restoration of known sites in the Elk Creek watershed. These treatments will be scheduled for treatment in compliance with the Clean Water Act as a condition of the North Coast Regional Water Quality Control Board waiver of waste discharge requirements (Order No. R1-2010-0029). The portion of Elk Creek within the project area contains approximately 148 legacy sites. Most of the legacy sites are located on or adjacent to the Forest road transportation system. The other legacy sites are located on existing landings or roadbeds (historic roads, abandoned temporary roads, or decommissioned roads). Legacy site treatments will include the following:

- Culvert upgrades (about 45 sites) – replace culverts to accommodate the 100-year peak flow;
- Diversion prevention (about 51 sites, 17 include culvert upgrade) – construct armored rolling dips to prevent streams from diverting down roadways, should the culvert plug or fail;
- Aquatic organism passage (three sites)– replace existing stream crossing with bottomless arch culvert to improve or restore aquatic organism passage;
- Retaining wall (about 7 sites) – construct Hilfiker wall, rock buttress, reinforced embankment, or equivalent, where road prism has slumped or failed;
- Fill reduction (about 16 sites) – remove excess fill materials from the top of stream crossings to reduce the amount of fill available for discharge should the culvert plug or fail; add riprap to armor fill slopes;
- Fill removal (about 27 sites) - remove all fill materials from stream channels, swales, road shoulders and sliver fills; these treatments would occur on closed NFTS roads and existing roadbeds;
- Repair/maintain existing infrastructure (about 16 sites)– clean culvert inlets, ditches, etc., repair damaged culvert inlets, shorten “shotgun” culvert outlets, place riprap below culvert outlets to reduce hill slope erosion, remove cut slope slide materials,

In addition, road storm-proofing treatments between individual legacy sites will occur on about 33 miles of Forest system roads (15N02, 15N75, 16N05, 16N39 and 45N19). Treatments between legacy sites may include the following: where possible reconstruct road prism to an out sloped configuration, otherwise reduce inboard ditch length by adding additional relief culverts or dips; reduce road prism width; remove berms; place rip-rap below outlets of ditch relief culverts; recondition road subgrade and travel surface - apply crushed aggregate; add rolling dips where needed to control road surface runoff; stabilize road prism slumps with retaining walls or rock buttresses.

The potential for indirect effects to the Sediment indicators is highest for culvert upgrades or passage projects that are within active stream channels. The culvert projects will likely generate some short-term turbidity downstream. The proposed culvert upgrade actions in Elk Creek watershed were included in the programmatic BA Klamath National Forest Facility Maintenance and Watershed Restoration BA (USFS 2004), and thus

covered by the associated letter of concurrence (NMFS 2004). Turbidity from these types of projects was determined to have an insignificant, temporary impact where actions occurred less than 300 feet from areas occupied by fish; and where in-channel actions were greater than 300 feet from fish, no effect to fish was expected. In the long term, turbidity levels will return to pre-construction conditions as the site settles/stabilizes. Observation has confirmed that such settling/stabilization usually occurs after the first few precipitation events. None of these sites are within habitat accessible to anadromous salmonids. PDFs (Watershed-20 and 24) will be implemented for all projects to minimize impacts to sediment and aquatic habitat. All together, these legacy sediment site treatments will result in meaningful benefits to water quality and fish habitat in Elk Creek watershed, as well as improved passage for aquatic organisms and watershed products.

Summary of Indirect Effects. Legacy site repair will result in insignificant and short-term effects to the Sediment habitat Indicator group and anadromous salmonid habitat, minor effects to Coho salmon, and long-term beneficial effects to both sediment and Coho salmon through reducing sediment sources in the Elk Creek watershed.

Proximity and Probability. Maps in Appendix A indicate the proximity of legacy site repairs to CH. All project legacy sediment site crossing upgrade work will be outside of SONCC Coho salmon CH, and all but six sites are located at least 300 feet away from CH. The six sites that are relatively close to CH (300-400 feet upstream of CH) are culvert upgrades along side tributaries to Elk Creek, and East Fork Elk Creek. Implementation of these actions will adhere to all protection measures outlined in the Facilities Maintenance and Watershed Restoration Programmatic BA (2004), and Appendix E of this BA. Work will be scheduled to occur when channels at culvert upgrades are likely to be dry.

Two of the three aquatic organism passage improvement crossings (upgrading culverts to open bottom structures) are approximately 350 feet upstream of CH in Elk Creek in Twin and Malone Creeks. The third aquatic organism passage improvement crossing is approximately 2.5 miles above CH in upper East Fork Elk Creek.

The probability of negative effects to sediment is highest in the short term after implementation in sites that are close to CH (~300 feet away). However, the probability of effects to the Sediment habitat Indicator group and anadromous salmonid habitat is insignificant due to the requirement to work in a dry channel and adhere to all protection measures outlined in the Facilities Maintenance and Watershed Restoration Programmatic BA (2004) and associated Letter of Concurrence. Experience with similar projects supports that BMPs and Watershed PDFs as described in the programmatic BA (and Appendix E of this BA) will effectively minimize impacts related to sediment to insignificant levels. This work will result in long-term benefits to sediment and Coho salmon as sediment sources are reduced and passage of watershed products in Elk Creek Watershed is improved.

Water Quality

Effects on the Water Quality habitat Indicator group associated with changes to sediment supply and delivery are discussed above (e.g. turbidity) under the Sediment habitat Indicator group. The potential for changes to base flows are associated with water drafting, and are discussed above under direct effects. This discussion includes effects of

each PE on the following Water Quality habitat Indicator group based on the potential for indirect effects (see Analysis Methods section):

- Water Temperature: Potential effects are associated with alteration of stream shade along perennial streams associated with the following Project activities that will occur within RRs. reforestation/site preparation, hazard tree removal, fuels reduction, temporary road and landing construction and legacy site treatments.
- Chemical Contaminants/Nutrients: Potential effects are associated with use of mechanized equipment within RRs associated with the following activities: reforestation/site preparation, hazard tree removal, fuels reduction treatments, construction of temporary roads and stream crossings, landings and legacy site treatments.
- Refugia: Potential effects are associated with alteration of stream shade associated with the following activities that occur within RRs: reforestation/site preparation, hazard tree removal, fuels reduction, temporary road and landing construction and legacy site treatments. Channel aggradation associated with mass wasting and debris flows has the potential to affect channel morphology and affect fish passage to thermal refugia in tributaries. This potential effect is discussed above under the Sediment habitat Indicator group.

The WSFR Hydrology Report indicates that there are currently eight 7th field watersheds with high risk of temperature regime alteration: Buckhorn Gulch-Beaver Creek, Kohl Creek, Lower Grider Creek, O'Neil Creek, Walker Creek, Caroline Creek, Granite Creek and Middle Elk Creek. All of these watersheds have elevated risk due to the effects of the 2014 wildfires. There are twenty-one and forty-five watersheds with a moderate and low risk, respectively.

Maintaining or restoring stream shade as a way to control water temperature is important. Ambient air temperature over the stream drives maximum water temperature, along with other factors that influence humidity and other micro-climate conditions (Bartholow et al 1989, Essig 1999). The width of RRs, not just shade canopy is key to maintaining micro-climate conditions. FEMAT (1993) called for protection of two site potential tree heights or 300 feet, for all fish-bearing streams. Spence et al. (1996) note that the absolute minimum buffer width for maintaining cool air flow over the stream is one site potential tree height. The proposed action includes RR widths of two site potential tree height along fish-bearing streams and one site potential tree height along non-fish bearing streams. RRs are protected from salvage harvest, but some vegetation management will occur within RRs (fuels treatment, hazard tree removal, legacy site treatments). Watershed PDFs, as described below, will be implemented to maintain water quality, including existing stream shade.

Poole and Berman (1999) noted that large wood jams can contribute to stream cooling by forcing more stream flow into shallow ground water, which is called the hyporheic zone. The water drops slightly in temperature before emerging downstream. Temperature effects associated with large wood are discussed below under the Riparian Function habitat indicator group.

Activities within RRs have the highest risk of affecting the Water Quality habitat Indicator group. Table 34 summarizes the scope of proposed activities that will occur within RRs.

Table H-34. Acres of RR that are adjacent or within WSFR treatment units.

Treatment Type	WSFR Project Unit acres adjacent or within RRs
Fuels	6,206
Salvage Harvest	1,990
Hazard Tree Removal	5,684

1. Salvage Harvest and Reforestation

RRs have been established along all streams to protect water quality (for widths of RRs see PDF Watershed-3). Risks to sediment supply and delivery are discussed above under the Sediment habitat Indicator group. Cutting trees for salvage harvest will not occur within RRs, during any and all methods of removal (tractor, skyline and helicopter). Figure 3 displays an example of how RRs and other unstable areas will be excluded from salvage harvest. The acres of salvage harvest are shown above (Table 1) and indicate the amount of RRs that fall within harvest units. But salvage harvest itself will not occur within any RRs. Acres of RRs within or near units are listed in Table 34 because those areas represent a higher risk to water quality due to proximity to stream courses. Skyline yarding corridors that run parallel to streams will not occur within RRs and, in the rare instance when a corridor needs to cross a stream channel, full suspension (*i.e.*, saw logs are not allowed to touch the stream) is required (PDF Watershed- 29). A majority of units only have seasonal streams near or within them and trees in these treatment areas are burned. Acknowledging that standing dead trees do provide some shade to streams albeit short term, Project design provides for protection of standing trees along perennial streams. Therefore salvage harvest will not alter stream shade. Existing skyline yarding corridors will be reused when possible except where a less ground disturbing option is available. Because salvage harvest will not remove trees within RRs, salvage harvest will have insignificant effects on water quality and anadromous salmonid habitat and minor effects on Coho salmon.

Reforestation includes site-preparation, planting, and release of over 7,873 acres, to increase the likelihood and speed by which burned areas are reforested. Reforestation includes manual site preparation, skyline yarding, mastication, mechanical yarding and slash piling of dead trees. Treatments within RRs are limited to the Happy Camp and Whites fire areas in instances where moderate or high severity burned plantations overlap RRs. Proposed actions include lop and scatter of small dead trees and brush, accomplished by hand treatments. Site preparation and planting activities are proposed within salvage units and otherwise within plantations that burned at high or moderate severity. These treatments target plantations that were heavily burned during recent fires and are within units where ground-disturbing actions are proposed. The hand treatment is designed to provide near-term soil cover in locations where the natural buffering capacity of the RR has been reduced by fires. The treatment is likely to reduce short term erosion at the site level, and to help promote and encourage natural regeneration and soil recovery in the RRs treated.

Potential effects to chemical contamination associated with use of mechanized equipment for reforestation activities within RRs during site preparation will be minimized through implementation of Watershed PDF-27, which limits refueling to designated landings that are not hydrologically connected to streams and, as an added precaution, requires a spill containment kit to be on site.

Summary of Indirect Effects. Due to the following minimization measures: 1) site preparation activities within RRs will only occur in plantations (plantations have relatively young and smaller trees) and are solely designed to have beneficial effects to soil and vegetation recovery; 2) implementation of Watershed PDF-11, which limits removal of trees to those that are less than 8" in diameter when removal is needed to address fuels accumulations; 3) tree cutting and lop-scatter methods are limited to hand work; and 4) refueling is not allowed within RRs. Site preparation and reforestation is expected to have insignificant effects on the Water Quality habitat Indicator group and anadromous salmonid habitat, and minor effects on Coho salmon. Releasing over-crowded trees and reducing fuels within RRs will result in long-term beneficial effects because the remaining trees will grow to a larger size quicker and the severity of future fire may be reduced as a result of reduced fuels.

Proximity and Probability. Maps in Appendix A show that treatment units are in proximity to anadromous salmonid habitat. However, the probability of effects is insignificant, as described above.

2. Fuels Reduction

Table 34 above shows the extent of fuels treatments that will occur within or adjacent to RRs. Watershed PDFs for fuels treatments (33, 34, 35, and 36) have been designed to maintain stream shade, understory vegetation and water quality during fuels treatment within RRs. For example, within RRs, prescribed fire effects will mimic a low intensity backing fire, except for handpiles/windrows where higher intensity may occur to consume pile material. Fuels reduction activities are likely to reduce the severity of future fire events, particularly when fire occurs in the same area greater than 5 years in the future. Refer to the Sediment habitat Indicator group discussion above for a more detailed discussion of effects minimization measures.

Summary of Indirect Effects. Due to the Watershed PDFs that will implemented, and because shade canopy will not be affected by fuels treatment activities, fuels reduction actions will have insignificant effects on the Water Quality habitat Indicator group and anadromous salmonid habitat, and minor effects on Coho salmon.

Proximity and Probability. Maps in Appendix A and tables in Appendix B show that treatment units are in proximity to anadromous salmonid habitat. However, the probability of effects is insignificant, as described above.

3. Hazard Tree Abatement

Hazard trees will be removed from roadside areas as described above under the Sediment habitat Indicator group discussion above, including within RRs. The risk of effects to water quality and stream temperatures are where there are groups of hazard trees (especially if there are mature live trees) to be removed along roads that parallel to or repeatedly cross perennial streams. Removal of dead trees and individual hazard trees

that are not grouped will have no measurable effect on shade or stream temperatures. Based on field reviews and mapped hazard tree areas (see maps in Appendix A), removal of groups of hazard trees within RRs along perennial stream channels will not occur to an extent that will measurably reduce existing shade canopy. Many hazard trees designated for felling are burned, and now provide only near term and greatly reduced levels of shade to adjacent streams. The groups of hazard trees that will be removed are along short stretches of mostly non-fish bearing intermittent or ephemeral channels.

Summary of Effects. The highest risk of effects associated with hazard tree removal is where groups of trees, especially mature live trees, will be removed within RRs. The extent of removal of groups of trees is limited, based on hazard tree marking reviewed to this point. Hazard trees to be removed are burned or otherwise compromised and pose a safety hazard. Due to policy direction for administration of the road system, there isn't discretion as to whether to fell hazard trees. Based on review of hazard tree marking adjacent to streams, removal of hazard trees along roadsides will have insignificant effects on water quality and anadromous salmonid habitat, and minor effects on Coho salmon.

Proximity and Probability. Maps in Appendix A and tables in Appendix C show that treatment units are in proximity to anadromous salmonid habitat. However, the probability of effects is insignificant (extremely unlikely to occur), as described above.

4. Temporary Roads, Landings and Water Drafting

The proposed action includes approximately 16.4 miles of temporary road segments to access harvest units: 1.2 miles in the Beaver Fire; 14.3 miles in the Happy Camp Complex; and 0.8 miles in the Whites Fire. The total road mileage is divided among several short segments and all temporary roads will be hydrologically restored/stabilized after use. This hydrological stabilization includes: constructing waterbars; outsloping road prisms if appropriate; removing crossings; and obliterating access to the road.

There are a total of ~3.4 miles of proposed new temporary roads, consisting of many short segments proposed on ridgetops to facilitate skyline logging systems. These short spurs will create new alignments on the landscape however field review verified that all proposed new temporary road segments are outside of RR and not hydrologically connected to downstream fish habitat.

Roads can have a major impact on sediment and the drainage network. Temporary roads can affect water quality through increased sedimentation (discussed above under the Sediment indicator) or through alteration of stream shade associated with stream crossing construction or if construction of a temporary road occurs within RRs and tree removal is required. On existing road alignments, vegetation has previously been disturbed. None of the roads or stream crossings associated with project temporary roads require removal of shade trees along perennial streams. Watershed PDFs (5, 18 and 20) will be implemented to minimize other impacts. Temporary roads and stream crossings will have insignificant effects on the Water Quality habitat indicator group and anadromous salmonid habitat, and minor effects on Coho salmon.

Landing use and construction and potential effects to sediment are discussed above under the Sediment habitat Indicator group. Landings located within RRs represents one of the greatest risk to water quality because landings disturb vegetation in close proximity to

stream channels. The project has a risk of affecting water quality through construction or use of the following landings that are within RRs (see locations on map in Appendix A): Landings # DZ03, DZ10, DZ23, L043, L044, and L090). No trees providing effective canopy shade to streams will be removed as a result of landing use or construction. The following Watershed PDFs will be implemented to minimize effects of landings: existing landings will be used to the extent possible; existing landings in stream-course RRs will not be expanded towards stream channels or where vegetation providing shade to streams would need to be removed. Site reviews of all proposed landings to be constructed within RRs indicate that no shade trees would be removed and implementation of Watershed PDFs will effectively minimize impacts to water quality.

Water drafting can result in minor, short-term and localized decreases in flow, especially in smaller streams, affecting water quality. This is particularly true during drought conditions, which may occur during project implementation. However, NOAA specifications (2001) don't allow drafting volumes to exceed 10% of stream flow within fish-bearing streams, to allow for adequate downstream flow to support fish, aquatic insects, amphibians, and other biota. Project BMPs don't allow drafting volumes to exceed 50% of stream flow outside of CH. Additionally, KNF fish biologists will be consulted prior to water drafting operations so that they can ensure that sites with rearing Coho salmon are avoided and sites that are not suitable for fish (primarily due to high stream temperatures) are prioritized for use. Due to PDFs that have been designed to minimize drops in stream flow and associated changes to water quality (PDF 18), the requirement to adhere to NOAA's (2001) water drafting specifications and KNF BMPs, the proposed action will have insignificant effects on water quality and anadromous salmonid habitat, and minor effects on Coho salmon.

Heavy mechanized equipment will be utilized during construction of temporary roads and landings. The use of heavy equipment within RRs represents a risk to water quality because fuel or hydraulic fluid spills could occur. BMPs 2.8 and 2.11 of the Region 5 Forest Service BMP Handbook (USFS 2011), as well as the Watershed PDF-27 will be implemented to minimize the risk of spills. BMPs include requirements that equipment be properly maintained and cleaned, including daily inspections; fueling and servicing of equipment in designated areas outside of RR, with the exception of hydrologically disconnected project landings; having a spill plan in place prior to implementation; removal and disposal of leaks/spills; and requirement to have a spill kit on site. PDF-27 prohibits refueling within RRs except at designated landings in locations where they are disconnected from water features and requires that a spill containment kit be on site where refueling and servicing take place. Based on implementation of minimization measures, fuel spills are not expected and effects on the Water Quality habitat Indicator group and anadromous salmonid habitat will be insignificant, with minor effects on Coho salmon.

Summary of Indirect Effects. Based on BMPs, Watershed PDFs and other project design features that will minimize the potential adverse effects of roads and stream crossings on the Water Quality habitat Indicator group, and because none of the crossings will be within anadromous salmonid habitat, and all but 2 temporary road/stream crossings will be dry during construction and use, temporary roads and crossings will

have insignificant effects on the Water Quality habitat Indicator group and anadromous salmonid habitat, and minor effects on Coho salmon.

New landings within RRs have a high risk of impacts to the Water Quality habitat indicator group including to stream shade and chemical contamination. Although watershed-scale effects are expected to be insignificant, site-scale effects may not be insignificant. Therefore, the magnitude of site-scale effects will be discussed further.

The potential impacts of water drafting on the Water Quality habitat Indicator group is associated with fuel or oil spills near streams. BMPs and PDF-27 are expected to minimize the risk of a leak or spill such that effects on the Water Quality habitat Indicator group and anadromous salmonid habitat, and minor effects on Coho salmon.

Proximity and Probability. Maps in Appendix A show that treatment units are in proximity to anadromous salmonid habitat but outside of CH. The probability of effects is insignificant, as described above, with the exception of landing construction within RRs. Landings #DZ03, DZ10, DZ23, L043, L044, and L090 are within RRs, thus the magnitude of site-scale effects will be discussed below.

Magnitude: The proposed new landings in RRs were all reviewed in the field. Watershed specialists determined that no shade trees would be removed and that soil disturbance would be minimized. Watershed PDF 27 will prohibit refueling unless the landing is hydrologically disconnected. The magnitude of effects is limited in scope to landing #DZ03, DZ10, DZ23, L043, L044, and L090 and potential impacts will be minimized through implementation of BMPs and PDFs. The magnitude of effects to the Water Quality habitat Indicator group is insignificant. New landings in RRs will have insignificant effects on the Water Quality habitat Indicator group and anadromous salmonid habitat, and minor effects on Coho salmon.

5. Legacy Sediment Site Treatments

The potential for indirect effects to water quality is highest for culvert upgrades or passage projects that are within active stream channels that require disturbance to adjacent riparian vegetation. None of the culverts are within habitat accessible to anadromous salmonids or within CH, and most culvert upgrade sites will be dry during construction and use. The culvert projects will likely disturb streamside vegetation in localized areas where culverts are located, and to a limited extent on each side of roads outside of CH. However, this work will occur on existing road alignments, where vegetation has been previously disturbed or removed. Culvert upgrade work has been programmatically analyzed in the Klamath National Forest Facility Maintenance and Watershed Restoration BA (USFS 2004). Disturbance to streamside vegetation providing effective canopy shade will be limited in scope and minimized at each site through BMPs and Watershed PDFs (21-24).

The potential for indirect effects to Coho salmon from legacy sediment site repairs is highest for projects that are within or near CH. None of the culvert projects are within habitat accessible to anadromous salmonids. Most of the culvert projects are well outside of CH, however, six are within 300 feet of CH. The culvert upgrade projects will likely disturb streamside vegetation in localized areas outside of CH, and to a limited extent on each side of roads. However, this work will occur on existing road alignments, where vegetation has been previously disturbed or removed. Culvert upgrade work has been

programmatically analyzed in the Klamath National Forest Facility Maintenance and Watershed Restoration BA (USFS 2004). Disturbance to streamside vegetation providing effective canopy shade will be minimized at each site through BMPs and Watershed PDFs (21-24) and effects to the Water Quality habitat Indicator group and anadromous salmonid habitat will be insignificant, with minor effects to Coho salmon. All together, these legacy sediment site treatments will result in meaningful benefits water quality and fish habitat in Elk Creek watershed, as well as improved passage for aquatic organisms and watershed products.

Summary of Indirect Effects. Because this PE is not within anadromous salmonid habitat, these projects are expected to have insignificant effects to water quality and anadromous salmonid habitat, and minor effects to Coho salmon. Effects to Sediment are discussed above. Legacy site repair will result in long-term beneficial effects to Coho salmon and anadromous salmonid habitat through significant reductions in sediment sources (refer to information provided above under the Sediment habitat Indicator group). Long-term beneficial effects may also include prevention of road crossing failures and associated disturbance to vegetation at the site-scale and downstream.

Proximity and Probability. Maps in Appendix A and tables in Appendix B show that treatment units are in proximity to anadromous salmonid habitat but outside of CH. The probability of effects is insignificant.

Riparian Function

Key riparian functions include sediment retention (discussed above under the Sediment habitat Indicator group), stream shade (discussed above under the Water Quality habitat Indicator group), protection and development of channel morphological features (streambanks, floodplains and side channels) and large wood loading to stream channels. The following discussion is focused on effects to the following Riparian Function habitat indicators based on the potential for indirect effects from the PEs (see Methods section):

- Large Wood: Potential effects are associated with removal of trees within RRs associated with the following PEs: salvage and reforestation/site preparation, hazard tree removal, fuels reduction, temporary road and landing construction and legacy site treatments.
- Off-channel habitat and floodplain connectivity: These habitat indicators are not applicable to certain channel types (Rosgen types A, B, and G), which characterize many of the Action Area streams. Existing off-channel habitat and floodplain function and the potential for development of these features exists in low gradient, valley floor reaches. For example, in the lower 1.6 miles of Grider Creek there is potential for development of more off-channel habitat, however there has been channelization in this reach associated with the existing road to prevent flood damage. None of the PEs include channelization or other work within valley floor segments or floodplains within Analysis Area streams. The proposed action aims to provide protection to valley floor stream segments and floodplains though designation of RRs, inner gorges and other unstable areas, and by avoiding any modifications to streambanks or floodplains. Thus, the project will have neutral effects on off-channel habitat and floodplains.

The Analytical Process allows use of "efficiency measures" if there is no causal mechanism to affect an indicator. For these reasons, the off-channel and floodplain habitat indicator will not be discussed further.

- Streambank Condition: The Flood of 1997 and associated debris flows altered channel conditions in many of the Analysis Area streams including streambank conditions. Altered channels, streambanks and riparian vegetation are still recovering from the 1997 flood event. The potential for effects to this indicator are associated with activities that occur in the near-stream zone within RRs. Most of the PEs avoid this area with the exception of hazard tree removal (where this occurs along roads that cross or run parallel to streams), temporary road stream crossings/culvert installations, and legacy site treatments that include stream crossings.

Landscape-level changes to forested habitat occurred as a result of the 2014 wildfires. High fire intensity areas were characterized by total or near-total conifer crown consumption, resulting in severe impacts to riparian function in some areas. Within areas of moderate burn intensity, some crown consumption occurred, but generally these areas are characterized by total or near-total crown scorch. The vast majority of trees in these burned areas have been killed by the fire or damaged beyond their ability to survive. Within areas of light burn intensity only the smaller size and lower crown class conifers were burned.

The 2014 fires changed riparian function in a mosaic pattern across the landscape. Burned understory vegetation may recover quickly and fully re-establish in 20 years or so. Regrowth of large conifers will take much longer, at least 50 years. Within burned RRs, there will be an increase in large wood loading in the near-term, as burned trees fall and recruit to stream channels. There will be a reduction in large wood available for recruitment in the long-term, until large conifers and hardwoods re-establish. The process of regrowth and recruitment will occur at varying rates across the landscape, and burned areas will input large wood at different rates than adjacent unburned stands. Thus, a mosaic of different conditions are expected across the landscape over time.

The risk of impacts to riparian function is highest for actions that occur within RRs. As described above under the Water Quality section, FEMAT (1993) called for protection of two site potential tree heights or to the edge of the inner gorge and Spence et al. (1996) note that the absolute minimum buffer width is one site potential tree height. The proposed action includes RR widths of two site potential tree height along fish-bearing streams and one site potential tree height along non-fish bearing streams. RRs are protected from salvage harvest, but some proposed activities will occur within RRs and are the focus of this discussion. They are fuels treatment, hazard tree removal, roads/landings/stream crossings, and legacy site treatments. Watershed PDFs, as described below, will be implemented to minimize effects to riparian function.

A primary function of RRs is as a source for large wood recruitment to streams. Large wood plays a dominant role in forming pools, metering sediment, trapping spawning gravels and creating a more complex stream environment. In general, the larger the size of the wood, the greater its stability and duration in the stream channel. Heavier pieces require higher flows for mobilization and longer pieces are more likely to be caught by the stream bank and its vegetation (Spence et al., 1996). Large wood is important for

forming pools in lower order streams as well (Kelly et al., 1995; Bisson et al., 1987) and pieces that span the channel can create dam pools or form complex jams which make excellent cover for aquatic species. Much of the large wood entering stream channels does so through landslides and debris torrents during large storm events. The wood component of debris torrents forms log jams, which may retain sediment for several years, thereby protecting lower reaches of the stream from sediment impacts. Poole and Berman (2000) note that large wood jams can also force stream flows underground and that this connection with the hyporheic zone can help cool stream temperatures. Large wood in headwater areas may also prevent headward erosion of gullies and stream channels (Kelly et al., 1995). Where effects to large wood are predicted herein, potential effects to stream temperature and erosion are inferred through the aforementioned mechanisms.

1. Salvage Harvest and Reforestation

The primary risks to riparian function are associated with soil disturbance (discussed above under the Sediment Indicator), effects to stream shade and chemical contamination (discussed above under the Water Quality Indicator), and effects associated with removal of standing or down trees that provide various functions in RRs (e.g. soil retention and productivity, and large wood loading to streams).

RRs have been established along all streams to protect riparian function (see PDFs Watershed-3) including large wood sources. Cutting of trees for salvage harvest will not occur within RRs during any and all methods of removal/harvest (tractor, skyline and helicopter). For an example of how RRs and inner gorges will be identified and excluded from salvage harvest refer to earlier discussion around Figure 3. Refer to the Sediment Indicator discussion above for a discussion of watershed disturbance associated with the proposed action. Skyline yarding corridors will not impact riparian function, as existing corridors will be used where possible: unless a less ground disturbing option is available. Where skyline corridors are needed parallel to stream channels they will be placed outside of RRs.

Reforestation includes site-preparation, planting, and release over 7,873 acres to increase the likelihood and speed by which burned areas become reforested. Reforestation includes manual site preparation, skyline yarding, mastication, mechanical yarding and slash piling of dead trees. Treatments within RRs are proposed where existing heavily burned plantations overlap RRs in Happy Camp and Whites fire areas (approximately 1227 acres), and where safety of forest workers can be ensured. These RR treatments are limited to lop and scatter of small dead trees and brush, accomplished by hand. The effect of these actions would be increased near term ground cover which would improve the post-fire buffering capacity of RRs and promote quicker soil and vegetation recovery.

Summary of Indirect Effects. Because salvage harvest will not occur within RRs, salvage harvest will have insignificant effects on riparian function and anadromous salmonid habitat, and minor effects on Coho salmon.

Site preparation and reforestation will not occur in RRs. Hand treatments to lop and scatter small dead trees and brush may occur within RRs and has the potential to improve riparian function at the site level. Only hand treatment is allowed and only small trees

would be cut and small material lopped and scattered to achieve ground cover. Site preparation and reforestation outside of RRs are expected to have insignificant effects on riparian function and anadromous salmonid habitat and minor effects on Coho salmon. Lopping and scattering small material, releasing over-crowded trees, and reducing fuels within RRs will result in long-term beneficial effects to riparian function, anadromous salmonid habitat, and SONCC Coho salmon. Due to reforestation and release actions, trees are likely to grow to a larger size quicker than if no action were taken, and the severity of future fire may be reduced as a result of reduced fuels.

Proximity and Probability. Maps in Appendix A and tables Appendix C show that treatment units are within proximity to anadromous salmonid habitat. However, the probability of effects is insignificant because trees in RRs will not be removed.

2) Fuels Reduction Treatments

The risk of effects to riparian function is associated with soil disturbance (discussed above under the Sediment Indicator), effects to stream shade and chemical contamination (discussed above under the Water Quality Indicator), and effects associated with removal of standing or down trees that provide various functions in the riparian zone (soil retention and productivity and large wood loading to streams).

Fuels reduction through thinning small diameter trees in RRs will occur in the proposed roadside treatments and fuels reduction zones (see map in Appendix A). Thinning will remove smaller trees that represent a fuels hazard or ladder fuels. These actions will improve the growth rate of larger trees left on site, thereby improving riparian function relative to stream shade, microclimate and large wood loading in the future. Overstocked conditions prevent or retard the attainment of mature stands and desired conditions within RRs – and the crowded, small diameter trees targeted for removal will likely not reach desired size for providing stream shade or recruitment to streams. Watershed PDF 37 requires that prescribed fire retain at least 90% of the down and standing large woody debris in RRs to protect soil productivity, soil retention capacity and large wood loading to stream channels. Some small localized flareups could occur in pockets where fuel accumulations are high but overall, prescribed fire actions are designed to minimize adverse effects on riparian function and to make stands more resilient to wildfire. Effects to Sediment associated with mastication and other ground disturbance are discussed above under the Sediment Indicator.

Summary of Indirect Effects. Due to the Watershed PDFs that will be implemented to minimize effects to riparian function (primarily the requirement to maintain key standing and down large wood pieces, and to only thin small diameter trees), fuels reduction actions will have insignificant effects on riparian function and anadromous salmonid habitat, and minor effects on Coho salmon.

Proximity and Probability. Maps in Appendix A and tables Appendix B show that treatment units are in proximity to anadromous salmonid habitat. However, the probability of effects is insignificant primarily because of the requirement to maintain key standing and down large wood pieces, and to limit thinning to small diameter trees.

2. Hazard Tree Removal

Hazard trees will be removed from roadside areas, including within RRs. The risk of effects to riparian function is associated with soil disturbance (discussed above under the

Sediment Indicator), effects to stream shade (discussed above under the Water Quality Indicator), and effects associated with removal of standing or down trees that provide various functions in the riparian zone (soil retention and productivity and large wood loading to streams).

Table 35 displays miles of hazard tree removal that are proposed within 175 feet from SONCC Coho CH by watershed. Critical Habitat reaches of lower East Fork Elk Creek, Elk Creek, Walker Creek, China Creek, Tompkins Creek, North Russian Creek, and Whites Gulch, along with several reaches of the middle Klamath River, may be affected by this action.

Table H-35. Miles of roadside hazard removal within 175 feet of CH.

Fire area	5th Field watershed	Hazard Tree Removal Miles Within 175 feet of Coho CH
Beaver	Beaver Creek	1.7
	Horse Creek-Klamath River	1
	Humbug Creek-Klamath River	4.6
Happy Camp	Elk Creek	4
	Lower Scott River	4.1
	Seiad Creek-Klamath River	3.4
	Thompson Creek-Klamath River	2.1
Whites	North Fork Salmon	8.3
Total		29.2

Especially where roads proposed for hazard tree removal are parallel to, and within RR associated with SONCC Coho salmon CH streams (listed above Table 35), it is important that any trees below the road that are deemed a hazard to the road will be felled toward the stream channel, and any tree larger than 26 inches DBH will not be removed. The following Watershed PDFs will be implemented to minimize effects: Watershed-14 requires that all hazard trees cut within 25 feet of stream channels, including fish/bearing stream channels, be left on site unless they pose a safety hazard; all hazard trees that are 26 inches or greater in diameter at breast height, must be left on site, unless they pose a safety hazard; Watershed-16 prohibits trees from being cut that are on streambanks; Watershed-17 requires directional felling to protect streambanks. Most of the hazard trees along roads within the three burned areas are burned or otherwise compromised and pose a safety hazard, thus there is not discretion with regard to felling/removal.

Summary of Effects. Watershed PDFs will help maintain key riparian functions such as standing and down large wood (*i.e.*, felled trees will be left on site within the recruitment zone along streams to protect soil productivity, sediment retention and large wood loading) retention after hazard tree removal. Thus, hazard tree removal will have insignificant effects to riparian function and anadromous salmonid habitat, and minor effects to Coho salmon.

Proximity and Probability. Maps in Appendix A and tables Appendix C show that treatment units are in proximity to anadromous salmonid habitat. However, the probability of effects is insignificant primarily because felled trees will be left on site within the recruitment zone along streams wherever safety concerns permit, to protect soil productivity, sediment retention and large wood.

3. Roads, Landings and Water Drafting

The proposed action includes approximately 16.4 miles of temporary road segments to access harvest units: 1.2 miles in the Beaver Fire; 14.3 miles in the Happy Camp Complex; and 0.8 miles in the Whites Fire. The total road mileage is divided among several short segments, and all temporary roads will be hydrologically restored/stabilized after use, including: constructing waterbars; outsloping road prisms if appropriate; removing crossings; and obliterating access to the road.

Approximately 3.4 miles of proposed temporary roads will create new road bed alignments. Field review confirmed that new temporary roads are proposed as short segments, generally on ridgetops, that would facilitate skyline logging systems. All of these new temporary road alignments are well outside of riparian areas and construction, use, and hydrologic stabilization of these segments would not impact riparian function or threaten downstream water quality.

Temporary roads can affect riparian function through increased sedimentation (discussed above under the Sediment indicator) or through disturbance within near-stream zones associated with stream crossing construction, or if construction of a temporary road occurs within RRs. Large wood will not be affected at crossings on existing road alignments as these areas have been previously disturbed and cleared. The following minimization measures and project designs features will be implemented to minimize effects to riparian function at all stream crossings: 1) none of the stream crossings are within fish-bearing habitat; 2) none of the alignments require removal of shade trees along perennial streams; and 4) Watershed PDFs (5, 18 and 20) will be implemented to minimize site effects.

Landing use and construction and potential effects to sediment are discussed above under the Sediment habitat Indicator group. Landings located within RRs represents one of the greatest risks to riparian function because landings routinely disturb soil and vegetation in close proximity to stream channels. The proposed action has a high risk of affecting riparian function at the site-scale through construction of the following landings that are within RRs (see locations on map in Appendix A): Landings # DZ03, DZ10, DZ23, L043, L044, and L090.

Based on site reviews of all proposed new landings within RRs, the fact that no large conifers would be removed, and that Watershed PDFs will be implemented that are designed to minimize impacts to riparian function (existing landings will be used to the extent possible; existing landings in stream-course RRs will not be expanded towards stream channels or where trees that provide shade to streams would need to be removed), use or construction of landings will have insignificant effects on riparian function and anadromous salmonid habitat, and minor effects to Coho salmon.

Water drafting can result in impacts to riparian function if new sites are developed or existing sites are modified. Watershed-38 and 39 require that only existing developed water drafting sites be used and that the only modifications allowed to sites within Coho salmon CH is the rocking of approaches to minimize sedimentation. Due to PDFs and BMPs (described above under the Sediment and Water Quality indicators) that have been designed to minimize effects, water drafting will have insignificant effects on riparian function and anadromous salmonid habitat, and minor effects to Coho salmon.

Summary of Indirect Effects. General project design features, BMPs and Watershed PDFs (*e.g*. none of the stream crossings are within fish-bearing habitat, stream crossings are mostly limited to intermittent or ephemeral streams that will be dry during construction and use, and none of the road alignments require removal of shade trees/large wood along perennial streams) will be implemented to minimize impacts. Thus, temporary road construction and stream crossings will have insignificant effects on riparian function and anadromous salmonid habitat, and minor effects on Coho salmon.

At the watershed-scale, landings will have insignificant effects to riparian function because they are small areas of disturbance interspersed with undisturbed zones. General project design features guide locations, avoid unstable areas and require use of existing landings whereever possible. BMPs and PDFs have been designed to minimize impacts. Thus, at the watershed-scale, landing use and construction will have insignificant effects on riparian function and anadromous salmonid habitat, and minor effects on Coho salmon. However, at the site-scale, landings have a high risk of adverse effects when constructed within RRs (Landings # DZ03, DZ10, DZ23, L043, L044, and L090). Thus, the magnitude of this effect will be discussed further below.

Magnitude: All proposed new landings in RRs were reviewed in the field. The magnitude of potential effects is limited in scope to landing #DZ03, DZ10, DZ23, L043, L044, and L090. The criteria for use of existing landings are: existing landings in RR will not be expanded towards stream channels, or on to active landslides, or where vegetation that provides shade to a stream would need to be cut. Existing landings in RRs will be shaped and treated for erosion control at the end of each season of use, and hydrologically restored at project completion (including subsoiling and covering with slash/mulch as needed). Reused landings in RRs will have site specific erosion control measures to reduce risk of sediment delivery into streams.

Site review of all new landings proposed within RR confirmed that these criteria (PDF Watershed-23) and other PDFs, along with proper implementation of BMPs, would be sufficient to avoid any meaningful negative effect(s) to anadromous fish habitat. The magnitude of effects to the Riparian Function habitat Indicator group and anadromous salmonid habitat is insignificant, with minor effects on Coho salmon.

4. Legacy Site Treatments

The potential for indirect effects to riparian function is highest for projects that are within or near active stream channels. None of the culvert upgrade projects are within habitat accessible to anadromous salmonids. Most of the culvert projects are well outside of CH, however six are approximately 300 feet from CH. The culvert upgrade projects will likely disturb streamside vegetation in localized areas where culverts are located, and to a limited extent on each side of roads. However, this work will occur on existing road alignments, where vegetation has been previously disturbed or removed. Thus, only early seral stage vegetation will be disturbed. Culvert upgrade work has been programmatically analyzed in the Klamath National Forest Facility Maintenance and Watershed Restoration BA (USFS 2004). Disturbance to streamside vegetation will be minimized at each site through BMPs and Watershed PDFs (21-24). All together, these legacy sediment site treatments will result in meaningful long term benefits to riparian function in the Elk Creek watershed.

Summary of Indirect Effects. Because these project activities are not within anadromous salmonid habitat or CH, these project activities are expected to have insignificant effects to riparian function and anadromous salmonid habitat, and minor effects to Coho salmon. Long term effects include improved riparian function and reduced road-related threats to water quality. Effects to sediment have been discussed above.

Proximity and Probability. Maps in Appendix A show that treatment sites are not within anadromous salmonid habitat. As described above under the sediment discussion, there are six culvert projects that are approximately 300 feet of CH (Upper East Fork Elk Creek and Cougar Creek-Elk Creek). However, these sites are at existing road crossings that have been previously disturbed and no large trees eligible for recruitment to streams would be removed. The probability of effects to riparian function is insignificant, as described above. The legacy sediment site work will result in benefits to riparian function in the long-term as crossings are upgraded to handle larger flood events and the potential for major flood disturbance induced by undersized crossings is reduced.

VIII. Cumulative Effects

The ESA defines cumulative effects in 50 C.F.R. 402.02 as "those effects of future State or private activities, not involving Federal Activities that are reasonably certain to occur within the Action Area of the Federal action subject to consultation." The AP (on page 42) explains that, "if the effect determination is NLAA, an assessment of ESA cumulative effects is not required by the regulations…." However, the following information is provided for added perspective.

The KNF uses standardized Cumulative Watershed Effects (CWE) models (Equivalent Roaded Area, Universal Soil Loss Equation, Mass Wasting) to assess effects of past, present, and reasonably foreseeable activities. The WSFR Hydrology Report affected environment analysis includes the following projects within the Analysis Area: Eddy Late Successional Reserve, Elk Thin, Fish Meadows, Glassups Timber Sale, Happy Camp Fire Protection Phase 2, Johnny O'Neil Late Successional Reserve Habitat Restoration and Fuels Reduction, Lake Mountain Foxtail Pine, Lower Scott Roads, North Fork Roads Storm-proofing, Oak Flat Thin, Singleton, Thom Seider Vegetation Management and Fuels Reduction, Two Bit Vegetation Management projects, work done under the Burned Area Emergency Response, grazing allotments, Timber Harvest Plans since 2005, and private land salvage (under Emergency Timber Harvest Plans). These are on-going activities and the CWE model includes them in the "current" portion of the results.

The CWE models reflect that there will be no increase in disturbance at the 5th-field watershed scale, and only minor incremental increases at the 7th field watershed scale (and short term disturbance at sites), due to project actions. As described in this analysis, at the watershed and site scale, Project effects to SONCC Coho salmon are either discountable (extrememly unlikely to occur), or insignificant (not meaningful). Therefore, cumulative impacts from adding the effects of the proposed action to present and reasonably foreseeable future actions are insignificant.

Of note is that during several Project field visits from November 2014 to March 2015, private timber harvest and associated road activities in the Beaver Fire area (Beaver, Doggett, and Kohl creek drainages) were observed to be causing sediment mobilization

to streams downslope in Beaver and Doggett Creeks. This project proposes only minor amounts of ground disturbing activities in these watersheds (total of 350 acres of salvage, 1700 acres of site prep and plant, and 0.8 miles of temporary road on existing road bed in the Beaver Fire area), and project actions will help restore late seral vegetation quicker on the acres treated, when compared to no action. Even so, short term insignificant effects to the sediment regime due to this project could be viewed as additive to these ongoing sediment-related impacts from private land activities. However, due to the low level of impact caused by this project (no salvage harvest in RR, minimal new infrastructure proposed, and minor acreage of ground disturbance in these watersheds), the influence of these effects to the sediment regime in Beaver, Doggett and Kohl creeks, and in the mid Klamath River constitutes a minor and insignificant impact to Coho salmon and their CH.

Future Federal actions that have not already been consulted on will be analyzed through separate Section 7 consultations.

IX. Effects Summary

The Analytical Process requires that BAs provide a summary statement for each PE. A summary of project effects by Project Element and by 2014 fire area is in Appendix G.

Once a PE summary is provided (above), the AP requires that BA's use a Project Effects Determination Key to answer questions based on the Indicator summary conclusions at the ESA action area scale, as follows:

PROJECT EFFECTS DETERMINATION KEY FOR SPECIES AND DESIGNATED CH

1) Do any of the Indicator summaries have a positive (+) or negative (-) conclusion?
   Yes – Go to 2
   No – No Effect
2) Are the Indicator summary results only positive?
   Yes – NLAA
   No – Go to 3
3) If any of the Indicator summary results are negative, are the effects insignificant or discountable?
   Yes – NLAA
   No – LAA, fill out Adverse Effects Form

X. Effects Determinations

Taking all analysis into consideration, at the ESA action area scale, it is the determination of the Fisheries Biologists that <u>the WSFR may affect, but is not likely to adversely affect SONCC Coho salmon or its designated CH.</u>

KNF stream surveys, California Department of Fish and Wildlife information and professional judgment of fisheries biologists has been compiled into the KNF steelhead trout distribution layer in the KNF Geographic Information Systems electronic library. The use of the KNF steelhead trout distribution to define SONCC Coho salmon and UKTR spring and fall-run Chinook salmon EFH is a conservative estimate of the distribution of SONCC Coho salmon and UKTR Chinook salmon because their distribution is less extensive than steelhead trout. For the Project, EFH is considered synonymous with steelhead distribution.

The effects analysis considers effects to Pacific salmonid habitat in general; and since habitat requirements for Coho and Chinook salmon are similar, the effects of the Project as described above for Coho salmon CH are similar for EFH.

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Fisheries Biological Assessment: Appendices

Appendix A. Project maps – 7 total, 6 maps of fire areas with proposed actions and 1 map of proposed legacy sediment site repair in Elk Creek Watershed.
Appendix B Detailed tables of proposed activities and CWE model outputs
Appendix C. KNF Table of Population and Habitat Indicators
Appendix D. Environmental Baseline and Effects Checklists, 5th and 7th field watersheds
Appendix E. Project Design Features, Best Management Practices and Wet Weather Operation Standards
Appendix F. Life history and biological requirements of Pacific Salmonids
Appendix G. Summary of Project Element Effects to Coho Salmon, and Critical Habitat, by 2014 Fire Area

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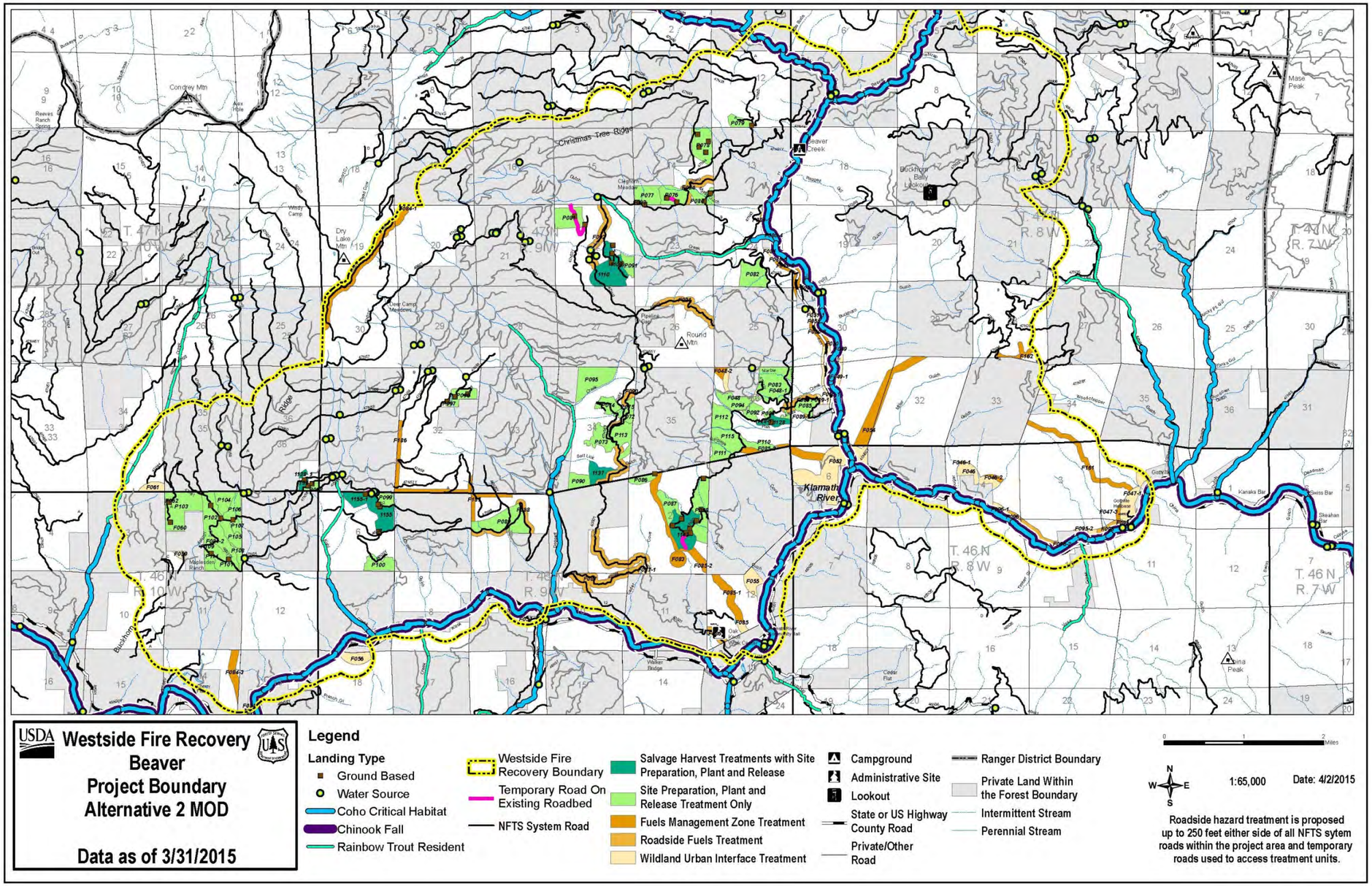

Map H-1: Alternative 2 Modified—Beaver Project Maps Submitted with the Fisheries Biological Assessment

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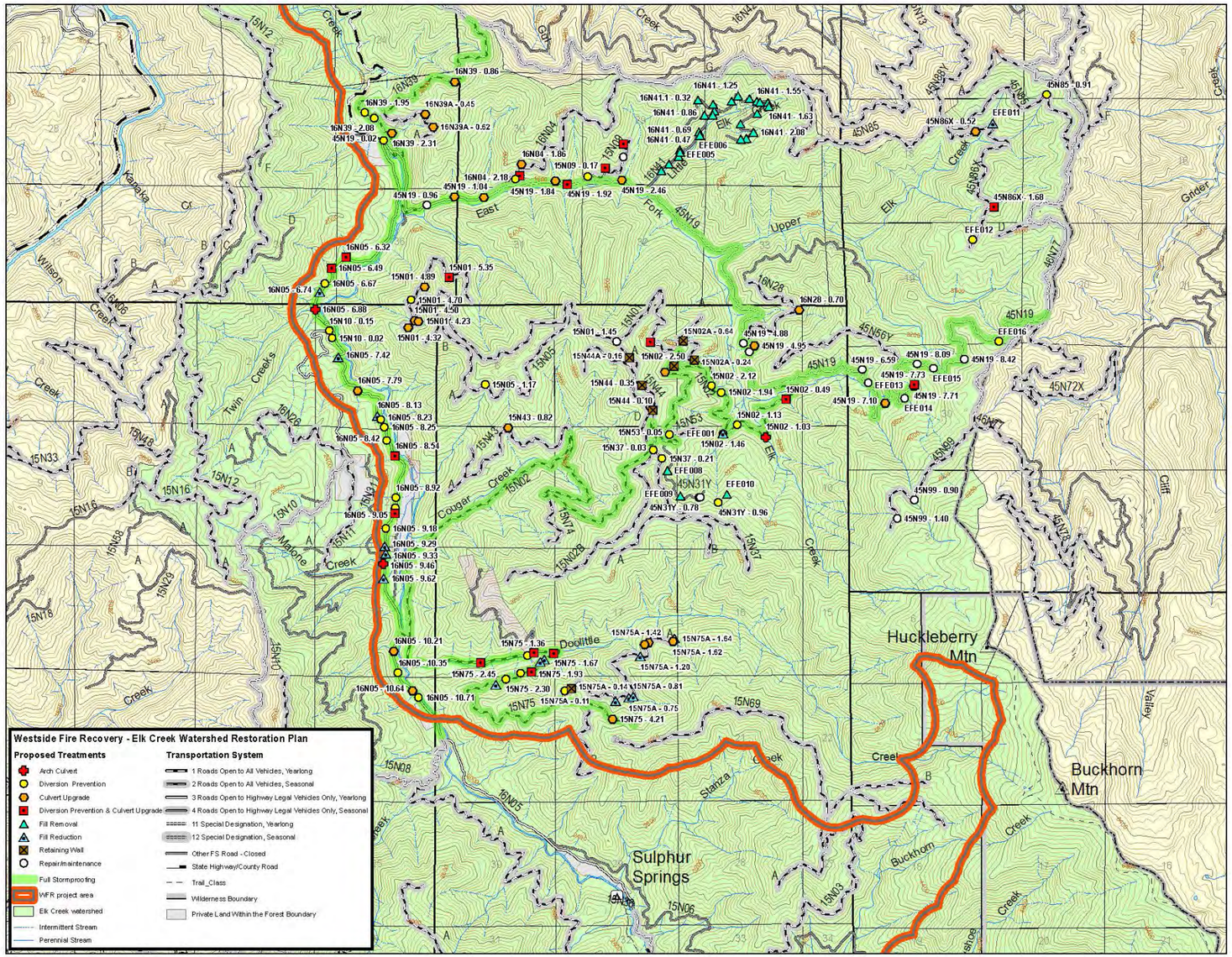
Westside Fire Recovery - Elk Creek Watershed Restoration Plan
Proposed Treatments
Arch Culvert
Diversion Prevention
Culvert Upgrade
Diversion Prevention & Culvert Upgrade
Fill Removal
Fill Reduction
Retaining Wall
Repair/Maintenance
Full Stormproofing
WFR project area
Elk Creek watershed
Intermittent Stream
Perennial Stream
Transportation System
1 Roads Open to All Vehicles, Yearlong
2 Roads Open to All Vehicles, Seasonal
3 Roads Open to Highway Legal Vehicles Only, Yearlong
4 Roads Open to Highway Legal Vehicles Only, Seasonal
11 Special Designation, Yearlong
12 Special Designation, Seasonal
Other FS Road - Closed
State Highway/County Road
Trail_Class
Wilderness Boundary
Private Land Within the Forest Boundary
Huckleberry Mtn
Buckhorn Mtn
Sulphur Springs
Upper Elk
East Fork
Doolittle
Cougar Creek
Twin Creeks
Malone Creek
Wilson Creek
Kapetka Cr
Stanza Creek
Buckhorn Creek
Cliff Creek
Grider Creek
Valley Creek

Map H-2

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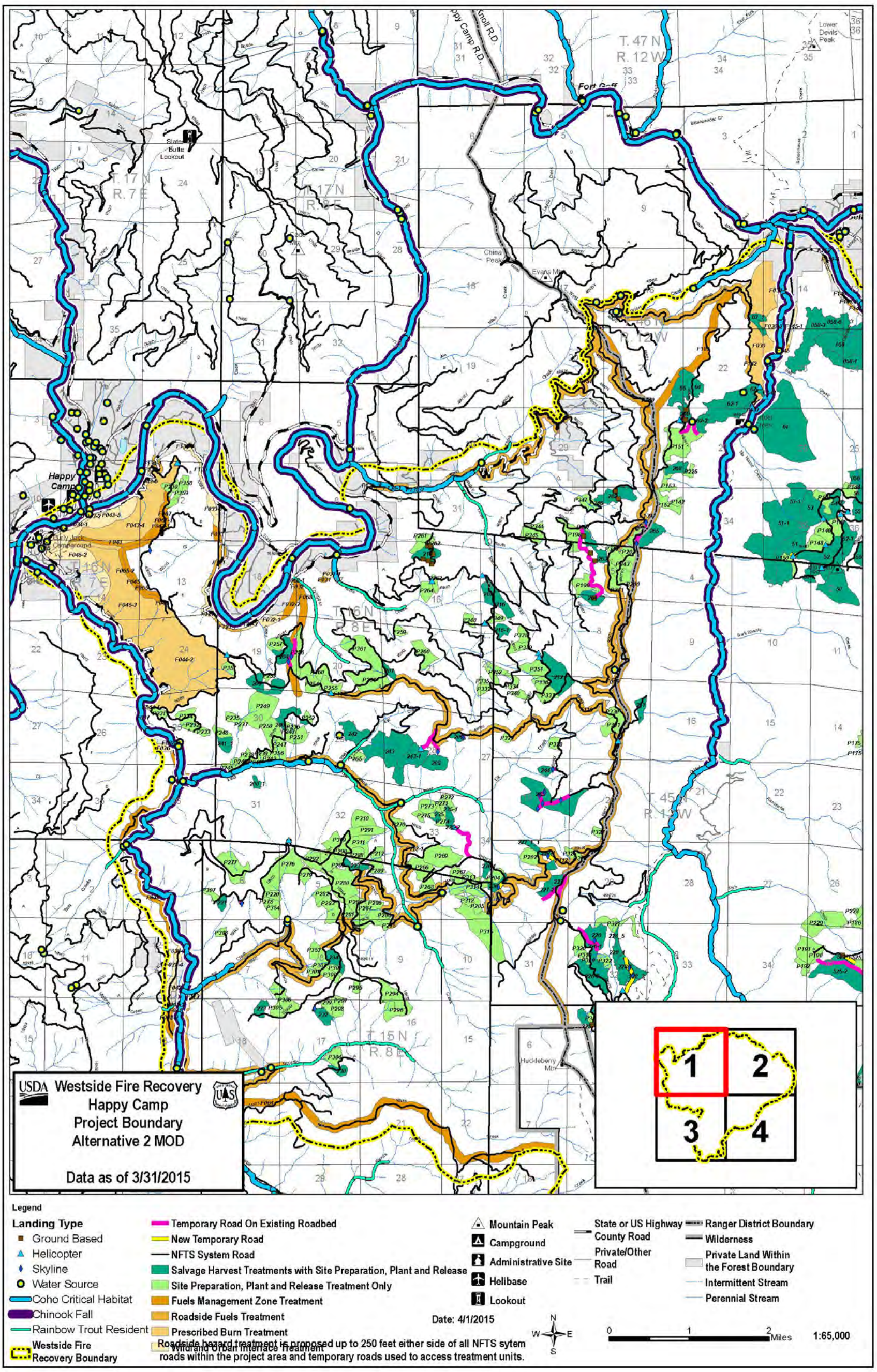

Map H-3: Alternative 2 Modified—Happy Camp (northwest) Project Maps Submitted with the Fisheries Biological Assessment

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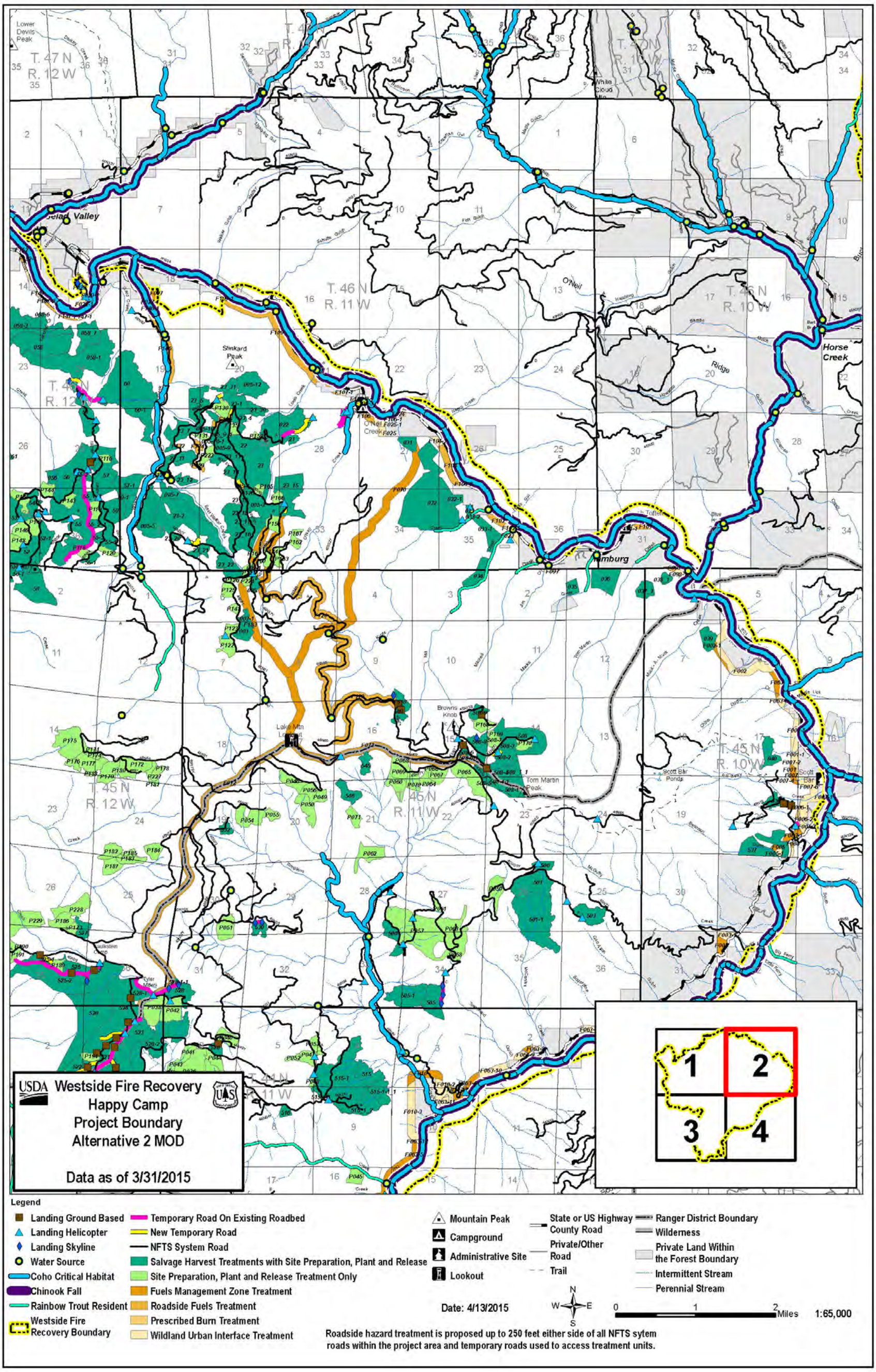

Map H-4: Alternative 2 Modified—Happy Camp (northeast) Project Maps Submitted with the Fisheries Biological Assessment

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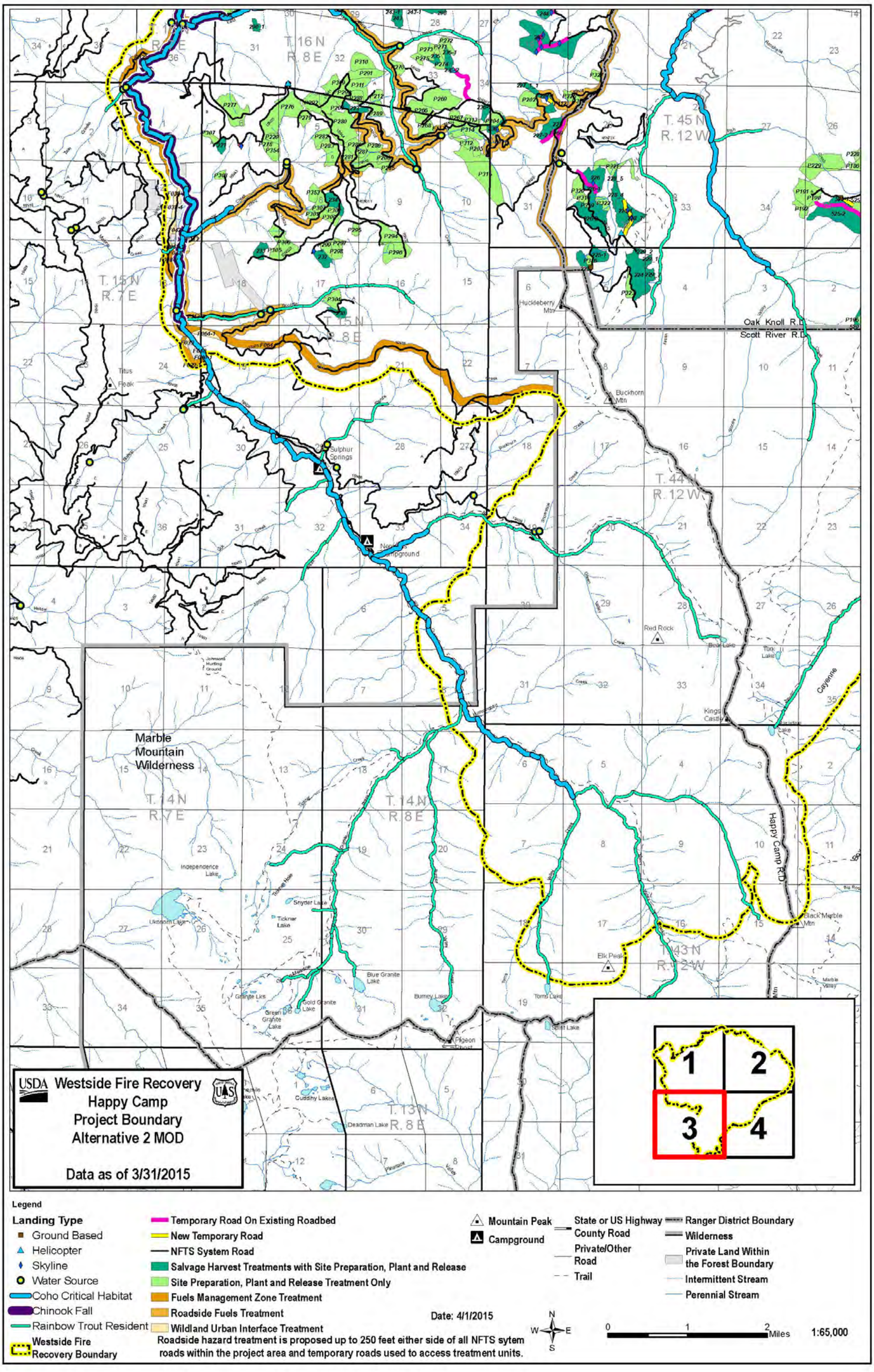

Map H-5: Alternative 2 Modified—Happy Camp (southwest) Project Maps Submitted with the Fisheries Biological Assessment:

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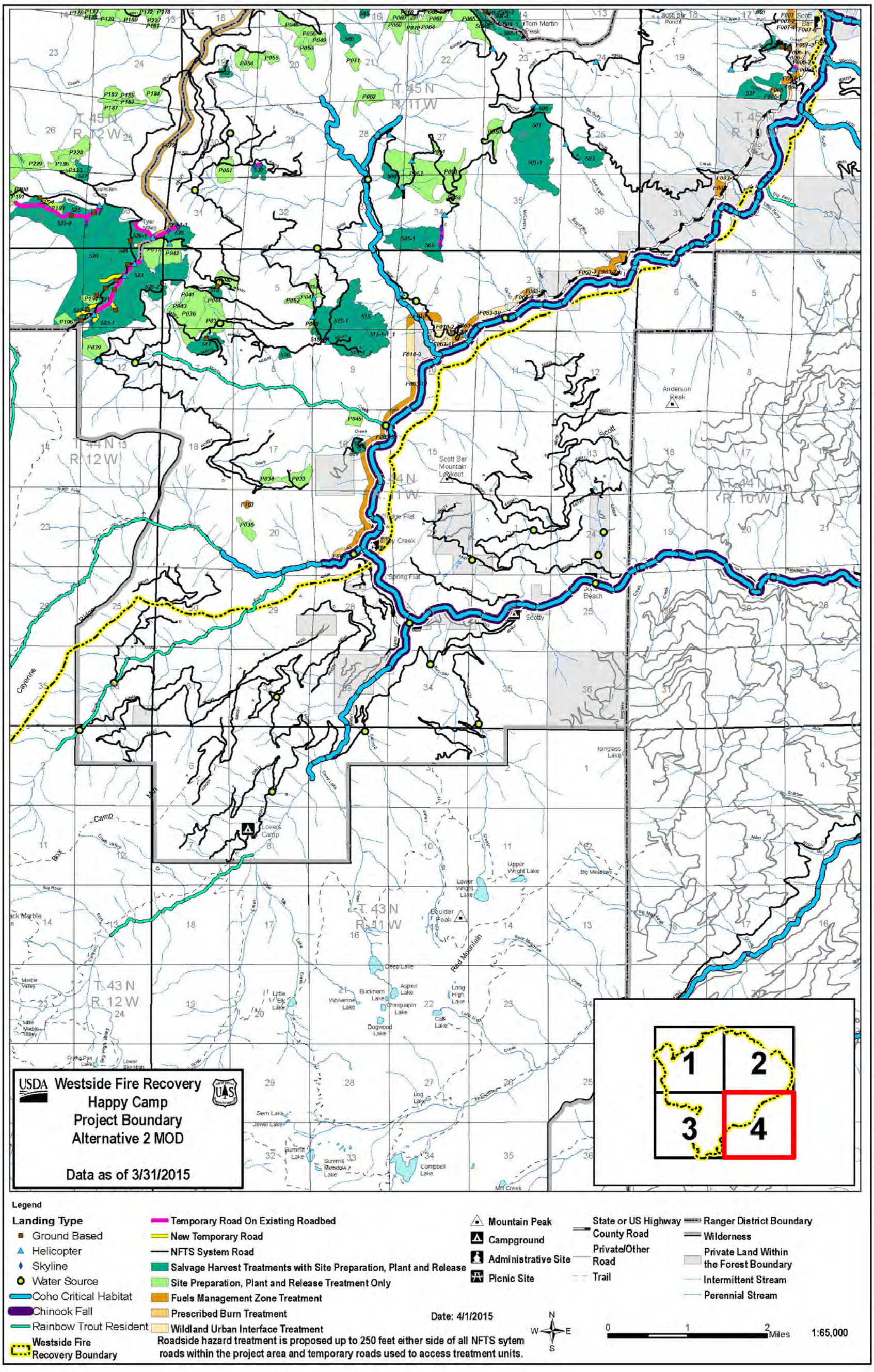

Map H-6: Alternative 2 Modified—Happy Camp (southeast) Project Maps Submitted with the Fisheries Biological Assessment

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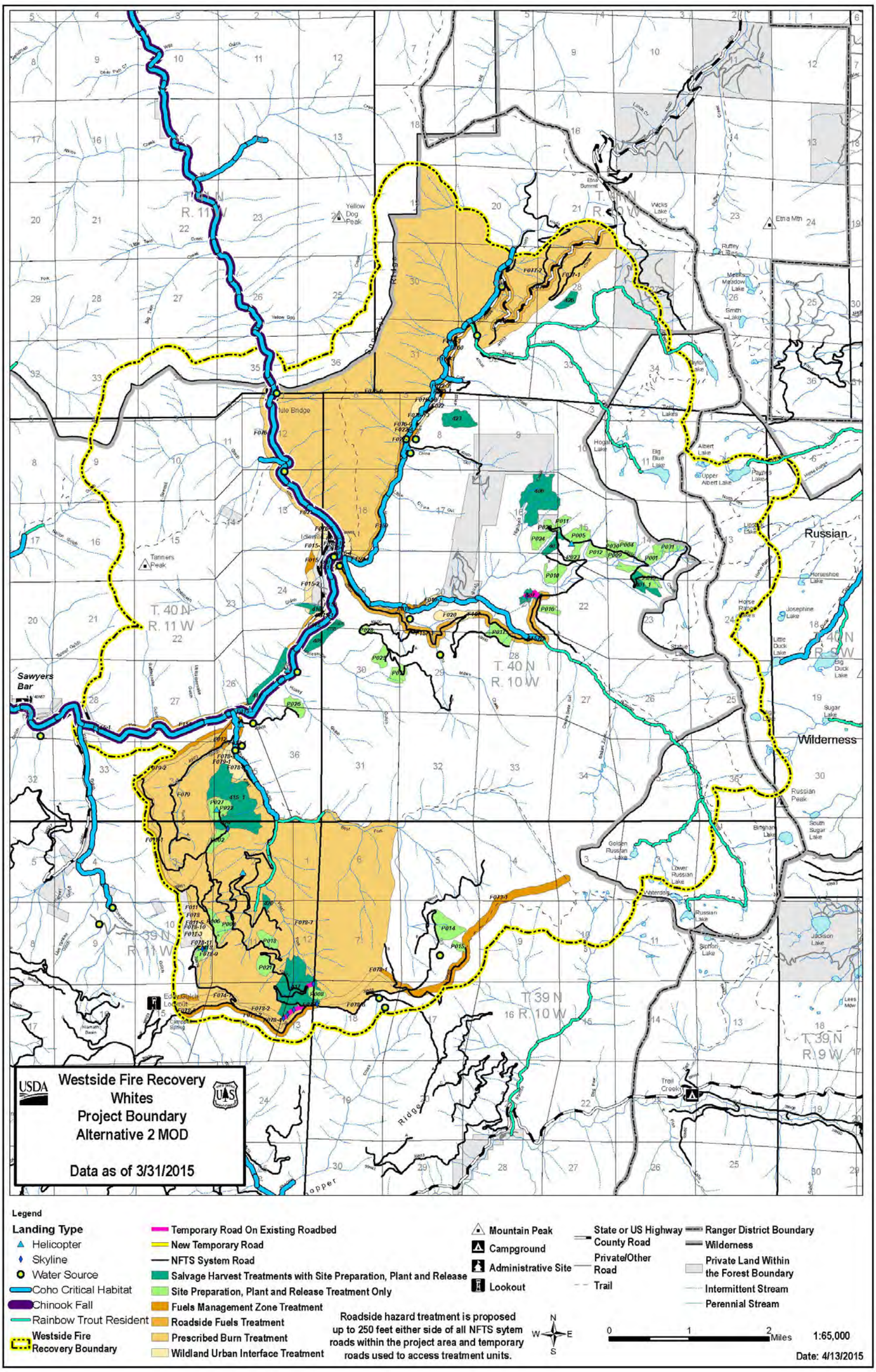

Map H-7: Alternative 2 Modified—Whites Project Maps Submitted with the Fisheries Biological Assessment

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Appendix B: Detailed Project Tables

Table H-36. Temporary road construction by 7th field watershed (all are outside of RR).

7th Field Watershed	Miles of New Temporary Road
Caroline Creek-Klamath River	0.12
Cliff Valley Creek	0.48
Cougar Creek-Elk Creek	0.04
Lower Grider Creek	0.09
Middle Creek	0.24
O'Neil Creek	0.43
Schutts Gulch-Klamath River	0.18
Shadow Creek	0.04
Tom Martin Creek-Klamath River	0.29
Upper East Fork Elk Creek	0.08
Upper Elk Creek	0.06
Upper Grider Creek	0.85
Walker Creek	0.46
Whites Gulch	0.06
Grand Total	**3.43**

Table H-37. Acres of Happy Camp fire area with proposed RR site preparation hand treatments by 7th field watershed (none proposed in Beaver Fire).

7th Field Watersheds	Acres of RR within site prep and plant units
China Creek	57.54
Cliff Valley Creek	39.72
Cougar Creek-Elk Creek	78.53
Deep Creek-Scott Creek	10.48
Doolittle Creek	24.76
Fryingpan Creek-Klamath River	37.12
Hoop&Devil-Elk Creek	23.51
Horse Creek	56.22
Lower East Fork Elk Creek	149.85
Lower Grider Creek	62.85
McCarthy Creek-Scott River	24.61
Middle Creek	106.99
North Fork Kelsey Creek	0.99
O’Neil Creek	11.57
Rancheria Creek	23.61
Schutts Gulch-Klamath River	2.92
South Fork Kelsey Creek	1.68
Tom Martin Creek-Klamath River	8.40
Tompkins Creek	133.10
Upper East Fork Elk Creek	192.32
Upper Elk Creek	20.93
Upper Grider Creek	15.85
Walker Creek	33.93
Total	1112.5

Table H-38. Acres of Whites Fire with proposed hand treatments in RR by 7th field watershed (none proposed in Beaver Fire).

7th Field Watersheds	Acres of RR within site prep and plant units
Music Creek	48.48
Robinson Gulch-North Fork Salmon River	10.71
Upper South Russian Creek	12.97
Whites Gulch	55.01
Total	127.17

Table H-39. CWE model outputs reflecting effects of Consultation Action by 5th field watershed.

5th Field Watershed	2014 Fire	Drainage Area (acres)	ERA Risk Ratio	USLE Risk Ratio	GEO Risk Ratio
Humbug Creek-Klamath River	Beaver	68023	0.31	0.58	0.85
Beaver Creek	Beaver	69610	1.02	1.11	1.01
Horse Creek-Klamath River	Beaver	98625	0.73	0.81	0.92
Seiad Creek-Klamath River	Happy Camp Complex	81706	0.56	0.32	0.70
Indian Creek-Scott River	Happy Camp Complex	76548	0.60	0.76	0.78
Lower Scott River	Happy Camp Complex	98016	0.55	0.41	0.64
Thompson Creek-Klamath River	Happy Camp Complex	67301	0.43	0.24	0.56
Elk Creek	Happy Camp Complex	60829	0.51	0.52	0.53
Ukonom Creek-Klamath River	Happy Camp Complex	87884	0.39	0.22	0.53
South Fork Salmon River	Whites	185597	0.31	0.27	0.47
North Fork Salmon River	Whites	130545	0.34	0.30	0.68

Table H-40. ERA model outputs showing current condition and effects of Consultation Action by 7th field watershed.

7th Field Watershed	2014 Fire	Drainage Area (acres)	Current ERA Risk Ratio	ERAs Fire, Salvage, Site Prep	ERA temp roads	ERA legacy Sites	ERA Risk Ratio	Change in ERA from Action
Bear Creek	Beaver	4219	0.76	0.0			0.76	0.00
Buckhorn Creek	Beaver	9118	0.95	12.3			0.97	0.02
Buckhorn Gulch-Beaver Creek	Beaver	8234	1.11	27.1			1.14	0.03
Collins Creek-Klamath River	Beaver	7845	0.41	7.5			0.42	0.01
Doggett Creek	Beaver	7701	2.36	17.6			2.39	0.03
Dona Creek-Klamath River	Beaver	4380	0.89	5.9			0.90	0.01
Dutch Creek	Beaver	6386	0.70	0.0	0.4		0.70	0.00
Dutch Creek	Beaver	3827	1.46	25.3			1.54	0.08
Jaynes Canyon	Beaver	7009	1.16	1.1			1.17	0.00
Kohl Creek	Beaver	3537	1.57	10.1	0.1		1.61	0.03
Little Humbug Creek	Beaver	6188	0.20	0.0			0.20	0.00
Lower West Fork Beaver Creek	Beaver	4044	1.31	1.3			1.31	0.00
Lumgrey Creek	Beaver	5496	0.44	1.0			0.44	0.00
McKinney Creek	Beaver	7275	0.80	0.0			0.80	0.00
Miller Gulch-Klamath River	Beaver	6557	0.30	12.6			0.31	0.02

7th Field Watershed	2014 Fire	Drainage Area (acres)	Current ERA Risk Ratio	ERAs Fire, Salvage, Site Prep	ERA temp roads	ERA legacy Sites	ERA Risk Ratio	Change in ERA from Action
Quigleys Cove-Klamath River	Beaver	6162	0.37	40.9	0.1		0.42	0.06
Soda Creek-Beaver Creek	Beaver	7370	1.08	2.3			1.08	0.00
Vesa Creek	Beaver	3141	0.10	0.0			0.10	0.00
Bear Creek	Happy Camp Complex	6698	0.66	1.3			0.66	0.00
Benjamin Creek-Klamath River	Happy Camp Complex	9998	0.41	7.8			0.42	0.01
Big Ferry-Swanson	Happy Camp Complex	7612	1.14	15.9	0.0		1.16	0.02
Bishop Creek-Elk Creek	Happy Camp Complex	9253	0.57	6.0		-4.1	0.58	0.00
Caroline Creek-Klamath River	Happy Camp Complex	1801	0.54	9.6	0.6		0.60	0.06
China Creek	Happy Camp Complex	6189	0.86	37.9	1.3		0.94	0.08
Cliff Valley Creek	Happy Camp Complex	3952	0.35	16.4	1.2		0.41	0.06
Cougar Creek-Elk Creek	Happy Camp Complex	6918	0.39	10.2	0.1	-19.2	0.37	-0.02
Deep Creek-Scott River	Happy Camp Complex	3798	0.44	3.7			0.45	0.01
Doolittle Creek	Happy Camp Complex	4050	0.56	10.1		-8.5	0.57	0.01
Franklin Gulch-Scott River	Happy Camp Complex	6450	0.37	6.4			0.38	0.01
Granite Creek	Happy Camp Complex	7541	0.59	0.0			0.59	0.00
Headwaters Elk Creek	Happy Camp Complex	2688	0.32	0.0			0.32	0.00
Hoop&Devil-Elk Creek	Happy Camp Complex	3075	0.39	54.0		-8.7	0.53	0.15
Horse Creek	Happy Camp Complex	2537	0.74	21.8	0.0		0.83	0.09
Lower East Fork Elk Creek	Happy Camp Complex	3430	0.43	7.9	0.3	-15.7	0.41	-0.02
Lower Grider Creek	Happy Camp Complex	10768	0.71	47.5	0.6		0.77	0.06
Lower Seiad Creek	Happy Camp Complex	3844	0.31	0.0			0.31	0.00
McCarthy Creek-Scott River	Happy Camp Complex	11611	0.51	18.9	0.2		0.52	0.02
Middle Creek	Happy Camp Complex	4496	0.69	41.0	0.6		0.80	0.11
Middle Elk Creek	Happy Camp Complex	2727	1.40	0.0			1.40	0.00
Negro Creek	Happy Camp Complex	2111	0.48	0.0			0.48	0.00
North Fork Kelsey Creek	Happy Camp Complex	5177	0.28	0.3			0.28	0.00
O'Neil Creek	Happy Camp Complex	2429	0.82	15.5	0.8		0.91	0.08

7th Field Watershed	2014 Fire	Drainage Area (acres)	Current ERA Risk Ratio	ERAs Fire, Salvage, Site Prep	ERA temp roads	ERA legacy Sites	ERA Risk Ratio	Change in ERA from Action
Rainy Valley Creek	Happy Camp Complex	2985	0.11	0.0			0.11	0.00
Rancheria Creek	Happy Camp Complex	4374	0.88	8.4			0.90	0.03
Sambo Gulch-Klamath River	Happy Camp Complex	6393	0.29	0.1			0.29	0.00
Schutts Gulch-Klamath River	Happy Camp Complex	6692	0.59	6.0	0.3		0.60	0.01
South Fork Kelsey Creek	Happy Camp Complex	6199	0.21	0.7			0.21	0.00
Tom Martin Creek-Klamath River	Happy Camp Complex	10690	0.53	42.3	0.2		0.58	0.04
Tompkins Creek	Happy Camp Complex	9327	0.53	48.7	0.1		0.60	0.07
Toms Valley Creek-Elk Creek	Happy Camp Complex	4564	0.23	0.0			0.23	0.00
Upper Canyon Creek	Happy Camp Complex	5179	0.08	0.0			0.08	0.00
Upper East Fork Elk Creek	Happy Camp Complex	3873	0.58	12.9	0.2	-13.7	0.58	0.00
Upper Elk Creek	Happy Camp Complex	3025	0.54	24.1	1.4	-5.0	0.63	0.09
Upper Grider Creek	Happy Camp Complex	8467	0.42	28.9	2.7		0.47	0.05
Walker Creek	Happy Camp Complex	7635	1.06	27.1	2.5		1.12	0.06
West Grider Creek-Klamath River	Happy Camp Complex	4026	0.41	6.1			0.42	0.02
Big Creek	Whites	2735	0.00	0.4			0.00	0.00
Eddy Gulch	Whites	4425	0.49	4.5			0.50	0.01
Jackass Gulch	Whites	2807	0.26	0.0			0.26	0.00
Jessups Gulch-North Fork Salmon River	Whites	4546	0.45	0.0			0.45	0.00
Lower North Russian Creek	Whites	4501	0.76	79.3			0.98	0.22
Lower South Russian Creek	Whites	2138	0.88	2.9			0.90	0.02
Music Creek	Whites	3286	1.03	4.7	0.0		1.05	0.02
Robinson Gulch-North Fork Salmon River	Whites	5202	0.74	10.1			0.76	0.02
Shadow Creek	Whites	5690	0.55	25.1	0.1		0.60	0.04
Sixmile Creek	Whites	4049	0.18	3.9			0.19	0.01
Specimen Creek	Whites	5009	0.30	0.0			0.30	0.00
Sugar Creek	Whites	8760	0.21	0.0			0.21	0.00
Taylor Creek	Whites	4016	0.54	3.2			0.55	0.01
Upper French Creek	Whites	8721	0.58	0.0			0.58	0.00
Upper North Russian Creek	Whites	3130	0.39	72.9			0.70	0.31
Upper South Russian Creek	Whites	6396	0.38	2.7	0.2		0.39	0.01
Whites Gulch	Whites	8576	0.64	223.8	0.3		0.97	0.33
Yellow Dog Creek-North Fork Salmon River	Whites	9239	0.20	72.2			0.28	0.08

Table H-41. USLE model outputs reflecting current condition and effects of Consultation Action by 7th field watershed.

7th Field Watershed	2014 Fire	Current Risk Ratio	USLE Fire, Salvage, Site Prep (yd3/year)	USLE temp roads (yd3/year)	USLE legacy Sites (yd3/year)	USLE Risk Ratio	Changes in USLE from Action
Bear Creek	Beaver	0.85	0.0			0.85	0.00
Buckhorn Creek	Beaver	0.85	2.8			0.85	0.00
Buckhorn Gulch-Beaver Creek	Beaver	1.34	2.1			1.35	0.01
Collins Creek-Klamath River	Beaver	0.89	1.0			0.89	0.00
Doggett Creek	Beaver	1.52	1.9			1.53	0.00
Dona Creek-Klamath River	Beaver	1.13	1.8			1.14	0.01
Dutch Creek	Beaver	1.67	4.4			1.70	0.03
Jaynes Canyon	Beaver	1.68	0.0			1.68	0.00
Kohl Creek	Beaver	1.53	4.7	0.1		1.55	0.01
Little Humbug Creek	Beaver	0.25	0.0			0.25	0.00
Lower West Fork Beaver Creek	Beaver	1.65	0.0			1.65	0.00
Lumgrey Creek	Beaver	1.38	0.0			1.38	0.00
McKinney Creek	Beaver	1.00	0.0			1.00	0.00
Miller Gulch-Klamath River	Beaver	0.48	0.0			0.48	0.00
Quigleys Cove-Klamath River	Beaver	0.73	0.8	0.03		0.74	0.01
Sambo Gulch-Klamath River	Beaver	0.39	0.0			0.39	0.00
Soda Creek-Beaver Creek	Beaver	1.60	0.0			1.60	0.00
Vesa Creek	Beaver	0.25	0.0			0.25	0.00
Bear Creek	Happy Camp Complex	0.28	0.0			0.28	0.00
Benjamin Creek-Klamath River	Happy Camp Complex	0.33	0.0			0.33	0.00
Big Ferry-Swanson	Happy Camp Complex	0.73	2.1	0.01		0.73	0.01
Bishop Creek-Elk Creek	Happy Camp Complex	0.10	0.0		-2.8	0.09	0.00
Caroline Creek-Klamath River	Happy Camp Complex	0.60	6.0	2		0.64	0.04
China Creek	Happy Camp Complex	0.79	5.6	2.9		0.81	0.02
Cliff Valley Creek	Happy Camp Complex	0.63	5.8	3.5		0.65	0.02
Cougar Creek-Elk Creek	Happy Camp Complex	0.50	0.4	0.1	-24.1	0.45	-0.05
Deep Creek-Scott River	Happy Camp Complex	0.52	0.7			0.53	0.00
Doolittle Creek	Happy Camp Complex	0.42	1.0		-8.3	0.41	-0.02
Franklin Gulch-Scott River	Happy Camp Complex	0.39	0.0			0.39	0.00

7th Field Watershed	2014 Fire	Current Risk Ratio	USLE Fire, Salvage, Site Prep (yd3/year)	USLE temp roads (yd3/year)	USLE legacy Sites (yd3/year)	USLE Risk Ratio	Changes in USLE from Action
Fryingpan Creek-Klamath River	Happy Camp Complex	1.07	2.5	0.2		1.08	0.01
Granite Creek	Happy Camp Complex	0.00	0.0			0.00	0.00
Headwaters Elk Creek	Happy Camp Complex	0.42	0.0			0.42	0.00
Hoop&Devil-Elk Creek	Happy Camp Complex	0.63	0.4		-12.1	0.57	-0.06
Horse Creek	Happy Camp Complex	1.00	6.3	0.01		1.03	0.03
Lower East Fork Elk Creek	Happy Camp Complex	1.00	1.2	0.4	-25.7	0.91	-0.09
Lower Grider Creek	Happy Camp Complex	0.77	26.9	0.7		0.79	0.02
Lower Seiad Creek	Happy Camp Complex	0.16	0.0			0.16	0.00
McCarthy Creek-Scott River	Happy Camp Complex	0.49	4.8	0.2		0.50	0.01
Middle Creek	Happy Camp Complex	0.87	8.7	1		0.89	0.02
Middle Elk Creek	Happy Camp Complex	0.12	0.0			0.12	0.00
Negro Creek	Happy Camp Complex	0.91	0.0			0.91	0.00
North Fork Kelsey Creek	Happy Camp Complex	0.50	0.0			0.50	0.00
O'Neil Creek	Happy Camp Complex	1.58	4.8	2.2		1.60	0.02
Rainy Valley Creek	Happy Camp Complex	0.17	0.0			0.17	0.00
Rancheria Creek	Happy Camp Complex	1.14	0.0			1.14	0.00
Schutts Gulch-Klamath River	Happy Camp Complex	0.74	0.5	1		0.75	0.00
South Fork Kelsey Creek	Happy Camp Complex	0.18	0.0			0.18	0.00
Tom Martin Creek-Klamath River	Happy Camp Complex	0.78	9.6	0.4		0.79	0.01
Tompkins Creek	Happy Camp Complex	0.82	11.2	0.1		0.83	0.01
Toms Valley Creek-Elk Creek	Happy Camp Complex	0.32	0.0			0.32	0.00
Upper Canyon Creek	Happy Camp Complex	0.01	0.0			0.01	0.00
Upper East Fork Elk Creek	Happy Camp Complex	0.81	1.4	0.2	-34.1	0.74	-0.08
Upper Elk Creek	Happy Camp Complex	0.93	19.2	3.1	-9.8	0.96	0.03

7th Field Watershed	2014 Fire	Current Risk Ratio	USLE Fire, Salvage, Site Prep (yd3/year)	USLE temp roads (yd3/year)	USLE legacy Sites (yd3/year)	USLE Risk Ratio	Changes in USLE from Action
Upper Grider Creek	Happy Camp Complex	0.55	12.6	5.5		0.57	0.02
Walker Creek	Happy Camp Complex	0.98	15.0	9.4		1.00	0.02
West Grider Creek-Klamath River	Happy Camp Complex	0.88	0.0			0.88	0.00
Big Creek	Whites	0.00	0.6			0.00	0.00
Eddy Gulch	Whites	0.97	0.1			0.97	0.00
Jackass Gulch	Whites	0.27	0.0			0.27	0.00
Jessups Gulch-North Fork Salmon River	Whites	0.40	0.0			0.40	0.00
Lower North Russian Creek	Whites	0.79	4.7			0.81	0.01
Lower South Russian Creek	Whites	0.81	0.0			0.81	0.00
Music Creek	Whites	0.82	1.2	0.1		0.83	0.00
Robinson Gulch-North Fork Salmon River	Whites	0.85	1.0			0.85	0.00
Shadow Creek	Whites	0.96	7.3	0.2		0.98	0.01
Sixmile Creek	Whites	0.56	0.0			0.56	0.00
Specimen Creek	Whites	0.09	0.0			0.09	0.00
Sugar Creek	Whites	0.25	0.0			0.25	0.00
Taylor Creek	Whites	0.55	0.2			0.55	0.00
Upper French Creek	Whites	0.33	0.0			0.33	0.00
Upper North Russian Creek	Whites	0.40	29.9			0.47	0.07
Upper South Russian Creek	Whites	0.46	3.2	0.9		0.47	0.00
Whites Gulch	Whites	0.83	41.1	1.1		0.86	0.03
Yellow Dog Creek-North Fork Salmon River	Whites	0.30	2.7			0.31	0.00

Table H-42. GEO model outputs reflecting current condition and effects of Consultation Action by 7th field watershed.

7th Field Watershed	2014 Fire	Current Risk Ratio	GEO Fire, Salvage, Site Prep (yd3/decade)	GEO temp roads (yd3/decade)	GEO legacy Sites (yd3/decade)	Risk Ratio	Changes to Risk Ratio from Action
Bear Creek	Beaver	0.73	0			0.73	0.00
Buckhorn Creek	Beaver	0.68	531			0.69	0.01
Buckhorn Gulch-Beaver Creek	Beaver	1.18	1193			1.21	0.03
Collins Creek-Klamath River	Beaver	0.78	163			0.79	0.01

7th Field Watershed	2014 Fire	Current Risk Ratio	GEO Fire, Salvage, Site Prep (yd3/decade)	GEO temp roads (yd3/decade)	GEO legacy Sites (yd3/decade)	Risk Ratio	Changes to Risk Ratio from Action
Doggett Creek	Beaver	1.11	572			1.13	0.01
Dona Creek-Klamath River	Beaver	1.17	395			1.19	0.02
Dutch Creek	Beaver	0.93	1408	53		0.99	0.06
Jaynes Canyon	Beaver	0.85	0			0.85	0.00
Kohl Creek	Beaver	1.19	698	13		1.22	0.04
Little Humbug Creek	Beaver	0.65	0			0.65	0.00
Lower West Fork Beaver Creek	Beaver	1.05	0			1.05	0.00
Lumgrey Creek	Beaver	1.04	0			1.04	0.00
McKinney Creek	Beaver	1.97	0			1.97	0.00
Miller Gulch-Klamath River	Beaver	0.75	0			0.75	0.00
Quigleys Cove-Klamath River	Beaver	0.72	986	12		0.77	0.05
Soda Creek-Beaver Creek	Beaver	1.46	0			1.46	0.00
Vesa Creek	Beaver	0.67	0			0.67	0.00
Bear Creek	Happy Camp Complex	1.01	0			1.01	0.00
Benjamin Creek-Klamath River	Happy Camp Complex	0.63	0			0.63	0.00
Big Ferry-Swanson	Happy Camp Complex	0.62	35	0		0.62	0.00
Bishop Creek-Elk Creek	Happy Camp Complex	1.76	0		-149	1.76	0.00
Caroline Creek-Klamath River	Happy Camp Complex	1.64	156	61		1.66	0.02
China Creek	Happy Camp Complex	0.76	590	134		0.78	0.02
Cliff Valley Creek	Happy Camp Complex	0.32	365	57		0.35	0.03
Cougar Creek-Elk Creek	Happy Camp Complex	0.64	16	1	-1080	0.60	-0.04
Deep Creek-Scott River	Happy Camp Complex	1.39	36			1.39	0.00
Doolittle Creek	Happy Camp Complex	0.46	17		-309	0.44	-0.02
Franklin Gulch-Scott River	Happy Camp Complex	0.39	0			0.39	0.00
Fryingpan Creek-Klamath River	Happy Camp Complex	0.76	87	5		0.76	0.00
Granite Creek	Happy Camp Complex	1.52	0			1.52	0.00
Headwaters Elk Creek	Happy Camp Complex	0.15	0			0.15	0.00
Hoop&Devil-Elk Creek	Happy Camp Complex	0.60	9		-311	0.57	-0.03
Horse Creek	Happy Camp Complex	0.81	919	0		0.91	0.10

7th Field Watershed	2014 Fire	Current Risk Ratio	GEO Fire, Salvage, Site Prep (yd3/decade)	GEO temp roads (yd3/decade)	GEO legacy Sites (yd3/decade)	Risk Ratio	Changes to Risk Ratio from Action
Lower East Fork Elk Creek	Happy Camp Complex	0.49	42	11	-680	0.42	-0.07
Lower Grider Creek	Happy Camp Complex	1.09	1921	70		1.12	0.04
Lower Seiad Creek	Happy Camp Complex	0.16	0			0.16	0.00
McCarthy Creek-Scott River	Happy Camp Complex	0.43	275	4		0.43	0.01
Middle Creek	Happy Camp Complex	1.09	1919	75		1.19	0.11
Middle Elk Creek	Happy Camp Complex	2.85	0			2.85	0.00
Negro Creek	Happy Camp Complex	0.24	0			0.24	0.00
North Fork Kelsey Creek	Happy Camp Complex	0.46	0			0.46	0.00
O'Neil Creek	Happy Camp Complex	1.53	90	14		1.54	0.01
Rainy Valley Creek	Happy Camp Complex	0.02	0			0.02	0.00
Rancheria Creek	Happy Camp Complex	0.68	0			0.68	0.00
Sambo Gulch-Klamath River	Happy Camp Complex	0.69	0			0.69	0.00
Schutts Gulch-Klamath River	Happy Camp Complex	1.16	8	11		1.16	0.00
South Fork Kelsey Creek	Happy Camp Complex	0.35	0			0.35	0.00
Tom Martin Creek-Klamath River	Happy Camp Complex	0.44	645	20		0.46	0.02
Tompkins Creek	Happy Camp Complex	0.82	1272	8		0.85	0.03
Toms Valley Creek-Elk Creek	Happy Camp Complex	0.60	0			0.60	0.00
Upper Canyon Creek	Happy Camp Complex	0.07	0			0.07	0.00
Upper East Fork Elk Creek	Happy Camp Complex	0.54	98	5	-591	0.50	-0.04
Upper Elk Creek	Happy Camp Complex	0.44	248	40	-238	0.45	0.01
Upper Grider Creek	Happy Camp Complex	0.32	1569	224		0.37	0.05
Walker Creek	Happy Camp Complex	1.92	817	715		1.96	0.04
West Grider Creek-Klamath River	Happy Camp Complex	0.59	0			0.59	0.00
Big Creek	Whites	0.00	0			0.00	0.00
Eddy Gulch	Whites	0.76	0			0.76	0.00

7th Field Watershed	2014 Fire	Current Risk Ratio	GEO Fire, Salvage, Site Prep (yd3/decade)	GEO temp roads (yd3/decade)	GEO legacy Sites (yd3/decade)	Risk Ratio	Changes to Risk Ratio from Action
Jackass Gulch	Whites	0.19	0			0.19	0.00
Jessups Gulch-North Fork Salmon River	Whites	0.59	0			0.59	0.00
Lower North Russian Creek	Whites	0.84	162			0.85	0.01
Lower South Russian Creek	Whites	0.63	0			0.63	0.00
Music Creek	Whites	1.17	33	1		1.17	0.00
Robinson Gulch-North Fork Salmon River	Whites	0.79	37			0.80	0.00
Shadow Creek	Whites	0.45	62	1		0.45	0.00
Sixmile Creek	Whites	0.38	0			0.38	0.00
Specimen Creek	Whites	0.65	0			0.65	0.00
Sugar Creek	Whites	0.45	0			0.45	0.00
Taylor Creek	Whites	0.54	0			0.54	0.00
Upper French Creek	Whites	0.78	0			0.78	0.00
Upper North Russian Creek	Whites	0.98	0			0.98	0.00
Upper South Russian Creek	Whites	0.77	16	5		0.77	0.00
Whites Gulch	Whites	0.61	218	6		0.62	0.01
Yellow Dog Creek-North Fork Salmon River	Whites	0.28	0			0.28	0.00

Appendix C: Klamath National Forest Matrix: Table of Population and Habitat Indicators for Use on the Klamath National Forest in the Northwest Forest Plan Area

Aquatic Habitat Conditions Analysis Guidelines

AP = Analytical Process for Developing Biological Assessments for Federal Actions Affecting Fish within the Northwest Forest Plan Area (USDI, USDA, and NOAA 2004).

Available at www.blm.gov/or/esa/reports/**Analytical_Process_**110504.doc.

The table(s) within this Appendix show criteria used to determine baseline conditions in 7th-and **5th-field** watersheds within the KNF boundaries that contain anadromous fish habitat. The criteria in the Table and footnotes are used to describe the current condition of Klamath Mountains watersheds, and to determine if projects are likely to affect anadromous salmonids via effects on salmonid habitat components. Current conditions of watershed(s) are assessed and documented in the Table of Habitat Indicators; and effects to Indicators from proposed actions are discussed in the narrative within the BA/BE and summarized in the Table of Habitat Indicators.

The initial KNF-NMFS Level 1 review of the Table criteria was completed by Perrochet, Thomas, and Flickinger in April 2007. Edits to LWD were made in March 2009 to reflect LRMP EIS values. The Table was updated in 2004 as part of the Analytical Process for ESA consultation with NMFS. In May 2012 Grunbaum and Meneks provided updates/edits to this document and the Table of Habitat Indicators.

The Table, as designed in the 2004 Analytical Process, and in earlier versions (1997 NMFS BO for the LRMP), suggests values to determine a level of functioning for anadromous fish bearing streams. A note about rigid values to assess level of functioning: in addition to fixed habitat parameters not allowing for natural variability, fixed habitat parameters set standards that may be geomorphically inappropriate (Bisson et al. 1997). Variability is an inherent property of aquatic ecosystems in the Pacific Northwest and habitats at any given location will change from year to year, decade to decade, and century to century (Bisson et al. 1997). Healthy lotic ecosystems require different parts of the channel system to exhibit very different in-channel conditions and that those conditions change through time (Reid and Furniss 1998). Also, data may not be available for the stream being assessed. Therefore, a conclusion of function must be evaluated with professional judgment recognizing the streams capability to perform within rigid values. In some cases, a stream's morphology, aspect or size may not support "Properly Functioning" criteria values for one or more habitat Indicators. If an Indicator for a particular stream is determined to be functioning at its capability (due to morphology, aspect, or size), it is rated as Properly Functioning even if it doesn't meet Table criteria values. In the absence of available data, table and associated footnotes suggest factors that should be considered when evaluating indicators.

Klamath National Forest Tributaries Table of Pathways and Indicators

Klamath National Forest Tributaries Table of Pathways and Indicators:				
Pathways	***Indicators***	***Properly Functioning***	***At Risk***	***Not Properly Functioning***
Habitat: Non Watershed Condition Indicators				
Water Quality:	Temperature [(1)]			
	1st - 3rd Order Streams [instantaneous]	69 F degrees (~ 20.5 C) or less	> 69 to 70.5 degrees F	70.5 F degrees (~ 21.3 C) or more
	4th-5th Order Streams [Maximum Weekly Maximum Temperature]	70.5 F degrees (~ 21.4 C) or less	> 70.5 to 73.5 degrees F	73.5 F degrees (~ 23.0 C) or more
	Suspended Sediment/Turbidity	Little to no quantitative turbidity data exists for streams on the Klamath National Forest. Use the following criteria to infer condition of turbidity Indicator: (1) professional judgment from years of direct observation of tributary streams; (2) amount of fines in substrate from stream survey data, (3) CWE modeled level of watershed surface erosion and mass wasting, and (4) condition of stream buffer RR and channel (particularly if there has been recent debris flows that altered the channel). Professional judgment of turbidity is based on observations of water clarity after peak flows in tributaries to the mainstems of the Klamath, Scott, and Salmon Rivers that have watersheds with varying degrees of disturbance from nearly pristine to highly disturbed. Properly Functioning: Water clarity returns quickly (within three days) following peak flows.	Water clarity slow (four to six days) to return following peak flows, moderate to high fines in substrate, moderate modeled surface erosion and mass wasting, and RRs are not fully functioning.	Water clarity poor for long periods of time (one week or more) following peak flows. Some suspended sediments occur even at low flows or base flow. High fines in substrate, stream buffers in poor condition, high modeled surface erosion and mass wasting, and riparian reserves are in poor condition.

Klamath National Forest Tributaries Table of Pathways and Indicators:				
	Chemical/Nutrient Contamination (2)	Scott, Salmon, and Klamath River mainstems: Low levels of contamination from agriculture, industrial, and other sources; no excess nutrients. No CWA 303d designated reaches. Scott, Salmon, and Klamath River tributaries: None or low levels of chemical and/or nutrient contamination from agriculture, industrial, and other sources; no excess nutrients.	Scott, Salmon, and Klamath River mainstems: Moderate levels of contamination from agriculture, industrial, and other sources; some excess nutrients. One or more CWA 303d designated reaches Scott, Salmon, and Klamath River tributaries: Moderate levels of contamination from agriculture, industrial, and other sources and/or moderate excess nutrients.	Scott, Salmon, and Klamath Rivers: mainstems: High levels of contamination from agriculture, industrial, and other sources; high levels of nutrients. One or more CWA 303d designated reaches Scott, Salmon, and Klamath River tributaries: High levels of contamination from agriculture, industrial, and other sources and/or moderate to high excess nutrients.
Habitat Access:	Physical Barriers (AP)	Any man-made barriers present in watershed allow upstream and downstream passage at all flows.	One or more human - made barriers present in watershed do not allow upstream and/or downstream passage at base/low flows.	Human-made barriers present in watershed do not allow upstream and/or downstream passage at a range of flows for at least one life history stage.
	Substrate character (3)	Use stream survey data for determining substrate character. In addition, use USLE and GEO models to determine functioning level of Indicator and potential effects of sediment delivery to streams that may affect anadromous fish and their habitat. Can also infer substrate character functioning level from other factors such as high road density and hydrologic connection, recent large intense wildfires, and recent (last 20 years) altered channel.		
Habitat Elements:		Less than 15% fines (<2 mm) in spawning habitat (pool tail-outs, low gradient riffles, and glides) and cobble embeddedness less than 20%. Additional desired conditions, as per TMDL/NCRWB water quality compliance, include: *Pool sediment vol (V*): ≤21% *Subsurface, <0.85 mm: ≤14% *Subsurface, <6.4 mm: ≤30%	15% or greater fines (<2 mm) in spawning habitat (pool tail-outs, low gradient riffles, and glides) and/or cobble embeddedness is 20% or greater.	Greater than 20% fines (<2 mm) in spawning habitat (pool tail-outs, low gradient riffles, and glides) and cobble embeddedness greater than 25%.
	Large Woody Debris (4)	See KNF LRMP EIS Chapter 3, text and tables on Pages 68-69. For stream reaches on the Westside of the Forest, manage for an average of 20 pieces of large wood per 1,000 ft in 3-5th order streams (LRMP Page 4-143). Large wood is defined as a minimum length of 50 feet and diameter of 24 inches on the Westside. However, site potential and channel width must be considered rather than using strict numbers. Also consider the potential for future LWD recruitment in both the short- and long-term.	Current levels are being maintained at minimum levels desired for "properly functioning" but potential sources for long term woody debris recruitment are lacking to maintain these minimum values.	Current levels are not at those desired levels for "properly functioning" and potential sources of woody debris for short and/or long term recruitment are lacking.

Klamath National Forest Tributaries Table of Pathways and Indicators:				
	Pool Quality and Frequency (5)	At least one primary pool every three to seven bankfull channel widths. In 1st through 3rd order streams, a primary pool must have a maximum depth of two feet or greater. In 4th and 5th order streams, a primary pool must have a maximum depth of three feet or greater. In 6th order and larger streams, a primary pool must have a maximum depth of four feet or greater.	At least one pool every three to seven bankfull channel widths. At least half of the pools are primary pools. At least half the pools have a maximum depth of at least 24 inches (1st- 3rd order streams) or 36 inches (4th order and greater).	There is less than one pool every three to seven bankfull channel widths and/or less than half the pools have maximum depth of at least 24 inches (1st-3rd order streams) or 36 inches (4th order and greater).
	Off-Channel Habitat	Fish have unrestricted access to off-channel habitats (such as oxbows, off-channel ponds, backwaters, and areas of low flow velocity and cover) in unconstrained reaches during high flows and flooding events in winter. And these off-channel areas are relatively undisturbed by dikes, levees, dredge tailings, roads, excavations, fills, flow diversions, development, vegetation clearing, wood removal, poor water quality, etc.	Fish access to off-channel habitats, and the quantity and quality of off-channel habitats, in unconstrained reaches, is diminished due to dikes, levees, dredge tailings, roads, excavations, fills, flow diversions, development, vegetation clearing, wood removal, poor water quality, etc.	Fish access to off-channel habitats in unconstrained reaches is severely restricted or impossible due to dikes, levees, dredge tailings, roads, excavations, fills, flow diversions, development, etc., and/or the quality of the off-channel habitats is poor due to vegetation clearing, wood removal, poor water quality, and the other factors listed above. .
Habitat Elements:	Refugia (important remnant habitat for sensitive aquatic species)	CHs necessary for successful completion of all anadromous salmonid life history phases (spawning, incubation, emergence, freshwater rearing, and migration) are functioning, accessible, and well-distributed. Critical summer refugia in Klamath Mountain streams include: (1) thermal refugia and (2) anadromous stream reaches with intact RRs, cool clean water, pools that are not filled-in or partially filled-in with excess sediment, adequate stream flows, and good water quality. Critical winter habitat for anadromous salmonids includes side channels, off-channel habitats, and floodplain habitats.	Not all CHs necessary for successful completion of all anadromous salmonid life history phases are functioning and/or accessible for salmonids and/or well-distributed. Habitat quality and/or accessibility is diminished due to dikes, levees, dredge tailings, other fills, roads, excavations, flow diversions, development, vegetation clearing, wood removal, poor water quality, etc.	Many of the CHs necessary for successful completion of all anadromous salmonid life history phases are not functioning and/or not accessible for salmonids, and are thus are poorly distributed across the stream network and not providing adequate biological connectivity.

Klamath National Forest Tributaries Table of Pathways and Indicators:				
Channel Condition and Dynamics:	Width/Depth Ratio (6)	Width-to-Depth ratio < 12 on all reaches that could otherwise best be described as 'A', 'G', and 'E' channel types. Width-to-Depth ratio > 12 on all reaches that could otherwise best be described as 'B', 'F', and 'C' channel types. No braided streams formed due to excessive sediment loads. Lacking data, width-to-depth ratio should be evaluated considering the following factors: (1) recent (last 20 years) history of debris flows that have scoured channel and resulted in aggradation or degradation of the stream bed, (2) recent history of mass wasting that delivered large volumes of sediment to the stream that may have filled in pools, (3) pool frequency and depth information from stream surveys, (4) watershed disturbance as estimated with CWE modeling for mass wasting (GEO) and peak flows (ERA/TOC), and (5) frequency of large woody debris in the stream channel. For properly functioning, stream crossing density is low, there have been few mass wasting events caused by management actions, there are numerous deep pools, modeled mass wasting and surface erosion is low, and there is adequate LWD. If there is no or little management disturbance legacy in a watershed, then width-to-depth ratio is assumed to be properly functioning.	More than 10% of the reaches are outside of the ranges given for Width/Depth ratios for the channel types specified in "Properly Functioning" block. Braiding has occurred in some alluvial reaches as a result of excessive aggradation due to high sediment loads. For at-risk, stream crossing density is moderate to high, there have been some mass wasting events caused by management actions, pool frequency and quality is at-risk, modeled mass wasting and surface erosion is moderate to high, and there is inadequate LWD.	More than 25% of the reaches are outside of the ranges given for Width/Depth ratios for the channel types specified in "Properly Functioning" block. Braiding has occurred in many alluvial reaches as a result of excessive aggradation due to high sediment loads. For not properly functioning, stream crossing density is high, there have been some large mass wasting events caused by management actions, pool frequency and quality is poor, modeled mass wasting and surface erosion is moderate to high, and there is inadequate LWD.

Klamath National Forest Tributaries Table of Pathways and Indicators:				
	Streambank Condition (AP)	> 80% of any stream reach has ≥ 90% stability. Most watersheds have no bank stability surveys data so the level of streambank stability should be evaluated by considering: (1) density of road-stream crossings per stream or stream reach, (2) amount of inner gorge road, (3) other clearing and/or compaction directly adjacent to the stream, (4) artificial banks created by pushing up berms, and (5) recent (since 1996) channel altering debris flows. For properly functioning: Stream crossing density is low to moderate, there is little to no inner gorge road, there is no or only minor disturbance next to the stream channel, there are few or no berms, dikes, or levees constraining the channel, and/or there has been no or minor channel alteration/filling due to debris flows/landslides related to past management actions.	50-80% of any stream reach has ≥ 90% stability. For at-risk: Stream crossing density is moderate to high, there is some inner gorge road, there is some disturbance next to the stream channel, there are some berms, dikes, or levees constraining the channel, and/or there has been some channel alteration/filling due to debris flows/landslides related to past management actions.	< 50% of any stream reach has ≥90% stability For not properly functioning: Stream crossing density is high, there is over a mile of inner gorge road, there is significant disturbance next to the stream channel, berms, dikes, or levees constrain over a mile of channel; and/or there has been significant channel alteration/filling due to debris flows/landslides related to past management actions.
	Floodplain Connectivity (AP)	Off-channel areas are frequently hydrologically linked to main channel; overbank flows occur and maintain wetland functions, riparian vegetation, and succession.	Reduced linkage of wetland, floodplains, and riparian areas to main channel; overbank flows are reduced relative to historic frequency, as evidenced by moderate degradation of wetland function, riparian vegetation/succession.	Severe reduction in hydrologic connectivity between off-channel, wetland, floodplain, and riparian areas; wetland area drastically reduced and riparian vegetation/succession altered significantly.
Flow / Hydrology:	Change in Peak/Base Flows (7)	Properly functioning watersheds for peak flow have low modeled ERA/TOC, low road density, few large clearings in the rain-snow transition zone, and vegetation close to reference condition. Properly functioning watersheds for base flow have low modeled ERA/TOC, low road density and hydrologic connectivity, and vegetation close to reference condition.	Watersheds at-risk for change in peak flow have moderately high to high modeled ERA/TOC, moderate to high road density, and/or some large recent clearings in the rain-snow transition zone. Watersheds at-risk for change in base flow have denser vegetation compared to reference conditions, several water diversions, and moderate density of roads that have hydrologic connectivity.	Watersheds not properly functioning or change in peak flow have high modeled ERA/TOC, high road density, and may have large recent clearings in the rain-snow transition zone. Watersheds not properly functioning for change in base flow have much denser vegetation compared to reference conditions, numerous or large water diversions, and high density of roads that have hydrologic connectivity.

Klamath National Forest Tributaries Table of Pathways and Indicators:				
	Increase in Drainage Network (AP)	Zero or minimum increases in active channel length correlated with human caused disturbance (e.g., trails, ditches, compaction, impervious surface, etc.). The primary cause of drainage network increase in Klamath Mountain watersheds is hydrologic connectivity between the road system and the stream network.	Low to Moderate increases in active channel length correlated with human caused disturbance (e.g., trails ditches, compaction, impervious surface, etc.).	Greater than moderate increase in active channel length correlated with human caused disturbance (e.g., trails ditches, compaction, impervious surface, etc.).
Watershed Condition Indicators				
Watershed Conditions:	Road Density and Location (AP)	Less than 2 miles per square mile.	Two to three miles per square mile.	Over 3 miles per square mile.
	RRs – NW Forest Plan (AP) [8]	The RR system provides adequate shade, large woody debris recruitment, and habitat protection and connectivity in all subwatersheds, and buffers or includes known refugia for sensitive aquatic species (> 80% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/composition > 50%.	Moderate loss of connectivity or function (shade, LWD recruitment, etc.) of RR system, or incomplete protection of habitat and refugia for sensitive aquatic species (approx. 70-80% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/composition 25-50% or better. Some past stand-replacement timber harvest or intense fire in RR, moderate road and landing density in RR, minor to moderate level of mining in RR, vegetation/fuels moderately departed from historic fuels conditions, species diversity and vegetation structure in stream buffers moderately altered from reference condition due to fire suppression and past timber harvest, and moderate modeled CWE values.	RR system is fragmented, poorly connected, or provides inadequate protection of habitat and refugia for sensitive aquatic species (approx. less than 70% intact), and/or for grazing impacts; percent similarity of riparian vegetation to the potential natural community/composition is 25% or less. Extensive past stand-replacement timber harvest or intense fire in RR, high road and landing density in RR, moderate to high intensity of mining in RR, vegetation/fuels greatly departed from historic fuels conditions, species diversity and vegetation structure in stream buffers significantly altered from reference condition due to fire suppression and past timber harvest, and high modeled CWE values.

Klamath National Forest Tributaries Table of Pathways and Indicators:				
	Disturbance History/Regime	Frequency, duration, and magnitude of stochastic disturbance events are close to reference condition. The following factors should be considered in rating the Watershed Disturbance/Regime indicators: (1) overall watershed disturbance as determined through CWE modeling, (2) road density and location, (3) current impacts from past stand-replacing forestry, mining, and intense fires, (4) departure from historic fire regime, (5) departure from historic vegetation structure and composition, and (6) character of development on private property. For properly functioning, a watershed should have low CWE and road density (all models under "1" threshold), few impacts from past stand-replacement forestry or intense fire, are not significantly departed from historic vegetation/fuels condition and fire regime, and/or have low disturbance on private property.	In at-risk watersheds, frequency, duration, and magnitude of stochastic disturbance events are moderately departed from reference condition. At-risk watersheds have moderate to high CWE and road density (one or two models over "1" threshold), some significant impacts from past stand-replacement forestry or intense fire, are moderately departed from historic vegetation/fuels condition and fire regime, and/or have moderate disturbance on private property.	In not properly functioning watersheds, frequency, duration, and magnitude of stochastic disturbance event is significantly departed from reference condition. Not properly functioning watersheds have high CWE and road density (all models over "1" threshold), significant impacts from past stand-replacement forestry or intense fire, are significantly departed from historic vegetation/fuels condition and fire regime, and/or have significant disturbance on private properties.
Summary Integration of all species and habitat indicators effects	How do the effects to indicators affect each fish species and their habitat? Describe by species and by 7th and **5th-field** watersheds. See AP guidance. In addition to the narrative summary, use Summary Table in Tables required for BA/BE.			

Footnotes to Table Above: Table of Population and Habitat Indicators For Use on the Klamath National Forest in the Northwest Forest Plan Area, as adjusted from Appendix A in the Analytical Process.

1) (Temperature) Proper Functioning criteria for 4th -5th Order streams is derived from temperature monitoring near the mouth of streams of relatively undisturbed watersheds (Clear, Dillon, and Wooley Creeks). –Maximum Weekly Maximum Temperatures (MWMT) as high as 70.5 degrees F have been recorded on these streams (EA Engineering, 1998 Salmon River and Dillon Creek Watershed Fish Habitat and Channel Type Analysis, Appendix 2). At-Risk criteria

for 4th/5th order streams is derived from monitoring in streams that support populations of anadromous fish, although temperatures in this range (70.5 to 73.5 degrees F) are considered sub-optimal. The Not Properly Functioning criterion is sustained temperatures above 73.5 degrees F - that causes cessation of growth and approach lethal temperatures for salmon and steelhead. Properly Functioning criteria for 1st - 3rd order streams is derived from Desired Future Conditions (DFC) values given in the LRMP EIS p 3-68. At Risk and Not Properly Functioning criteria for 1st – 3rd order streams are assigned on a temperature continuum with values given for 4th/5th order streams, with the maximum instantaneous temperature of At Risk 1st - 3rd order streams coinciding with the minimum MWMT of 4th/5th order At Risk streams. [Stream Order according to Strahler (1957).]

(2) (Chemical/Nutrient Contamination) For projects within the river corridors of the mainstem Scott, Salmon, and Klamath Rivers the criteria is unchanged from AP Table. For tributaries to the Scott, Salmon, and Klamath Rivers use the criteria from the AP table. Although these tributaries have CWA 303d designation, Klamath National Forest tributaries are typically properly functioning for dissolved oxygen, nutrients, and microcystin, and because temperature and sediment is assessed in the Temperature and Substrate Character Indicators. Chemical contamination and nutrients should be assessed for Scott, Salmon, and Klamath River tributaries.
(3) (Substrate Character) Use recent stream survey data where available. Properly Functioning criteria for % fines in gravel is from the LRMP EIS p 3-68. Additional Forest-wide desired conditions for sediment (pool sediment, subsurface sediment) are described by Laurie and Elder (2012) in relation to monitoring for TMDL and NCRWB water quality standards. When location-specific information is unavailable, use the following as best appropriate: use USLE and GEO models to determine functioning level of Indicator and potential effects of sediment delivery to streams that may affect anadromous fish and their habitat, infer substrate character functioning level from other factors such as high road density and degree of hydrologic connection, recent large intense wildfires, and recent (last 20 years) debris flows that altered channels, and lastly use professional judgment to describe existing conditions and to estimate effects based upon model output interpretation, research results, or other information. The KNF CWE modeling procedure describes the risk (probability) of project-caused sediment production (see 2004 CWE process paper, by Elder and Reichert, in fisheries sufficiency guides). For existing condition and effects of the action:

1. Properly Functioning: USLE and GEO values are less than 1.0
2. At Risk: USLE and GEO values are between 1.0-1.20
3. Not Properly Functioning: USLE and GEO values are greater than 1.20

(4) (Large Woody Debris) See KNF LRMP EIS Chapter 3, text and tables on Pages 68-69. For stream reaches on the Westside of the Forest, manage for an average of 20 pieces of large wood per 1,000 ft in 3-5th order streams (LRMP Page 4-143). Large wood is defined as a minimum length of 50 feet and diameter of 24 inches on the Westside. However, site potential and channel width must be considered rather than using strict numbers. Also consider the potential for future LWD recruitment in both the short- and long-term.
Criteria for length of LWD for larger streams may be based on average bankfull channel width of the reach: in streams larger than 3rd order a piece of woody debris may qualify as large woody debris in a stream reach if its length is 1.5 times the average bankfull channel width, or if it has a rootwad attached and its length is 1¼ times the average bankfull channel width. Stable pieces of woody debris remain stationary during normal to high flows. Channel width and depth largely determines whether large woody debris recruited into a stream reach will be stable, and largely determines the average size of wood retained in streams (Bilby and Ward 1989, 1991; Robison and Beschta 1990). As channels become wider and deeper, the average size of a stable piece of wood increases. Pieces shorter than bankfull width and with a diameter less than bankfull depth are more likely to be transported out of a reach by streamflow (Bilby 1984, Braudrick et al. 1997). Length of woody debris appears to be most important to its stability where stream

discharge is sufficient to float large diameter stems (Bilby 1985, Swanson and others 1984). Branches and/or rootwads, if still attached, add to the stability of woody debris. Therefore, criteria for length of LWD for larger streams may be based on average bankfull channel width of the reach: in streams larger than 3rd order a piece of woody debris may qualify as large woody debris in a stream reach if its length is 1.5 times the average bankfull channel width, or if it has a rootwad attached and its length is 1¼ times the average bankfull channel width.

(5) (Pool Quality and Frequency) A measurable pool is an area of channel which (1) shows clear signs that the pool was created by scour at high flows and/or that the pool is the result of the channel being dammed at the downstream end; (2) has a significant residual depth - the deepest part of the pool must be at least twice as deep as the water flowing out of the pool at the riffle crest; (3) has an essentially flat water surface during low flow - water surface slope <0.05 percent; and (4) includes most of the channel - it must include the thalweg and occupy at least half of the width of the low-flow channel. "Primary" pools are defined by their maximum depth in relationship to size or stream order. As the order or size of the stream increases the required minimum depth for a primary pool increases. In 1st through 3rd order streams, a primary pool must have a minimum depth of two feet or greater. In 4th and 5th order streams, a primary pool must have a minimum depth of three feet. In 6th order and larger streams, a primary pool must have a minimum depth of four feet.

(6) (Width/Depth Ratio) The Width-to-Depth ratio for various channel types is based on delineative criteria of Rosgen (1996). Properly Functioning means that Width-to-Depth ratio falls within expected channel type as determined by the other four delineative factors (entrenchment, sinuosity, slope, and substrate). Aggradation on alluvial flats causing braiding is well known phenomenon that often accompanies changes in Width-to-Depth ratio as watershed condition deteriorates. Stream width is a function of streamflow occurrence and magnitude, size and type of transported sediment, and the bed and bank materials of the channel (Rosgen 1996). Channel widths generally increase with flow volume downstream. Channel widths can be modified by changes in riparian vegetation, landslides particularly debris flows, changes in streamflow regimes, and changes in sediment supply. The AP Table indicates that confined or entrenched channel types (such as A, G, and E types) are Properly Functioning when Width-to-Depth ratios are <12, and wider channel types (such as B, C, and F types) are Properly Functioning when Width-to-Depth ratios are >12. To meet the Properly Functioning criteria channels must also have no or minimal braiding due to excessive sediment.

(7) (Peak/Base Flows) In most cases, sufficient hydrograph data is not available to determine comparative changes in peak flows as suggested in the AP. Infer changes in **peak flows** when no hydrograph data is available by considering the following factors: (1) CWE runoff model (ERA/TOC) outputs, (2) road density and the degree of hydrologic connectivity between the road system and the stream network, and (3) number, size, and vintage of openings in the forest canopy resulting from past stand-replacement forestry in the snow-rain transition zone where increased openings can result in elevated runoff from rain-on-snow events. The potential for decreased **base flows** in the Project HUC7 watersheds should be evaluated by considering the following factors: (1) increased/decreased evapotranspiration due to denser/sparser vegetation than reference condition that has resulted from stand-replacement forestry and/or fire suppression, (2) number and size of water diversions, and (3) degree of hydrologic connectivity between the road system and the stream network (watersheds with high road density likely have reduced base flows due to impervious surfaces and groundwater interception in road cuts).

(8) (RRs) The following factors should be considered in determining the condition of stream buffer (hydrologic) RR: (1) amount and age of past stand-replacement forestry or intense fire in

stream buffers, (2) road and landing density in stream buffers, (3) mining in stream buffers, (4) departure from historic fire regime, (5) condition of riparian vegetation for providing shade, large woody debris, sediment-filtering, and nutrient cycling, and (6) the amount of overall disturbance in the watershed particularly as estimated by the peak flow (ERA) and mass wasting (GEO) models. The following two factors should be considered in determining the condition of geologic RR: (1) amount and age of past stand-replacement timber harvest and/or recent intense wildfire on geologic RR and (2) road and landing density on geologic RR.

Appendix D: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS

OF PROPOSED ACTION(S) ON RELEVANT INDICATORS

PROJECT: **Westside Fire Recovery**

WATERSHED: **Beaver Creek**

Pathways: INDICATORS	ENVIRONMENTAL BASELINE **Beaver Creek 5th Field watershed**			EFFECTS OF THE ACTION(S) **Beaver Creek 5th Field watershed**		
	PROPERLY FUNCT	**AT RISK**	**NOT ROP FUNCT**	**RESTORE**	**MAINTAIN**	**DEGRADE**
Water Quality Temperature		**TEMP**			**X**	
Sediment-Turbidity			**SED KNF CWE PO/PJ**		**X**	
Chemical Contamination	**ND/PO/PJ**				**X**	
Habitat Access Physical Barrier	**FPI**				**X**	
Habitat Elements Substrate Character			**SED KNF CWE PO/PJ**		**X**	
Large Woody Debris			**SS89 KNF GIS PO/PJ**		**X**	
Pool Frequency/Quality			**KNF GIS SS06 PO/PJ**		**X**	
Off-channel Habitat		**PO/PJ**			**X**	
Refugia		**TEMP SS89 PO PJ**			**X**	
Channel Cond & Dyn Width-to-Depth Ratio			**SS89 Flood PO/PJ**		**X**	
Streambank Condition			**KNF GIS Flood PO PJ**		**X**	
Floodplain Condition		**PO/PJ**			**X**	
Flow /Hydrology Change in Peak/Base Flow			**KNF GIS RSS**		**X**	
Drainage Network Increase			**KNF GIS RSS**		**X**	
Watershed Cond. Road Density/Location			**KNF GIS RSS**		**X**	
Disturbance History/Regime			**KNF GIS Flood RSS**		**X**	

Pathways: INDICATORS	ENVIRONMENTAL BASELINE **Beaver Creek 5th Field watershed**			EFFECTS OF THE ACTION(S) **Beaver Creek 5th Field watershed**		
	PROPERLY FUNCT	**AT RISK**	**NOT ROP FUNCT**	**RESTORE**	**MAINTAIN**	**DEGRADE**
Riparian Reserves			**KNF GIS RSS PO/PJ**		**X**	

TEMP = Water temperature monitoring at RM 0.8 and RM 5.8 of mainstem Beaver Creek from 2010 to 2014, and water temperature monitoring of West Fork Beaver Creek at RM 0.8 from 2010 to 2014;
SS89 = 1989 KNF stream survey of mainstem Beaver Creek from mouth to Grouse Creek Confluence (9 miles);
SED = 2009, 2010, 2013 sediment assessment survey; **RSS =** KNF Road Sediment Source Inventory and Risk Assessment;
FPI = KNF Forest-Wide Fish Passage Barrier Inventory; **Flood** = KNF analysis of the 1997 New Year Flood; **ND** = No Data; **PJ** = Professional Judgement; **PO** = Personal Observation based on 20+ years observing; **NA** = Not Applicable;
KNF GIS = KNF GIS database query and CWE modeling for WFR Project (Fall 2014 to Winter 2015);
Environmental Baseline and Checklist last updated by Jon Grunbaum on April 3, 2015.

The Beaver Creek 5th-field (HUC10) watershed is an area of 69,610 acres. The Beaver Creek watershed is 64% National Forest land and the rest is mostly private industrial timberland. About 2% of the watershed is private residential. There is a 300-acre parcel of BLM land. The mainstem of Beaver Creek from the mouth to the confluence of West Fork Beaver Creek at RM 5.7 is a 5th-order (Strahler 1957) stream. This entire length of mainstem provides spawning and rearing habitat for Coho and Chinook salmon, and steelhead trout. The lower reaches of mainstem Beaver Creek provides thermal refugia for juvenile salmonids as does the creeks cold water plume at the confluence with the Klamath River. Based on recent annual spawning surveys: (1) Chinook salmon spawn in the lower two miles of mainstem Beaver Creek upstream of the West Fork confluence, and Coho salmon spawn in the lower half mile of mainstem Beaver Creek upstream of West Fork; (2) Chinook and Coho salmon spawn in the lower 2.5 miles of West Fork Beaver Creek; and (3) none of the other tributaries to mainstem Beaver Creek or mainstem WF Beaver Creek are known to support salmon. Steelhead utilize and mainstem habitats as well as these tributaries: Jaynes Canyon Creek, Bear Creek, Hungry Creek, Grouse Creek, and Cow Creek. The only current stream survey in the Beaver watershed was a physical and biological assessment of the lower few miles of Hungry Creek in 2010. Otherwise, the most recent surveys were 1989 stream surveys of mainstem Beaver Creek and West Fork Beaver Creek. Stream surveys prior to the 1997 Flood are not very reliable for portraying current condition because the 1997 Flood altered many of the stream channels and stream buffer, and altered substrate composition (but still useful for describing trend). Channel sediment metrics were assessed in 2009, 2010, and 2013 but those metrics are less reliable now for describing current condition because excess sediment has already been delivered to the channel as a result of the 2014 Beaver Fire (but still useful for describing trend).

Beaver Creek 5th-Field (HUC10) Watershed Environmental Baseline Elements:

WATER QUALITY

Water Temperature: From 2010 to 2014, summer water temperature of mainstem Beaver Creek was monitored just upstream from the mouth and at RM 5.8 (just above the West Fork Beaver Creek confluence); and summer water temperature of mainstem West Fork Beaver Creek was monitored just upstream from the mouth at about RM 0.8. The results of this monitoring is shown in the three tables below.

Recent Water Temperature Monitoring Results for Mainstem Beaver Creek Near Mouth						
Start	**End**	**Max Daily Max Temp C**	**Max Average Daily Temp C**	**Max Diurnal Variation Temp C**	**Maximum Weekly Average Temp C (MWAT)**	**Maximum Weekly Maximum Temp C (MWMT)**
10/8/2009	10/26/2010	19.5	17.1	5.2	16.9	18.9
6/10/2011	10/5/2011	18.0	15.9	4.3	15.7	17.7
6/15/2012	11/1/2012	20.3	18.0	4.7	17.4	19.6
6/11/2013	10/31/2013	21.7	19.1	5.1	18.5	20.7
6/3/2014	9/23/2014	23.2	20.3	6.3	19.6	22.4

Recent Water Temperature Monitoring Results for Mainstem Beaver Creek at RM 5.8						
Start	**End**	**Max Daily Max Temp C**	**Max Average Daily Temp C**	**Max Diurnal Variation Temp C**	**Maximum Weekly Average Temp C (MWAT)**	**Maximum Weekly Maximum Temp C (MWMT)**
6/27/2010	10/3/2010	17.9	16.4	4.8	16.1	17.5
6/22/2011	10/3/2011	16.6	15.1	5.5	14.9	16.1
6/15/2012	10/31/2012	18.2	17.0	4.5	16.4	17.7
6/11/2013	10/15/2013	19.1	17.8	4.1	17.2	18.4
6/3/2014	10/6/2014	20.3	18.8	4.1	18.3	19.8

Recent Water Temperature Monitoring Results for WF Beaver Creek at RM 0.8						
Start	**End**	**Max Daily Max Temp C**	**Max Average Daily Temp C**	**Max Diurnal Variation Temp C**	**Maximum Weekly Average Temp C (MWAT)**	**Maximum Weekly Maximum Temp C (MWMT)**
6/28/2010	10/2/2010	15.2	16.7	4.2	15.0	16.3
6/23/2011	10/2/2011	15.3	14.2	4.7	14.0	15.0
6/16/2012	10/31/2012	17.2	16.1	4.1	15.6	16.8
6/11/2013	10/15/2013	18.3	16.8	3.9	16.1	17.5
6/3/2014	10/6/2014	18.9	17.4	4.2	16.9	18.5

As shown in the tables above: (1) water temperature in mainstem Beaver Creek at RM 5.8 and mainstem WF Beaver Creek at RM 0.8 was within the properly functioning range from 2010 to 2014 and (2) water temperature in mainstem Beaver Creek at RM 0.9 was within the properly functioning range from 2010 to 2013 but was in the At-Risk range in 2014. Near record low base flows in summer 2014 may have been a primary factor in high water temperatures and large diurnal temperature variation. It is likely that the rate and magnitude of stream heating and cooling will increase due the 2014 Beaver Fire because: (1) the wildfire burned large swaths of riparian vegetation that had provided shade to stream channels, (2) pools are likely to infill or partially infill with excess sediment which will increase surface area to volume ratio, and (3) the wildfire is likely to significantly increase the frequency of in-channel debris flows and upslope landslides that can remove riparian vegetation and widen-and-shallow stream channels. **At-Risk**.

Sediment - Turbidity: From annual snorkel fish census surveys through the years it is well documented that mainstem Beaver Creek is turbid with fine suspended sediment even after long periods of low flow – underwater visibility is low with a range of about

five or six feet during the most optimal conditions. High watershed disturbance from past vegetation management projects (particularly clearcutting on private timberlands) and the extensive road system are likely the cause of persistent turbidity but no point sorces are known.

The results of 2009, 2010, and 2013 intensive monitoring and evaluation of sediment in mainstem Beaver Creek and mainstem West Fork Beaver Creek that included the metrics: percent surface fines < 2mm, percent sub-surface sediment < 0.85mm, percent sub-surface sedient < 6.38mm, and percent residual pool volume filled with fine sediment (V*), are shown in the three tables in the Substrate Character section below. Substrate quality impairment is evaluated, in part, by comparing the four sediment indicators in mainstems of Beaver Creek and West Fork Beaver Creek to the 85th percentile value of four indicators for reference streams that have minor to negligble management-related watershed disturbance. Watersheds exceeding the 85% percentile of reference streams are considered impaired. One to two sediment indices exceeded reference values in all the sites/survey years that were assessed.

Average surface fines, average sub-surface fines, and average volume of fine sediment filling pools (V*) from the 2010 and 2013 Beaver Creek response reach (beav1) compared to KNF Stream Sediment Monitoring reference conditions (85th percentile). (beav1) metrics over threshold values are bolded.

Sediment Index	2010 beav1 reach average %	2013 beav1 reach average %	Reference Condition (%)
Surface Fines < 2mm	3.0	2.4	6.4
Sub-surface fines < 0.85mm	**18.2**	**18.2**	16.2
Sub-surface fines < 6.38mm	44.2	**47.4**	46.1
Fraction of pools filled with fine sediment < 2mm (V star)	0.053	0.056	0.108

Post 2014 Beaver Fire water quality and sediment conditions in lower mainstem Beaver Creek and lower West Fork Beaver Creek were observed and photographed in the winter after several light to moderate precipitation events: the observations and photographs revealed that (1) turbidity was very high during and long- after precipitation events and (2) large quantities of fine sediment had been delivered to the mainstem which had partially smothered the pre-Fire streambed and salmonid spawning gravels. The 2014 Fire increased the actual rate of surface erosion as well as the modeled rate of surface erosion to well over threshold (USLE = 1.16). Increase in the frequency, magnitude and duration of turbidity due to increased surface erosion due to the 2014 Beaver Fire is likely last for a few years to a decade or more until vegetation gets re-established and ground cover is largely recovered in burned areas. Modeled mass-wasting is over threshold (GEO = 1.07). The rate of mass wasting that can cause bouts of acute turbidity will likely be increased for a decade or more due to decreased evapotranspiration, decreased ground cover, increased groundwater, increased overland flow, and/or loss of soil cohesion provided by living tree roots. **Not Properly Functioning**.

Chemical Contamination: No significant source of chemical contamination is known to exist on National Forest lands. No known significant source of chemical contamination is suspected from private lands. **Properly Functioning**.

HABITAT ACCESS

Physical Barriers: There are no barriers to fish passage. **Properly Functioning**.

HABITAT ELEMENTS

Substrate Character: Substrate character was determined: (1)intensive evaluation of substrate composition in 2009, 2010, and 2013; (2) from CWE modeling; and (3) from personal observation of surface substrate composition after the 2014 Beaver Fire and a few light to moderate rainstorms.

Sediment composition was intensely evaluated at three sites within the Beaver Creek HUC10 watershed since 2009. The metrics evaluated were: percent surface fines < 2mm (medial axis), percent sub-surface sediment < 0.85mm, percent sub-surface sediment < 6.38mm, and percent residual pool volume filled with fine sediment (V*). The results of these evaluations are shown in the tables below. Substrate quality is judged in part by comparing the value of the four sediment indicators in Beaver Creek (a managed watershed) to the 85th percentile value of the indicators for reference streams that have minor to negligble management-related watershed disturbance. Stream reaches exceeding the 85% percentile of reference streams may be impaired. One to two sediment indices exceeded reference values in all the sites/survey years that were assessed.

Average surface fines, average sub-surface fines, and average volume of fine sediment filling pools (V*) from the lower Beaver Creek response reach (beav1) in 2010 and 2013 compared to KNF stream sediment monitoring reference conditions (@85 percentile). beav1 metrics over reference values are bolded.

Sediment Index	2010 beav1 reach average (%)	2013 beav1 reach average (%)	Reference Condition (%)
Surface Fines < 2mm	3	2.4	6.4
Sub-surface fines < 0.85mm	**18.2**	**18.2**	16.2
Sub-surface fines < 6.38mm	44.2	**47.4**	46.1
Fraction of pools filled with fine sediment < 2mm (V star)	0.053	0.056	0.11

Average surface fines, average sub-surface fines, and average volume of fine sediment filling pools (V*) from the upper Beaver Creek response reach (beav2) in 2010 and 2013 compared to KNF stream sediment monitoring reference conditions (@85 percentile). beav2 metrics over reference values are bolded.

Sediment Index	2010 beav2 reach average (%)	2013 beav2 reach average (%)	Reference Condition (%)
Surface Fines < 2mm	3.6	6.3	6.4
Sub-surface fines < 0.85mm	16.0	**19.3**	16.2
Sub-surface fines < 6.38mm	44.0	44.4	46.1
Fraction of pools filled with fine sediment < 2mm (V star)	0.076	0.074	0.11

Average surface fines, average sub-surface fines, and average volume of fine sediment filling pools (V*) from the mainstem West Fork Beaver Creek response reach (wfbea1) in 2009 and 2013 compared to KNF stream sediment monitoring reference conditions (@85 percentile). wfbea1 metrics over reference values are bolded.

Sediment Index	2009 wfbea1 reach average (%)	2013 wfbea1 reach average (%)	Reference Condition (%)
Surface Fines < 2mm	3.1	6.1	6.4
Sub-surface fines < 0.85mm	**16.9**	**20.1**	16.2
Sub-surface fines < 6.38mm	45.6	45.5	46.1
Fraction of pools filled with fine sediment < 2mm (V star)	**0.143**	0.124	0.11

Post 2014 Beaver Fire water quality and sediment conditions in lower mainstem Beaver Creek and lower West Fork Beaver Creek were observed and photographed in the winter after several light to moderate precipitation events: the observations and photographs revealed that (1) turbidity was very high during and long- after precipitation events and (2) large quantities of fine sediment had been delivered to the mainstem which had partially smothered the pre-Fire streambed and salmonid spawning gravels. The 2014 Fire increased the actual rate of surface erosion as well as the modeled rate of surface erosion to well over threshold (USLE = 1.16). Increase in the frequency, magnitude and duration of turbidity due to increased surface erosion due to the 2014 Beaver Fire is likely last for a few years to a decade or more until vegetation gets re-established and ground cover is largely recovered in burned areas. Modeled mass-wasting is over threshold (GEO = 1.07). The rate of mass wasting that can cause bouts of acute turbidity will likely be increased for a decade or more due to decreased evapotranspiration, decreased ground cover, increased groundwater, increased overland flow, and/or loss of soil cohesion provided by living tree roots. **Not Properly Functioning**.

Large Woody Debris: There is no current quantitative information on LWD and potential for future LWD recruitment to the stream, however, according to a 1989 stream survey there was 1.5 pieces of LWD per 1000 lineal feet on the mainstem between the mouth and Grouse Creek. That is well below the 20 pieces/1000 feet that is desired condition in the Forest Plan or the 20 pieces/mile that is the bare minimum for Properly Functioning is the Table of Habitat Indicators. Late in the 1980s it was recognized that there was a lack of sufficient LWD in fish-bearing reaches in the Beaver Creek watershed. By 1996 over 340 LWD structures were installed in the mainstem Beaver, West Fork, and Cow Creeks in an attempt to make up for lack of LWD but these structures have almost entirely been blown out by high water, floods, and debris flows.

Currently and qualitatively, there is very little effective LWD in the mainstem channel and little potential for future LWD recruitment (personal observation made during numerous salmon and steelhead census surveys of mainstem Beaver Creek). The density of LWD in West Fork is greater than that of the mainstem but still well below desired condition.

Existing down LWD and standing large green conifer trees or snags are likely reduced in the stream channel and stream buffer due: (1) a “stream cleaning” program that removed LWD from stream channels after the 1964 Flood, (2) easy access to standing live and dead trees at the very high density of stream crossings, (3) easy access to standing live and dead trees along stretches of valley bottom and inner gorge road within stream buffer RRs, (4) past (Forest Service and private) and current (private) clear cutting close to a stream channel, (5) clearing in the Beaver Creek streamside campground, and (6) clearing and disturbance on private property (about half of the land adjacent to mainstem Beaver Creek is private).

Based on these factors, it is my professional opinion that the LWD indicator is **Not Properly Functioning**.

Pool Frequency and Quality: There were 26 pools in the 6.2 miles of mainstem Beaver Creek within the Buckhorn-Beaver composite watershed that was surveyed in 1989 with an average maximum pool depth of 3.6 feet. Assuming the average bankfull width was 36 feet there was one pool every 35 bankfull widths, however, the frequency of deep pools (over three feet maximum depth) would be less. Pool frequency was low most likely due to lack of LWD, infilling with excessive sediment from a highly disturbed watershed, and/or extirpation of Beaver (Lanman et.al. 2013). These factors still exist today. There is still very little LWD in stream channels and low potential for LWD in the near future. Pool filling from excessive sedimentation is expected to increase over the next ten years or more due to elevated surface erosion and increased mass wasting associated with the 2014 Beaver Fire that burned large swaths of vegetation at moderate to high intensity. Modeled surface erosion and mass wasting risk are over threshold (USLE = 1.28; GEO = 1.16). Sedimentation into Beaver Creek has already significantly increased due to the 2014 Beaver Fire.

Aquatic habitat in Beaver Creek was likely much different before fur trapping and European settlement due to beaver activity. Beaver Creek likely had numerous beaver dams which created pools and prime habitat for salmonids. Pool frequency and quality was likely much higher before trapping and settlement. There are still some beaver left in (or migrated back into) Beaver Creek but the population is slow to rebound probably because of continued trapping but also because of streamside disturbance, lack of in-stream key pieces of LWD, and lack of large recruit-able streamside trees greatly diminishes beaver habitat suitability. **Not Properly Functioning**.

Off-Channel Habitat: Much of the channel of mainstem Beaver Creek is constrained with little potential for floodplain and off-channel habitat development. Most of the unconstrained reaches are on private land where the floodplain is cut-off and the potential for off-channel habitat is restricted by existing roads, berms, and current human activities. There are a few areas where there is functioning off-channel habitat. **At-Risk**.

Refugia: Cold water and cover are the primary elements of salmonid refugia in this watershed. Prior to 2013 summer water temperature was suitable to optimal at all monitoring locations on the mainstem and West Fork. Water temperature was slightly high at the mouth in 2013 and 2014 but still suitable for rearing and for thermal refugia from the Klamath River. Cover is sparse in the lower reaches mainstem Beaver Creek where it is needed most to increase the carrying capacity of the cold thermal refugia. Cover is sparse in these reaches because: (1) the channel has been simplified in order to keep it aligned with the Highway 96 bridge; (2) there are few pools or slack-water areas, and (3) there are few streamside conifer and very little LWD. **At-Risk**.

CHANNEL CONDITION AND DYNAMICS

Width to Depth Ratio: (same discussion as the Pool Frequency/Quality indicator above). **Not Properly Functioning.**

Stream Bank Condition: Streambanks are degraded at: (1) numerous stream crossings, (2) where roads and berms are constructed within the stream buffer and inner gorge, (3) adjacent to

mainstem Beaver Creek where residences have cleared, compacted, or otherwise modified the streambank, and (4) at the campground where the streambank is a berm and where large conifers on the streambank are removed as hazard trees before they have a chance to be recruited to the stream by streamside residents. There are long stretches of road next to mainstem Beaver Creek, West Fork Beaver Creek, and Hungry Creek where the road fill constitutes on bank of the stream. The 2014 Beaver Fire burned 1,977 acres of vegetation in stream buffer RRs at moderate to high intensity. **Not Properly Functioning**.

Floodplain Connectivity: Much of the channel of mainstem Beaver Creek is constrained with little potential for floodplain and off-channel habitat development. Most of the unconstrained reaches are on private land where the floodplain is cut-off and the potential for off-channel habitat is restricted by existing roads, berms, and current human activities. There are a few areas where there is functioning off-channel habitat. **At-Risk**.

FLOW/HYDROLOGY

Change in Peak/Base flow: Modeled runoff risk is just over threshold (ERA/TOC = 1.01) primarily due to vegetation management, roads, and wildfires (in that order). The firelines are mostly not hydrologically-connected. Increased peak flow due to all these factors combined is likely significant. Base flows are reduced in summer due to State-authorized and riparian water diversions. **Not Properly Functioning**.

Increase in Drainage Network: Road density is very high and hydrologic connectivity of the road system to the stream network ranges from 2% to 54% in the eleven HUC14s (see table below) with an average of 18% across all HUC14s in the HUC10. Therefore, there is likely significant increase in drainage network density due to roads. Fire-lines constructed in attempting to suppress the 2008 and 2014 fires have no or minor hydrologic connectivity with the stream network. **Not Properly Functioning.**

Percent of road system hydrologically-connected to stream network by HUC14 watershed	
HUC14 Name	Hydrologically Connected Road
Buckhorn-Beaver	21%
Deer Creek-Beaver Creek	54%
Dutch Creek	36%
Grouse Creek	10%
Hungry Creek	2%
Jaynes Canyon	16%
Lower Cow Creek	11%
Lower West Fork Beaver Creek	22%
Soda Creek-Beaver Creek	10%
Upper Cow Creek	12%
Upper West Fork Beaver Creek	14%

WATERSHED CONDITION

Road Density/Location: Road density is very high at four miles road per square mile watershed. There are over 10 miles of valley-bottom road in the watershed and many additional miles within inner gorge. Not Properly Functioning.

Disturbance History/Regime: Much of the northeast quadrant of the watershed was clearcut logged between 1909 and 1931 using railroads to transport logs out of the drainage. There was a period of intense logging from 1955 to 1995 during which 11, 480 acres were clearcut and much of the present road system was constructed. The forest that has regenerated or was planted has developed into over-dense nearly even-aged conifer stands with low vegetative diversity. Fire suppression likely contributed to the low diversity in these regenerated stands. Much of this even-age stand is industrial timberland and the timber owners have been and are still in the process of clearcutting it. The even-

age stands on National Forest are very dense and starting to self-thin and the Forest Service has been thinning and reducing fuels in some of the stands.

The last major fire before the 2014 Beaver Fire was the 1955 Dutch Fire (a.k.a. the Haystack Fire) that burned about 1,000 acres along the lower reach of mainstem Beaver Creek. Mining and grazing impacts were intense in the early- to mid-1900s and had major impacts on erosional processes and aquatic habitat. The primary effect of historic railroad logging and intense grazing and mining on watershed processes is slow (or no) vegetative regeneration in highly disturbed areas, but the current magnitude of this effect is small and likely has minor impact on the quality of aquatic habitats beyond the site or stream reach scale.

Approximately 21 miles of stream channel was altered by high water and debris flows during the 1997 Flood which is about 10% of all channels in the watershed. The 1997 Flood triggered 67 major road failures in the Beaver Creek watershed some of which caused or contributed to the channel-altering debris flows, and all of which contributed to excessive sediment delivery to stream channels. 1997 Flood-altered channels are likely slow to recover because watershed disturbance is still very high. The 2014 Beaver Fire disturbance has setback recovery of the stream channel and aquatic habitats by increasing the rate of chronic sediment delivery. The 2014 Fire is likely to increase the rate of channel-altering debris flows for the next ten years or longer.

Currently, watershed disturbance is high primarily due to: (1) vegetation management (clear-cutting on private lands and thinning and fuels reduction on National Forest); (2) the high density road system; and (3) the 2014 Beaver Fire that burned approximately 7,407 acres at moderate to high intensity. Several miles of fire-lines were constructed or re-constructed in attempts to suppress the fire. Modeled watershed disturbance is over threshold in all three models at the HUC10 scale: surface erosion risk (USLE = 1.16); mass wasting risk (GEO = 1.07); and runoff risk (ERA/TOC = 1.01). The source of disturbance in the mass wasting model and runoff models is first and foremost from vegetation management projects followed closely by roads with wildfires a not so distant third source. The source of disturbance in the surface erosion model is primarily the road system with wildfire and vegetation management having minor influence. Firelines were a very minor source of disturbance in the surface erosion and runoff models and accounted for less than 4% of the disturbance in the mass wasting model. Not Properly Functioning.

Riparian Reserve: Stream buffer RRs are degraded at: (1) numerous upslope stream crossings and numerous valley bottom and/or inner gorge roads – road density in stream buffer RRs is over 4 miles road per square mile stream buffer RR; (2) the campground (streamside on the mainstem), (3) on private property (about half of the land adjacent to mainstem Beaver Creek downstream from West Fork is private), and (4) on industrial timberlands (nearly half of the Beaver Creek HUC10 is industrial timberland where stream buffers are narrow).

The 2014 Beaver Fire burned 1,977 acres of stream buffer RR at moderate-to-high severity and these areas are in initial or early stage of recovery depending on site condition and site potential. This much moderate and high intensity fire in hydrologic RRs, coupled with a high-density road system, is expected to significantly: (1) decrease

hydrologic retention, (2) decrease the sediment filtering and nutrient spiraling function of riparian vegetation compromising the potential of hydrologic RRs to buffer the stream from upslope ground disturbances and landslides, and (3) increase streamside landsliding.

The 2014 Beaver Fire burned 934 acres of geologic RR as follows: 38 acres active landslide; 192 acres toe-zone; and 704 acres inner gorge. Many of the acres of moderate to high severity burned inner gorge are within the 1,977 acres of stream buffer RR that burned at moderate-to-high severity. Not Properly Functioning.

CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS

OF PROPOSED ACTION(S) ON RELEVANT INDICATORS

PROJECT: **Westside Fire Recovery**

WATERSHED**: Elk Creek**

Pathways: INDICATORS	ENVIRONMENTAL BASELINE **Elk Creek 5th Field watershed**			EFFECTS OF THE ACTION(S) **Elk Creek 5th Field watershed**		
	PROPERLY FUNCT	**AT RISK**	**NOT ROP FUNCT**	**RESTORE**	**MAINTAIN**	**DEGRADE**
Water Quality Temperature		**TEMP**			**X**	
Sediment-Turbidity		**SED KNF CWE PO/PJ**		**X**		
Chemical Contamination	**ND/PO/PJ**				**X**	
Habitat Access Physical Barrier	**FPI**				**X**	
Habitat Elements Substrate Character		**SED KNF CWE PO/PJ**		**X**		
Large Woody Debris		**SS06 KNF GIS PO/PJ**			**X**	
Pool Frequency/Quality		**KNF GIS SS06 PO/PJ**			**X**	
Off-channel Habitat	**NA**					
Refugia		**TEMP SS06 PO PJ**			**X**	
Channel Cond & Dyn Width-to-Depth Ratio		**SS06 Flood PO PJ**			**X**	
Streambank Condition			**KNF GIS Flood PO PJ**		**X**	
Floodplain Condition	**NA**					
Flow /Hydrology Change in Peak/Base		**KNF GIS RSS**			**X**	
Drainage Network Increase		**KNF GIS RSS**		**X**		
Watershed Cond. Road Density/Location		**KNF GIS RSS**			**X**	
Disturbance History/Regime		**KNF GIS Flood RSS**			**X**	
Riparian Reserves			**KNF GIS RSS PO PJ**		**X**	

TEMP = Water temperature monitoring at RM 0.5 and RM 4.5 of mainstem Elk Creek from 1990 to 2014;

SS06 = 2006 KNF stream survey of mainstem Elk Creek from mouth to Bear Creek Confluence (13 miles); **SED =** 2011 sediment assessment survey; **RSS =** 1999 KNF Road Sediment Source Inventory and Risk Assessment; **FPI** = KNF Forest-Wide Fish Passage Barrier Inventory; Flood = KNF analysis of the 1997 New Year Flood; ND = No Data; PJ = Professional Judgement; **PO** = Personal Observation based on 20+ years observing; NA = Not Applicable; **KNF GIS** = KNF GIS database query and CWE modeling for WFR Project (Fall 2014 to Winter 2015);
Environmental Baseline and Checklist last updated by Jon Grunbaum on April 3, 2015.

The Elk Creek 5th-field (HUC10) watershed is a true watershed with an area of 60,829 acres. The Elk Creek watershed is over 97% National Forest land and about 3% private or local government. The national forest land has been used for timber production or is in wilderness. The private land is mostly residential with low ground disturbance, however: one large upslope parcel has a several-acre auto wrecking yard complete with hundreds of old cars and noxious weeds; one streamside several acre parcel is the intake facility and water treatment plant for the town of Happy Camp; and one large (10-20 acres) streamside parcel is a commercial campground. The mainstem of Elk Creek is a 5th-order (Strahler 1957) stream from the mouth to East Fork Elk Creek and a 4th-order stream from East Fork Elk Creek to Granite Creek. Mainstem Elk Creek provides approximately 13 miles of habitat for Coho salmon; 12 miles for fall Chinook salmon; 14 miles for spring Chinook salmon; and steelhead throughout the entire mainstem. Several tributaries to mainstem Elk Creek are fish-bearing: East Fork Elk Creek is 4th-order stream that provides 0.4 miles of habitat for Coho salmon and about 2.5 miles of habitat for steelhead/rainbow trout; Twins Creek (1st-order) provides a couple tenths of a mile of habitat for steelhead/rainbow trout; Cougar Creek (2nd-order) provides a few tenths of a mile of habitat for Coho salmon and steelhead/rainbow trout; Bear Creek provides about 0.5 mile of habitat for steelhead trout and several miles of habitat for rainbow trout (some brook trout higher up in the reaches downstream from Bear Lake); Granite and Rainey Valley Creeks are 2nd-order streams that each provide several tenths of a mile of habitat for steelhead trout and a little more for rainbow trout. The other named tributaries to the mainstem (Stanza, Malone, Doolittle, Johnson, Lick) provide a few tenths or less of habitat for steelhead/rainbow trout. None of the un-named tributaries to the mainstem are fish-bearing. The last stream survey of mainstem Elk Creek was in 2006 and went from the mouth to Bear Creek (13.9 miles). The last stream survey of East Fork Elk was in 1990. Bear, Granite, and Burney Creeks were surveyed in 1994 and 1995. Stream surveys prior to the 1997 Flood are not very reliable for portraying current condition because the 1997 Flood altered many of the stream channels and stream buffer, and altered substrate composition. Channel sediment metrics were assessed in 2009, 2011, and 2012 but those metrics are less reliable now for describing current condition because excess sediment has already been delivered to the channel as a result of the 2014 Fire (but still useful for describing trend).

Elk Creek 5th-field (HUC10) Watershed Environmental Baseline Elements:

WATER QUALITY

Water Temperature: Summer (and some winter) water temperature of mainstem Elk Creek was monitored within the Hoop&Devil HUC14 at approximately RM 4.5 nearly every year since 1990 (no data for 1996). Summer water temperature of the mainstem within the HUC14 was monitored near the mouth at RM 0.5 since 2011. The 1997 flood greatly altered the mainstem channel of Elk Creek – resulting in widening and shallowing of the channel, and loss of streamside vegetation. Much of mainstem Elk and several tributaries to mainstem Elk Creek experienced large debris flows that scoured and altered

their channels and ripped out riparian vegetation. Excess sediment from numerous natural debris torrents, and from over 200 road failures, resulted in excessive bedload which overwhelmed and altered the channel of mainstem Elk Creek. The loss of riparian vegetation and narrowing/widening of the stream channel increased the range and magnitude of daily heating and cooling – as described in the assessment: *The Flood of 1997- Klamath National* Forest (USDA KNF, November 1998). Riparian and channel recovery was still taking place when the 2014 Fire hit. Before the 1997 Flood: from 1990 to 1995, the 7-day maximum water maximum temperature (MWMT) 18.7 ^{o}C to 21.8 ^{o}C, with six-year average of 20.8^{o}C. After the 1997 Flood: from 1997 to 2004, the MWMT ranged from 20.1 ^{o}C to 23.7 ^{o}C, with eight-year average of 22.9^{o}C. Since then, the 2008 Panther Fire burned riparian vegetation and increased water temperatures in tributary watersheds upstream from the Hoop-n-Devil watershed. Much higher than average water temperatures in Klamath River tributaries in 2014, including Elk Creek, was likely the result of record or near record low streamflows. As shown in the table below, in the last five years of monitoring, the maximum instantaneous water temperature at RM 4.5 ranged from 20.2^{o}C to 24.8 ^{o}C; the maximum weekly average temperature (MWAT) ranged from 17.5 ^{o}C to 21.1^{o}C; and the MWMT ranged from 19.6 ^{o}C to 23.8^{o}C, with a five-year average of 21.8 ^{o}C.

Recent Water Temperature Monitoring Results for Mainstem Elk Creek at RM 4.5

Start	End	Max Daily Average Temp C	Max Daily Max Temp C	Min Daily Min Temp C	Max Diurnal Variation Temp C	Maximum Weekly Average Temp C (MWAT)	Maximum Weekly Maximum Temp (MWMT)
7/1/2010	10/21/2010	19.7	22	8.3	5.3	19.0	21.4
7/14/2011	10/11/2011	17.8	20.2	5.3	4.9	17.5	19.6
6/22/2012	10/23/2012	19.5	22.0	7.4	5.2	18.8	21.0
6/8/2013	11/3/2013	21.5	24.4	5.9	6.2	20.5	23.0
5/28/2014	9/24/2014	21.8	24.8	10.3	6	21.1	23.8

As shown in the table below, in the last four years of monitoring, the maximum instantaneous water temperature at RM 0.5 ranged from 20.4^{o}C to 25.3 ^{o}C; the maximum weekly average temperature (MWAT) ranged from 18.0 ^{o}C to 22.1^{o}C; and the MWMT ranged from 19.8 ^{o}C to 24.3^{o}C, with a five-year average of 21.8 ^{o}C.

Recent Water Temperature Monitoring Results for Mainstem Elk Creek at RM 0.5

Start	End	Max Daily Average Temp C	Max Daily Max Temp C	Min Daily Min Temp C	Max Diurnal Variation Temp C	Maximum Weekly Average Temp C (MWAT)	Maximum Weekly Maximum Temp (MWMT)
6/11/2011	10/4/2011	18.5	20.4	7.3	4.7	18.0	19.8
6/8/2012	10/23/2012	20.1	21.8	7.8	4.9	19.5	20.9
6/6/2013	9/25/2013	22.3	24.4	11.4	5.2	21.3	23.2
5/23/2014	9/30/2014	**22.8**	**25.3**	**10.9**	**5.5**	**22.1**	**24.3**

Therefore, the condition of the Water Temperature indicator is **At-Risk** bordering on Not Properly Functioning.

Sediment - Turbidity: The 2008 Panther Fire significantly elevated the magnitude and duration of turbidity in mainstem Elk Creek (personal observation). This increase in turbidity was generally subsiding when the 2014 Fire hit. The 2014 Fire again

significantly elevated the magnitude and duration of turbidity in mainstem Elk Creek during peak runoff events (personal observation). Chronic turbidity is likely to remain elevated for several more years until vegetation and duff recovers ground cover again. Acute fire-related turbidity in mainstem Elk Creek is expected to be elevated for up to ten years or longer because mass wasting/debris flows are expected to significantly increase in 2014 wildfire burned areas in that period of time. Modeled surface erosion is slightly elevated (USLE = 0.30) in the Elk Creek HUC10 and moderately to highly elevated in the three East Fork Elk Creek HUC14s that drain into the the mainstem. Modeled wasting is at threshold (GEO = 0.98). **At-Risk**.

Chemical Contamination: No significant source of chemical contamination is known to exist other than an auto wrecking yard on private property (which is not known to be point source of water contamination). **Properly Functioning**.

HABITAT ACCESS

Physical Barriers: No barriers to fish passage were found in the KNF Fish Passage Inventory (KNF 2003). **Properly Functioning**.

HABITAT ELEMENTS

Substrate Character: Substrate character was determined from a 2006 stream survey, intensive evaluation of streambed sediment composition, existing watershed disturbance levels as described under the *Disturbance History/Regime Indicator* below; and personal observation and judgment.

During the 2006 stream survey, in the mainstem reach from the mouth to EF Elk Creek: (1) surface fines in pebble counts averaged 6.9%; (2) surface fines in pool tail-outs averaged 8.1%, and (3) embeddedness averaged 26.4%. The values of surface fines were within desired range for properly functioning streams but embeddedness slightly exceeded desired range.

During the 2006 stream survey, in the mainstem reach from EF Elk Creek to Bear Creek: (1) surface fines in pebble counts averaged 9.0%; (2) surface fines in pool tail-outs also averaged 9.0%, and (3) embeddedness averaged 27.5%. The values of surface fines were within desired range for properly functioning streams but embeddedness slightly exceeded desired range.

Sediment composition was intensely evaluated at three sites within the Elk Creek HUC10 watershed since 2009. The metrics evaluated were: percent surface fines < 2mm (medial axis), percent sub-surface sediment < 0.85mm, percent sub-surface sediment < 6.38mm, and percent residual pool volume filled with fine sediment (V*). The results of these evaluations are shown in the table below. Substrate quality is judged in part by comparing the value of the four sediment indicators in Elk Creek (a managed watershed) to the 85th percentile value of the indicators for reference streams that have negligble management-related watershed disturbance. Stream reaches exceeding the 85% percentile of reference streams may be impaired.

Average surface fines, average sub-surface fines, and average volume of fine sediment filling pools (V*) from the 2011 East Fork Elk Creek response reach (efelk1) compared to KNF Stream Sediment Monitoring reference conditions (@85 percentile). efelk1 metrics over reference values are bolded.

Sediment Index	efelk1 reach average (%)	Reference Condition (%)
Surface Fines < 2mm	**9.0**	6.4
Sub-surface fines < 0.85mm	15.2	16.2
Sub-surface fines < 6.38mm	45.6	46.1
Fraction of pools filled with fine sediment < 2mm (V star)	0.065	0.11

Average surface fines, average sub-surface fines, and average volume of fine sediment filling pools (V*) from the 2011 Elk Creek response reach (elk2) compared to KNF Stream Sediment Monitoring reference conditions (@85 percentile). elk2 metrics over reference values are bolded.

Sediment Index	elk2 reach average (%)	Reference Condition (%)
Surface Fines < 2mm	**6.7**	6.4
Sub-surface fines < 0.85mm	**18.9**	16.2
Sub-surface fines < 6.38mm	36.6	46.1
Fraction of pools filled with fine sediment < 2mm (V star)	0.05	0.11

Average surface fines, average sub-surface fines, and average volume of fine sediment filling pools (V*) from the 2009 and 2012 Elk Creek response reach (elk4) that is just upstream of Bear Creek confluence compared to KNF Stream Sediment Monitoring reference conditions (@85 percentile). Elk4 metrics over reference values are bolded.

Sediment Index	2009 elk4 reach average (%)	2011 elk4 reach average (%)	Reference Condition (%)
Surface Fines < 2mm	4.2	3.8	6.4
Sub-surface fines < 0.85mm	**20.8**	**17.7**	16.2
Sub-surface fines < 6.38mm	**61.6**	**56.2**	46.1
Fraction of pools filled with fine sediment < 2mm (V *)	**0.121**	0.043	0.11

The area of streambed covered by sand, and the size of sandbars, in mainstem Elk Creek has been noticeably increasing since the 2008 Panther Fire and more recently the 2014 Happy Camp Complex (personal observation from frequent fish/stream surveys and kayak trips down mainstem Elk Creek over the last 20 years). Surface erosion and chronic sedimentation into streams that drain 2014 wildfire burned watersheds is likely to be elevated for several years until vegetation and duff recovers ground cover in areas that burned at moderate-to-high intensity. The rate of mass wasting and debris flows is expected to increase for up to ten years or longer until ground cover increases and the roots of recovering vegetation regain the capacity to bind soil in areas that burned at moderate-to-high intensity. Modeled surface erosion is slightly elevated (USLE = 0.30) in the Elk Creek HUC10 and moderately to highly elevated in the three East Fork Elk Creek HUC14s that drain into the the mainstem. Modeled wasting is at threshold (GEO = 0.98). **At-Risk**.

Large Woody Debris: During the 2006 stream survey of mainstem Elk Creek from the mouth to Bear Creek (about 13.5 stream miles) there were only eight pieces of LWD. However, the potential for future LWD recruitment was near site potential between RM 0.7 and RM 3.8; and between RM 4.3 to RM 13.6. In fact, many large trees along these reaches did fall into mainstem Elk Creek during heavy snowfall in winter 2012-13. Along mainstem Elk Creek from the mouth to EF Elk Creek there was an estimated 107

recruitable (over 24" dbh) trees per miles; along mainstem Elk Creek from EF Elk to Bear Creek there was an estimated 126 recruitable trees per mile. The potential for future LWD recruitment and for recruited LWD to be left in the stream is greatly diminished along the lower 0.7 mile of Elk Creek mainstem due to the existence of the Happy Camp community water treatment plant, a campground, private residences, roads and a bridge, and an off-road ATV play area in the stream buffer. The potential for future LWD recruitment and for recruited LWD to be left in the stream is greatly diminished from RM 3.8 to RM 4.3 of Elk Creek mainstem due to private residences, roads, and a bridge in the stream buffer. The potential for future LWD recruitment and for recruited LWD to be left in the stream buffers of tributaries to mainstem Elk Creek is moderate to high because most tributary watersheds have low-moderate disturbance in the stream buffers. Many trees within one site potential tree height distance from a channel that were killed or damaged by the 2008 and/or 2014 wildfires are likely to be recruited into the stream over the next ten years or so. **At-Risk**.

Pool Frequency/Quality: In the 2006 stream survey of mainstem Elk Creek from the mouth to EF Elk Creek there was one deep (over three feet maximum depth) pool every 5.6 bankfull widths with an average maximum depth of 6.6 feet; and maximum pool depth ranged from 3.5 to 13.9 feet. In the 2006 stream survey of mainstem Elk Creek from EF Elk Creek to Bear Creek there was one deep (over three feet maximum depth) pool every 7.5 bankfull widths with an average maximum depth of 5.8 feet; and maximum pool depth ranged from 2.7 to 11.4 feet. Excessive fines that are being delivered to mainstem Elk Creek as a result of the 2008 Panther Fire and 2014 Happy Camp Complex fire have significantly increased the size of sandbars in pools reducing residual pool volume (last personal observation made in middle of January 2015). It is likely that pools will continue to fill over the next few to ten years due to increased rate of surface erosion and mass wasting from areas of the watershed that burned at moderate to high severity. **At-Risk**.

Off-Channel Habitat: Generally NA to the Rosgen C-, G-, and F-Channel types in mainstem Elk Creek. Off-channel habitats are not characteristic of these channel types. There are few unconstrained areas – all unconstrained areas are private land. **NA**

Refugia: Cold water and cover are the primary elements of fish refugia in this watershed. Water temperature is slightly high due to channel-widening and loss of vegetation during the 1997 Flood and from loss of stream-shading vegetation in the 2008 Panther Fire. The 2014 Happy Camp Complex fire burned many acres of stream buffer RR which will likely lead to further increases in peak high temperatures. LWD is below desired condition in the lower 0.7 mile of mainstem Elk Creek where rufugia cover is most needed for fish trying to escape high water temperatures in the Klamath River. There are frequent deep pools that provide good cover. **At-Risk**.

CHANNEL CONDITION AND DYNAMICS

Width to Depth Ratio: Approximately 28% of stream channels in the Elk Creek watershed were altered by high water and debris flows during the 1997 Flood. Most of mainstem Elk Creek was scoured and overwhelmed with excess sediment and pools were completely or partially filled with sediment. Most of the channel of mainstem Elk Creek is constrained and excessive sediment from the 1997 Flood has largely been transported out based on the 2006 pool frequency/quality data and personal observation. Many of the

flood-altered channel reaches were in tributaries where debris flows altered channel cross-section from V-shape to U-shape. 1997 Flood altered tributary reaches were well on the way to recovery when the 2008 Panther Fire and then the 2014 Happy Camp Complex wildfires hit. Currently, excessive delivery of fines due to the 2008 and 2014 wildfires is filling pools thereby reducing pool volume and mean pool depth. The 2008 and 2014 fires are likely to increase the rate of landsliding and mass wasting which in turn could lead to more altered channel and pool infilling with course sediment. **At-Risk**.

Stream Bank Condition: Much of the streambank of mainstem Elk Creek was scoured and altered during the 1997 Flood event, however, most (over 90%) of the mainstem reaches are constrained with bedrock banks that have largely recovered to site potential from the flood. Streamside vegetation was largely ripped out and the streambanks were altered in the few unconstrained reaches. Recovery of vegetation and streambanks in unconstrained reaches is well underway and most streamside alder trees are still small having only sprouted or germinated in 1998 and have limited ability to stabilize the streambank. The 2014 wildfire burned 1,743 acres of stream buffer RR at moderate to high severity which is approximately 15.2% of the stream buffer in the Elk Creek watershed. Vegetation was killed or burned off streambanks in these areas and will take years to decades to recover. **Not Properly Functioning**.

Floodplain Connectivity: Generally NA to the Rosgen C-, G-, and F-Channel types in mainstem Elk Creek. Floodplains are not characteristic of these channel types. There are few unconstrained areas – all unconstrained areas are private land. **NA**.

FLOW/HYDROLOGY

Change in Peak/Base flow: Modeled runoff risk is moderately elevated (ERA/TOC = 0.51) primarily due to past wildfires, roads, vegetation management, and firelines (in that order). The firelines are mostly not hydrologically-connected. Increased peak flow due to all these factors combined is likely minor. Base flows are reduced in summer due to riparian water rights and municipal water diversion from mainstem Elk Creek. Municipal demand can divert as much as 1.5 million gallons of water per day – this water is diverted at about RM 0.6. **At-Risk**.

Increase in Drainage Network: Road density is moderate to high in 8 of the 12 HUC14s within the Elk Creek HUC10; and very low or zero in the other five HUC14s. Hydrologic connectivity of the road system to the stream network ranges from 10% to 47% in the eight roaded HUC14s. Therefore, there is low to moderate increase in drainage network density due to roads. Fire-lines constructed in attempting to suppress the 2008 and 2014 fires have no or minor hydrologic connectivity with the stream network. **At-Risk**.

WATERSHED CONDITION

Road Density/Location: Road density is low to moderate at one mile road per square mile watershed. There are over 13 miles of valley-bottom road in the watershed. **At-Risk**.

Disturbance History/Regime: The entire length of the stream channel of mainstem Elk Creek was altered by debris flows from road failures and/or natural landslides during the 1997 Flood, and is still recovering. The 1997 Flood triggered 135 major road failures in the Elk Creek watershed some of which caused or contributed to channel-altering debris

flows. 1997 Flood-altered channels were well on the way to recovery when the 2008 Panther Fire and 2014 Happy Camp Complex Fires hit.

Currently, watershed disturbance is high primarily because of the 2008 Panther Fire that burned approximately 18,000 acres mostly at moderate to high intensity, and the 2014 Happy Camp Complex which burned 7,762 acres (12.8% of the watershed) at moderate to high intensity. Several miles of fire-lines were constructed or re-constructed in attempts to suppress these fires. Modeled surface erosion is slightly elevated (USLE = 0.30); modeled wasting is at threshold (GEO = 0.98); and modeled runoff risk is moderately elevated (ERA/TOC = 0.51). Disturbance in the models is primarily due to wildfire and roads (in that order). Firelines account for a small fraction (less than 5%) of the modeled disturbance. **At-Risk**.

Riparian Reserve: The stream buffer RR of mainstem Elk Creek is largely intact between RM 0.7 and RM 3.8 because there are no valley bottom roads, stream crossings, or development along this section of mainstem. The stream buffer RR of mainstem Elk Creek is largely intact between RM 4.3 and RM 13.9 because there are few valley-bottom roads, stream-crossings, or development along these reaches. The stream buffer of mainstem Elk Creek is significantly impacted along the lower 0.7 mile of Elk Creek mainstem due to the existence of the Happy Camp community water treatment plant, a campground, private residences, valley-bottom roads, a bridge, and an off-road ATV play area at the mouth. The stream buffer of mainstem Elk Creek is slightly impacted from RM 3.8 to RM 4.3 due to private residences, roads, and a bridge in the stream buffer.

Road density is low at the HUC10 scale because four of the 13 HUC14s are in wilderness where there are no roads. Several of the HUC14s outside of wilderness have moderate to high road density though.

The 2014 Happy Camp Complex fire burned 1,521 acres of stream buffer RR (15.2% all of stream buffer RR in the HUC10) at moderate-to-high severity and these areas are still in initial or early stage of recovery depending on site condition and site potential. Many acres of stream course RRs burned at moderate to high intensity during the 2008 Panther Fire and these areas are still in early to late stages of recovery depending on site condition.

The 2014 Happy Camp Complex fire burned 790 acres of geologic RR as follows: 18 acres active landslide; 5 acres toe-zone; and 767 acres inner gorge. Many of the acres of moderate to high severity burned inner gorge are within the 1,521 acres of stream buffer RR that burned at moderate-to-high severity. **Not Properly Functioning**.

CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS
PROJECT: **Westside Fire Recovery**
WATERSHED: **Horse Creek-Klamath River**

Pathways: INDICATORS	ENVIRONMENTAL BASELINE Horse Creek-Klamath River HUC10 *			EFFECTS OF THE ACTION(S) Horse Creek-Klamath River HUC10 *		
	Properly Functioning	**At Risk**	**Not Properly Functioni**	**Restore**	**Maintain**	**Degrade**
Water Quality Temperature			TEMP TMDL		X	
Sediment – Turbidity			KNF GIS TMDL PO/PJ		X	
Chemical/Nutrient Contamination			TMDL		X	
Habitat Access Physical Barrier		FPI/PO/ PJ			X	
Habitat Elements Substrate Character		KNF GIS TMDL			X	
Large Woody Debris			ND/PO/ PJ		X	
Pool Frequency/Quality		ND/PO/PJ			X	
Off-Channel Habitat			PO/PJ		X	
Refugia		TMDL PO/PJ			X	
Channel Cond & Dyn Width-to-Depth Ratio		ND/PO/ PJ			X	
Streambank Condition		PO/PJ			X	
Floodplain Condition			PO/PJ		X	
Flow /Hydrology Change in Peak/Base Flow			TMDL KNF GIS		X	
Drainage Network Increase		KNF GIS			X	
Watershed Cond. Road Density/Location			KNF GIS		X	
Disturbance History/Regime		KNF GIS			X	
Riparian Reserves			KNF GIS		X	

TEMP = Water temperature monitoring of mainstem Klamath River upstream of Scott River (at downstream drain of Horse Creek-Klamath River HUC10); **TMDL =** These indicators are impaired according to USEPA Clean Water Act Section 303(D) for exceeding allowable Total Maximum Daily Loads (TMDLs) of pollutants – SEE Klamath RIVER TMDL; **ND** = No Data; **NA** = Not Applicable; **PO** = Personal Observation; **PJ** = Professional Judgment; **FPI** = KNF

Forest-Wide Fish Passage Barrier Inventory; **RSS** = Road Sediment Source surveys (KNF 1999-2013); **KNF GIS** = KNF GIS database query and CWE modeling for WFR Project (Fall 2014 to Winter 2015);
Environmental Baseline completed by Jon Grunbaum on April 15, 2015.

* = This environmental baseline describes the watershed condition of the Horse Creek-Klamath River HUC10. Specifically, this environmental baseline describes the condition of aquatic habitat and water quality in the Klamath River and watershed conditions throughout the HUC10. Appendices to this environmental baseline are HUC14 environmental baseline summary tables that summarize the condition of aquatic habitat and watershed in the HUC14 tributary reaches that are known to support salmon. These HUC14s are: Lower Horse Creek and Middle Horse Creek (completed descriptive versions of these HUC14 environmental baselines are available in the project record).

Horse Creek-Klamath River 5th-Field (HUC10) Environmental Baseline Elements:

Water Quality

Water Temperature: The mainstem Klamath River exceeds the water temperature TMDL (CA State Water Board, 2010). Summer water temperature of the mainstem Klamath River was monitored from 2011 to 2014 just upstream of the confluence of Horse Creek (which is the downstream drain of the Horse Creek-Klamath River HUC10). In the four year period of record the maximum instantaneous water temperature ranged from 25.0^{o}C to 27.3^{o}C; the maximum weekly average temperature (MWAT) ranged from 23.0^{o}C to 25.3^{o}C; and the maximum weekly maximum temperature ranged from 24.6^{o}C to 26.8^{o}C. **Not Properly Functioning**.

Recent Water Temperature Monitoring Results for Mainstem Klamath River Upstream of Scott River Confluence						
Start	**End**	**Max Daily Max Temp C**	**Max Average Daily Temp C**	**Max Diurnal Variation Temp C**	**Maximum Weekly Average Temp C (MWAT)**	**Maximum Weekly Maximum Temp C (MWMT)**
6/28/2011	10/2/2011	25.0	23.4	3.7	23.0	24.6
6/20/2012	10/15/2012	25.8	24.3	4.1	23.8	25.3
5/17/2013	10/1/2013	26.7	25.1	4.5	24.7	26.1
5/29/2014	10/6/2014	27.3	25.7	4.3	25.3	26.8

Sediment - Turbidity: Even before the 2014 Beaver Fire the mid-Klamath River would become quite turbid during moderate to heavy precipitation and runoff events and remain turbid for long periods thereafter. However, the magnitude and duration of turbidity had actually been decreasing over the 20 years preceding the 2014 Fires (personal observation). Much of the pre-2014 Fires turbidity was due to high levels of disturbance from an era of intense logging and road construction (1955 – 1995) in the Horse Creek-Klamath River HUC10 and in many areas within the HUC10s upstream of the Horse Creek-Klamath River HUC10. The 1987 Fires also likely contributed to the turbidity. HUC10s upstream of Iron Gate Dam contribute very little sediment or turbidity to the mainstem Klamath River because the deep volcanic soils do not facilitate much overland flow and because the dam acts as a settling basin.

Thousands of acres of forest that drain into the reach of the mid-Klamath River that flows through the Horse Creek-Klamath River HUC10 burned at moderate to high severity in the 2014 Beaver Fire. Much of the northeast quadrant of the Horse Creek-Klamath River HUC10 burned at moderate to high severity; and a large area in the southwest quadrant of the Beaver Creek HUC10 (which is upstream of the Horse Creek-Klamath River HUC10)

burned at moderate to high severity. The 2014 Fires have already greatly increased the rate of sediment delivery into streams and increased the magnitude and duration of turbidity events. The frequency, magnitude and duration of 2014 Fires-related turbidity is likely to be significantly elevated for at least the next few years until vegetation gets re-established and ground cover increases, and excess fines are winnowed out of the system. Risk of landslides that can cause bouts of acute turbidity will likely be increased for a decade or more due to decreased evapotranspiration, decreased ground cover, increased groundwater, increased overland flow, and/or loss of soil cohesion provided by living tree roots. Modeled surface erosion risk (USLE = 0.81) and mass wasting risk (GEO = 0.86) are high in the Horse Creek-Klamath River HUC10. Modeled surface erosion risk (USLE = 1.16) and mass wasting risk (GEO = 1.07) are over threshold in the (upstream) Beaver Creek HUC10. **Not Properly Functioning**

Chemical/Nutrient Contamination: The Klamath River mainstem is listed under the US-EPA Section 303(d) of the Clean Water Act as exceeding TMDL for water temperature, nutrients, and organic enrichment/low dissolved oxygen. Industrial and municipal point sources, agricultural runoff, water impoundment, flow regulation and modification, and natural and non-point sources are implicated for the high nutrient and organic enrichment loads, and low dissolved oxygen concentration. Chemical contamination (from fertilizers, pesticides, pharmaceuticals, heavy metals, solvents, etc.) can reasonably be expected to accompany agricultural return flows, and municipal and industrial point sources. Most organic enrichment of the mid-Klamath River occurs upstream of the Horse Creek-Klamath River HUC10 - in the upper Klamath, Scott, and Shasta River basins. The mainstem Klamath River has its origins in the naturally warm shallow eutrophic Upper Klamath Lake that is rich in nutrients and organic matter. However, considerably more nutrient and organic matter is delivered to the mainstem in tailwater from grazing and agriculture occurring throughout the upper Klamath, Scott, and Shasta River basins, and from urban effluent. Excess nutrients and water impoundment is suspected of causing intense blooms of a toxic blue-green algae (cyanobacteria) in Iron Gate Reservoir and other impoundments upstream of Iron gate Reservoir. Toxic algae (or toxin from burst cyanobacteria) from these impoundments has been entrained throughout the entire length of the mid- and lower mid-Klamath River nearly every summer since 2005. The mid-Klamath tributaries within the Horse Creek-Klamath River HUC10 contribute relatively nutrient-poor chemical contamination-free water to the river, although nutrients are likely elevated in Horse Creek due to extensive grazing on former floodplains in the lower valley. **Not Properly Functioning**.

Habitat Access

Physical Barriers: There are few fish passage problems of much significance on National Forest land. The Klamath River Highway 96 makes access to some tributaries difficult. **At-Risk.**

Habitat Elements

Substrate Character: Even before the 2014 Beaver Fire, many Klamath River tributary drainages in the Horse Creek-Klamath River HUC10 and in upstream had elevated erosion and sedimentation rates, and moderate to high modeled Cumulative Watershed Effects (**CWEs**), primarily due to roads, past timber harvest, and mining on all-lands, and

to clearing and development on private land. Thousands of acres of forest that drain into the reach of the mid-Klamath River that flows through the Horse Creek-Klamath River HUC10 burned at moderate to high severity in the 2014 Beaver Fire. The 2014 Beaver Fire has already greatly increased the rate of sediment delivery into streams and the Klamath River (personal observation). The frequency, magnitude and duration of chronic elevated sediment delivery from surface erosion from the 2014 Fire is likely to be remain elevated for at least the next few years until vegetation gets re-established and ground cover increases, and excess fines are winnowed out of the system. The risk of acute bouts of elevated sediment delivery from mass wasting resulting from the 2014 Fire will be increased for a decade or more due to decreased evapotranspiration, decreased ground cover, increased groundwater, increased overland flow, and/or loss of soil cohesion provided by living tree roots. Modeled surface erosion risk (USLE = 0.81) and mass wasting risk (GEO = 0.86) are high in the Horse Creek-Klamath River HUC10. Modeled surface erosion risk (USLE = 1.16) and mass wasting risk (GEO = 1.07) are over threshold in the (upstream) Beaver Creek HUC10.

Sediment character and regime in the Klamath River is also adversely affected by water diversions and hydropower operations (dams) up-river which: (1) adversely affects sediment transport processes in the river below the diversions and dams by decreasing stream flow and the river's ability to move sediment and to self-cleanse and (2) adversely affects sediment transport processes by preventing sediment delivery from the upper basin (above Iron Gate Dam) to the lower basin. **At-Risk**

Large Woody Debris: Because the channel of the mainstem Klamath River is so wide, even whole trees with rootwads attached often do not remain in the channel for long periods before being transported downstream by high flows, however, current levels of LWD in the mainstem Klamath River are likely considerably reduced from pre-settlement levels. Most of the type of LWD that does tend to have long in-channel residence time results from large streamside conifers that fall over into the stream with the rootwad still attached and rootwad still on the streambank or hillslope. The capacity to grow large streamside conifers and the potential for future LWD recruitment to the river has been significantly reduced within the Horse Creek-Klamath River HUC10 because trees within or adjacent to the stream buffer RR are readily accessible to the public (permitted or not) and agencies via the Klamath River Highway that closely parallels much of the mainstem length, via the old Klamath River Highway that runs along the opposite side of the river, via river accesses and other public roads, and via riverfront private property which comprises the majority of ownership in this HUC10. Road construction and maintenance (including hazard tree removal) in stream buffers prevents large trees from growing and removes large trees that might have become LWD. On many of the streamside private properties, current land use practices removes large trees that could recruit to the river and/or preclude the growth of large trees. Compared to pre-settlement conditions, there are fewer and/or smaller logs being delivered to the mainstem from tributary watersheds because of road construction and maintenance within stream buffer, past clearcut logging within stream buffers, and clearing and/or development on private land within stream buffers. **Not Properly Functioning**

Pool Frequency and Quality: Reduction of mainstem pool depth and volume due to infilling is likely occurring because: (1) excessive sediment has been delivered to the mainstem from numerous areas of high watershed disturbance upstream in the mid-

Klamath sub-basin and the Scott River watershed and (2) reduced magnitude and duration of flow in the mainstem (due to upstream water management and hydropower operations) has reduced sediment transport capability. Pool quality may be reduced because of lack of LWD. **At-Risk**.

Off-Channel Habitat: The constrained channel types characteristic of much of the mid-Klamath River generally do not have broad floodplains and do not allow much development of off-channel habitat. The only major unconstrained reach of the mainstem in the Horse Creek-Klamath River HUC10 is north of the river just upriver from Horse Creek but the nearly entire reach is currently a gravel mining operation and major stream crossing for the Klamath River Highway 96. Berms to protect the gravel mining operation and berms to protect the Klamath River Highway prevent the river from interacting with its (historical) floodplain and from developing off-channel habitats. There are also numerous small relatively unconstrained channel reaches that have been impacted by historical industrial dredging that eliminated and continue to preclude development of off-channel habitat. Access to other mainstem floodplain/off-channel habitat areas is adversely affected by altered flow regime from upstream water diversions and hydropower operations. Decreased flows from up-river have decreased hydrologic connectivity between the river and off-channel habitats/floodplains, have reduced the size and temporal duration of these habitats, and have decreased ease of access to and from these critical rearing areas by juvenile salmon and steelhead. Lower Horse Creek is the only other major unconstrained valley reach in the HUC10. In the mid-1900s, lower Horse Creek was tightly constrained against the hillslope by a berm that was constructed to keep Horse Creek from flooding pasture that now exists on the former floodplain. **Not Properly Functioning**

Refugia: This section of the Klamath River provides spawning, rearing, and migration habitats for salmon, steelhead trout, and other anadromous and resident fish species. Poor water quality in the mainstem Klamath River has been physically documented through monitoring (as is described in the Environmental Baselines in the Indicator analyses for Water Temperature, Turbidity, Substrate, and Chemical Contamination) and biologically evidenced by frequent fish kills and high incidence of disease and mortality. Water temperatures in the Klamath River mainstem reach critically high levels for salmonids in summer and salmonids must find cooler water on hot days or during hot periods in order to survive. Klamath River summer thermal refugia is associated with tributaries having cool clear water. Cool, clear, un-polluted water from (most) mid-Klamath River tributaries function to maintain or improve water quality in the mid-Klamath River in summer. Unfortunately, flow and water quality from some of the tributaries is diminished in summer due to water diversion. Winter refugia from high water has been eliminated or degraded by past industrial dredging and berming (see Off-Channel Habitat indicator discussion). **At-Risk**.

Width-to-Depth Ratio: Reduction of mainstem pool depth and volume due to infilling is likely occurring because: (1) excessive sediment has been delivered to the mainstem from numerous areas of high watershed disturbance upstream in the mid-Klamath sub-basin and the Scott River watershed and (2) reduced magnitude and duration of flow in the mainstem (due to upstream water management and hydropower operations) has reduced sediment transport capability. Historical industrial dredging along several channel

reaches, and a current gravel mining operation have altered sections of channel. The channel of Lower Horse Creek has been constrained by berming. **At-Risk**.

Streambank Condition: There are roads in the riparian buffer on both sides of the river – some of the road sections are directly adjacent to the river or within inner gorge so that the road fill or revetment composes the "streambanks". Much of the land adjacent to the Klamath River and lower Horse Creek is private and has had riparian vegetation on streambanks cleared or greatly reduced, and wetlands converted, to enable grazing, farming, or other uses. Grazing occurs on the streambank in the vicinity of Horse Creek and keeps the riparian zone denuded of vegetation. Historic large-scale industrial dredging has overturned the streambed and streambanks in many locations leaving large piles of dredge tailings as "streambanks" that will not support vegetation and that blocks the rivers interaction with its floodplain - resulting in significant diminishment of off-main-channel aquatic habitats. The "streambank" of lower Horse Creek is a berm. There is high density of roads in stream buffer RRs and high density of stream crossings in many of the tributary watersheds. Hundreds of acres of riparian vegetation in hydrologic RRs burned at moderate to high severity in the 2014 Beaver Fire. **At-Risk**.

Floodplain Connectivity: See discussion for Off-Channel Habitat indicator above. **Not Properly Functioning.**

Flow/Hydrology

Change in Peak/Base Flow: The flow regime in the mid-Klamath River is altered by numerous water diversions and hydropower operations that are mostly upstream from the Horse Creek-Klamath River HUC10. However, there are also numerous water diversions from tributaries within the Horse Creek –Klamath River HUC10. Adverse changes in river flow regime have resulted in less water in spring/summer when juvenile anadromous salmonids need to migrate to the ocean and/or to access off-channel habitats. Peak flows in the Klamath River tributaries are elevated from roads, past timber harvest, past wildfires, and other ground compaction/disturbance throughout the Klamath Basin. The 2014 Beaver Fire is expected to increase peak flows in tributaries where large swaths of forest burned at moderate to high intensity. Modeled runoff risk is moderately elevated (ERA/TOC = 0.73). The flow regime in the mid-Klamath River is Not Properly Functioning because of significant water diversion and flow regulation by dams. The flow regime in tributaries in not properly functioning because of excessive water diversion in summer and increased peak flows in winter**. Not Properly Functioning**

Drainage Network Increase: The Klamath River corridor has moderate to high road density, many miles of valley bottom and inner gorge road, and private and public development that has compacted the ground. Many of the tributary watersheds also have moderate to high road densities. There is significant potential for hydrologic connectivity of these compacted areas with the stream network and increase in extent of drainage network. **At-Risk**.

Watershed Conditions

Road Density/Location: Many of the tributary watersheds within the Horse Creek-Klamath River HUC10 have moderate to high road densities. The valley-bottom Klamath River Highway closely parallels the river for much of its' length in the HUC10 and the valley-bottom/inner gorge Old Klamath River Highway runs along the opposite side of

the river for much of the length as well. There are miles of valley-bottom/inner gorge road in the tributaries as well, particularly in the Horse Creek watershed. There are numerous private roads in stream buffers and river accesses throughout the HUC10. **Not Properly Functioning**

Disturbance History/Regime: Many of the HUC14 watersheds in the Horse Creek-Klamath River HUC10 have moderate to high CWEs due primarily to roads, past timber harvest, wildfires, and/or historic large-scale mining. There is moderate to high road density within the river corridor and localized areas of disturbance in the stream buffer associated with stream crossings and established public vehicular river accesses, plus private and unauthorized roads. Roads parallel both sides of the river for most of its length in the HUC10 and many miles are constructed within the actively eroding Klamath River canyon inner gorge. The mid- Klamath River corridor has been impacted in places by historic large-scale hydraulic mining operations that have left lasting imprints on lower slopes adjacent to the river and large mounds of dredge tailings in the stream channel and stream buffer. The 2014 Beaver Fire burned thousands of acres at moderate to high severity. Modeled watershed disturbance is moderately to highly elevated due to roads, the 2014 Fire, vegetation management, and firelines – in that order: surface erosion risk (USLE = 0.81); mass wasting risk (GEO = 0.86); and runoff risk (ERA/TOC = 0.73). **At-Risk.**

Riparian Reserves: There are roads in the riparian buffer on both sides of the river. Much of the land adjacent to the Klamath River and lower Horse Creek is private and has had riparian vegetation cleared or greatly reduced, and wetlands converted, to enable grazing, farming, or other uses. Noxious weed species have invaded the river bars. Historic large-scale industrial dredging has overturned the streambed in many locations leaving large piles of dredge tailings that will not support vegetation and that blocks the rivers interaction with its floodplain - resulting in significant diminishment of off-main-channel aquatic habitats. Within the largest (historically) unconstrained reach of the river there is a large gravel mining operation that does not support vegetation and prevents the river from interacting with its floodplain - resulting in significant diminishment of off-main-channel aquatic habitats. There is high density of roads in RR and stream crossings in in many of the tributary watersheds. Hundreds of acres of vegetation in hydrologic RRs and geologic RRs burned at moderate to high severity in the in the 2014 Beaver Fire. **Not Properly Functioning**.

Also refer to the following 7th field checklists for more detailed info. on conditions in this watershed:

Lower Horse Creek HUC14 environmental baseline summary table

Middle Horse Creek HUC14 environmental baseline summary table

CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS

OF PROPOSED ACTION(S) ON RELEVANT INDICATORS

PROJECT: **Westside Fire Recovery**
WATERSHED: **North Fork Salmon River**

DIAGNOSTIC OR PATHWAY and INDICATOR	Environmental Baseline			Effects of the Action		
	PROPERLY FUNCTIONING	**FUNCTIONING - AT RISK**	**NOT PROP. FUNCT.**	**RESTORE**	**MAINTAIN**	**DEGRADE**
HABITAT:						
Habitat Quality Temperature		Coho 2014; SRCA 1998; WA 1995			X	
Suspended Sediment - Intergravel DO/Turbidity	CWE 2015; WA 1995				X	
Chemical Contamination/ Nutrients	CA-EPA				X	
Habitat Access Physical Barriers	CDFW 2015; Coho 2014; Siskiyou 2002; FishPass 2001				X	
Habitat Elements Substrate Character and Embeddedness		SRCA 1998; WA 1995			X	
Large Woody Debris			Coho 2014; SRCA 1998; WA 1995		X	
Pool Frequency and Quality		SRCA 1998; WA 1995			X	
Large Pools					X	
Off-channel Habitat		PJ; Coho 2014			X	
Refugia	PJ				X	
Channel Cond & Dyn Average Wetted Width/Maximum Depth	PJ; CWE 2015				X	
Streambank Condition	ND - likely Properly Functioning (PJ)				X	
Floodplain Connectivity	PJ, Coho 2014				X	
Flow/Hydrology Change in Peak/Base Flows	PJ; CWE 2015; Coho 2014				X	
Increase in Drainage Network	PJ; CWE 2015				X	

DIAGNOSTIC OR	Environmental Baseline			Effects of the Action		
Watershed Conditions Road Density & Location	CWE 2015; SRSS 2002				X	
Disturbance History & Regime	PJ; CWE 2015; WA 1995				X	
Riparian Reserves - Northwest Forest Plan		PJ; Coho 2014; WA 1995			X	
SPECIES AND HABITAT:						
Species and Habitat: Summary/Integration of all Species and Habitat Indicators		X			X	
	For the Salmon River drainage, long-term trends for most anadromous species/runs are unclear (Quiñones 2011). The exceptions include spring Chinook (increasing) and summer steelhead (decreasing), but these trends also show a signal of hatchery influence (Quiñones 2011). See Life History section for additional information.			See Env. Conseq. for a Indicator effects summary. The Env. Conseq. section also describes effects to fish and their habitat.		

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Quiñones, R.M. 2011. Recovery of Pacific salmonids (*Oncorhynchus* spp.) in the face of climate change: a case study of the Klamath River Basin, California. PhD Thesis. University of California, Davis, California. 129 p.

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USDA Forest Service (USFS). 2013. Stream sediment monitoring on the Klamath National Forest, 2009-2012. Klamath National Forest, Yreka, CA. 18 pp.

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_____. 1998. Salmon River and Dillon Creek watersheds fish habitat and channel type analysis. Prepared for the Klamath National Forest by EA Engineering, Science, and Technology, Sacramento, CA. 31 pp + appendices.

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Note on temperatures:
Greg's report has N. Russian, S. Russian, and Whites (barely) above the 16 C MWMT beneficial uses water temperature, but raw hobo temps all well below AP condition for Properly Functioning

CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS
PROJECT: **Westside Fire Recovery**
WATERSHED: **Seiad Creek-Klamath River**

Pathways: INDICATORS	ENVIRONMENTAL BASELINE Seiad Creek-Klamath River HUC10 *			EFFECTS OF THE ACTION(S) Seiad Creek-Klamath River HUC10 *		
	Properly Functioning	**At Risk**	**Not Properly Functioni**	**Restore**	**Maintain**	**Degrade**
Water Quality Temperature			TEMP TMDL		X	
Sediment – Turbidity			ND/PO/ PJ		X	
Chemical/Nutrient Contamination			TMDL		X	
Habitat Access Physical Barrier	FPI/PO				X	
Habitat Elements Substrate Character		TMDL ND/PO/ PJ			X	
Large Woody Debris			ND/PO/ PJ		X	
Pool Frequency/Quality		ND/PO/ PJ			X	
Off-Channel Habitat			PO/PJ		X	
Refugia		TMDL PO/PJ			X	
Channel Cond & Dyn Width-to-Depth Ratio		ND/PO/ PJ			X	
Streambank Condition		ND/PO/ PJ			X	
Floodplain Condition			PO/PJ		X	
Flow /Hydrology Change in Peak/Base Flow			TMDL RSS PO/PJ		X	
Drainage Network Increase		KNF GIS RSS			X	
Watershed Cond. Road Density/Location		PO/PJ			X	
Disturbance History/Regime		KNF GIS PO/PJ			X	
Riparian Reserves			KNF GIS		X	

TEMP = Water temperature monitoring of mainstem Klamath River upstream of Grider Creek; **TMDL =** These indicators are impaired according to USEPA Clean Water Act Section 303(D) for exceeding allowable Total Maximum Daily Loads (TMDLs) of pollutants – SEE Klamath RIVER TMDL; **ND** = No Data; **NA** = Not Applicable; **PO** = Personal Observation; **PJ** = Professional Judgment; **FPI** = KNF Forest-Wide Fish Passage Barrier Inventory; **RSS** = Road Sediment Source surveys (KNF 1999-2013); **KNF GIS** = KNF GIS database query and CWE modeling for WFR Project (Fall 2014 to Winter 2015);

Environmental Baseline completed by Jon Grunbaum on April 15, 2015.

* = This environmental baseline describes the watershed condition of the Seiad Creek-Klamath River HUC10. Specifically, this environmental baseline describes the condition of aquatic habitat and water quality in the Klamath River and watershed conditions throughout the HUC10. Appendices to this environmental baseline are HUC14 environmental baseline summary tables that summarize the condition of aquatic habitat and watershed in the tributaries that support salmon (that were affected by the 2014 Fires). These HUC14s are: Lower Grider Creek; Upper Grider Creek; Lower Seiad Creek; O'Neil Creek; and Tom Martin Creek (completed descriptive versions of these HUC14 environmental baselines are available in the project record). All of the Grider Creek HUC14 environmental baselines were included because this is an important watershed for salmon and steelhead and because so much of this watershed burned at moderate to high severity (therefore, the Cliff Valley Creek HUC14 and the Rancheria Creek HUC14 environmental baselines are included in the appendices).

Seiad Creek-Klamath River Environmental Baseline Elements:

Water Quality

Water Temperature: The mainstem Klamath River exceeds the water temperature TMDL (CA State Water Board, 2010). Summer water temperature of the mainstem Klamath River was monitored from 2011 to 2014 just upstream of the confluence of Grider Creek (which is about three miles upstream of the downstream drain of the Seiad Creek-Klamath River HUC10). In the four year period of record the maximum instantaneous water temperature ranged from 24.5^{o}C to 27.8^{o}C; the maximum weekly average temperature (MWAT) ranged from 22.9^{o}C to 25.7^{o}C; and the maximum weekly maximum temperature ranged from 24.2^{o}C to 27.0^{o}C. **Not Properly Functioning**.

Recent Water Temperature Monitoring Results for Mainstem Klamath River Upstream of Grider Creek Confluence

Start	End	Max Daily Max Temp C	Max Average Daily Temp C	Max Diurnal Variation Temp C	Maximum Weekly Average Temp C (MWAT)	Maximum Weekly Maximum Temp C (MWMT)
7/7/2011	8/14/2011	24.5	23.3	3.5	22.9	24.2
6/14/2012	10/23/2012	25.6	24.5	3.8	24.0	25.1
6/11/2013	10/16/2013	27.2	25.8	3.6	25.2	26.4
5/29/2014	10/6/2014	27.8	26.3	3.9	25.7	27.0

Sediment - Turbidity: Even before the 2014 Beaver Fire and Happy Camp Complex Fire the mid-Klamath River would become quite turbid during moderate to heavy precipitation and runoff events and remain turbid for long periods thereafter. However, the magnitude and duration of turbidity had actually been decreasing over the 20 years preceding the 2014 Fires (personal observation). Much of the pre-2014 Fires turbidity was due to high levels of disturbance from an era of intense logging and road construction (1955 – 1995) in the Seiad Creek-Klamath River HUC10 and in many areas within the HUC10s upstream of the Seiad Creek-Klamath River HUC10. The 1987 Fires also likely contributed to the turbidity. HUC10s upstream of Iron Gate Dam contribute very little sediment or turbidity to the mainstem Klamath River because the deep volcanic soils do not facilitate much overland flow and because the dam acts as a settling basin.

Many thousands of acres within the Seiad Creek-Klamath River HUC10 burned at moderate to high intensity in the 2014 Happy Camp Complex Fire. Additionally, many thousands of acres of forest that drain into the reach of the mid-Klamath River that flows through the Seiad Creek-Klamath River HUC10 burned at moderate to high severity in the 2014 Beaver and Happy Camp Complex Fires. The 2014 Fires have already greatly increased the rate of sediment delivery into streams and increased the magnitude and duration of turbidity events. The frequency, magnitude and duration of 2014 Fires-related turbidity is likely to be significantly elevated for at least the next few years until vegetation gets re-established and ground cover increases, and excess fines are winnowed out of the system. Risk of landslides that can cause bouts of acute turbidity will likely be increased for a decade or more due to decreased evapotranspiration, decreased ground cover, increased groundwater, increased overland flow, and/or loss of soil cohesion provided by living tree roots. Modeled surface erosion risk (USLE = 0.68) is moderately elevated and modeled mass wasting risk (GEO = 0.82) is highly elevated in the Seiad Creek-Klamath River HUC10. Modeled surface erosion risk and mass wasting risk are high to over-threshold in many of the HUC10s upstream of the Seiad Creek-Klamath River HUC10. **Not Properly Functioning**

Chemical/Nutrient Contamination: The Klamath River mainstem is listed under the US-EPA Section 303(d) of the Clean Water Act as exceeding TMDL for water temperature, nutrients, and organic enrichment/low dissolved oxygen. Industrial and municipal point sources, agricultural runoff, water impoundment, flow regulation and modification, and natural and non-point sources are implicated for the high nutrient and organic enrichment loads, and low dissolved oxygen concentration. Chemical contamination (from fertilizers, pesticides, pharmaceuticals, heavy metals, solvents, etc.) can reasonably be expected to accompany agricultural return flows, and municipal and industrial point sources. Most organic enrichment of the mid-Klamath River occurs upstream of the Seiad Creek-Klamath River HUC10 (in the upper Klamath, Scott, and Shasta River basins). The mainstem Klamath River has its origins in the naturally warm shallow eutrophic Upper Klamath Lake that is rich in nutrients and organic matter. However, considerably more nutrient and organic matter is delivered to the mainstem in tailwater from grazing and agriculture occurring throughout the upper Klamath, Scott, and Shasta River basins, and from urban effluent. Excess nutrients and water impoundment of the Klamath River is suspected of causing intense blooms of a toxic blue-green algae (cyanobacteria) in Iron Gate Reservoir and other impoundments upstream of Iron gate Reservoir. Toxic algae (or toxin from burst cyanobacteria) from these impoundments has been entrained throughout the entire length of the mid- and lower mid-Klamath River nearly every summer since 2005. Mid-Klamath tributaries (with the exception of the Scott and Shasta Rivers) including those in the Seaid Creek-Klamath River HUC10 generally contribute relatively nutrient-poor chemical contamination-free water to the river. **Not Properly Functioning**.

Habitat Access

Physical Barriers: There are no known human-caused barriers to fish passage within the Seaid Creek-Klamath River HUC10. **Properly Functioning.**

Habitat Elements

Substrate Character: Even before the 2014 Beaver and Happy Camp Complex Fires many Klamath River tributary drainages in the Seaid Creek-Klamath River HUC10 and in upstream HUC10s had elevated erosion and sedimentation rates, and moderate to high modeled Cumulative Watershed Effects (**CWEs**), primarily due to roads, past timber harvest, and mining on all-lands, and to clearing and development on private land. Many thousands of acres of forest that drain into the reach of the mid-Klamath River that flows through the Seaid Creek-Klamath River HUC10 burned at moderate to high severity in the 2014 Beaver and Happy Camp Complex Fires. The 2014 Fires have already greatly increased the rate of sediment delivery into streams and the Klamath River (personal observation). The frequency, magnitude and duration of chronic elevated sediment delivery from surface erosion from the 2014 Fires is likely to be remain elevated for at least the next few years until vegetation gets re-established and ground cover increases, and excess fines are winnowed out of the system. The risk of acute bouts of elevated sediment delivery from mass wasting resulting from the 2014 Fire will be increased for a decade or more due to decreased evapotranspiration, decreased ground cover, increased groundwater, increased overland flow, and/or loss of soil cohesion provided by living tree roots. Modeled surface erosion risk (USLE = 0.68) and mass wasting risk (GEO = 0.82) are high in the Seiad Creek-Klamath River HUC10. Modeled surface erosion risk and mass wasting risk are highly elevated to over threshold in many of the HUC10s upstream of the Seiad Creek-Klamath River HUC10.

Sediment character and regime in the Klamath River is also adversely affected by water diversions and hydropower operations (dams) up-river which: (1) adversely affects sediment transport processes in the river below the diversions and dams by decreasing stream flow and the river's ability to move sediment and to self-cleanse and (2) adversely affects sediment transport processes by preventing sediment delivery from the upper basin (above Iron Gate Dam) to the lower basin. **At-Risk**

Large Woody Debris: Because the channel of the mainstem Klamath River is so wide, even whole trees with rootwads attached often do not remain in the channel for long periods before being transported downstream by high flows, however, current levels of LWD in the mainstem Klamath River are likely considerably reduced from pre-settlement levels. Most of the type of LWD that does tend to have long in-channel residence time results from large streamside conifers that fall over into the stream with the rootwad still attached and rootwad still on the streambank or hillslope. The capacity to grow large streamside conifers and the potential for future LWD recruitment to the river has been significantly reduced within the Seiad Creek-Klamath River HUC10 because trees within or adjacent to the stream buffer RR are readily accessible to the public (permitted or not) and agencies via the Klamath River Highway that closely parallels much of the mainstem length, via Grider Creek Road that parallels the Klamath River between Walker Creek and Grider Creek, via Ladd Road, via river accesses, and via riverfront private properties. Road construction and maintenance (including hazard tree removal) in stream buffers prevents large trees from growing and removes large trees that might have become LWD. On many of the streamside private properties, current land use practices removes large trees that could recruit to the river and/or precludes the growth of large trees. There is a large area of dredge tailings north of the river in the Seiad Valley that does not support the growth of large streamside trees. Compared to pre-

settlement conditions, there are fewer and/or smaller logs being delivered to the mainstem from tributary watersheds because of road construction and maintenance within stream buffer, past clearcut logging within stream buffers, and clearing and/or development on private land within stream buffers.

N**ot Properly Functioning**.

Pool Frequency and Quality: Reduction of mainstem pool depth and volume due to infilling is likely occurring because: (1) excessive sediment has been delivered to the mainstem from numerous areas of high watershed disturbance upstream in the mid-Klamath sub-basin and the Scott River watershed and (2) reduced magnitude and duration of flow in the mainstem (due to upstream water management and hydropower operations) has reduced sediment transport capability. Pool quality may be reduced because of lack of LWD. **At-Risk**.

Off-channel Habitat: The constrained channel types characteristic of much of the mid-Klamath River generally do not have broad floodplains and do not allow much development of off-channel habitat. The only major unconstrained reach of the mainstem in the Seiad Creek-Klamath River HUC10 is north of the river in Seiad Valley but the entire floodplain was industrially dredged in the mid-1900s and the dredge tailings are still there preventing the river from interacting with its historical floodplain and from developing off-channel habitat. Access to other mainstem floodplain/off-channel habitat areas is adversely affected by altered flow regime from upstream water diversions and hydropower operations. Decreased flows from up-river have decreased hydrologic connectivity between the river and off-channel habitats/floodplains, have reduced the size and temporal duration of these habitats, and have decreased ease of access to and from these critical rearing areas by juvenile salmon and steelhead. Lower Seiad Creek and lower Grider Creek are the only other major unconstrained stream reaches in the HUC10. Lower Seiad Creek has been constrained by berms that were pushed with bulldozers up after major floods in attempts to re-constrain the stream. The berms on lower Grider Creek are minor and constrain only small reaches of stream. **Not Properly Functioning**

Refugia: This section of the Klamath River provides spawning, rearing, and migration habitats for salmon, steelhead trout, and other anadromous and resident fish species. Poor water quality in the mainstem Klamath River has been physically documented through monitoring (as is described in the Environmental Baselines in the Indicator analyses for Water Temperature, Turbidity, Substrate, and Chemical Contamination) and biologically evidenced by frequent fish kills and high incidence of disease and mortality. Water temperatures in the Klamath River mainstem reach critically high levels for salmonids in summer and salmonids must find cooler water on hot days or during hot periods in order to survive. Klamath River summer thermal refugia is associated with tributaries having cool clear water. Cool, clear, un-polluted water from (most) mid-Klamath River tributaries function to maintain or improve water quality in the mid-Klamath River in summer. Unfortunately, flow and water quality from some of the tributaries is diminished in summer due to water diversion. The 2014 Happy Camp Complex Fire is likely to result in further diminishment of thermal refugia by increasing water temperatures in tributaries where large swaths of riparian vegetation burned at moderate to high intensity. Winter refugia from high water has been eliminated or degraded by past industrial dredging and berming (see Off-Channel Habitat indicator discussion). **At-Risk**.

Width-to-Depth Ratio: Reduction of mainstem pool depth and volume due to infilling is likely occurring because: (1) excessive sediment has been delivered to the mainstem from numerous areas of high watershed disturbance upstream in the mid-Klamath sub-basin and the Scott River watershed and (2) reduced magnitude and duration of flow in the mainstem (due to upstream water management and hydropower operations) has reduced sediment transport capability. Historical industrial dredging has altered a major reach of channel in the Seiad Valley transforming it from an unconstrained to a constrained channel. The channel of lower Seiad Creek has been constrained by berming. **At-Risk**.

Streambank Condition: There are roads in the riparian buffer on both sides of the river for over half its length within the Seiad Creek-Klamath River HUC10. Some of the road sections are directly adjacent to the river or within inner gorge so that the road fill or revetment composes the "streambanks". Dredge tailings compose the streambank in a long reach in the Seaid Valley. Historic large-scale industrial dredging has overturned the streambed and streambanks in several locations leaving large piles of dredge tailings as "streambanks" that will not support vegetation. The "streambank" of lower Seaid Creek is a series of berms. There is high density of roads in stream buffer RRs and high density of stream crossings in many of the tributary watersheds. Hundreds of acres of riparian vegetation in hydrologic RRs burned at moderate to high severity in the 2014 Happy Camp Complex Fire. **At-Risk**.

Floodplain Connectivity: See discussion for Off-Channel Habitat indicator above. **Not Properly Functioning.**

Flow/Hydrology

Change in Peak/Base Flow: The flow regime in the mid-Klamath River is altered by numerous water diversions and a major hydropower operation (PacifiCorps) that are upstream from the Seiad Creek-Klamath River HUC10. However, there are also numerous water diversions from tributaries within the Seiad Creek –Klamath River HUC10. Adverse changes in river flow regime have resulted in less water in spring/summer when juvenile anadromous salmonids need good flow and water quality to migrate to the ocean and/or to access off-channel habitats. Modeled runoff risk for the entire HUC10 is moderately elevated (ERA/TOC = 0.55). The flow regime in the mid-Klamath River is Not Properly Functioning because of significant water diversion and flow regulation by dams. Peak flows in some of the Klamath River tributaries are elevated from roads, past timber harvest, past wildfires, and other ground disturbances. The flow regime in some of the tributaries is not properly functioning because of excessive water diversion (particularly Seiad Creek that is officially "over-allocated") in summer and increased peak flows in winter**.** The 2014 Happy Camp Complex Fire is expected to increase peak flows in tributaries in the where large swaths of forest burned at moderate to high intensity. **Not Properly Functioning**

Drainage Network Increase: The Klamath River corridor has moderate to high road density, many miles of valley bottom and inner gorge road, and low to moderate level of ground disturbance and compaction from private and public development. Some of the tributary watersheds have moderate to high road densities. There is some potential for drainage network increase due to roads because percent hydrologically-connected road ranges from 0% to 25% (median = 7%) in the HUC14 watersheds. **At-Risk**

Watershed Conditions

Road Density/Location: Some of the tributary watersheds within the Seiad Creek-Klamath River HUC10 have moderate to high road densities. The valley-bottom Klamath River Highway closely parallels the river for much of its' length in the HUC10 and other miles of streamside roads run along the opposite bank (particularly Grider Road between Walker Creek and Grider Creek; Ladd Road between Seiad and Negro Creek). There are miles of valley-bottom/inner gorge road in the tributaries as well, particularly in the Seaid and Walker Creek watersheds. There are numerous private roads in stream buffers and river accesses throughout the HUC10. **At-Risk**

Disturbance History/Regime: Some of the HUC14 watersheds in the Seiad Creek-Klamath River HUC10 have moderate to high CWEs due primarily to roads, past timber harvest, wildfires, and/or historic large-scale mining. There is moderate to high road density within the river corridor in some of the tributaries, and many miles of valley-bottom and inner gorge road throughout the HUC10. There are numerous localized areas of disturbance in the stream buffer associated with stream crossings and vehicular river accesses, plus private and unauthorized roads. The lower Seiad Creek and valley was overturned during industrial dredging in the mid-1900s and has a long ways to go to recovery. The mid- Klamath River corridor has been impacted in places by historic large-scale hydraulic mining operations that have left lasting imprints on lower slopes adjacent to the river and large mounds of dredge tailings in the stream channel and stream buffer. The 2014 Happy Camp Complex Fire burned thousands of acres at moderate to high severity - nearly the entire HUC10 on the south side of the river burned. Modeled watershed disturbance is moderately to highly elevated due to roads, the 2014 Fire, vegetation management, and firelines – in that order: surface erosion risk (USLE = 0.68); mass wasting risk (GEO = 0.82); and runoff risk (ERA/TOC = 0.55). **At-Risk.**

Riparian Reserves: There are roads in the riparian buffer on both sides of the river. There is high density of roads in RR and stream crossings in many of the tributary watersheds. Much of the land adjacent to the Klamath River and lower Seiad Creek is private and has had riparian vegetation cleared or greatly reduced, and wetlands converted, to enable grazing, farming, or other uses. Noxious weed species have invaded the river bars. Historic large-scale industrial dredging has overturned the streambed in many locations leaving large piles of dredge tailings that will not support vegetation and that blocks the rivers interaction with its floodplain - resulting in significant diminishment of off-main-channel aquatic habitats. Lower Seiad Creek valley was overturned in industrial dredging operations in the mid-1900s and is still far from recovery. Subsequently, berms that were pushed up to "contain" lower Seiad Creek after floods prevent the stream from interacting with its floodplain and has resulted in severe degradation and aggradation of the channel. The floodplain of the largest (historically) unconstrained reach of the river (in this HUC10) was industrially dredged and the mountains of tailings are still there preventing the river from interacting with its floodplain. Hundreds of acres of vegetation in hydrologic RRs and geologic RRs burned at moderate to high severity in the in the 2014 Beaver Fire. **Not Properly Functioning**.

Refer to the following 7th field matrices for more detailed information on this watershed:

- Cliff Valley Creek HUC14 environmental baseline summary table
- Lower Grider Creek HUC14 environmental baseline summary table

- Lower Seiad Creek HUC14 environmental baseline summary table
- O'Neil Creek HUC14 environmental baseline summary table
- Rancheria Creek HUC14 environmental baseline summary table
- Tom Martin Creek HUC14 environmental baseline summary table
- Upper Grider Creek HUC14 environmental baseline summary table
- Walker Creek HUC14 environmental baseline summary table

CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS

OF PROPOSED ACTION(S) ON RELEVANT INDICATORS

PROJECT: **Westside Fire Recovery**

WATERSHED: South Fork Salmon River

DIAGNOSTIC OR PATHWAY and INDICATOR	Environmental Baseline			Effects of the Action		
	PROPERLY FUNCTIONING	FUNCTIONING - AT RISK	NOT PROP. FUNCT.	RESTORE	MAINTAIN	DEGRADE
HABITAT:						
Habitat Quality Temperature[1]			Coho-Sal 2014; SRCA 1998; WA 1997, 1994		X	
Suspended Sediment - Intergravel DO/Turbidity	CWE 2015; WA 1997, 1994				X	
Chemical Contamination/ Nutrients	CA-EPA				X	
Habitat Access Physical Barriers	CDFW 2015; Coho-Sal 2014; Siskiyou 2002; FishPass 2001[2]				X	
Habitat Elements Substrate Character and Embeddedness		SRCA 1998; WA 1997, 1994			X	
Large Woody Debris			Coho-Sal 2014; SRCA 1998; WA 1997, 1994		X	
Pool Frequency and Quality		SRCA 1998; WA 1997, 1994			X	
Large Pools					X	
Off-channel Habitat		PJ; Coho-Sal 2014			X	
Refugia	PJ				X	

DIAGNOSTIC OR	Environmental Baseline			Effects of the Action		
Channel Cond & Dyn Average Wetted Width/Maximum Depth	PJ; CWE 2015				X	
Streambank Condition	ND - likely Properly Functioning (PJ)				X	
Floodplain Connectivity	PJ, Coho-Sal 2014				X	
Flow/Hydrology Change in Peak/Base Flows	PJ; CWE 2015; Coho-Sal 2014				X	
Increase in Drainage Network	PJ; CWE 2015				X	
Watershed Conditions Road Density & Location	CWE 2015; SRSS 2002				X	
Disturbance History & Regime		PJ; Coho-Sal 2014; WA 1997, 1994			X	
Riparian Reserves - Northwest Forest Plan		PJ; Coho-Sal 2014; WA 1997, 1994			X	
SPECIES AND HABITAT:						
Species and Habitat: Summary/Integration of all Species and Habitat Indicators		X			X	
	For the Salmon River drainage, long-term trends for most anadromous species/runs are unclear (Quiñones 2011). The exceptions include spring Chinook (increasing) and summer steelhead (decreasing), but these trends also show a signal of hatchery influence (Quiñones 2011). See Life History section for additional information.			See Env. Conseq. for a Indicator effects summary. The Env. Conseq. section also describes effects to fish and their habitat.		
[1]Mainstem temperatures considered to be Not Properly Functioning. EF Salmon River, the largest tributary, is Functioning-At-Risk; and smaller tributaries generally Functioning Properly. [2]Barriers within range of anadromy in EF Salmon River have been remediated or are scheduled for remediation.						

CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS

OF PROPOSED ACTION(S) ON RELEVANT INDICATORS

PROJECT: **Westside Fire Recovery**

WATERSHED: **Lower Scott River**

DIAGNOSTIC OR PATHWAY and INDICATOR	Environmental Baseline			Effects of the Action		
	PROPERLY FUNCTIONING	**FUNCTIONING - AT RISK**	**NOT PROP. FUNCT.**	**RESTORE**	**MAINTAIN**	**DEGRADE**
HABITAT:						
Habitat Quality Temperature			Temps-Scott		X	
Suspended Sediment - Intergravel DO/Turbidity		PJ			X	
Chemical Contamination/ Nutrients			CA-EPA		X	
Habitat Access Physical Barriers	CDFW 2015; Coho-Sct 2014				X	

DIAGNOSTIC OR	Environmental Baseline			Effects of the Action		
Habitat Elements Substrate Character and Embeddedness			PJ[1,2]; Coho-Sct 2014		X	
Large Woody Debris			Coho-Sct 2014; WA 2000		X	
Pool Frequency and Quality	ND - likely altered due to historic mining practices				X	
Large Pools					X	
Off-channel Habitat		PJ[1]; Coho-Sct 2014			X	
Refugia		PJ[1]			X	
Channel Cond & Dyn Average Wetted Width/Maximum Depth	ND - likely altered due to historic mining practices				X	
Streambank Condition			PJ[1,2]		X	
Floodplain Connectivity		PJ[1]; Coho-Sct 2014			X	
Flow/Hydrology Change in Peak/Base Flows			PJ[1]; Coho-Sct 2014		X	
Increase in Drainage Network		PJ[1]			X	
Watershed Conditions Road Density & Location		WA 2000			X	
Disturbance History & Regime		PJ[1]; Coho-Sct 2014; WA 2000			X	
Riparian Reserves - Northwest Forest Plan		PJ; Coho-Sct 2014; WA 2000			X	
SPECIES AND HABITAT:						
Species and Habitat: Summary/Integration of all Species and Habitat Indicators		X			X	
	Due to lack of data, specific trend for anadromous fish in this drainage is unknown. However, some sources are available to examine the general Scott River condition. (1) Screw trap data since 2000 suggests a steady to upward trend for Chinook smolts and steady to slightly down for steelhead smolts (CDFW 2011). (2) Run size estimate for spawning Chinook since 1978 is steady to slightly down (CDFW 2013). Recent trends for coho are unclear, but overall the run is considered to be depressed. See Life History section for additional information			See Env. Conseq. for a Indicator effects summary. The Env. Conseq. section also describes effects to fish and their habitat.		

[1]This 5th-field watershed includes extensive private property within/without the Forest boundary. Historic resource use throughout the drainage, including dredging, has impacted the watershed, and agriculture and timber extraction continue on private. Therefore, while Forest Service, or inholdings within the boundary, may show properly functioning condition - for instance, all CWE models under "1" threshold (CWE 2015) - the consideration of the *whole* 5th-field watershed suggest lower ratings. Data is largely lacking for private properties.
[2]Due to size of lower Scott River and extreme difficulty to survey, comprehensive datasets for physical attributes are not available.

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CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS
PROJECT: **Westside Fire Recovery**
WATERSHED: **Thompson Creek-Klamath River**

Pathways: INDICATORS	ENVIRONMENTAL BASELINE Thompson Creek-Klamath River (HUC10) Watershed *			EFFECTS OF THE ACTION(S) Thompson Creek-Klamath River (HUC10) Watershed *		
	Properly Functioning	**At Risk**	**Not Properly Functioni**	**Restore**	**Maintain**	**Degrade**
Water Quality Temperature			TEMP TMDL		X	
Sediment – Turbidity			ND/PO/ PJ		X	
Chemical/Nutrient Contamination			TMDL		X	
Habitat Access Physical Barrier	FPI/PO				X	
Habitat Elements Substrate Character		TMDL ND/PO/ PJ			X	
Large Woody Debris			ND/PO/ PJ		X	
Pool Frequency/Quality		ND/PO/ PJ			X	
Off-Channel Habitat		PO/PJ			X	
Refugia		TMDL PO/PJ			X	
Channel Cond & Dyn Width-to-Depth Ratio		ND/PO/ PJ			X	
Streambank Condition		KNF GIS			X	
Floodplain Condition	PO/PJ				X	
Flow /Hydrology Change in Peak/Base Flow			KNF GIS RSS PO/PJ		X	
Drainage Network Increase		KNF GIS PO/PJ			X	
Watershed Cond. Road Density/Location		KNF GIS PO/PJ			X	
Disturbance History/Regime		KNF GIS PO/PJ			X	
Riparian Reserves		KNF GIS			X	

TEMP = Water temperature monitoring of mainstem Klamath River upstream of Indian Creek (at downstream drain of Thompson Creek-Klamath River HUC10); **TMDL =** These indicators are impaired according to USEPA Clean Water Act Section 303(D) for exceeding allowable Total Maximum Daily Loads (TMDLs) of pollutants – SEE Klamath RIVER TMDL; **ND** = No Data; **NA** = Not Applicable; **PO** = Personal Observation; **PJ** = Professional Judgment; **FPI** =

KNF Forest-Wide Fish Passage Barrier Inventory; **RSS** = Road Sediment Source surveys (KNF 1999-2013); **KNF GIS** = KNF GIS database query and CWE modeling for WFR Project (Fall 2014 to Winter 2015);
Environmental Baseline completed by Jon Grunbaum on April 15, 2015.

* = This environmental baseline describes the watershed condition of the Thompson Creek-Klamath River HUC10. Specifically, this environmental baseline describes the condition of aquatic habitat and water quality in the Klamath River and watershed conditions throughout the HUC10. Appendices to this environmental baseline are HUC14 environmental baseline summary tables that summarize the condition of aquatic habitat and watershed in the tributaries that support salmon or steelhead: These HUC14s are: China Creek, Fort Goff Creek, Horse Creek, and Portuguese Creek.

Thompson Creek-Klamath River 5th-Field (HUC10) Environmental Baseline Elements:

Water Quality

Water Temperature: The mainstem Klamath River exceeds the water temperature TMDL (CA State Water Board, 2010). Summer water temperature of the mainstem Klamath River was monitored from 2011 to 2014 just upstream of the confluence of Indian Creek (this monitoring site is at the downstream drain of the Thompson Creek-Klamath River HUC10). In the four year period of record the maximum instantaneous water temperature ranged from 25.6°C to 28.7°C; the maximum weekly average temperature (MWAT) ranged from 23.5°C to 26.3°C; and the maximum weekly maximum temperature ranged from 25.2°C to 28.2°C. **Not Properly Functioning**.

Recent Water Temperature Monitoring Results for Mainstem Klamath River Upstream of Indian Creek Confluence						
Start	**End**	**Max Daily Max Temp C**	**Max Average Daily Temp C**	**Max Diurnal Variation Temp C**	**Maximum Weekly Average Temp C (MWAT)**	**Maximum Weekly Maximum Temp C (MWMT)**
7/6/2011	10/3/2011	25.6	23.9	3.3	23.5	25.2
6/22/2012	10/23/2012	26.7	25.0	3.5	24.5	26.2
6/10/2013	9/30/2013	28.7	26.7	3.8	25.8	27.6
5/28/2014	9/30/2014	28.7	26.7	3.6	26.3	28.2

Sediment - Turbidity: Even before the 2014 Beaver Fire and Happy Camp Complex Fire the mid-Klamath River would become quite turbid during moderate to heavy precipitation and runoff events and remain turbid for long periods thereafter. However, the magnitude and duration of turbidity had actually been decreasing over the 20 years preceding the 2014 Fires (personal observation). Much of the pre-2014 Fires turbidity was due to high levels of disturbance from an era of intense logging and road construction (1955 – 1995) in the Thompson Creek-Klamath River HUC10 and in many upstream HUC10s. The 1987 Fires also likely contributed to the turbidity. HUC10s upstream of Iron Gate Dam contribute very little sediment or turbidity to the mainstem Klamath River because the deep volcanic soils do not facilitate much overland flow and because the dam acts as a settling basin.

A couple thousand acres within the Thompson Creek-Klamath River HUC10 burned at moderate to high intensity in the 2014 Happy Camp Complex Fire. Additionally, many thousands of acres of forest that drain into the reach of the mid-Klamath River that flows through the Thompson Creek-Klamath River HUC10 burned at moderate to high severity in the 2014 Beaver and Happy Camp Complex Fires. The 2014 Fires have already greatly increased the rate of sediment delivery into streams and increased the magnitude and duration of turbidity events. The frequency, magnitude and duration of 2014 Fires-related turbidity is likely to be significantly elevated for at least the next few years until vegetation gets re-established and ground cover increases, and excess fines are winnowed out of the system. Risk of landslides that can cause bouts of acute turbidity will likely be increased for a decade or more due to decreased evapotranspiration, decreased ground cover, increased groundwater, increased overland flow, and/or loss of soil

cohesion provided by living tree roots. The 2014 Happy Camp Complex burned the portion of HUC10 that is south of the Klamath River. Much of the portion of the HUC10 that is north of the river burned in the 2012 Goff Fire, however, that fire burned at mostly low intensity. Modeled surface erosion risk (USLE = 0.29) is slightly elevated and modeled mass wasting risk (GEO = 0.49) is moderately elevated in the Thompson Creek-Klamath River HUC10. Modeled surface erosion risk and mass wasting risk is moderate to high to over-threshold in many of the HUC10s upstream of the Thompson Creek-Klamath River HUC10. The sediment-turbidity indicator is **Not Properly Functioning** primarily because of watershed disturbance upstream of the Thompson Creek-Klamath River HUC10.

Chemical/Nutrient Contamination: The Klamath River mainstem is listed under the US-EPA Section 303(d) of the Clean Water Act as exceeding TMDL for water temperature, nutrients, and organic enrichment/low dissolved oxygen. Industrial and municipal point sources, agricultural runoff, water impoundment, flow regulation and modification, and natural and non-point sources are implicated for the high nutrient and organic enrichment loads, and low dissolved oxygen concentration. Chemical contamination (from fertilizers, pesticides, pharmaceuticals, heavy metals, solvents, etc.) can reasonably be expected to accompany agricultural return flows, and municipal and industrial point sources. Most organic enrichment of the mid-Klamath River occurs upstream of the Thompson Creek-Klamath River HUC10 (in the upper Klamath, Scott, and Shasta River basins). The mainstem Klamath River has its origins in the naturally warm shallow eutrophic Upper Klamath Lake that is rich in nutrients and organic matter. However, considerably more nutrient and organic matter is delivered to the mainstem in tailwater from grazing and agriculture occurring throughout the upper Klamath, Scott, and Shasta River basins, and from urban effluent. Excess nutrients and water impoundment of the Klamath River is suspected of causing intense blooms of a toxic blue-green algae (cyanobacteria) in Iron Gate Reservoir and other impoundments upstream of Iron gate Reservoir. Toxic algae (or toxin from burst cyanobacteria) from these impoundments has been entrained throughout the entire length of the mid- and lower mid-Klamath River nearly every summer since 2005. Mid-Klamath tributaries (with the exception of the Scott and Shasta Rivers) including those in the Thompson Creek-Klamath River HUC10 generally contribute relatively nutrient-poor chemical contamination-free water to the river. **Not Properly Functioning**.

Habitat Access

Physical Barriers: There are no known human-caused barriers to fish passage within the Thompson Creek-Klamath River HUC10. **Properly Functioning.**

Habitat Elements

Substrate Character: Even before the 2014 Happy Camp Complex Fires many Klamath River tributary drainages in the Thompson Creek-Klamath River HUC10 and in upstream HUC10s had elevated erosion and sedimentation rates, and moderate to high modeled Cumulative Watershed Effects (**CWEs**), primarily due to roads, past timber harvest, mining on all-lands, and to clearing and development on private land. Many thousands of acres of forest that drain into the reach of the mid-Klamath River that flows through the Thompson Creek-Klamath River HUC10 burned at moderate to high severity in the 2014 Beaver and Happy Camp Complex Fires. The 2014 Fires have already greatly increased the rate of sediment delivery into streams and the Klamath River (personal observation). The frequency, magnitude and duration of chronic elevated sediment delivery from surface erosion from the 2014 Fires is likely to be remain elevated for at least the next few years until vegetation gets re-established and ground cover increases, and excess fines are winnowed out of the system. The risk of acute bouts of elevated sediment delivery from mass wasting resulting from the 2014 Fire will be increased for a decade or more due to decreased evapotranspiration, decreased ground cover, increased groundwater, increased overland flow, and/or loss of soil cohesion provided by living tree roots. Modeled surface erosion risk (USLE = 0.29) and mass wasting risk (GEO = 0.49) are moderate in the Thompson Creek-Klamath River HUC10. Modeled surface erosion risk and mass wasting risk are highly elevated to over threshold

in many of the HUC10s upstream of the Thompson Creek-Klamath River HUC10.

Sediment character and regime in the Klamath River is also adversely affected by water diversions and hydropower operations (dams) up-river which: (1) adversely affects sediment transport processes in the river below the diversions and dams by decreasing stream flow and the river's ability to move sediment and to self-cleanse and (2) adversely affects sediment transport processes by preventing sediment delivery from the upper basin (above Iron Gate Dam) to the lower basin. **At-Risk**

Large Woody Debris: Because the channel of the mainstem Klamath River is so wide, even whole trees with rootwads attached often do not remain in the channel for long periods before being transported downstream by high flows, however, current levels of LWD in the mainstem Klamath River are likely considerably reduced from pre-settlement levels. Most of the type of LWD that does tend to have long in-channel residence time results from large streamside conifers that fall over into the stream with the rootwad still attached and rootwad still on the streambank or hillslope. The capacity to grow large streamside conifers and the potential for future LWD recruitment to the river has been slightly reduced within the Thompson Creek-Klamath River HUC10 because trees within or adjacent to the stream buffer RR are readily accessible to the public (permitted or not) and agencies via the Klamath River Highway that closely parallels about half of the mainstem length, via river accesses, and via riverfront private properties. Road construction and maintenance (including hazard tree removal) in stream buffers prevents large trees from growing and removes large trees that might have become LWD. On many of the streamside private properties, current land use practices removes large trees that could recruit to the river and/or precludes the growth of large trees. Compared to pre-settlement conditions, there are fewer and/or smaller logs being delivered to the mainstem from tributary watersheds because of road construction and maintenance within stream buffer, past clearcut logging within stream buffers, and clearing and/or development on private land within stream buffers.

N**ot Properly Functioning**.

Pool Frequency and Quality: Reduction of mainstem pool depth and volume due to infilling is likely occurring because: (1) excessive sediment has been delivered to the mainstem from numerous areas of high watershed disturbance upstream in the mid-Klamath sub-basin and the Scott River watershed and (2) reduced magnitude and duration of flow in the mainstem (due to upstream water management and hydropower operations) has reduced sediment transport capability. Pool quality may be reduced because of lack of LWD. **At-Risk**.

Off-Channel Habitat: There is very little unconstrained valley/channel adjacent to the Klamath River within the Thompson Creek-Klamath River HUC10 so there are few floodplains and little potential for off-channel habitat development. In the lower miles of mainstem in this HUC10 there are a few low-gradient reaches where the channel widens out that provides off-main channel salmonid habitat such as in secondary channels and braids, and depressions in the stream channel where ponds form when groundwater/streamflow gets high enough. No on-site past or current activity or management has significantly altered the channel in these small unconstrained reaches. [*However, use of these floodplain/off-channel habitat areas can be adversely affected by altered flow regime from upstream water diversions and hydropower operations. Decreased flows from up-river have decreased hydrologic connectivity between the river and off-channel habitats/floodplains, have reduced the size and temporal duration of these habitats, and have decreased ease of access to and from these critical rearing areas by juvenile salmon and steelhead. See discussion for Change in Peak Flow Indicator below*]. **At Risk** because of streamflow issues.

Refugia: This section of the Klamath River provides spawning, rearing, and migration habitats for salmon, steelhead trout, and other anadromous and resident fish species. Poor water quality in the mainstem Klamath River has been physically documented through monitoring (as is described in the Environmental Baselines in the Indicator analyses for Water Temperature, Turbidity, Substrate, and Chemical Contamination) and biologically evidenced by frequent fish kills and high incidence of disease and mortality. Water temperatures in the Klamath River mainstem reach critically high levels

for salmonids in summer and salmonids must find cooler water on hot days or during hot periods in order to survive. Klamath River summer thermal refugia is associated with tributaries having cool clear water. Cool, clear, un-polluted water from (most) mid-Klamath River tributaries function to maintain or improve water quality in the mid-Klamath River in summer. Unfortunately, flow and water quality from some of the tributaries may be diminished in summer due to water diversion. The 2014 Happy Camp Complex Fire is likely to result in further diminishment of thermal refugia by increasing water temperatures in tributaries where large swaths of riparian vegetation burned at moderate to high intensity. **At-Risk**.

Width-to-Depth Ratio: Reduction of mainstem pool depth and volume due to infilling is likely occurring because: (1) excessive sediment has been delivered to the mainstem from numerous areas of high watershed disturbance upstream in the mid-Klamath sub-basin and the Scott River watershed and (2) reduced magnitude and duration of flow in the mainstem (due to upstream water management and hydropower operations) has reduced sediment transport capability. **At-Risk**.

Streambank Condition: Several miles of the Klamath River Highway run along the north streambank of the Klamath River (from Portuguese Creek to Fort Goff Creek). Several miles of China Grade Road run along the south bank and/or within inner gorge of the Klamath River (from China Creek to Happy Camp). Besides these and a few other minor road impacts streambanks along the Klamath River in this HUC10 are relatively undisturbed in good condition. There is high density of roads in stream buffer RRs and high density of stream crossings in most of the tributary watersheds except for Fort Goff Creek, Portuguese Creek, upper Thompson Creek, and the face drainages on the south side of the river from Ladd Creek (not including Ladd Creek watershed) downstream to Joe Miles Creek. Hundreds of acres of riparian vegetation in hydrologic RRs burned at moderate to high severity in the 2014 Happy Camp Complex Fire which burned only on the south-side of the river in the Thompson Creek-Klamath River HUC10. **At-Risk**.

Floodplain Connectivity: There is very little unconstrained valley/channel adjacent to the Klamath River within the Thompson Creek-Klamath River HUC10 so there is very little floodplain. What floodplain there is has not been significantly altered. **Properly Functioning.**

Flow/Hydrology

Change in Peak/Base Flow: The flow regime in the mid-Klamath River is altered by numerous water diversions and a major hydropower operation (PacifiCorps) that are upstream from the Thompson Creek-Klamath River HUC10. Adverse changes in river flow regime have resulted in less water in spring/summer when juvenile anadromous salmonids need good flow and water quality to migrate to the ocean and/or to access off-channel habitats. The flow regime in the mid-Klamath River is Not Properly Functioning because of significant water diversion and flow regulation by dams. There are also numerous domestic water diversions from tributaries within the Thompson Creek–Klamath River HUC10 that may significantly lower base flows in some of the tributaries. Peak flows in many of the Klamath River tributaries within this HUC10 are likely elevated due to high road density and/or the 2014 Happy Camp Complex Fire. Modeled runoff risk for the entire HUC10 is moderately elevated (ERA/TOC = 0.55). **Not Properly Functioning**

Drainage Network Increase: The Klamath River corridor within the Thompson Creek-Klamath River HUC10 has low to moderate road density and several miles of valley bottom/inner gorge road. Road density is high to very high in all tributary watersheds except for Fort Goff Creek, Portuguese Creek, upper Thompson Creek, and the face drainages on the south side of the river from Ladd Creek (not including Ladd Creek watershed) downstream to Joe Miles Creek. The road system generally has low hydrologic connectivity with the stream network. There is some potential for drainage network increase due to roads because percent hydrologically-connected road ranges from 0% to 15% (median = 5%) in the HUC14 watersheds. **At-Risk**

Watershed Conditions

Road Density/Location: The Klamath River corridor within the Thompson Creek-Klamath River HUC10 has low to moderate road density and several miles of valley bottom/inner gorge road. Road density is high to very high in all tributary watersheds except for Fort Goff Creek, Portuguese Creek, upper Thompson Creek, and the face drainages on the south side of the river from Ladd Creek (not including Ladd Creek watershed) downstream to Joe Miles Creek. **At-Risk** because of the high density road areas.

Disturbance History/Regime: There is high level of disturbance from roads and vegetation management in all tributary watershed areas except for Fort Goff Creek, Portuguese Creek, upper Thompson Creek, and the face drainages on the south side of the river from Ladd Creek (not including Ladd Creek watershed) downstream to Joe Miles Creek. There is high level of disturbance in the China, Fryingpan, and Horse Creek watersheds due to large swaths of forest that burned at moderate to high severity in these watersheds in the 2014 Happy Camp Complex Fire. There is a low level of watershed disturbance from the 2012 Fort Goff Fire that burned mostly at low severity from Thompson Creek east to Seiad Creek. Modeled watershed disturbance at the HUC10 scale is slightly to moderately elevated due to roads, the 2014 Fire, vegetation management, and firelines – in that order: surface erosion risk (USLE = 0.29); mass wasting risk (GEO = 0.49); and runoff risk (ERA/TOC = 0.43). **At-Risk.**

Riparian Reserves: Several miles of the Klamath River Highway run along the north streambank of the Klamath River (from Portuguese Creek to Fort Goff Creek). Several miles of China Grade Road run along the south bank and/or within inner gorge of the Klamath River (from China Creek to Happy Camp). Besides these and a few other minor road impacts, stream course RRs along the Klamath River in the Thompson Creek-Klamath River HUC10 are relatively undisturbed and in good condition. Riparian reserves are in good condition in the Fort Goff Creek watershed, Portuguese Creek watershed, upper Thompson Creek, and the face drainages on the south side of the river from Ladd Creek (not including Ladd Creek watershed) downstream to Joe Miles Creek because these areas are roadless and not much has recently burned at moderate to high severity. Stream buffer RRs in the China, Fryingpan, and Horse Creek watersheds are generally in poor condition because there is high road and stream crossing density and secondarily because about 100 acres of stream buffer RR burned at moderate to high severity in each watershed. Stream course RRs are in fair condition in the remaining tributary watersheds because road density is medium-high and there have been no recent moderate to high severity wildfires of any significance. **At-Risk**

Refer to the following 7th field matrices for more detailed information on this watershed:

- China Creek HUC14 environmental baseline summary table
- Fort Goff Creek HUC14 environmental baseline summary table
- Horse Creek HUC14 environmental baseline summary table
- Portuguese Creek HUC14 environmental baseline summary table

Appendix E: Project Design Features and Best Management Practices

Project Design Features (as submitted April 13, 2015)

Project Design Feature	Description	Applicable Alternatives and Units
Watershed - 1	The project is proposed to take place during the normal operating season (NOS) that is defined as May 1 to October 31. All ground disturbing activities, whether inside or outside of the NOS, will be implemented according to the Forest's Wet Weather Operation Standards (Klamath National Forest, 2002).	All units where applicable
Watershed - 2	Areas where soil has been disturbed by project activities within Riparian Reserves must be stabilized prior to the end of the normal operating season, prior to sunset if the National Weather Service forecast is a "chance" (30%) of rain within the next 24 hours, or at the conclusion of the operations, whichever is sooner. This includes skid trails that cross swales (i.e. linear depressions perpendicular to the slope contour that do not meet definition for designation as a Riparian Reserve). Restoration generally consists of removing excess sediment, reshaping and waterbarring former approaches, and spreading slash on the former crossing.	All units where applicable
Watershed - 3	Project Riparian Reserves are established in the following manner per the Forest Plan (site tree for Salmon and Happy Camp districts is 170 feet, site tree for Scott and Oak Knoll districts is 150 feet): For fish-bearing streams, it is the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream), whichever is greatest. For Salmon and Happy Camp ranger districts, this will be 340 feet (680 feet total). For permanently flowing non-fish-bearing streams, it is the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream), whichever is greatest. For Salmon and Happy Camp ranger districts, this will be 170 feet (340 feet total) and 150 feet for the Oak Knoll and Scott River Ranger District. For intermittent streams, the stream channel and extending to the top of the inner gorge, or extension from the edges of the stream channel to a distance equal to the height of one site potential tree, or 100 feet slope distance, whichever is greatest. For unstable lands, it is the extent of unstable and potentially unstable areas. Consistent with Forest Plan direction, riparian reserves for wetlands and springs will be defined by the edge of the feature out to a distance equal to 1 site potential tree. These riparian reservess will be flagged and avoided during salvage harvest.	All units where applicable

Project Design Feature	Description	Applicable Alternatives and Units
Watershed - 4	Tractors and mechanical harvesters will be excluded from all riparian reserves associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits. Hazard tree removal units are the exception. In Hazard tree units the equipment will be excluded from the inner 50 feet of the non-fish bearing riparian reserve, one site tree for fish bearing streams and in the perimeter of all active landslides and toe zones of dormant landslides. Equipment will be excluded from wetlands or wet meadows (excluding small springs and seeps). To limit slope disturbance, inner gorge terrain (> 65% slope) that extends beyond riparian reserves will be buffered by 20-foot slope distance and excluded from mechanical equipment activities. In areas where treatments may conflict, a hydrologist will be consulted.	All units where applicable
Watershed - 5	New temporary roads or landings will not be constructed in any riparian reserve associated with stream channels, on toe zones of landslides, active landslides or inner gorges. Exceptions for this project design feature for Alternative 2: Landings # DZ03, DZ10, DZ23, L043, L044, and L090.	All units where applicable
Watershed - 6	There will be no salvage logging on active landslides.	All units where applicable
Watershed - 7	Limit equipment disturbance within 20 feet on either side of swales by minimizing equipment crossings and avoiding running trails up the axis of swales, except at designated crossings.	All units where applicable
Watershed - 8	In salvage units and subsequent site preparation, skidding equipment will be restricted to slopes less than 35 percent. Skid trails that connect benches in dormant landslide terrain can have minor portions of the skid trails on slopes greater than 35 percent. In site preparation units (where no salvage will occur) felling and skidding equipment will be restricted to slopes less than 45% in non-granitic and non-schist soil types (see soils report for locations).	All salvage and site preparation units
Watershed - 9	Ground-based harvest equipment will be limited to 35% slopes, except when moving from one bench to another on dormant landslide terrain. In addition, ground-based equipment can travel up to 100 feet on slopes 35 to 45 percent.	All units where applicable
Watershed - 10	During site preparation, material greater than 8’’ inches in diameter would not be removed unless needed to reduce 1,000 hour fuel loading to seven tons per acre, retain as close to seven tons per acre as possible.	All units where applicable
Watershed - 11	Site preparation treatments would be designed to meet soils management direction in the Forest Plan. This may include use of low ground pressure equipment, retaining slash and large woody material and implementing hand treatments instead of mechanical.	All units where applicable
Watershed - 12	All hazard trees cut within 25 feet of a stream channel will be left on site unless it continues to pose a threat to safety or accessibility (see watershed-4 for equipment exclusion restrictions). Along fish-bearing stream reaches, all hazard trees greater than 26 inches in diameter at breast height within the first site tree (150-170 feet) will be left on site unless after felling, it continues to pose a threat to safety, infrastructure, forest road drainage system integrity or accessibility.	All units where applicable
Watershed - 13	Live trees directly rooted into the banks or otherwise integral to the stability of the channel bank will not be felled unless they pose an overhead hazard and, if felled, will be left on site unless this poses a hazard on the ground per Forest Service safety requirements.	All units where applicable
Watershed - 14	Directional felling will be used to protect streambanks where hazard trees need to be mitigated for public or employee safety.	All units where applicable

Project Design Feature	Description	Applicable Alternatives and Units
Watershed - 15	Improvements to existing system roads in the project area will avoid over-steepened road cuts where possible, minimize sidecasting, and maintain ditches, cross drains, and any outsloped road segments.	All units where applicable
Watershed - 16	Roads will be watered as appropriate to maintain road fines on site. Other materials may be used for dust abatement as approved by the Forest Service.	All units where applicable
Watershed - 17	Upgrades or improvements to stream crossings will be built to Forest Plan standards.	All units where applicable
Watershed - 18	Activities which require culvert replacement or removal will occur during the least critical periods for water and aquatic resources: when streams are dry or during low-water conditions; and in compliance with spawning and breeding season restrictions.	All units where applicable
Watershed - 19	Legacy sediment site treatments within or adjacent to streams will have erosion-prevention techniques applied such as silt fences, straw waddles, or mulch to minimize the risk of discharge.	All units where applicable
Watershed - 20	All project-related temporary structures, materials and project-related debris will not be stored for any length of time on active landslides and will be removed from riparian areas and stream channels prior to winter shutdown.	All units where applicable
Watershed - 21	For legacy sediment site repairs, fill materials generated will be reincorporated back into subgrade to the extent possible; all excess fill materials will be spoiled at a site reviewed and approved by Forest Service botanist, watershed, and heritage specialists.	All legacy site repair where applicable
Watershed - 22	Following harvest activities achieve at least 50 percent effective soil cover on new temporary roads and block them after the harvest season (prior to the first winter after use). New temporary roads will also be sub-soiled (or tilled) after use. All temporary roads (new, existing or re-opened decommissioned roads) will have the takeoffs from system road obliterated or blocked to avoid unauthorized use. All temporary roads will be hydrologically stabilized including removal of culverts and fills at stream crossings, out-sloping of road surfaces, and proper construction of water bars. Erosion and sedimentation control structures (water bars) will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.	New temp roads: 6, 7, 8, 10, 11, 12, 20, 27
Watershed - 23	Existing landings will be used to the extent possible. Existing landings in stream-course riparian reserves will not be expanded towards stream channels, or on to active landslides, or where vegetation that provides shade to a stream would need to be cut. Existing landings in riparian reserves will be shaped and treated for erosion control at the end of each season of use, and hydrologically restored at project completion (including subsoiling and covering with slash/mulch as needed). Reused landings in riparian reserves will have site specific erosion control measures to reduce risk of sediment delivery into streams. During opening or construction of any landings, material will not be sidecast into intermittent or perennial stream channels. At project conclusion, landings will be configured for long-term drainage and stability by reestablishing natural runoff patterns. All landings will be covered with at least 50 percent effective soil cover. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient.	All units where applicable
Watershed - 24	Refueling will not take place within riparian reserves except at designated landings in locations where most disconnected from water resources. A spill containment kit will be in place where refueling and servicing take place.	All units where applicable

Project Design Feature	Description	Applicable Alternatives and Units
Watershed - 25	Skid trail erosion control work will be kept current during implementation. Erosion control and drainage of skid trails will be complete prior to shutting down operations due to wet weather or at project completion.	All units where applicable
Watershed - 26	Use existing skid trails instead of building new skid trails unless using existing skid trails will have greater negative effects. Space skid trails at least 75 feet apart, except near landings and where trails converge. Use no skid trails in areas in which ground-based mechanical equipment is excluded. Designation of new skid trails will be approved by a Timber Sale Administrator. Erosion and sedimentation control structure will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.	All units where applicable
Watershed - 27	No full bench skid trails will be constructed. Full bench skid trails have the entire skid trail cut into the hillslope.	All units where applicable
Watershed - 28	Locations where skid trails intersect roads will be obliterated or effectively blocked to vehicle access.	All units where applicable
Watershed - 29	Skyline corridors will be placed on the landscape as to minimize disturbance to active landslides, inner gorges and toe zones of dormant landslide deposits. All skyline and ground-based yarding will require one-end suspension in corridors and on skid trails. Corridors for skyline yarding that are parallel to the stream channel will be placed outside of the riparian reserve. The corridor may cross the stream channel with full suspension of logs within ten feet from the stream bank. Apply erosion control measures as necessary in cable corridors to control erosion and runoff. This could include hand construction of water bars and /or spreading slash from adjacent areas.	All units where applicable
Watershed - 30	Where skidding occurs through units with less than 50 percent soil cover, mulch skid trails of greater than 15 percent slope, to achieve at least 50 percent effective soil cover on skid trails (approximately 40 acres across the project area may require this). Effective soil cover could include plant litter, woody material in contact with the soil, living vegetation, and rock fragments with a diameter of ½ to 3 inches. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient. Masticators will cover their tracks/traces with masticated slash upon exiting fuels treatment units/areas.	Based on soil burn severity data, these units are most likely to require this: 225, 264, 402, 525, 528, 540, 1109, 1129, 1136, 1140, 1142, 1151, and 1155.
Watershed - 31	Prescribed fire effects in riparian reserves will mimic a low intensity backing fire, except for handpiles where higher intensity may occur to consume pile material. Ignition of underburns will generally not occur in riparian reserves. Approval by the District Fish Biologist is needed for underburn riparian reserve ignitions.	All units where applicable
Watershed - 32	Handpiles and windrows in riparian reserves will be placed in a checkerboard pattern whenever possible (not piled directly above another). Handpiles will be less than six feet in diameter and will be more than 15 feet away from intermittent streams and 30 feet away from perennial streams.	All units where applicable
Watershed - 33	For underburning, hand-line construction in riparian vegetation shall be avoided and in general should be farther than 25 feet from stream channels. Handlines will be mitigated (waterbarred and covered with organic material) immediately following prescribed burning, when safe to do so.	All units where applicable

Project Design Feature	Description	Applicable Alternatives and Units
Watershed - 34	Draft water only at sites designated by the Forest Service. Decisions related to where water drafting occurs will be coordinated with a Forest Service fisheries biologist so that potential impacts to anadromous fish, and the thermal refugia they rely upon, are sufficiently minimized. Sites that are not likely to have rearing Coho salmon present will be prioritized for use, such as mainstem sites on the Klamath, Scott, and Salmon rivers. Priority will also be given to sites that involve drafting relatively warmer waters in mainstem rivers; drafting from tributaries and colder water sources, especially in their lower reaches, will be avoided particularly during late summer and early fall (when fish survival is dependent upon thermal refugia). Water storage facilities such as foldable tanks are encouraged and will be assessed for sites with moderate flows that simultaneously support rearing SONCC coho salmon, and may be subject to high drafting use (e. g., Walker Creek). Project-related water drafting will be monitored, and shifted away from streams if their baseflows will no longer sustain drafting-related water withdrawal consistent with PDFs. The following creeks will be avoided, due to their small size, small summer base flows, and consistent presence of rearing SONCC Coho salmon - Tom Martin Cr, O'Neil Cr, Little Horse Cr, and China Cr. <u>When drafting from waters designated as coho salmon Critical Habitat:</u> *NOAA Fisheries Water Drafting Specifications (2001) apply* 1. Intakes will be screened with 3/32" mesh for rounded or square openings, or 1/16" mesh for slotted openings. When in habitat potentially occupied by steelhead trout, intakes will be screened with 1/8" mesh size. Wetted surface area of the screen or fish-exclusion device shall be proportional to the pump rate to ensure that water velocity at the screen surface does not exceed 0.33 feet/second. a. Use of a NOAA approved fish screen will ensure the above specifications are met. 2. Fish screen will be placed parallel to flow. 3. Pumping rate will not exceed 350 gallons-per-minute or 10% of the flow of the anadromous stream drafted from. 4. Pumping will be terminated when tank is full. Additional applicable specifications: • There will be no modification/improvement of drafting sites in Coho Critical Habitat. Water drafting by more than one truck shall not occur simultaneously. <u>When drafting from waters that are not Coho Salmon critical habitat, but do contain fish:</u> *Forest Service Best Management Practices (BMP) Handbook direction applies (BMP 2.5)* 1. For fish-bearing streams, the water drafting rate should not exceed 350 gallons per minute for streamflow greater than or equal to 4.0 cubic feet per second (cfs). 2. Below 4.0 cfs, drafting rates should not exceed 20 percent of surface flows. 3. Water drafting should cease when bypass surface flows drop below 1.5 cfs. 4. Intakes, for trucks and tanks, shall be placed parallel to the flow of water and screened, with opening size consistent with the protection of aquatic species of interest. 5.Fish-bearing streams that are temporarily dammed to create a drafting pool shall provide fish passage for all life stages of fish.	All units where applicable
	<u>When drafting from non-fish-bearing waters:</u> *Forest Service BMP Handbook direction applies (BMP 2.5)* • Drafting rate should not exceed 350 gallons per minute for stream flow greater than or equal to 2.0 cubic feet/second. • Drafting rate should not exceed 50 percent of surface flow. • Drafting should cease when bypass surface flow drops below ten gallons per minute.	

Project Design Feature	Description	Applicable Alternatives and Units
Watershed – 35	Rock and gravel will be applied to drafting sites if it is needed to prevent stream sedimentation. Water drafting sites located in non-fish-bearing waters only may include minor instream modification, such as fine sediment removal and building of board/plastic dams. All boards and plastic will be removed after use. Water drafting sites located within fish-bearing stream segments may not be modified, except rocking the approach to prevent sedimentation.	All units where applicable

Best Management Practices (as submitted April 13, 2015)

Best Management Practices (BMPs) were developed to comply with Section 208 of the Clean Water Act. BMPs have been certified by the State Water Quality Resources Control Board and approved by the Environmental Protection Agency (EPA) as the most effective way of protecting water quality from impacts stemming from non-point sources of pollution. These practices have been applied to forest activities and have been found to be effective in protecting water quality within the Klamath National Forest (Forest). Specifically, effective application of the Region 5 Forest Service BMPs has been found to maintain water quality that is in conformance with the Water Quality Objectives in the North Coast Regional Water Quality Control Board's Basin Plan (http://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/).

Region 5 Forest Service BMPs have been monitored and modified since their original implementation in 1979 to make them more effective. Numerous on-site evaluations by the North Coast Region Water Quality Control Board have found the practices to be effective in maintaining water quality and protecting beneficial uses.

The Forest monitors the implementation and effectiveness of BMPs on randomly selected projects each year. From 2000 to 2012, BMP implementation requirement were met on 78-100 percent (91 percent average) of sites sampled, and BMP effectiveness requirements were met on 88-100 percent (94 percent average) of the sites sampled (USDA Forest Service, 2013c). The critical BMP evaluation is *effectiveness* which is a field evaluation to determine how well the BMP worked to prevent sedimentation. The success rate for effectiveness has been in the high 80s and 90s each year since 1993.

Best Management Practices first identified and utilized by the Klamath National Forest are listed in appendix D of the Forest Plan. These basic BMPs have been revised over the years, and are currently similar to those listed in the 2012 Region 5 BMP update in Chapter 10 of the Soil and Water Conservation Handbook, which additionally includes a narrative and objective of each (USDA USFS 2011); and where there are differences, direction is to employ the newer BMP list. The following 'on-the-ground' prescriptions below are incorporated into the project (see chapter 2 of draft EIS).

BMP 1.1 – Timber Sale Planning Process:

> Requires the Interdisciplinary Team (interdisciplinary team) to consider methods of reducing water quality impacts during the planning phase of a project. This is accomplished during the planning process of the Timber Sale project.

- An interdisciplinary team review was completed and project design features have been incorporated into the project design (See Chapter 2 of the DEIS).

BMP 1.2 – Timber Harvest Unit Design:

Requires the interdisciplinary team to consider methods of reducing water quality impacts due to changes in unit design. This is accomplished during the planning phase of a project. Examples of design changes are restricting timing of tree removal and utilizing less impacting yarding systems.

- An interdisciplinary team review was completed and project design features have been incorporated into the project design (See Chapter 2 of the DEIS).

BMP 1.3 – Use of Erosion Hazard Rating for Unit Design:

Identifies high or very high erosion hazard areas and adjust management activities to prevent downstream water quality impacts; and to increase soil cover for those areas that have a high risk of contributing sediment into streams. This is done during the planning and layout phase of the project.

- Based on field review and site data (percent slope distribution, soil texture), the Forest Soil Scientist determined the surface erosion hazard rating for each treatment unit and prescribed logging systems and soil cover needs based on the erosion hazard rating.

BMP 1.4 – Use of Sale Area Maps for Designating Water Quality Protection:

Identifies sensitive areas and water uses as part of the Timber Sale contract to assist operators in locating water concerns and applying protection methods. This is accomplished during contract preparation and implemented during layout of the sale.

- The Sale Area Map will include all protected stream-courses, unstable land features, springs, wetlands, meadows, water drafting sites, landings, temporary roads, and logging system for each unit.

BMP 1.5 – Limiting Operating Period of Timber Sale:

To prevent soil compaction and erosion from operations during wet weather; and to ensure placement of erosion control structures prior to the onset of winter to reduce water quality impacts. This is accomplished during the timber sale operations.

- The project is proposed to take place during the normal operating season (NOS) that is defined as May 1 to October 31. All ground disturbing activities, whether inside or outside of the NOS, will be implemented according to the Forest's Wet Weather Operation Standards (Klamath National Forest, 2002).
- Areas where soil has been disturbed by project activities within Riparian Reserves must be stabilized prior to the end of the normal operating season, prior to sunset if the National Weather Service forecast is a "chance" (30 percent) of rain within the next 24 hours, or at the conclusion of the operations, whichever is sooner. This includes skid trails that cross swales (i.e. linear depressions perpendicular to the slope contour that do not meet definition for designation as a Riparian Reserve). Restoration generally consists of removing excess sediment, reshaping and waterbarring former approaches, and spreading slash on the former crossing.

BMP 1.6 – Protection of Unstable Lands:

Provides for special treatment of unstable areas to avoid triggering mass slope failure with resultant erosion and sedimentation.

- Tractors and mechanical harvesters will be excluded from all Riparian Reserves associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits. Hazard tree removal units are the exception. In Hazard tree units the equipment will be excluded from the inner 50 feet of the non-fish bearing Riparian Reserve, one site tree for fish bearing streams and in the perimeter of all active landslides and toe zones of dormant landslides.
- To limit slope disturbance, inner gorge terrain (greater than 65 percent slope) that extends beyond Riparian Reserves will be buffered by 20-foot slope distance and excluded from mechanical equipment activities. In areas where treatments may conflict, a hydrologist will be consulted.
- There will be no salvage logging on active landslides.
- Limit equipment disturbance within 20 feet on either side of swales by minimizing equipment crossings and avoiding running trails up the axis of swales, except at designated crossings.

BMP 1.8 – Streamside Management Zone Designation:

Designates zones adjacent to water and/or riparian areas as zones of special management. This is accomplished during the planning and layout phase of the project.

- Project Riparian Reserves are established in the following manner per the Forest Plan (site tree for Salmon and Happy Camp districts is 170 feet, site tree for Scott and Oak Knoll districts is 150 feet):
    - For fish-bearing streams, it is the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream), whichever is greatest. For Salmon and Happy Camp ranger districts, this will be 340 feet (680 feet total).
    - For permanently flowing nonfish-bearing streams, it is the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream), whichever is greatest. For Salmon and Happy Camp ranger districts, this will be 170 feet (340 feet total) and 150 feet for the Oak Knoll and Scott River Ranger District.
    - For intermittent streams, , the stream channel and extending to the top of the inner gorge, or extension from the edges of the stream channel to a distance equal to the height of one site potential tree, or 100 feet slope distance, whichever is greatest. For unstable lands, it is the extent of unstable and potentially unstable areas.
    - Consistent with Forest Plan direction, Riparian Reserves for wetlands and springs will be defined by the edge of the feature out to a distance equal to 1 site potential tree. These RRs will be flagged and avoided during salvage harvest.

BMP 1.9 – Determining Tractor Loggable Ground:

Minimize erosion and sedimentation resulting from ground disturbance of tractor logging systems.

- Ground-based harvest equipment will be limited to 35 percent slopes, except when moving from one bench to another on dormant landslide terrain. In addition, ground-based equipment can travel up to 100 feet on slopes 35 to 45 percent.
- Site preparation treatments would be designed to meet soils management direction in the KNF Forest Plan. This may include use of low ground pressure equipment, retaining slash and large woody material and implementing hand treatments instead of mechanical.

BMP 1.10 – Tractor Skidding Design:

Designates a tractor skid pattern over steepened areas, designates tractor crossings, and reduces skid patterns in sensitive areas to reduce erosion and compaction. This is accomplished during the sale layout and operations phase of the project.

- In salvage units and subsequent site preparation, skidding equipment will be restricted to slopes less than 35 percent. Skid trails that connect benches in dormant landslide terrain can have minor portions of the skid trails on slopes greater than 35 percent.
- In site preparation units (where no salvage will occur) felling and skidding equipment will be restricted to slopes less than 45 percent in non-granitic and non-schist soil types (see soils report for locations).
- Use existing skid trails instead of building new skid trails unless using existing skid trails will have greater negative effects. Space skid trails at least 75 feet apart, except near landings and where trails converge. Use no skid trails in areas in which ground-based mechanical equipment is excluded (Designation of new skid trails will be approved by a Timber Sale Administrator. Erosion and sedimentation control structure will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.
- No full bench skid trails will be constructed. Full bench skid trails have the entire skid trail cut into the hillslope.
- Locations where skid trails intersect roads will be obliterated or effectively blocked to vehicle access.

BMP 1.11 – Suspended Log Yarding in Timber Harvesting:

Protect the soil mantle from excessive disturbance; maintain the integrity of the Streamside Management Zone and other sensitive watershed areas, and to control erosion on cable corridors.

- Skyline corridors will be placed on the landscape as to minimize disturbance to active landslides, inner gorges and toe zones of dormant landslide deposits. All skyline and ground-based yarding will require one-end suspension in corridors and on skid trails. Corridors for skyline yarding that are parallel to the stream channel will be placed outside of the Riparian Reserve. The corridor may cross the stream channel with full suspension of logs within ten feet from the stream bank. Apply erosion control measures as necessary in cable corridors to control erosion and

runoff. This could include hand construction of water bars and /or spreading slash from adjacent areas.

BMP 1.12 – Log Landing Location:

Locate new landings or reuse existing landings in such a way as to avoid watershed impacts and associated water quality degradation.

- See BMP 2.4
- Existing landings will be used to the extent possible. Existing landings in stream-course Riparian Reserves will not be expanded towards stream channels, or on to active landslides, or where vegetation that provides shade to a stream would need to be cut. Existing landings in Riparian Reserves will be shaped and treated for erosion control at the end of each season of use, and hydrologically restored at project completion (including subsoiling and covering with slash/mulch as needed). Reused landings in Riparian Reserves will have site specific erosion control measures to reduce risk of sediment delivery into streams.
- During opening or construction of any landings, material will not be sidecast into intermittent or perennial stream channels.
- At project conclusion, landings will be configured for long-term drainage and stability by reestablishing natural runoff patterns. All landings will be covered with at least 50 percent effective soil cover. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient.

BMP 1.13 – Erosion Prevention and Control Measures During Timber Sale Operations:

Ensures that Purchasers operations shall be conducted reasonably to minimize soil erosion. This is accomplished during the pre-operations meeting with the purchaser, and throughout the operations phase of the timber sale.

- Erosion control measures are discussed during the pre-operations meeting with the purchaser and the Forest Service. They are updated throughout the operations phase of the timber sale.
- The Klamath Wet Weather Operation Standards (USDA Forest Service 2002) will be used for all project activities (harvest, hauling, planting).

BMP 1.16 – Log Landing Erosion Prevention and Control:

Works to reduce erosion and subsequent impacts sedimentation from log landings. Timber Sale Contract provide for erosion prevention and control measures on all landings. This is best done by design of landing drainage measures during the planning phase of the project, and implemented during the operations phase.

- See BMP 1.12.

BMP 1.17 – Erosion Control on Skid Trails:

Employs preventive measures such as drainage structures to reduce water concentration and erosion. This is accomplished during the operations phase of the project. Because of the timing of this project, pre-staging of straw bales for timely construction of water bars will be called for.

- Where skidding occurs through units with less than 50 percent soil cover, mulch skid trails of greater than 15 percent slope, to achieve at least 50 percent effective

soil cover on skid trails (approximately 40 acres across the project area may require this). Effective soil cover could include plant litter, woody material in contact with the soil, living vegetation, and rock fragments with a diameter of ½ to 3 inches. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient.

BMP 1.18- Meadow Protection during Timber Harvest:

The objective is to avoid damage to ground cover, soil and hydrologic function of meadows.

- Equipment will be excluded from wetlands or wet meadows (excluding small springs and seeps).

BMP 1.19 – Streamcourse Protection:

Protects the natural flow of streams and reduces the entry of sediment and any other pollutants into streams. The location of stream crossings must be agreed to by the Sale Administrator and the Hydrologist. The accomplishment of the objective of this measure is during the operations phase of the project.

- Tractors and mechanical harvesters will be excluded from all Riparian Reserves associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits. Hazard tree removal units are the exception. In Hazard tree units the equipment will be excluded from the inner 50 feet of the non-fish bearing Riparian Reserve, one site tree for fish bearing streams and in the perimeter of all active landslides and toe zones of dormant landslides.
- To limit slope disturbance, inner gorge terrain (greater than 65 percent slope) that extends beyond Riparian Reserves will be buffered by 20-foot slope distance and excluded from mechanical equipment activities. In areas where treatments may conflict, a hydrologist will be consulted.
- All hazard trees cut within 25 feet of a stream channel will be left on site unless it continues to pose a threat to safety or accessibility (See watershed-4 for equipment exclusion restrictions). Along fish-bearing stream reaches, all hazard trees greater than 26 inches in diameter at breast height within the first site tree (150-170 feet) will be left on site unless after felling, it continues to pose a threat to safety, infrastructure, forest road drainage system integrity or accessibility.
- Live trees directly rooted into the banks or otherwise integral to the stability of the channel bank will not be felled unless they pose an overhead hazard and, if felled, will be left on site unless this poses a hazard on the ground per Forest Service safety requirements.
- Directional felling will be used to protect streambanks where hazard trees need to be mitigated for public or employee safety.

BMP 1.20 – Erosion Control Structure Maintenance:

Requires periodic inspection of erosion control structures to assess maintenance needs and effectiveness. This is accomplished during the operations and post-operations phase of the project; this ensures the adequacy of erosion control measures.

- Skid trail erosion control work will be kept current during implementation. Erosion control and drainage of skid trails will be complete prior to shutting down operations due to wet weather or at project completion.

BMP 1.21 – Acceptance of Erosion Control Measures Before Timber Sale Closure:

Erosion control measures are inspected for adequacy to ensure erosion control as planned. This is accomplished during the post-operations phase of the project during the contract final inspection.

- At project completion, permanent operating water bars will be installed and/or repaired as necessary on all skid trails, and slash scattered on all skid trails if necessary.
- The Timber Sale Administrator will inspect the Erosion Control Measures for compliance with contract.

BMP 2.4 – Road Maintenance and Operations (Temporary Roads):

The objective is to improve road slope stabilization by applying mechanical and vegetative measures. This is accomplished during the operations phase of the project.

- New temporary roads or landings will not be constructed in any Riparian Reserve associated with stream channels, on toe zones of landslides, active landslides or inner gorges. Exceptions for this project design feature for Alternative 2: Landings # DZ03, DZ10, DZ23, L043, L044, and L090. Further exceptions may be approved if they meet the criteria described in the hydrology effects analysis.
- Following harvest activities achieve at least 50 percent effective soil cover on new temporary roads and block them after the harvest season (prior to the first winter after use). New temporary roads will also be sub-soiled (or tilled) after use.
- All temporary roads (new, existing or re-opened decommissioned roads) will have the takeoffs from system road obliterated or blocked to avoid unauthorized use. All temporary roads will be hydrologically stabilized including removal of culverts and fills at stream crossings, out-sloping of road surfaces, and proper construction of water bars. Erosion and sedimentation control structures (water bars) will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.

BMP 2.4 – Road Maintenance and Operations (System Roads)

- Improvements to existing system roads in the project area will avoid over-steepened road cuts where possible, minimize sidecasting, and maintain ditches, cross drains, and any outsloped road segments.
- Roads will be watered as appropriate to maintain road fines on site. Other materials may be used for dust abatement as approved by the Forest Service.
- Upgrades or improvements to stream crossings will be built to Forest Plan standards.
- Activities which require culvert replacement or removal will occur during the least critical periods for water and aquatic resources: when streams are dry or during low-water conditions; and in compliance with spawning and breeding season restrictions.

- Legacy sediment site treatments within or adjacent to streams will have erosion-prevention techniques applied such as silt fences, straw waddles, or mulch to minimize the risk of discharge.

  All project-related temporary structures, materials and project-related debris will be removed from riparian areas and stream channels prior to winter shutdown.
  For legacy sediment site repairs, fill materials generated will be reincorporated back into subgrade to the extent possible; all excess fill materials will be spoiled at a site reviewed and approved by Forest Service botanist, watershed, and heritage specialists.

BMP 2.5 - Water Source Development Consistent with Water Quality Protection:

The objective is to limit and mitigate the effects of water source development through the planning of impoundments and withdrawals.

Draft water only at sites designated by the Forest Service.

- When drafting from waters designated as coho salmon Critical Habitat: NOAA Fisheries Water Drafting Specifications (2001) apply
- Intakes will be screened with 3/32" mesh for rounded or square openings, or 1/16" mesh for slotted openings. When in habitat potentially occupied by steelhead trout, intakes will be screened with 1/8" mesh size. Wetted surface area of the screen or fish-exclusion device shall be proportional to the pump rate to ensure that water velocity at the screen surface does not exceed 0.33 feet/second.

  1. Use of a NOAA approved fish screen will ensure the above specifications are met.
  2. Fish screen will be placed parallel to flow.
  3. Pumping rate will not exceed 350 gallons-per-minute or 10 percent of the flow of the anadromous stream drafted from.
  4. Pumping will be terminated when tank is full.
  5. Additional applicable specifications:
  6. There will be no modification/improvement of drafting sites in Coho Critical Habitat.

- Water drafting by more than one truck shall not occur simultaneously.
- When drafting from waters that are not coho salmon Critical Habitat, but do contain fish:

  1. For fish-bearing streams, the water drafting rate should not exceed 350 gallons per minute for streamflow greater than or equal to 4.0 cubic feet per second (cfs).
  2. Below 4.0 cfs, drafting rates should not exceed 20 percent of surface flows.
  3. Water drafting should cease when bypass surface flows drop below 1.5 cfs.
  4. Intakes, for trucks and tanks, shall be placed parallel to the flow of water and screened, with opening size consistent with the protection of aquatic species of interest.
  5. Fish-bearing streams that are temporarily dammed to create a drafting pool shall provide fish passage for all life stages of fish.
  6. When drafting from non-fish-bearing waters:
  7. Drafting rate should not exceed 350 gallons per minute for stream flow greater than or equal to 2.0 cubic feet/second.

8. Drafting rate should not exceed 50 percent of surface flow.
9. Drafting should cease when bypass surface flow drops below ten gallons per minute.
10. Drafting by more than one truck shall not occur simultaneously.

- Rock and gravel will be applied to drafting sites if it is needed to prevent stream sedimentation.
- Water drafting sites located in non-fish-bearing waters only may include minor instream modification, such as fine sediment removal and building of board/plastic dams. All boards and plastic will be removed after use.
- Water drafting sites located within fish-bearing stream segments may not be modified, except rocking the approach to prevent sedimentation.

BMP 2.11 - Servicing and Refueling of Equipment:

Prevent fuels, lubricants, cleaners, and other harmful materials from discharging into nearby surface waters or infiltrating through soils to contaminate groundwater resources.

- Refueling will not take place within Riparian Reserves except at designated landings in locations where most disconnected from water resources. A spill containment kit will be in place where refueling and servicing take place.

BMP 2.13 – Erosion Control Plan:

Effectively limit and mitigate erosion and sedimentation from any ground-disturbing activities, through planning prior to commencement of project activity, and through project management and administration during project implementation.

- An Erosion Control Plan will be completed prior to project implementation.
- The Forest's Wet Weather Operations Standards are included in the Erosion Control Plan.

BMP 5.2 – Slope Limitations for Mechanized Equipment Operations:

The objective is to reduce gully and sheet erosion and associated sediment production by limiting tractor use.

- See BMP 1.9 and 1.10.

BMP 5.5 – Disposal of Organic Debris:

The objective is to prevent gully and surface erosion with associated reduction if sediment production and turbidity during and after treatment.

- During site preparation, material greater than 8’’ inches in diameter would not be removed unless needed to reduce 1,000 hour fuel loading to 7 tons per acre, retain as close to 7 tons per acre as possible.

BMP 5.6 – Soil Moisture Limitations for Mechanical Equipment Operations:

The objective is to prevent soil compaction, rutting, and gulling that may result in increased sedimentation and turbidity.

- All ground based equipment will follow the Wet Weather Operation Standards.

BMP 6.3 Protection of Water Quality from Prescribed Burning Effects:

The objective is to maintain soil productivity; minimize erosion; minimize ash, sediment, nutrients, and debris from entering water bodies.

- Prescribed fire effects in Riparian Reserves will mimic a low intensity backing fire, except for handpiles where higher intensity may occur to consume pile material. Ignition of underburns will generally not occur in Riparian Reserves. Approval by the District Fish Biologist is needed for underburn Riparian Reserve ignitions.
- Handpiles and windrows in Riparian Reserves will be placed in a checkerboard pattern whenever possible (not piled directly above another). Handpiles will be less than 6 feet in diameter and will be more than 15 feet away from intermittent streams and 30 feet away from perennial streams.
- For underburning, hand-line construction in riparian vegetation shall be avoided and in general should be farther than 25 feet from stream channels. Handlines will be mitigated (waterbarred and covered with organic material) immediately following prescribed burning, when safe to do so.

References for Best Management Practices

USDA Forest Service. 2013c. Klamath National Forest Best Management Practices Evaluation Program: Water Quality Monitoring Report 2013. Klamath National Forest, Yreka, CA. Retrieved from http://www.fs.usda.gov/detail/klamath/landmanagement/resourcemanagement/?cid=stelprdb5312713 on June 6, 2014.

USDA Forest Service. 2011. Soil and Water Conservation Handbook. Chapter 10 – Water Quality Management Handbook.

USFS. 2002. Wet Weather Operating Standards. Klamath National Forest, Region 5. US Forest Service.

Appendix F: Life History and Biological Requirements

Coho Salmon

General life history information and biological requirements of Southern Oregon/Northern California Coastal (SONCC) Coho salmon have been described in various documents (Hassler 1987; Sandercock 1991; Weitkamp, *et al*. 1995) as well as NOAA-Fisheries' final rule listing SONCC Coho salmon (May 6, 1997; 62 FR 24588).

Coho salmon enter the mainstem of the Klamath River for spawning typically in their third year, primarily between September and December, with a peak in October (NFMS 2007). Over most of this interval, mainstem flows below Iron Gate Dam often are high (ca. 2500-3000 cfs: NMFS 2001). Thus, standard methods for observing and counting spawning fish are not easily applied, and the size of the spawning population is unknown. Approximations put the entire ESU at about 10,000 spawning Coho salmon of non-hatchery origin per year (Weitkamp, *et al*. 1995), of which only a small portion is associated with the Klamath Basin, where several important tributary runs have been reduced to a handful of individuals (NMFS 2001, 2007). Although a minor amount of spawning and growth may occur in the mainstem, the mainstem serves adults primarily as a migration route (NFMS 2007).

Spawning occurs from November to January (Hassler 1987) in the tributaries to the Klamath River, but occasionally as late as February or March (Weitkamp, *et al*. 1995). Coho salmon eggs incubate for 35-50 days between November and March. Successful incubation depends on several factors including dissolved oxygen levels, temperature, substrate size, amount of fine sediment, and water velocity. Fry start emerging from the gravel two to three weeks after hatching and move into shallow areas with vegetative or other cover. As fry grow larger, they disperse up or downstream. In summer, Coho salmon fry prefer pools or other slower velocity areas such as alcoves, with woody debris or overhanging vegetation. Juvenile Coho salmon over-winter in slow water habitat with cover as well. Juveniles may rear in fresh water for up to 15 months then migrate to the ocean as smolts from March to June (Weitkamp, *et al.* 1995). Coho salmon adults typically spend two years in the ocean before returning to their natal streams to spawn as three-year olds.

Available historical and most recent published Coho salmon abundance information are summarized in the NOAA-Fisheries coast-wide status review (Weitkamp, *et al*. 1995). The rivers and tributaries in the California portion of this ESU were estimated to have average recent runs of 7,080 natural spawners and 17,156 hatchery returns, with 4,480 identified as native fish occurring in tributaries having little history of supplementation with non-native fish. However, limited information exists regarding Coho salmon abundance in the Klamath River basin. What information exists [CDFW unpublished data; U.S. Fish and Wildlife Service (USFWS) unpublished data] suggests adult populations are small to nonexistent in most years. The decline of SONCC Coho salmon across the ESU is not the result of one single factor, but rather a number of natural and anthropogenic factors that include dam construction, instream flow alterations; land use activities coupled with large flood events, fish harvest and hatchery effects.

Garwood, J. 2012. Historic and recent occurrence of Coho salmon (*Oncorhynchus kisutch*) in California streams within the Southern Oregon/Northern California Evolutionarily Significant Unit. Fisheries Branch Administrative Report, 2012-03. California Department Fish and Wildlife, Arcata, CA. 77 p.

Salmon River Restoration Council (SRRC). 2005. Salmon River Coho salmon presence/absence and refugia use assessment summary. Unpub. data.

Chinook Salmon

The following information was excerpted or summarized from NMFS status review of Chinook salmon (Meyers, *et al.* 1998). Chinook salmon mature between 2 and 6+ years of age (Meyers, *et al.* 1998). Fall-run Chinook salmon enter freshwater at an advanced stage of maturity, move rapidly to their spawning areas on the mainstem or lower tributaries of the rivers, and spawn within a few days or weeks of freshwater entry (Healey 1991). Incubation temperature for eggs is 5.0 to 14.4°C, with below 13.0°C preferred for optimal development in most stocks (McCullough 1999). Emerging fry generally do not develop normally above 12.8°C (McCullough 1999). Post-emergent fry seek out shallow, nearshore areas with slow current and good cover, and begin feeding on small terrestrial and aquatic insects and aquatic crustaceans. Once feeding, the optimal growth range for juveniles is 10.0 to 15.6°C, with fingerlings preferring to hold at 12 to 14°C (McCullough 1999). In preparation for their entry into a saline environment, juvenile salmon undergo physiological transformations known as smoltification that adapt them for their transition to salt water. For Chinook salmon, the recommended maximum temperature to maintain migratory response and seaward adaptation is 12.0°C; and at temperatures greater than 13.0°C, some physiological processes of smolting may be delayed, and, in extreme cases, reversed (McCullough 1999). Chinook salmon spend between one and four years in the ocean before returning to their natal streams to spawn (Meyers, *et al*. 1998). Chinook salmon addressed in this document exhibit an ocean-type life history, and smolts out-migrate predominantly as subyearlings, generally during April through July. Chinook salmon spend between 2 and 5 years in the ocean (Healey 1991), before returning to freshwater to spawn. Some Chinook salmon return from the ocean to spawn one or more years before full-sized adults return.

The UKT ESU includes fall- and spring-run Chinook salmon in the Klamath and Trinity River Basin upstream of the confluence of the Klamath and Trinity rivers. Historically, spring-run Chinook salmon were probably the predominate run. This ESU still retains several distinct spring-run populations, albeit at much reduced abundance levels. Fish from this ESU exhibit an ocean-type life history; however genetically and physically, these fish are quite distinct from coastal and Central Valley Chinook salmon ESUs. Genetic analysis indicated that this ESU form a unique group that is quite distinctive compared to neighboring ESUs. The majority of spring- and fall-run fish emigrate to the marine environment primarily as subyearlings, but have a significant proportion of yearling smolts. Recoveries of coded wire tags indicate that both runs have a coastal distribution off the California and Oregon coasts. The 2011 fall-run Chinook salmon run into the Klamath River system, as compiled by CDFW, was estimated to be 188,845 fish (103,005 adult and 85,840 grilse) (CDFW 2012). This is 154% of the 1978-2011 mean run total of 122,510 fish. Of the 110,554 basin-wide natural spawners (i.e., not of hatchery origin), 5,493 were from the Salmon River and 5,515 from the Scott River. The Klamath River run in 2013 was projected to be above recent historical average (KRTT 2013).

North Fork Salmon River – Chinook Surveys

Chinook are present in the NF Salmon River, inclusive the Project area (~River Mile 4 to Mile 16).

Spawning surveys targeting Chinook have occurred on the NF Salmon River in the Project area since 1980, with fish and/or redds reported most years. Focus has primarily been on the fall-run, although some surveys have happened early enough (September through early-October) to

captured spring-run Chinook. Also, spring Chinook are routinely reported during the annual spring Chinook/summer steelhead dive event (late-July or early-August) since 1990.

A 2005 survey of thermal refugia of the NF Salmon River found Chinook juveniles at the mouth of the following tributaries between Forks of Salmon and Jackass Gulch (downstream to upstream): Big Creek, Olsen Gulch, Jones Gulch, Cronan Gulch, Little North Fork Salmon River, Shiltos Creek, and Jackass Gulch (SRRC 2005).
*Location restricted to general Project area (River Mile 4 to Mile 16)
*Query performed on 2/3/2014

- See project record for expanded datasets referred in summary
- Chinook distribution maps include the NF Salmon River in the Project area

Live/Dead Fish Count

- CalFish records available (8): 91145, 91170, 91518, 91519, 91522, 91523, 91526, 91527
    - Inclusive years (all datasets): 1980-1985, 1988, 1989, 1990-2005
- Summary: Chinook recorded in all years, except 1983 and 1984 (no surveys)

Redd Count

- CalFish records available (1): 91073
    - Inclusive years (all datasets): 1971, 1972, 1978, 1980, 1981, 1983-1994
- Summary: Redds recorded all years

Unpublished data and/or field notes from: 1985-2013

Salmon River Restoration Council (SRRC). 2005. Salmon River Coho salmon presence/absence and refugia use assessment summary. Unpub. data.

Steelhead

Biologically, steelhead can be divided into two basic run-types, based on the state of sexual maturity at the time of river entry and duration of spawning migration (Moyle 2002). The stream-maturing type, or summer steelhead, enters fresh water in a sexually immature condition and requires several months in freshwater to mature and spawn. The ocean-maturing type, or winter steelhead, enters fresh water with well-developed gonads and spawns shortly after river entry (August 9, 1996, 61 FR 41542; Barnhart 1986). South of Cape Blanco, Oregon, summer steelhead are known to occur in the Rogue, Smith, Klamath, Trinity, Mad, and Eel rivers, and in Redwood Creek (Busby, *et al.* 1996).

Winter steelhead in California enter fresh water after rivers rise in response to fall/winter rains, typically from December through March, with a peak in January and February, with spawning soon after reaching the breeding grounds (Moyle 2002). In contrast, summer steelhead enter systems as flows taper off in the spring, then spawn the following winter (Moyle 2002). Steelhead require a minimum depth of 0.18 m and a maximum velocity of 2.44 m/s for active upstream migration (Smith 1973). Spawning and initial rearing of juvenile steelhead generally take place in small, moderate-gradient (generally 3-5%) tributary streams (Nickelson, *et al*. 1992). A minimum depth of 0.18 m, water velocity of 0.30-0.91 m/s, and clean substrate 0.6-10.2 cm (Nickelson, *et al*. 1992) are required for spawning. Steelhead spawn in 3.9-9.4°C water (Bell 1991). Depending on water temperature, steelhead eggs may incubate for 1.5 to 4 months (August 9, 1996, 61 FR 41542) before hatching, generally between February and June (Bell 1991). After two to three weeks, in late spring, and following yolk sac absorption, alevins emerge from the gravel and begin actively feeding. After emerging from the gravel, fry usually inhabit shallow water along banks of perennial streams. Fry occupy stream margins (Nickelson, *et al*. 1992). Summer rearing takes place primarily in the faster parts of pools, although young-of-the-year are abundant in glides and riffles. Winter rearing occurs more uniformly at lower densities across a wide range of fast and slow habitat types. Productive steelhead habitat is characterized by complexity, primarily in the form of large and small wood. Some older juveniles move downstream to rear in larger tributaries and mainstem rivers (Nickelson, *et al*. 1992). Steelhead prefer water temperatures

ranging from 12-15°C (Reeves *et al*. 1987). Juveniles live in freshwater from one to four years (usually two years in the California ESUs), then smolt and migrate to the ocean in March and April (Barnhart 1986). Winter steelhead populations generally smolt after two years in fresh water (Busby, *et al*. 1996).

The KMP steelhead ESU occurs in coastal river basins between the Elk River in Oregon and the Klamath River in California, inclusive. The KMP steelhead ESU contains populations of both winter and summer steelhead. The Rogue and Klamath River basins are distinctive in that they are two of the few basins producing "half-pounder" steelhead. In 2001, NOAA-Fisheries reconsidered the status of KMP steelhead under the ESA (66 FR 17845, April 4, 2001) and determined that KMP steelhead do not warrant listing as threatened or endangered at this time.

In California, the largest proportions of naturally spawning hatchery fish are believed to occur in the Trinity River, where estimates from 1990s range from 20-70 percent hatchery. These estimates apply to fall-run fish. Because the hatchery program in the Trinity River basin propagates mostly fall-run fish, natural spawners in this basin that return at other times are believed to be predominantly of natural origin. Counts at Willow Creek weir provide an estimate of about 2000 natural origin fall-run spawners per year. The Willow Creek weir samples steelhead only over a period of about 3 months during the fall run and thus provides no information about other runs in the basin. CDFW biologists estimated natural escapement in the California portion of the ESU to be approximately 30,000-50,000 adults per year.

CH for Coho Salmon (and) EFH for Coho/Chinook Salmon

Designated CH (CH) for Coho salmon encompasses accessible reaches of all rivers (including estuarine areas and tributaries) between the Mattole River in California and the Elk River in Oregon, inclusive (May 5, 1999, 64 FR 24049). The area described in the final rule represented the current freshwater and estuarine range of Coho salmon. Land ownership patterns within the Coho salmon ESU analyzed in this document and spanning southern Oregon and northern California are 53% private lands; 36% Federal lands; 10% State and local lands; and 1% Tribal lands. The Forest Service manages about 1,680,000 acres (90.6%) of land within the Forest boundaries and about 200,000 acres (9.4%) of land are within the Forest boundaries but in other ownership (LRMP, Page 3-12). EFH (EFH) is considered for both Coho and Chinook salmon, with consultation occurring under 305 (b) (4) (A) of the Magnuson-Stevens Fishery Conservation and Management Act. The definition of Coho/Chinook EFH components and extent is described by Amendment 14 (Appendix A, pages 12-35 [adopted year 2000]) of the 1978 Pacific Fisheries Management Council Salmon Fisheries Management Plan.

Conclusions regarding CH and EFH occurrence are based on field review of habitat suitability, professional judgment, District fish survey records, and California Department of Fish and Wildlife (CDFW) information. In general, the KNF Coho Presence (GIS) layer defines CH, and Coho or Chinook distribution (whichever is of maximal extent) defines EFH. As appropriate, the California state information in Calfish.org may also be utilized. Where information on Coho or Chinook is lacking (e.g., no/few surveys have been completed), else it is the professional judgment of the Fish Biologist that neither KNF nor Calfish.org range maps fully capture CH/EFH extent, the KNF Steelhead Trout Distribution (GIS) layer may be used as a proxy for maximum range of anadromous fishes. This dataset is recognized as a conservative approach for assessment of effects to anadromous fish habitat because Coho and Chinook salmon may not occupy the same waters as steelhead due to differences in jumping abilities. The maximum jumping height (under ideal conditions) for Coho is 2.2 meters; Chinook salmon is 2.4 meters; and steelhead is 3.4 meters (Meehan 1991). Therefore, steelhead trout can access more habitat than Coho or Chinook salmon (i.e., steelhead trout can make a 3-meter jump to migrate up a stream, but Coho and Chinook salmon cannot.). Additionally, differences in spawn timing may also affect actual distribution. As an example, steelhead spawn in the spring, encountering higher discharge conditions than Chinook, which spawn in the fall. In consequence, Chinook may be denied access to streams, or segments thereof, due to the presence of low-water barriers that are passible to steelhead during spring flows.

In all cases, field review and site-specific surveys may refine the location of CH or EFH.

Map A-X shows the distribution of CH and EFH the Action Area and Analysis Area. This map is based on fish distribution with site-specific changes made per professional fisheries biologist knowledge, stream surveys, or CDFW data. Although Field review, survey history, and CalFish.org generally agree concerning known Coho and Chinook presence in the Project area, lack of survey data means the existing range maps may not fully capture actual extent within the NF Salmon River tributaries.

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Appendix G: Summary of Project Element Effects to Coho Salmon, and Critical Habitat, by 2014 Fire Area

Beaver Fire

Beaver-Project element	Direct Effects to Coho Salmon	Indirect and Cumulative Effects to Coho Salmon and Critical Habitat			
		Sediment	**Water Quality**	**Riparian Function**	**Beneficial Effects**
Salvage and Reforestation 350 acres salvage; 1,782 acres site prep and plant	No effect	Minor effects due to small acreage treated; effects would add to elevated sediment conditions in Beaver, Doggett, and Kohl creeks which are heavily disturbed due to 2014 fires and private timber harvest (green and salvage)	Minor effects due to small acreage treated; insignificant effects due to project design	No effect because none is proposed in RR	Reduction of heavy fuels and planting will allow for quicker recovery of late seral vegetation on acres treated and the likely severity of future fires impacts are reduced, especially when fires occur greater than 5 years into the future
Fuels Reduction	No effect	Minor and insignificant due to low level of ground disturbance involved and project design	Minor and insignificant effects due to project design	Minor and insignificant due to project design	Reducing accumulations of dead and live fuels will mimic and promote the natural role of fire in the ecosystem
Hazard Tree Removal	No effect	Minor and insignificant effects due to project design	Minor and insignificant effects due to project design	Approximately 7 miles along CH would be affected; Minor and insignificant effects due to project design	None
Roads, Landings, and Water Drafting	Roads and Landings: no effect Water Drafting: minor short term effects related to disturbance; project design feature that requires coordination with KNF fisheries biologists when determining where water drafting will occur is critical to avoiding adverse effects to salmonids relying upon thermal refugia during base flows	Roads: no temporary road stream crossings, only 1.2 miles of road on existing roadbed outside of RR Landings: no new landings in RR Water Drafting: insignificant effects due to project design			None
Legacy Sediment Sites	No effect (none treated)				

Happy Camp Fire

Happy Camp-Project element	Direct Effects to Coho Salmon	Indirect and Cumulative Effects to Coho Salmon and Critical Habitat			
		Sediment	**Water Quality**	**Riparian Function**	**Beneficial Effects**
Salvage and Reforestation 8,728 acres salvage; 5,437 acres site prep and plant	No effect	Minor and insignificant effects due to project design	Minor and insignificant effects due to project design	No effect because none is proposed in RR	Lop and scatter hand treatments in RR would benefit 1,100 acres; Reduction of heavy fuels and planting will allow for quicker recovery of late seral vegetation on acres treated and the likely severity of future fires impacts are reduced, especially when fires occur greater than 5 years into the future
Fuels Reduction	No effect	Minor and insignificant effects due to low level of ground disturbance involved and project design	Minor and insignificant effects due to project design	Minor and insignificant effects due to project design	Reducing accumulations of dead and live fuels will mimic and promote the natural role of fire in the ecosystem
Hazard Tree Removal	No effect	Minor and insignificant effects due to project design	Minor and insignificant effects due to project design	Approximately 13 miles along CH would be affected; Minor and insignificant effects due to project design	None

Happy	Direct	Indirect and Cumulative Effects to Coho Salmon and Critical Habitat			
Roads, Landings, and Water Drafting	Roads and Landings: no effect Water Drafting: minor short term effects related to disturbance; project design feature that requires coordination with KNF fisheries biologists when determining where water drafting will occur is critical to avoiding adverse effects to salmonids relying upon thermal refugia during base flows	Roads: temporary road crossings would result in short term site level effects nine sites in tributaries above fish bearing habitat in Grider Creek, Cliff Valley Creek, and China Creek; effects to Critical Habitat would be insignificant; Landings: see riparian function; Water Drafting: insignificant effects due to project design	Minor and insignificant effects due to project design	Minor and insignificant effects due to project design; Landings: six new landings in RR were approved for use because potential risks to nearby aquatic habitat were minimized during project design so that meaningful effects to aquatic habitat are not likely; effects to Critical Habitat would be insignificant	None
Legacy Sediment Sites	No effect due to project design	All together these actions will result in meaningful beneficial effects in terms of aquatic organism passage (outside of Critical Habitat), habitat connectivity at crossings, and significant reduction in potential future sediment-related impacts from roads in Doolittle, Cougar, East Fork Elk, and mainstem Elk creeks. Approximately 17 miles of stream habitat, most within Critical Habitat, would benefit from these actions. The passage of aquatic organisms and watershed products down to Critical Habitat, would be improved in Malone, Twin, and Upper Elk creeks. Site level beneficial effects would also result from project use, and treatment of legacy sediment sites, on several temporary roads (46N41YA in lower Grider Creek, and temporary roads on existing roadbeds near the bottom of Kuntz and O'Neil creeks). These long term beneficial effects would occur on approximately 1.5 miles of stream habitat, above Critical Habitat, in Grider, Kuntz, and O'Neil creeks.			

Whites Fire

Whites-Project element	Direct Effects to Coho Salmon	Indirect and Cumulative Effects to Coho Salmon and Critical Habitat			
		Sediment	**Water Quality**	**Riparian Function**	**Beneficial Effects**
Salvage and Reforestation 741 acres salvage; 654 acres site prep and plant	No effect	Minor and insignificant effects due to project design	Minor and insignificant effects due to project design	No effect because none is proposed in RR	Lop and scatter hand treatments in RR would benefit about 127 acres; Reduction of heavy fuels and planting will allow for quicker recovery of late seral vegetation on acres treated and the likely severity of future fires impacts are reduced, especially when fires occur greater than 5 years into the future
Fuels Reduction	No effect	Minor and insignificant effects due to low level of ground disturbance involved and project design	Minor and insignificant effects due to project design	Minor and insignificant effects due to project design	Reducing accumulations of dead and live fuels will mimic and promote the natural role of fire in the ecosystem
Hazard Tree Removal	No effect	Minor and insignificant effects due to project design	Minor and insignificant effects due to project design	Approximately 8 miles along CH would be affected; Minor and insignificant effects due to project design	None
Roads, Landings, and Water Drafting	Roads and Landings: no effect Water Drafting: minor short term effects related to disturbance; project design feature that requires coordination with KNF fisheries biologists when determining where water drafting will occur is critical to avoiding adverse effects to salmonids relying upon thermal refugia during base flows	Roads: no temporary road stream crossings Landings: one new landing in RR was approved for use because potential risks to nearby aquatic habitat were minimized during project design so that meaningful effects to aquatic habitat are not likely; effects to Critical Habitat would be insignificant Water drafting: Minor and insignificant effects due to project design			None
Legacy Sediment Sites	No effect (none treated)				

Amendment to the Biological Assessment Submitted June 19, 2015

KNF – Westside Fire Recovery Project

Fisheries ESA consultation – Biological Assessment Addendum 6/19/15

This document summarizes how the Westside Fire Recovery Project (Project) action has evolved from what is proposed and analyzed in the 4/13/15 Biological Assessment (BA), received by NMFS on 4/16/2015. This document will also provide further clarification of several project design and effects analysis considerations contained in the original Project BA. As part of ongoing Project interdisciplinary team analysis, including consultation with USFWS and further economic and feasibility evaluations, there has been both a reduction in Project acreage to be included and an increase in resource protection measures since submittal of the original Project BA. Both singly, and cumulatively, these revisions reduce anticipated Project effects on SONCC Coho salmon and their CH when compared to effects anticipated from the Project as analyzed in the 4/13/15 BA. Changes will be discussed in the following categories:

1. Specific salvage and site prep and plant Project treatment units were deleted or reduced in size, including deletion of any associated temporary roads and landings;
2. Changes to specific project design features (increased protection measures);
3. Reduction in the extent of proposed roadside hazard tree removal and further restrictions on felling/removal and ground-based equipment in Riparian Reserves (RR);
4. Clarifications related to project design in Riparian Reserves (RR) and cumulative watershed effects modeling; and
5. Inclusion of a strategy for USFS/NMFS/Karuk cooperative Project monitoring.

Reduction in Project Unit Footprint

During further analysis as part of consultation with USFWS, some units (both salvage harvest units and site prep and plant units) were deleted from the Project, or reduced in size due to considerations related to Northern Spotted Owl. Also, some units were dropped due to economic and other feasibility considerations. Table 1 in the Fisheries BA displays the acres of salvage harvest and site prep and plant proposed. Below is an update of this table, showing where acreage is reduced in the updated consultation action. Relative to the Project Environmental Impact Statement (EIS), the consultation action analyzed in the 4/13/15 Fisheries BA is the same as Modified Alternative 2; this addendum updates the consultation action (referred to here as the updated consultation action) to make it the same as the action analyzed in the EIS as Modified Alternative 3. Based on these unit deletions and reductions in size, the total Project area subject to salvage harvest is now 5,627 acres.

Table 1. Updated Table 1 from 4/13/15 BA.

	Beaver Fire	Happy Camp Complex	Whites Fire	Grand Total
Site Prep and Plant	1,661	4,918	556	7,135
Logging System				
Ground-based	0	490	40	529
Skyline	0	3,200	210	3,409
Helicopter	0	2,519	438	2,956
Total	0	6,208	687	6,895
Watershed PDFs	Wet weather operations PDF-1; Skid trail and erosion control: PDFs 2, 7, 8, 10, 27, 28, 29, 30 and 32; Tractor harvest limitations: PDFs 3,4,7,9,12,14 and 26; Cable harvest limitations PDFs 3, 6 and 31.			
Total Acres of RRs within Harvest Units, which will be excluded from salvage harvest.	1,268			

Changes to Project Design Features

As part of completing an analysis to ensure Project consistency with the Forest Plan, several project design features (PDF) were refined to provide more protection to riparian and aquatic resources, including SONCC coho salmon and their designated critical habitat (CH). The updated PDFs are as follows (new text shown in *italics*): Watershed-4 (related to equipment in RR), Watershed-12 (related to hazard tree removal), and a Wildlife PDF that has been added to further restrict removal of live trees during roadside hazard operations. That new Wildlife PDF is: "*Trees without fire damage will not be felled unless they are an immediate hazard.*" Another PDF, Watershed-6, was updated to provide more information on geologic features in specific units. The three updated watershed PDFs are:

Updated Watershed-4

Tractors and mechanical harvesters will be excluded from all RR associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits. *During roadside hazard tree removal actions within RR, ground based equipment will not leave the road.*

Updated Watershed-6

There will be no salvage logging on active landslides *or toe zones of dormant landslides except for units 5, 23, 32, 39, 55, 56, 57, 59, 64, 226, 268, 406, 520, 524, 525, and 530 which have been field reviewed by the Forest Geologist (see Geology amendment for details on criteria for exceptions).*

Updated Watershed-12

All hazard trees cut within 25 feet of a stream channel *or spring* will be left on site unless they continue to pose a threat to safety or accessibility (see Watershed-4 for equipment exclusion restrictions). *Along all stream channels (perennial and intermittent),* all hazard trees 26 inches diameter at breast height (dbh) or greater that are within the first site tree distance (150-170 feet) of any stream channel will be left on site unless after felling, they continue to pose a threat to safety, infrastructure, forest road drainage system integrity or

accessibility. *Any hazard tree (equal or greater than 26 inches dbh) below a road that would contact a fish bearing stream channel if felled that direction will be retained on site.*

Changes to Proposed Roadside Hazard

Additional field reconnaissance provided more information on where fire-killed roadside hazard trees would be removed. The Forest deleted from roadside hazard removal any areas that were not directly affected by the 2014 fires. Also, any roads that would need substantial work to again be drivable were dropped from hazard tree removal. As described above, a PDF was updated to prohibit equipment from leaving the road during roadside hazard removal within RR. Six maps covering the entire Project are included at the end of this document and display the reduced extent of roadside hazard in this updated consultation action.

Clarifications

During consultation, several topics were raised that the level 1 team believes may not have been sufficiently clear in the 4/13/15 Fisheries BA.

- Cumulative watershed effects modeling (CWE) output did not exclude RR acreage from salvage harvest treatment units (1,268 acres), which will, in fact, be avoided during all Project salvage harvest; therefore effects related to watershed disturbance are over-estimated in CWE modeling;
- Riparian Reserves associated with geologic features are included in the Project in the following manner:
    1) Stream course RR – no salvage harvest
    2) Inner gorge (not associated with annual scour stream channel) – no salvage harvest
    3) Active landslides – no salvage harvest*
    4) Toe zones of dormant slides – no salvage harvest*
    5) Severely weathered/highly dissected granitic lands where they do not overlap with numbers 1-4 above - yes, included for salvage

*There are several exceptions that were field approved for proposed salvage/replanting by the Project geologist, because they showed no indication of movement for at least 10 years and have vegetation conditions that would benefit from planting. These exceptions are generally small in size and many are road fill failures/slips which have been extensively mapped, especially in Walker Cr drainage; the largest is a toe zone area within helicopter Unit 32 which face drains to the Klamath River (see Table 2 below). All exceptions are skyline or helicopter, no ground based exceptions were considered.

Table 2. Exceptions listed in updated Watershed-6 PDF.

Fire area	7th field NAME	Unit #	Acres of Active LS or Toe Zone with Salvage and Planting
HC	Upper Grider Creek	520	0.04
HC		524	0.5
HC		525	0.5
HC	Cliff Valley Creek	226	0.4
HC	Lower Grider Creek	268	0.1

Fire area	7th field NAME	Unit #	Acres of Active LS or Toe Zone with Salvage and Planting
HC		56	1.0
HC		64	0.4
HC	Tom Martin Creek- Klamath River	32	18.0 17 of these acres are one toe zone
HC	O'Neil Creek	5	0.07
HC	Walker Creek	23	2.3
HC		55	3.6
HC		57	0.1
HC		59	1.6
HC	Tompkins Creek	530	1.1
HC	Franklin Gulch-Scott River	39	1.0
Whites	Music Creek	406	0.08

Added Strategy for Interagency and Tribal Project Monitoring

As part of the Project consultation, the Forest, NMFS, and Karuk Tribe jointly developed a strategy to monitor implementation of Project elements that have the greatest likelihood of impacting SONCC coho salmon and other salmonids. Pre Project, the group will monitor the hazard tree mark where it is proposed near SONCC coho salmon CH; during the Project (especially June-Sept) all parties will share information about where Project water drafting is occurring, jointly monitor those water drafting actions, and help Forest Service Representatives decide where to shift Project water drafting so that impacts to SONCC Coho salmon and its CH are not adverse; also during the Project, the Forest Service and NMFS level 1 team will coordinate in closer monitoring of the status of ground disturbing actions if/when operations are occurring outside of the Normal Operating Season (NOS) or within the NOS during wet weather - to ensure compliance with Forest Service Best Management Practices and Wet Weather Operations standards.

Hazard Tree Mark

As described in the BA, roadside hazard tree removal is proposed in relatively close proximity to SONCC Coho salmon CH along several reaches of the following streams:
Beaver Cr, Walker Cr, Grider Cr, China Cr, Little Horse Cr, East Fork Elk Cr, Cougar Cr, Tompkins Cr, North Russian Cr, North Fork Salmon River, and Whites Gulch.
Prior to implementation of roadside hazard tree removal, the hazard tree mark downslope of roads adjacent to these creeks will be checked by fisheries biologists working for Forest Service, NMFS, or Karuk Tribe.

- Beaver Cr – Forest Service review on 6/5/15 confirmed that there are no hazard trees in close proximity to Coho CH in Beaver Cr, including West Fork Beaver Cr. Forest Service timber staff confirmed that Project timber sales of hazard trees do not include trees along the mainstem and West Fork Beaver Cr;
- East Fork Elk Cr - Forest Service and NMFS level 1 team reviewed hazard tree marking on 6/9/15 and confirmed that trees in close proximity to Coho CH have been marked according to description;
- Tompkins Cr – Forest Service review on 6/12/15 confirmed that trees in close proximity to Coho CH have been marked according to description; and
- The remaining creeks listed will be checked for appropriate hazard tree marking by July 15.

Water Drafting

The Fisheries BA identifies all the water drafting locations within the most current KNF GIS layers, and project design features related to where, and the manner in which, water is drafted. As part of designating water drafting sites for timber sale operations, Forest Service fisheries biologists will be involved in the process in determining where water will be drafted. Especially during June through September, Forest Service fisheries biologists will coordinate with NMFS and Karuk fisheries biologists about where Project-related water drafting is occurring, and this water drafting will be monitored by fisheries biologists working for Forest Service, NMFS, or Karuk Tribe.

Wet Weather Operations Monitoring

Starting in the fall when wet weather is forecast, the Level 1 team will coordinate with timber sale administrators to track what ground disturbing actions are ongoing. At least once a month during the months outside of the NOS, the level 1 team will meet with timber staff and will schedule field visits to ongoing Project actions accordingly. These updates will identify where delayed or unfinished Project operations may pose erosion risks; and assess the likelihood that Project sediment mobilization and/or erosion impacts has exceeded, or is expected to exceed, wet weather operation standards. As described in wet weather operations standards, immediate action will be taken to hydrologically stabilize Project areas with erosion risks, to avoid or minimize sediment mobilization.

Reduction in Effects to SONCC Coho Salmon and CH

The proposed action includes five Project Elements:

- Salvage and Reforestation
- Fuels Reduction
- Hazard Tree Removal
- Temporary Roads, Landings and Water Drafting
- Legacy Site Treatments

Changes to the proposed action, as described above, result in a reduction of potential effects to SONCC Coho salmon and CH related to the following Project Elements: salvage and reforestation, temporary roads and landings, and hazard tree removal.

Salvage and Reforestation

Project units have been reduced by about 3,000 acres, distributed across the project area. The following table updates Table 2 of the Fish BA.

Table 3. Updated Table 2 of 4/13/15 Fisheries BA, showing proposed salvage acreage by watershed.

5th Field Watershed	Proposed Salvage Acres 4/13/15 BA	Proposed Salvage Acres Updated Action
Beaver Creek	129	0
Elk Creek	651	250
Horse Creek-Klamath River	221	0
Humbug Creek-Klamath River	0	0

5th Field Watershed	Proposed Salvage Acres 4/13/15 BA	Proposed Salvage Acres Updated Action
Lower Scott River	1619	636
Indian Creek	0	0
North Fork Salmon River	741	687
Seiad Creek-Klamath River	6107	5103
South Fork Salmon River	0	0
Thompson Creek-Klamath River	350	219
Ukonom Creek-Klamath River	0	0
Total	9,818 Approximately 1,990 acres of this total were within stream course RR and therefore excluded from salvage harvest	6,895 Approximately 1,268 acres of this total are within stream course RR and therefore excluded from salvage harvest

Updated Effects

The BA describes the expected effects from salvage and reforestation actions to sediment related habitat indicators (pgs. 40-46), water quality (pgs. 55-56), and riparian function including LWD (pgs. 60-62). The analysis concludes that these actions would have only minor and insignificant effects to SONCC Coho salmon and CH due to the exclusion of stream course RR and inner gorge areas and implementation of PDFs that sufficiently minimize disturbance outside of RR.

Figure 3 in the BA displays how inner gorges and other geologic features overlap Project units in lower Grider and Walker Creek. The figure below updates the original Figure 3 in the 4/13/15 Fisheries BA, and displays how the updated action units overlap these features.

The BA, pg. 40, states that "Stream course RR, as well as inner gorges and active landslides, are excluded from salvage harvest units." As described above, this addendum clarifies that there are several exceptions that were field reviewed and approved by the Forest Geologist because they are relatively small areas that show no indication of movement in at least 10 years and proposed salvage/reforestation would result in a net benefit to slope stability (updated Watershed-6 PDF). The Project Geology Report describes that there is expected to be no effect to slope stability from salvage harvest, even on these small areas of unstable lands listed as exceptions. The level 1 team reviewed the exceptions listed in Table 2 above and considered potential impacts to fish habitat (including SONCC Coho salmon CH). The largest area is a toe zone within helicopter Unit 32 located upslope of Highway 96 in a face drainage to the Klamath River, just downstream from where Kuntz Cr joins the Klamath River. As described in the Project Geology Report, the current landslide risk in this 7th field watershed is Moderate and the Forest Geologist expects there is low likelihood of landsliding associated with helicopter salvage harvest on the potentially unstable toe zone in Unit 32. Potential Project effects to slope stability, or landsliding risk, are related to the infrastructure needed for logging; these effects are summarized below under Temporary Roads and Landings and in more detail in the Project Geology Report. At the site scale there is a net benefit from salvage/reforestation on these areas of unstable lands because the removal of dead trees does not increase the risk of landslides and planting is likely to reduce the duration of elevated landsliding risk.

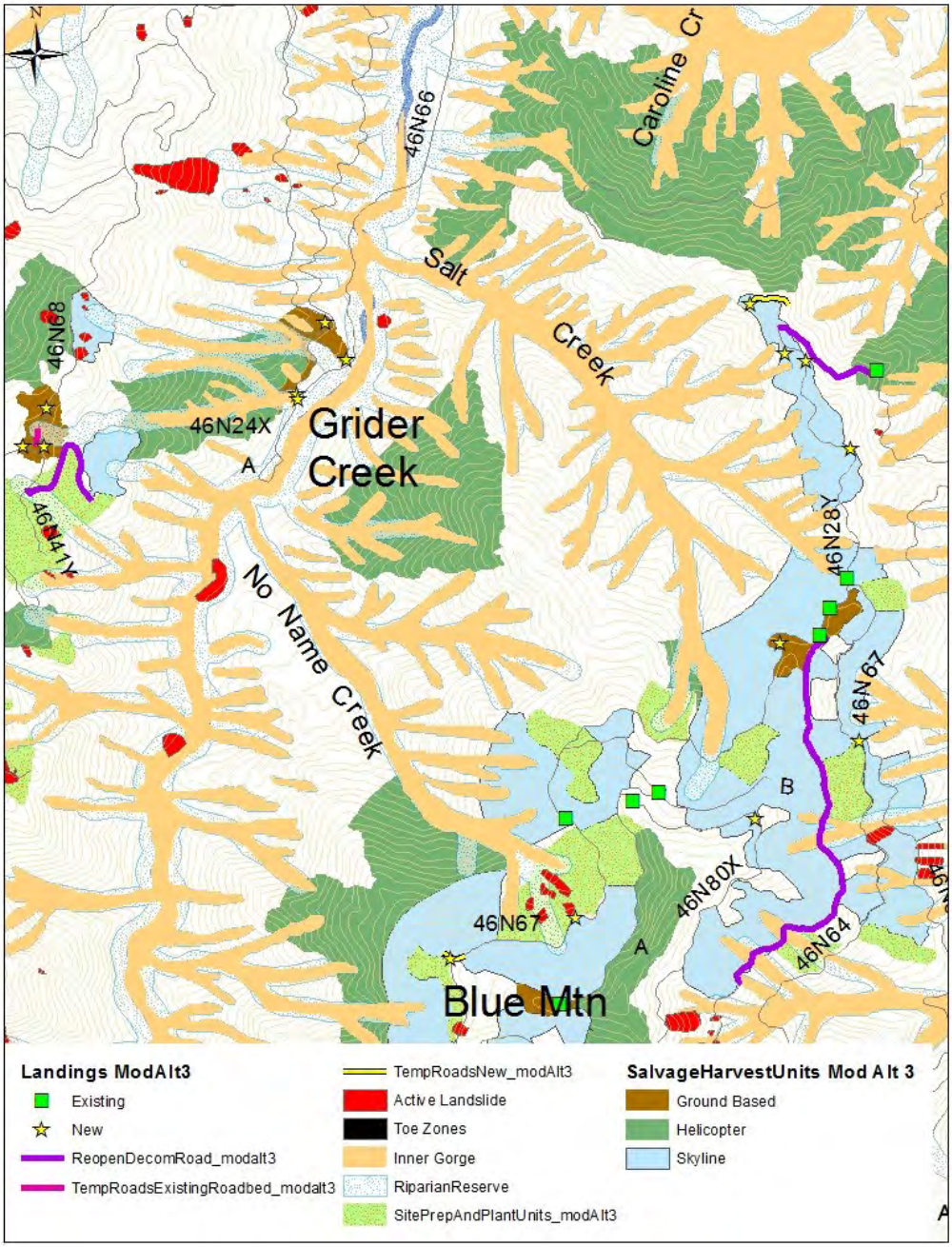


Figure 1. Updated Figure 3 of Fish BA.

Several areas in relatively close proximity to CH were dropped from salvage harvest in the following drainages: Little Elk Cr/EF Elk Cr, Grider Cr, and Walker Cr (Figure 2 displays where salvage is reduced in Grider and Walker Creek areas). All salvage harvest was dropped from Beaver and Horse Cr-Klamath River watersheds (Beaver Fire), and in Cougar Cr and Doolittle Cr drainages (Happy Camp Fire). Overall these changes reduce ground disturbance outside of RR and incrementally reduce cumulative watershed effects, but this reduction does not change the not likely to adversely affect (NLAA) determination of the Project on SONCC coho salmon and its designated CH.

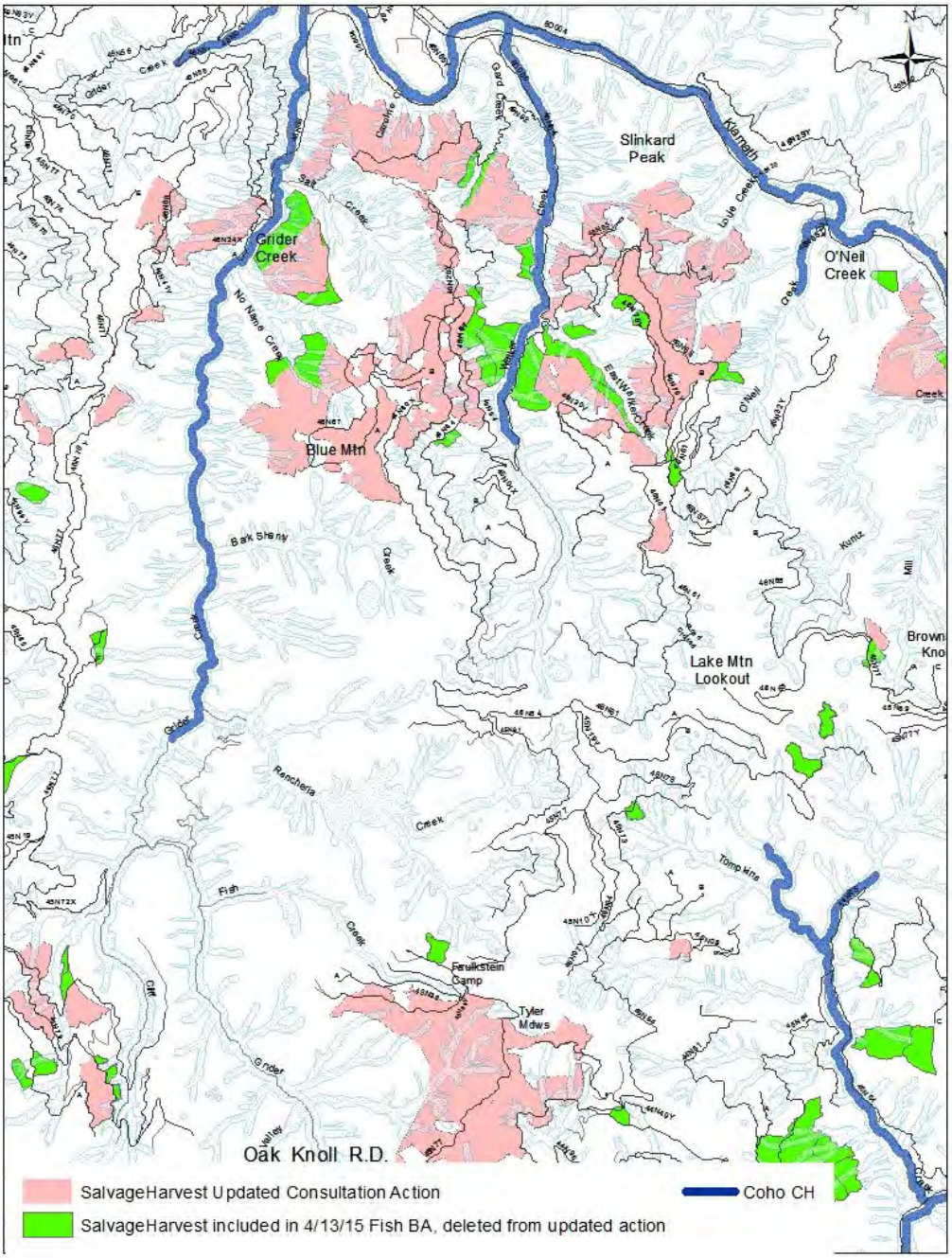


Figure 2. Proposed salvage harvest in the Grider and Walker Creek areas, showing the reduced area proposed in Updated Consultation Action. The green polygons have been deleted from the updated consultation action.

Temporary Roads and Landings

Implementation of the updated reduced action would involve less temporary roads and landings. Temporary road actions and landings that were removed from the Project, due to deletion of associated units, include several near- stream roads that were identified in Table 32 of the 4/13/15 Fisheries BA. The table below updates Table 32.

Table 4. Updated Table 32 from 4/13/15 BA, new text in italics.

Receiving Stream Name	Road Type	Confirmed Stream Type Crossing	Comments
Grider Creek	Decomm. Road 46N41YA	2 perennial	One crossing is legacy site; the Project will reduce sediment in the long term.
Walker Creek	Decomm. Road 46N63	No crossing	No stream crossing features; old road bed cut in bedrock. Several small road fill slips/slides occur below road bed, more effects information on this road below under Updated Effects.
Cliff Valley Creek	Decomm. Road 46N77	1 Intermittent	Stable, moderate risk
China Creek	Decomm. Road 46N78	5 Intermittent	Use of this road segment has been reduced, only the beginning 0.55 miles of the road will be used including one intermittent stream crossing. The 4/13/15 Fisheries BA analyzed use of 1.1 miles of this road with 5 intermittent or ephemeral channel crossings.Stable, low risk
Kuntz Creek	Existing Temporary Road	No crossing involved in road (except crossing of private diversion ditch)	Road has drainage problems; use of road is low risk; the Project will reduce sediment long term
O'Neil Creek	Existing Temporary Road	1 intermittent	This road segment will no longer be used for the Project.Road has drainage problems; intermittent channel captured by road prism; use of road is low risk; the Project will reduce sediment long term

Other temporary roads that did not involve near stream actions were dropped from the Project, along with many landings. All temporary roads and landings in the Beaver Fire were dropped. The following tables update Tables 7 and 8 from the BA and display the number of temporary roads and landings that remain in the updated consultation action.

Table 5. Updated BA Table 7, temporary road actions.

	Project Temporary Road Actions
Miles New Temp. Road	3.2
Miles Temp. Road Existing Alignment	4.6
Miles Reopened Decomm. Roads	4.8
Total Miles of Temporary RoadConstruction	12.7
# of Temp Road Stream Crossings	4
# of Temp Road Stream Crossings in anadromous salmonid habitat	0
Watershed PDFs	New temporary roads: PDFs 5, 23, 24 Watering roads: PDFS 18 Culvert replacements 20Water drafting 37, 38.

Table 6. Updated BA Table 8, temporary road miles by 5th field watershed.

5TH-FIELD	Reopen Decomm.Road	Temp. Roads on Existing Roadbed	Temp. Roads New	Total Miles
Beaver Creek	0	0	0	0
Elk Creek	0.2	0.7	0.2	1.1
Horse Creek-Klamath River	0	0	0	0
Humbug Creek-Klamath River	0	0	0	0
Indian Creek	0	0	0	0
Lower Scott River	0	0.8	0	1.1
North Fork Salmon River	0	0.6	0	0.6
Seiad Creek-Klamath River	4.0	1.8	2.9	8.7

5TH-FIELD	Reopen Decomm.Road	Temp. Roads on Existing Roadbed	Temp. Roads New	Total Miles
South Fork Salmon River	0	0.1	0.0	0.1
Thompson Creek-Klamath River	0.6	0.5	0	1.1
Ukonom Creek-Klamath River	0	0	0	0
Total Miles	4.8	4.6	3.2	12.7

The 4/13/15 Fisheries BA identified six new landings within RR that were approved for use by watershed specialists. None of these new landings in RR were dropped in the updated action. For the updated action, 95 landings were dropped. These landings are either existing landings in RR, or new/existing landings outside RR. The table below displays how landings are distributed across 5th field watersheds for the updated consultation action.

Table 7. Updated 4/13/15 Fisheries BA Table 9, types and numbers of Project landings, by 5th field watershed.

5th-field Watershed	Existing Landings	New Landings	Total
Ground Based Landing			
Beaver Creek	0	0	0
Horse Creek-Klamath River	0	0	0
Lower Scott River	3	3	6
North Fork Salmon River	0	1	1
Seiad-Creek-Klamath River	12	5	17
Thompson Creek-Klamath River	0	6	6
Total	15	15	30
Helicopter Landing			
Elk Creek	0	4	4
Lower Scott River	5	1	6
North Fork Salmon River	6	1	7
Seiad-Creek-Klamath River	14	28	42
Thompson Creek-Klamath River	0	0	0
Total	25	34	59
Skyline Landings			
Elk Creek	0	3	3
Lower Scott River	0	4	4
North Fork Salmon River	0	6	6
Seiad-Creek-Klamath River	0	10	10
South Fork Salmon River	0	0	0
Thompson Creek-Klamath River	0	3	3
Total	0	26	26
Total number of landings	40	75	115
New Landings in RRs	Landings # DZ03, DZ10, DZ23, L043, L044,and L090.		
Watershed PDFs	Use of existing landings: PDF 26 Expansion of landings: PDF 26 Erosion control on landings: PDF 26 Restoration of soil cover: PDF 26		

Updated Effects

The 4/13/15 Fisheries BA describes the expected effects of temporary road and landing actions to sediment related habitat indicators (pgs. 48-52), water quality (pgs. 57-58), and riparian function including LWD (pgs. 63-64).Reopening of decommissioned roads, use of temporary roads on existing roadbeds, construction of new temporary roads and the construction of new landings were considered high disturbance and incorporated into the 7th field scale landslide risk assessment in the Project Geology Report. There are two primary site scale effects of reopening decommissioned roads, use of temporary roads on existing roadbeds, construction of new temporary roads and the construction of new landings; these effects are described in the Project Geology Report and summarized here.The first effect is change to the hillslope mass balance such as undercutting and increasing the weight in unstable areas (spoil piles) from earthwork. Slope stability is most susceptible to the change in mass balance with new temporary road construction. There are no new temporary roads or landings being constructed on toe zones of dormant landslides, active landslides or inner gorges; only use of existing roadbeds will occur. Project design feature Watershed-20 restricts excess material from temporary roads, landings and other actions from being stored on active landslides (which include road fill failures/slips). This minimizes the potential for landslide re-activation due to increased weight. The second effect is the potential for poor drainage on the roads and landings which concentrates water onto hillslope which can, in turn, exacerbate existing unstable lands or create new landslides.The cessation of the use of temporary roads per the Wet Weather Operations (Project Design Feature Watershed- will minimize any rutting or tire tracks that can concentrate water on the road and hillslope. Project design feature Watershed-22 requires hydrologic stabilization of all temporary roads which includes control of the drainage on the roadbed. Project design feature Watershed-23 requires new landings to be configured for long- term drainage with the intention to (re)establish natural runoff patterns.

While PDFs minimize the effects to landslide risk, they do not eliminate them. The likelihood of a landslide at the site scale from temporary road actions and the construction of new landings will be increased. The increase will be highest during implementation of the project and will be reduced after the hydrologic stabilization has occurred at the completion of the Project. At the site scale, the landslide risk will remain above pre-project levels through the first winter after stabilization. Following the first winter they will likely be back to pre-project levels, or below in areas were legacy sites are being addressed on temporary road access. Temporary road actions were reviewed in the field to assess the presence of active features and potential consequences of landsliding to fish habitat. With the updated consultation action (and the action analyzed in 4/13/15 Fisheries BA), active features associated with proposed temporary road actions on existing road beds are primarily road fill failures/slips. As described above, re- opening these roads, using them, and then re-closing them increases the likelihood of further, or other, failures along the road prism as it re-adjusts. Table 4 above displays the temporary road actions most likely to have a noticeable influence on hillslope processes that translate to downhill fish habitat. The temporary road action remaining in the Project that may be most likely to experience fill failures or slides is the re-opening of decommissioned road 46N63 in Walker Cr drainage (visible in Figure 1 map above). Field review of this existing roadbed by the Forest Geologist found several fill failures/slides below the road which led to the conclusion that these fill slips, or other new slips along the roadbed, are likely when the roadbed is re-opened, used and re-adjusts after use and hydrologic stabilization. In consideration of the history of how this road adjusted during the 1997 flood event, its current condition and geology, and the distance to CH (about 1 mile downslope with another road in between), there is low likelihood that post-Project

slides/slips initiated from this roadbed would travel down to fisheries habitat or have any measurable effect to SONCC Coho salmon CH. The changes to temporary road actions reduce site scale short term negative effects to aquatic habitat disclosed in the BA (pgs. 49-51) only in the O'Neil Cr drainage; as described in the BA, use of this old roadbed would require fixing existing erosion-related problems which would have long term benefits to protection of water quality in this drainage. These potential long-term beneficial effects are to be foregone with the updated consultation action as these temporary road beds near the bottom of O'Neil Cr drainage will not be used and then appropriately hydrologically stabilized. They are to remain in their current condition and Project temporary road actions will have no effect to SONCC Coho salmon CH in O'Neil Creek. Other temporary roads dropped did not involve near stream actions and therefore the overall reduction in mileage of temporary road actions (from 16.4 miles to 12.7 miles) does reduce potential site-scale effects to hillslope processes including the sediment regime, but this reduction would not change the NLAA effect determination of the Project on SONCC coho salmon and its designated CH. The reduction in use of existing landings within RR, and reduction of new and existing landings outside of RR, results in less potential short term impact to watershed resources and fish habitat. However, this reduction in effects would not change the NLAA effect determination of the Project on SONCC coho salmon and its designated CH. Roadside Hazard Tree Removal Proposed roadside hazard tree removal has been changed in the following manner: Reduced extent – maps at the end of this document display where this action is reduced; increased retention of large wood – hazard trees 26 inches dbh and greater, within one site tree distance of all streams (intermittent and perennial), will not be removed; reduced ground disturbance – during implementation of roadside hazard tree removal in RR, equipment is prohibited from leaving the road; and increased retention of green trees – trees that were not affected by 2014 fires will not be felled unless they pose an immediate hazard. These changes result in reduced extent of potential impacts to SONCC Coho salmon and CH. As displayed in the following maps, areas dropped for roadside hazard removal include a few reaches in close proximity to CH. These include reaches of the Scott River and Klamath River as well as Kelsey, China, and Elk creeks. Other areas dropped that are in relatively close proximity to CH in an adjacent stream include Doolittle Cr, China Gul (NF Salmon), and Taylor Cr (NF Salmon). Table 8 below displays, by watershed, how many miles of CH are within 200 feet of roadside hazard roads, and the reduction in miles of CH potentially affected by roadside hazard analyzed in 4/13/15 BA relative to the updated action. Table 9 displays, by watershed, how many miles of intermittent and perennial stream total may be affected by proposed roadside hazard tree actions in the updated consultation action.

Table 8. Miles of Coho CH in close proximity to roadside hazard tree removal, showing where miles are reduced in the updated consultation action.

5th field Watershed	Miles of Coho CH within 200 feet of roadside hazard roads4/13/15 BA	Miles of Coho CH within 200 feet of roadside hazard roadsUpdated Consultation Action	Total CH miles in watershed
Humbug Creek - Klamath River	2.5	0	7.0
Beaver Creek	1.5	1.5	16.4
Horse Creek – Klamath River	0.3	0	26.4
Seiad Creek – Klamath River	2.9	1.3	38.5
Lower Scott River	3.6	1.0	26.7
Thompson Creek – Klamath River	1.1	0.6	13.7

5th field Watershed	Miles of Coho CH within 200 feet of roadside hazard roads4/13/15 BA	Miles of Coho CH within 200 feet of roadside hazard roadsUpdated Consultation Action	Total CH miles in watershed
Elk Creek	4.1	2.4	22.1
Uknonom Creek	0.2	0	8.4
North Fork Salmon River	5.7	5.2	32.3
TOTAL	22.0	12.0	191.5

Table 9. Miles of intermittent and perennial stream in close proximity to Project roadside hazard tree removal, Updated Consultation Action.

5th field watershed	Miles of perennial stream within 200 feet from roadside hazard tree removal roads	Miles of intermittent stream within 200 feet from roadside hazard tree removal roads	Total stream miles in watershed - intermittent and perennialPercentage of streams miles potentially affected by Project roadside hazard tree removal
Beaver Creek	3	4	2772.5%
Horse Creek-Klamath River	0	2	3220.6%
Seiad Creek-Klamath River	6	0	2052.9%
Lower Scott River	4	5	4761.9%
Thompson Creek-Klamath River	2	4	2972.0%
Elk Creek	5	4	3003.0%
North Fork Salmon River	11	5	6542.4%
TOTAL	31	24	2,5312.2%

Updated Effects

The BA describes the expected effects of roadside hazard tree removal to sediment related habitat indicators (pgs. 47-48), water quality (pg. 57), and riparian function including LWD (pgs. 62-63). As described in the BA, potential effects of roadside hazard tree removal are associated with soil disturbance, effects to stream shade, and removal of wood that provides various functions in the riparian zone (soil retention and productivity, and large wood loading to streams). The updated action reduces effects in each of these categories. Soil disturbance is reduced by restricting ground based equipment to roads when implementing hazard tree removal within RR. Potential effects to stream shade are reduced by restricting hazard trees targeted for removal to fire injured/killed trees. As described in the BA (pg. 57), potential effects to stream shade are associated with the removal of green hazard trees. The updated action restricts the felling of green hazard trees unless they are deemed to be an immediate hazard which will almost eliminate the felling/removal of live trees in the Project. This reduces the level of potential effect this action may have on stream shade across the reduced area it is now proposed.Effects related to loss of wood from riparian areas are reduced by extending the retention of all hazard trees 26 inches dbh and greater when they are within one site tree distance of all streams (the action analyzed in the 4/13/15 Fisheries BA retained these trees only adjacent to fish-bearing streams). In this manner, the project now ensures that any larger hazard trees that must be felled within stream LWD recruitment zones will be retained. Removal of hazard trees less than 26 inches dbh within stream LWD recruitment zones is included in order to address fuels-related

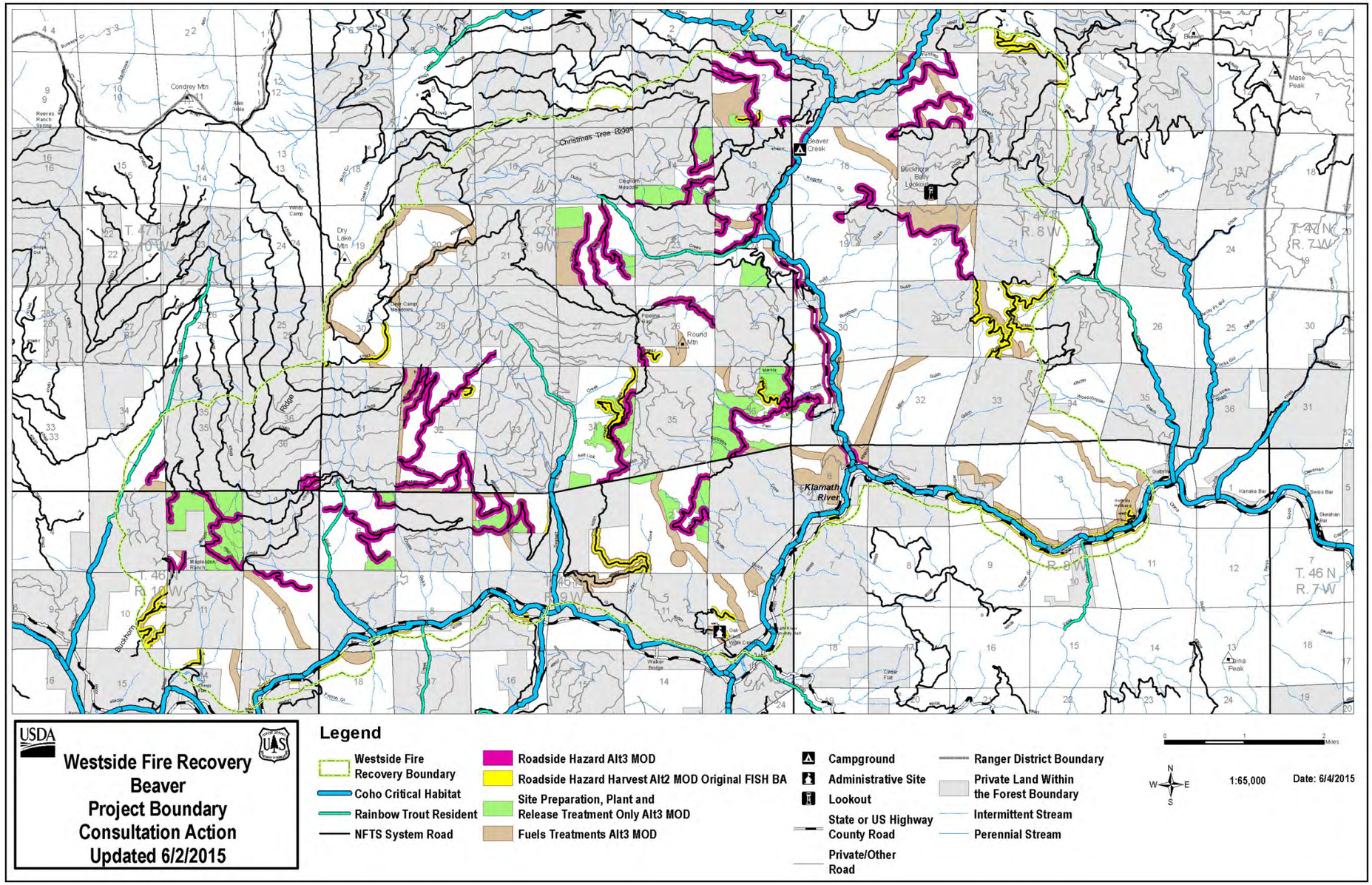
considerations summarized below. Also related to fuels, the removal of hazard trees is included within the outer portions of Riparian Reserve (generally outside of stream LWD recruitment zones); fish- bearing streams have Riparian Reserve that is two site trees wide on both sides of the stream, the outer portion refers to the area farther than one site tree from a stream.As part of Project planning and effects analysis, biologists and fuels specialists worked to find consensus on what fuels reduction actions are needed in Riparian Reserve in order to manage these areas within their historical range of variability. The team relied upon Forest Plan direction, historic information including fire history, field review, and best available information including scientific literature. Research specific to fire regimes and forest management in the Klamath Mountains are particularly relevant, including Skinner, 1997; Taylor and Skinner, 1998; and Skinner, 2003. In order to manage riparian areas within their natural range of variability, the historical fire regime must be an important and explicit consideration (Skinner 1997). As described in the literature, the Mediterranean climate of the Klamath Mountains is characterized by pronounced annual drought (independent of any prolonged drought). Even Riparian Reserves in the Klamath Mountains regularly experience conditions where fires can easily ignite and spread. Field review of existing conditions in the project area further reinforced for biologists the need to propose fuels and site preparation treatments in Riparian Reserves, and that removal of hazard trees 14-26 inches dbh within Riparian Reserves is consistent with LWD objectives and appropriate management to maintain and restore riparian function within the natural range of variability. Field review also included evaluation of potential effects of proposed hazard tree removal in the outer Riparian Reserve (farther than one site tree distance from fish-bearing streams). In consideration of both the historic fire regime (frequent mixed severity fire) and the current fire regime which is a product of mostly effective suppression then high severity fire, allowing hazard tree removal in these outer portions of the Riparian Reserve is likely to provide for more effective fuels management and decrease the probability that future high severity fire would reach near stream areas. For these reasons, and considering the relatively minor amount of near stream habitat that would be exposed to effects of these actions (Table 9), proposed hazard tree removal would have only discountable effects to large wood recruitment. The reduction in extent, and increase in protection measures for proposed roadside hazard tree removal results in less potential effects to SONCC Coho salmon CH. This reduction in effect is not expected to change the NLAA effect determination of the Project on SONCC coho salmon and its designated CH.Conclusions The updated consultation action is expected to result in less potential effects to SONCC Coho salmon and its designated CH as described above. The effects determination remains that this action May Affect, and is Not Likely to Adversely Affect Coho Salmon and CH.

Literature Cited

Skinner, C.N., 2003. A tree-ring based fire history of Riparian Reserves in the Klamath Mountains. In: Faber, P.M (ed.) 2003. California Riparian Systems: processes and floodplain management, ecology, and restoration. 2001 Riparian Habitat and Floodplains Conference Proceedings, Riparian Habitat Joint Venture, Sacramento, CA.

Skinner, C.N. 1997. Toward an understanding of fire history information. Pages 15-22 in: S. Sommarstrom (Editor). Proceedings of the Sixth Biennial Watershed Management Conference; October 23-25, 1996; Lake Tahoe, California/Nevada. Water Resources Center Report No. 92. Davis, CA. Centers for Water and Wildland Resources, University of California.

Taylor, A.H., C.N. Skinner, 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management 111: 285-301.



Map H-8:Map of Beaver Fire area submitted with the Fisheries BA (July 2, 2015)

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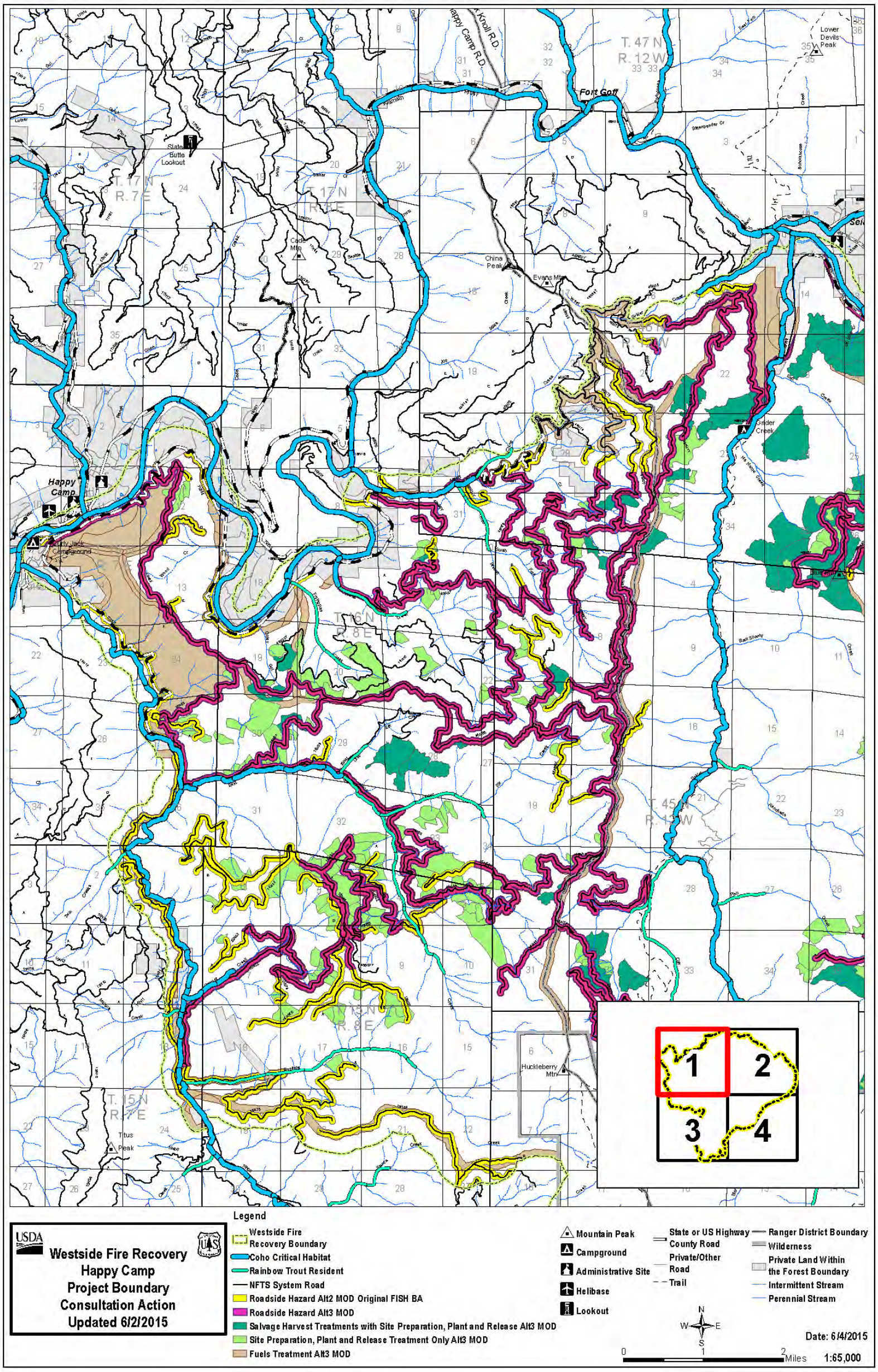

Map H-9: Map of Happy Camp Fire area (northwest section) submitted with the Fisheries BA (July 2, 2015)

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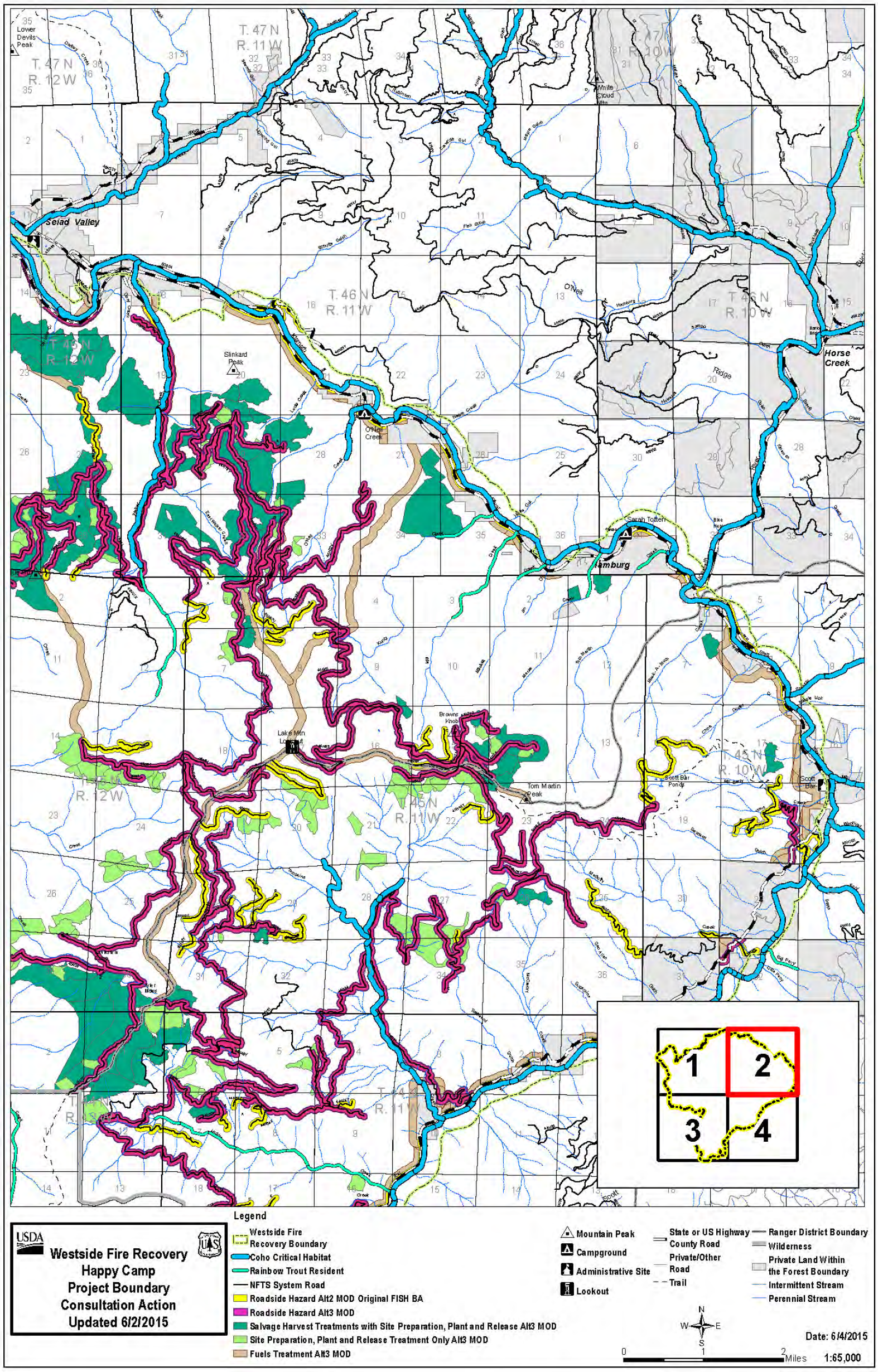

Map H-10: Map of Happy Camp Fire area (northeast section) submitted with the Fisheries BA (July 2, 2015)

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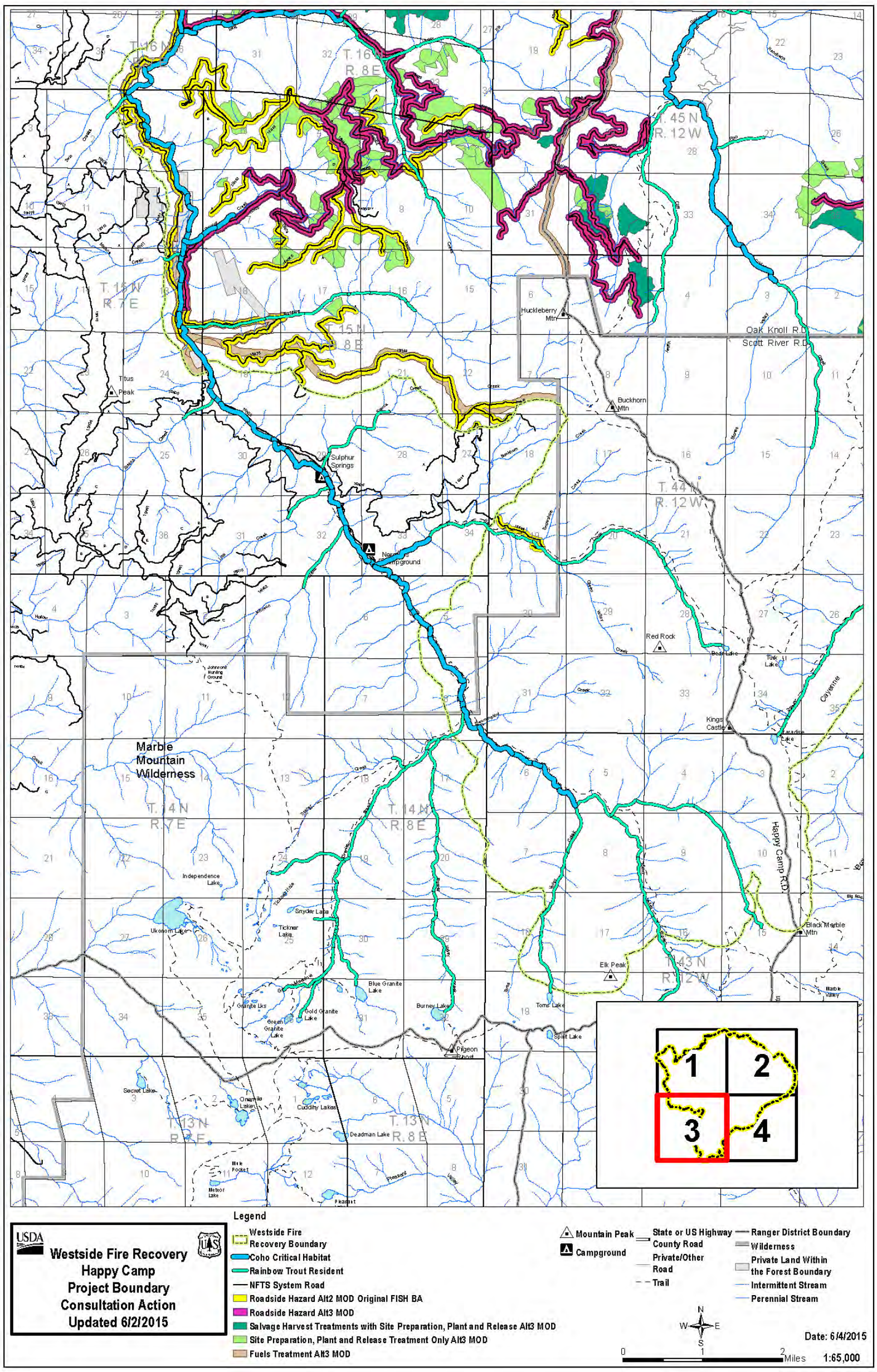

Map H-11: Map of Happy Camp Fire area (southwest section) submitted with the Fisheries BA (July 2, 2015)

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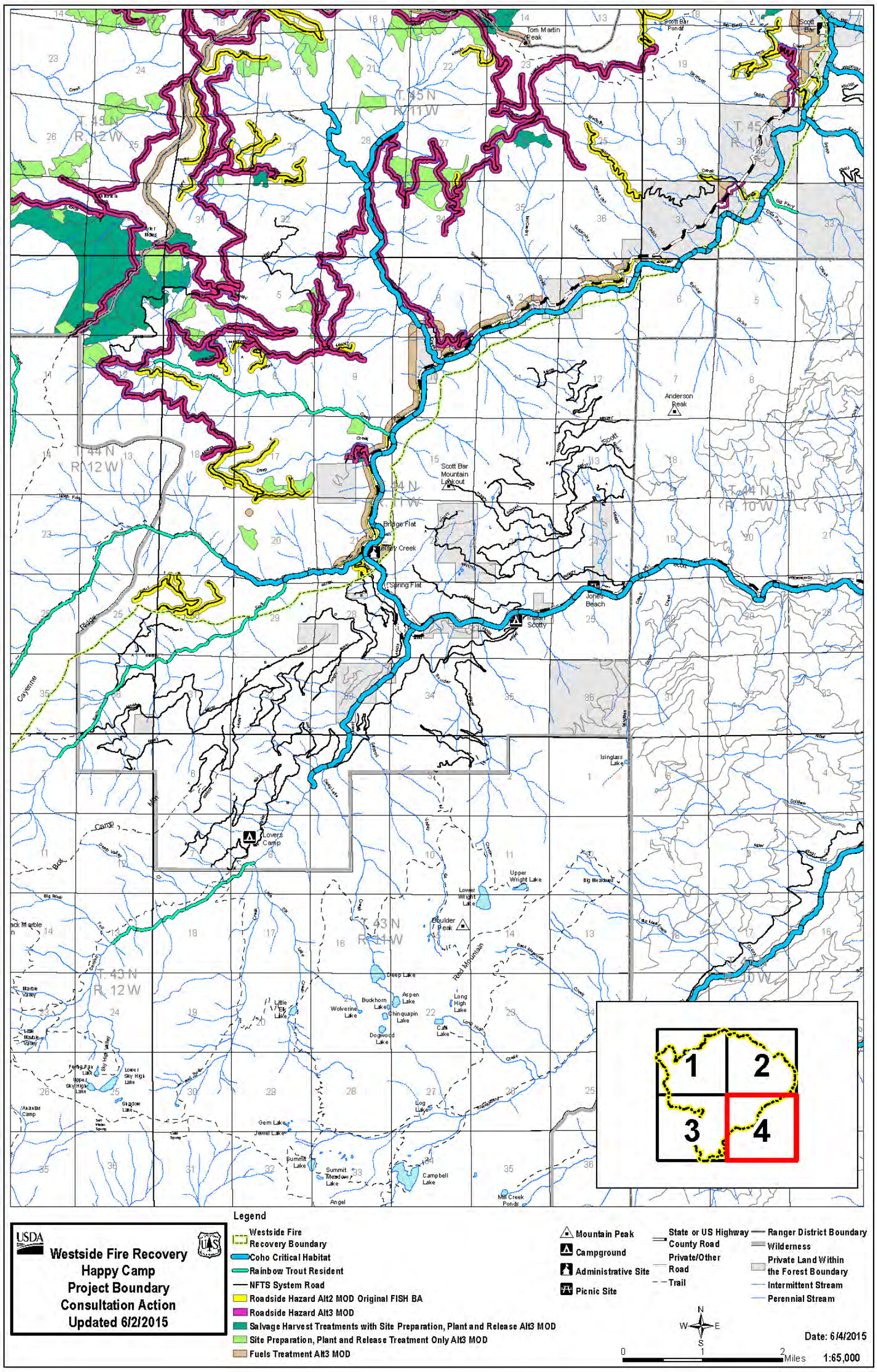

Map H-12: Map of Happy Camp Fire area (southeast section) submitted with the Fisheries BA (July 2, 2015)

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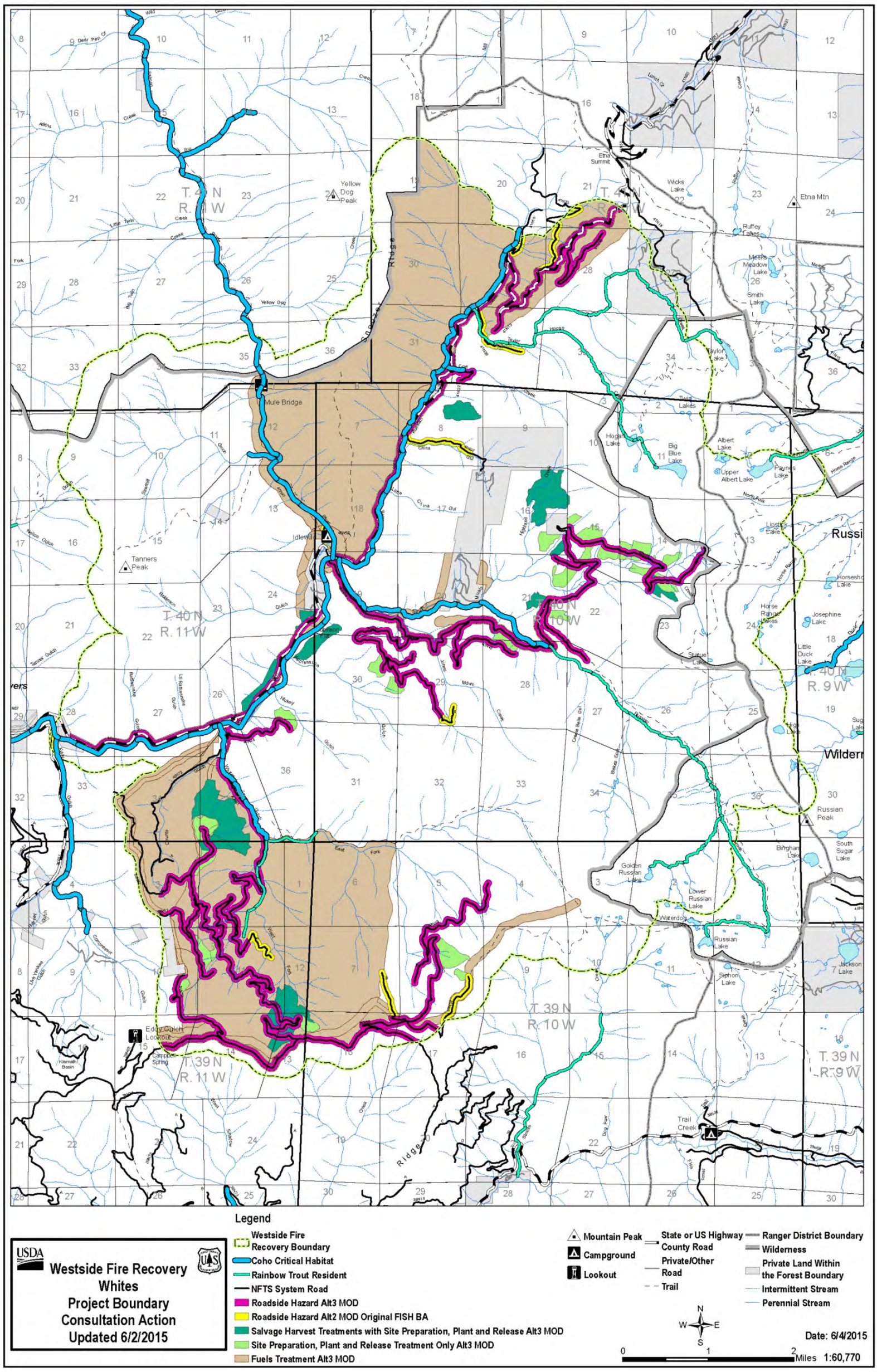

Map H-13: Map of Whites area submitted with the Fisheries BA (July 2, 2015)

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National Marine Fisheries Service Letter of Non-Concurrence Received on July 22, 2015

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1655 Heindon Road
Arcata, California 95521-4573

JUL 2 2 2015 In response refer to: WCR-2015-2518

Ms. Patricia Grantham
Forest Supervisor
Klamath National Forest
1711 South Main Street
Yreka, CA 96097

Re: Endangered Species Act Section 7(a)(2) Non-Concurrence Letter for the Westside Fire Recovery Project in Siskiyou County, CA.

Dear Ms. Grantham:

On April 16, 2015, NOAA's National Marine Fisheries Service (NMFS) received the final biological assessment (BA) for the Westside Fire Recovery Project (Project) along with your request for a written concurrence with the Unites States Forest Service's (USFS) determination that the Project is not likely to adversely affect (NLAA) the Southern Oregon / Northern California Coastal (SONCC) coho salmon (*Oncorhynchus kisutch*) evolutionarily significant unit (ESU) listed under the Endangered Species Act (ESA) as threatened (70 FR 37160; June 28, 2005), or its critical habitat (64 FR 24049; May 5, 1999). On June 22, 2015, NMFS then received a USFS addendum to the Project, which clarified Project revisions that included both a reduction in Project treatment acreage and an increase in resource protection measures since submission of the original Project BA.

Based on this information, NMFS cannot concur with USFS' determination that the project is not likely to adversely affect listed species and designated critical habitat. Our analysis has determined salvage logging operations in harvest units 5, 23, 32, 39, 55, 56, 57, 59, 64, 226, 268, 406, 520, 524, 525, and 530 may contribute to the risk of landslides and/or debris flows. Further increases in sediment loading into salmon bearing streams and rivers of the Action Area are of concern as it may adversely affect listed salmonids. If the possibility of adverse effects to SONCC coho salmon or its critical habitat cannot be eliminated, USFS is required to request initiation of formal consultation with NMFS.

If you have questions concerning this non-concurrence letter, please contact Jim Simondet, Klamath Branch Supervisor by phone at (707) 825-5171, or via e-mail at jim.simondet@noaa.gov.

Sincerely,

for

William W. Stelle Jr.
Regional Administrator

cc: Copy to ARN file # 151422WCR2015AR00120

Forest Service Response to Letter of Non-Concurrence Sent July 24, 2015

USDA United States Department of Agriculture
Forest Service
Klamath National Forest
Supervisor's Office
1711 S. Main Street
Yreka, CA 96097-9518
530-842-6131
TDD: 530-841-4573

File Code: 2670
Date: July 24, 2015

William W. Stelle Jr.
Regional Administrator
National Marine Fisheries Service
1655 Heidon Road
Arcata, CA 95521-4573

Dear Mr. Stelle:

The Klamath National Forest (KNF) received your non-Concurrence letter of July 22, 2015 concerning the Biological Assessment (BA) for the Westside Fire Recovery Project. This non-Concurrence letter states your disagreement with the level of effect analysis in the BA. The Forest Service's determination in the BA is "not likely to adversely affect" (NLAA) the Southern Oregon/Northern California Coastal (SONCC) coho salmon evolutionarily significant unit listed under the Endangered Species Act as threatened, or its critical habitat. The National Marine Fisheries Service (NMFS) does not concur with the KNF determination due to NMFS concerns that harvest operations in units 5, 23, 32, 39, 55, 56, 57, 59, 64, 226, 268, 406, 520, 524, 525, and 530 may contribute to the risk of landslides and/or debris flows. As a result of your July 22nd letter, I requested project biologists review the current BA with respect to your concerns regarding the 16 timber salvage units identified. Project biologists confirmed that the timber salvage units identified, while containing landslide features, were field verified by our Forest geologist to ensure treatment actions would not adversely affect slope stability in that area. In addition, the Forest geologist also confirmed that planting and retaining trees on those high severity burn areas was the single most beneficial, stabilizing action that could be taken on those landslide features.

We believe our BA accurately depicts project effects and that the appropriate determination for affects to SONCC is NLAA. We acknowledge that NMFS disagrees with this determination. Given that the only way this important project is able to move forward at this time is for us to request formal consultation, please consider this letter as such a request. It is imperative that formal consultation move forward rapidly in order to implement this project while it is still feasible. The Forest will provide the NMFS with any available information that would be useful in performing their analysis for the biological opinion.

Please contact Dan Blessing, Natural Resources Staff Officer, at (530)841-4521.

Sincerely,

PATRICIA GRANTHAM
Forest Supervisor

cc: James Simondet

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