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Final Environmental Impact Statement

Johnson Bar Fire Salvage Final EIS

Nez Perce/Clearwater National Forests
Moose Creek Ranger District
Idaho County, Idaho

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Summary

The Nez Perce-Clearwater National Forests are proposing project activities, to include the salvage harvest of fire killed timber and road decommissioning, within the Johnson Bar Fire Salvage proposed project area in order to recover economic value, achieve desired age and size classes, trend tree species composition towards more resilient species, and to reduce road related effects to aquatic species and the watersheds. The approximately 26,788-acre project area is located south, southeast, and southwest of Lowell, Idaho within the Middle Fork Clearwater River and Lower Selway Watersheds in Idaho County, Idaho, and would include the Swiftwater, Elk City, Goddard, and O'Hara Creeks. The river corridor within this area is classified as a "recreation" segment of the Middle Fork Clearwater Wild and Scenic River System. There are no Wilderness Areas, Idaho Roadless Areas, or Research Natural Areas within the project area.

The purpose of the Johnson Bar Fire Salvage Project would be to salvage dead and dying timber before it loses its economic value, which would assist in supporting the economic structure of local communities, and contribute to regional and national needs; and to reduce potential sediment inputs into the aquatic ecosystem by decommissioning approximately 20 miles of roads. Other benefits would include maintaining habitat structure, function, and diversity; improving overall watershed conditions; restoring early seral species on the landscape; and to provide improved forage for big game species. These actions are needed to move resource conditions in the project area from existing conditions toward desired future conditions.

Desired future conditions were identified after careful consideration of the existing conditions in the area; applicable Forest Plan management direction; recommendations in the Selway and Middle Fork Clearwater Rivers Subbasin Assessment (USDA Forest Service 2001); and the needs, opportunities, and issues identified by a site specific interdisciplinary watershed assessment and pre-National Environmental Policy Act analysis. Completing the project will move the area towards the desired future conditions as defined in the Nez Perce National Forest Plan (USDA Forest Service 1987a)

A Notice of Intent (NOI) advertising the scoping period was originally published in the *Federal Register* on October 16, 2014. A corrected NOI was published in the *Federal Register* on October 24, 2014 updating the scoping period from the originally published 30 days to the corrected 45 days. The proposed project has been presented to the Nez Perce Tribe at quarterly staff-to-staff meetings since November 2014. The Draft Environmental Impact Statement (DEIS) was advertised for a 45-day public comment period in April 2015. Seventeen commenters provided comments during the 45-day DEIS comment period.

The Forest Service developed four alternatives in response to public scoping and issues raised as a result of interdisciplinary team (IDT) input. These alternatives consist of the No Action Alternative (Alternative 1), Proposed Action (Alternative 2), Reduced Ground Disturbance (Alternative 3), and Economic Feasibility/No Wild and Scenic River Harvesting (Alternative 4). All alternatives were given equal weight, and any remaining issues were used to modify the action alternatives.

Actions Common to all Action Alternatives

The following actions would be included as a component of all of the action alternatives.

- Harvest activities would include 57.8 miles of maintenance and reconditioning of haul roads, to include removal of brush, clearing of culvert inlets, grading of the roads for water flow control, and the removal of closure barriers as needed;
- 20.2 miles of non-system road decommissioning;
- 1.1 miles of system road decommissioning;
- 4.8 miles of road storage of system roads;
- The Design Criteria.

Alternative 1 – No Action

The No Action alternative provides a baseline for comparison of the environmental consequences as a result of potential implementation of the other alternatives. Under the No Action alternative, no project activities would be implemented.

Alternative 2 – Proposed Action

Alternative 2 was developed in response to the purpose and need for action. It was presented to the public during the scoping process. Alternative 2 proposes harvesting 3,096 acres, of which 100 acres would utilize tractor logging, 1,478 acres would utilize skyline logging, and 1,518 acres would be through helicopter logging. Activities would also include 16.9 miles of system haul road reconstruction, to include culvert replacement, spot surfacing, stabilization of Road #470, installation of cross-drainage on Road #9723B, installation of culverts on Road #653A, and opening of decommissioned Road #470B. Any additional haul roads being utilized as part of the proposed project would consist of County and State highways. The Proposed Action would utilize 3.1 miles of new and existing temporary roads, and 6 new and 11 existing helicopter landings.

Alternative 3 – Reduced Ground Disturbance

Alternative 3 was developed in response to comments received during the Scoping process regarding potential sedimentation in the Selway and Middle Fork Rivers. Alternative 3 proposes harvesting 2,710 acres, of which 18 acres would utilize tractor logging, 921 acres would utilize skyline logging, and 1,771 acres would be through helicopter logging. Activities would also include 16.5 miles of system haul road reconstruction, to include culvert replacement, spot surfacing, stabilization of Road #470, installation of cross-drainage on Road #9723B, and installation of culverts on Road #653A. Any additional haul roads being utilized as part of the proposed project would consist of County and State highways. Alternative 3 would utilize 0.3 mile of new and existing temporary roads, and 3 new and 11 existing helicopter landings.

Alternative 4 – Economic Feasibility/No Wild and Scenic River Harvesting (Preferred Alternative)

Alternative 4 was developed in response to internal and external comments received during the Scoping process regarding economic feasibility, harvesting within or seen from the Wild and Scenic River Corridor, and landings along Highway 12 and the Selway River Road. Alternative 4 proposes harvesting 2,207 acres, of which 100 acres would utilize tractor logging, 1,352 acres would utilize skyline logging, and 755 acres would be through helicopter logging. Activities would also include 16.9 miles of system haul road reconstruction, to include culvert replacement, spot surfacing, stabilization of Road #470, installation of cross-drainage on Road #9723B, installation of culverts on Road #653A, and opening of decommissioned Road #470B. Any additional haul roads being utilized as part of the proposed project would consist of County and State highways. Alternative 4 would utilize 3.4 miles of new and existing temporary roads, and 6 new and 8 existing helicopter landings.

After considering the potential effects of the alternatives, the Responsible Official will select an action or mix of actions to improve ecological conditions in the project area and best meet the social values associated with the area. If the No Action alternative is selected, the Responsible Official will decide what design criteria, management requirements, monitoring would be needed for its implementation.

Summary of Changes between Draft and Final Environmental Impact Statement

The Design Criteria have been updated to include weeds. In response to comments that were received for the DEIS, harvesting within the Wild and Scenic River Corridor has been eliminated from Alternative 4. Also the analyses for economics, fisheries, hydrology, soils, visuals, recreation, and wild and scenic rivers have been updated. The cumulative effects analyses has been moved and included with each respective resource section rather than as a separate section. A list of IDT members and a glossary have also been included in the FEIS. (A complete description of changes can be found in the FEIS Chapter 1).

Document Organization

The Forest Service prepared this FEIS in compliance with NEPA and other relevant Federal and State laws and regulations. This FEIS discloses the direct, indirect, and cumulative effects that would result from the Proposed Action and alternatives. The document is organized into 4 chapters and 8 appendices.

Additional documentation, include more detailed analyses of project area resources, are located in the project planning record located at Nez Perce-Clearwater National Forests, 903 3rd Street, Kamiah, Idaho 83536.

CHAPTER 1

PURPOSE AND NEED FOR ACTION

This chapter discusses current and desired conditions, purpose and need for action, the Proposed Action, management direction, scope of the analysis, availability of project files, and the organization of the Environmental Impact Statement.

1. Introduction

The Nez Perce-Clearwater National Forests are proposing project activities, to include the salvage harvest of fire killed timber and road decommissioning, within the proposed Johnson Bar Fire Salvage project area in order to recover economic value, achieve desired age and size classes, trend tree species composition towards more resilient species, and to reduce road related effects to aquatic species and the watersheds.

1.1. Project History

On August 3, 2014 the Johnson Bar wildfire started as a result of lightning and escaped initial attack. The fire burned over 13,300 acres in the Middle Fork Clearwater River and Lower Selway Watersheds, more specifically along Swiftwater, Elk City, Goddard, Lodge, Decker, and O'Hara creeks. The majority of the acres affected by the fire burned on National Forest System administered lands (12,910 acres), with 314 acres on State of Idaho Lands, and 76 acres on private lands (see Map 4).

Initial attack fire crews attempted to contain the fire for a number of days; however, due to the extreme fuel loadings, a product of increasing insect and disease mortality, and fire intensity firefighters were forced to back away from directly fighting the fire and instead attempt an indirect approach. A Type 2 Incident Management Team was brought in to manage the fire on August 9, 2014 and began indirect line construction; however, due to a lack of control options, dense forests, and extreme fuel loadings, coupled with several wind events, the fire was able to spread rapidly and uncontrollably.

The fire resulted in widespread tree mortality, particularly within the mixed conifer/western red cedar-grand fir stands. Prior to the fire, the Forests were actively analyzing forest and watershed restoration projects under the Collaborative Forest Landscape Restoration Program (CFLRP) within the fire area.

The CFLRP was established by Congress under Title IV of the Omnibus Public Land Management Act of 2009. In addition to encouraging the collaborative, science-based ecosystem restoration of priority forest landscapes, the CFLRP has the following program goals:

- Encourage ecological, economic, and social sustainability;
- Leverage local resources with national and private resources;

- Facilitate the reduction of wildfire management costs, including through reestablishing natural fire regimes and reducing the risk of uncharacteristic wildfire;
- Demonstrate the degree to which various ecological restoration techniques achieve ecological and watershed health objectives;
- Encourage utilization of forest restoration by-products to offset treatment costs, benefit local rural economies, and improve forest health.

The CFLRP established a fund to be used for restoration work on priority landscapes. Up to $4 million annually can be requested by selected projects. The Clearwater Basin Collaborative (CBC), in partnership with the Nez Perce-Clearwater National Forests, developed and submitted a comprehensive restoration proposal, the Selway–Middle Fork Clearwater project, in 2010 (CBC and Forest Service 2010). The Selway–Middle Fork Clearwater project was selected for funding by the Secretary of Agriculture in August 2010.

Projects that the Forests were analyzing or planned to develop in the fire affected area were generally proposing to utilize commercial timber harvest to restore natural fire regimes, create a balance of age classes across the landscape, restore more resilient tree species, and reduce fuel loads to prevent large uncontrollable wildfires. Merchantable timber generated would meet local and regional needs, as well as produce funds for the Forests to invest in future restoration work.

As a result of the Johnson Bar fire, the Environmental Impact Statement (EIS) for the Middle Fork Vegetation Management Project, scoped in January, 2014 has been *cancelled.* The O'Hara-Goddard Project, which was in development, has been incorporated in part into the proposed action of the Johnson Bar Fire Salvage Project.

Desired conditions for the Johnson Bar Fire Salvage proposed project area were developed using the Nez Perce National Forest Plan (Forest Plan) (USDA Forest Service 1987a) direction; broad-scale assessments [e.g., Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin (USDA Forest Service 1997) and the Selway and Middle Fork Clearwater Rivers Subbasin Assessment (USDA Forest Service 2001)]; and the best science currently available. The scoping process was started in January 2014 for the Johnson Bar Fire Salvage Project.

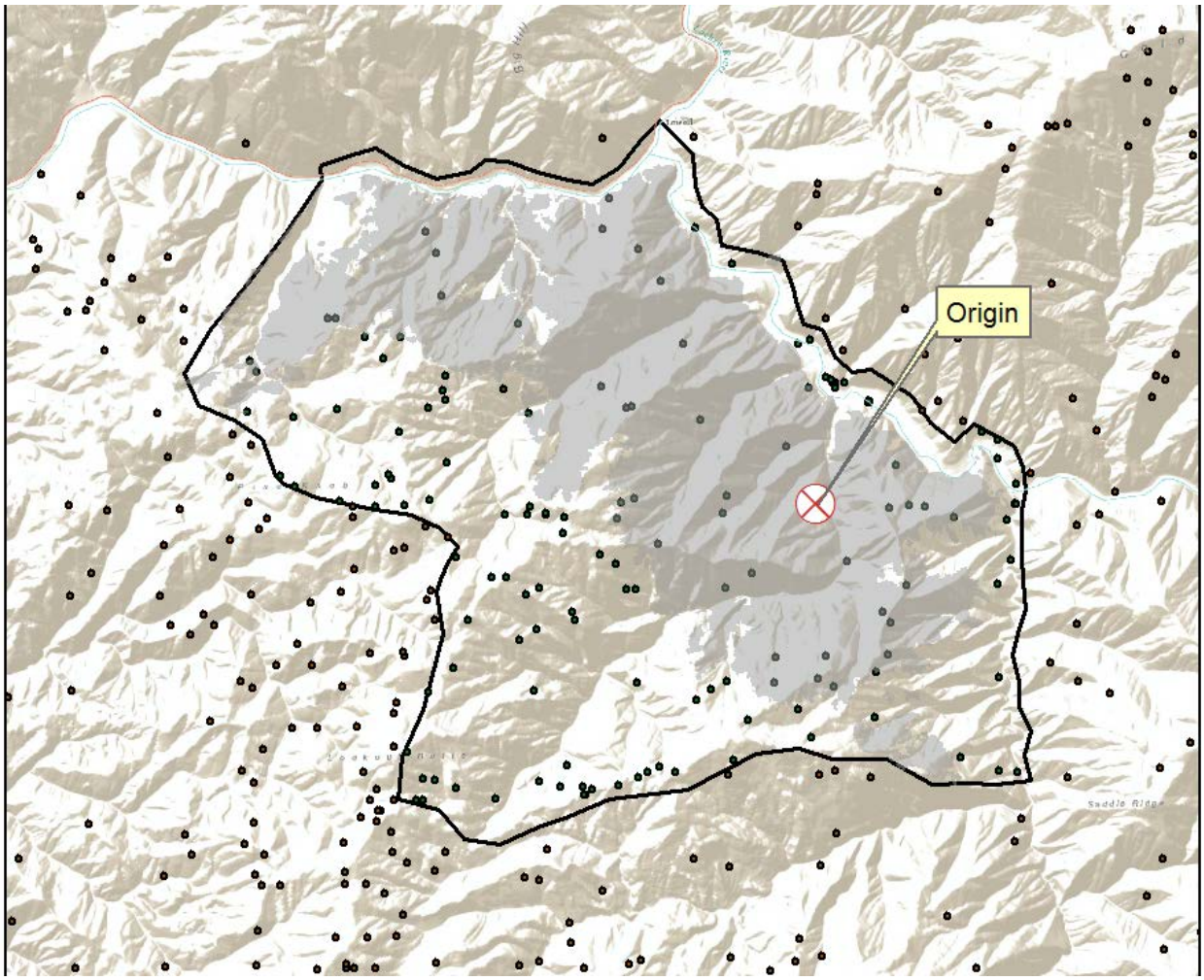
1.1.1. Background of Fire Occurrence, History, and Risks

Forests in the western United States are unhealthy due to high fuel build ups caused by bark beetle mortality (Western Governors' Association Forest Health Advisory Committee, 2008) (USDA Forest Service, 2004). Interactions of natural disturbance cycles, such as fires, wind events, insects, and disease can have cascading interactions leading to reduction in the number of old trees and shade tolerant species with thin bark. Natural successional processes, along with agents of change, have followed a natural trajectory. Trees grow and become dense and overstocked. Root rot has weakened trees allowing them to become susceptible to Douglas-fir tussock moth, Douglas-fir bark beetles, and mountain pine beetles. The tussock moth tends to attack trees with the most foliage, whereas, the Douglas-fir beetles and mountain pine beetles tend to attack larger, less vigorous trees [(Weatherby and Their) as cited in Kegley 2004] (USDA, 2004). Root rot, insects, and wind-

blown trees have resulted in large volumes of fuel (Tappeiner *et al*., 2007). In some cases, insect infestations may have contributed to large fires (USDA Forest Service 1998a). Recently, increased fuels have led to increased fire intensity (Jenkins, Runyon, Fettig, Page and Bentz, 2014).

Historically fires were the primary disturbance factor that shaped the composition and structure of the forests in the project area (See Map 1). In the period ranging from 1970 through 2013, there were 180 reported fires within the project area (See Map 1). Only three were larger than an acre: 2, 10, and 15 acres respectively.

The project area is characterized as a mixed severity fire regime (Smith, 1997), which is consistent with the pattern of the Johnson Bar fire (See Map 1.) Up to 90% percent of the surface fuels are in the greater than 3-inch category. Since the late 1880s, the total landscape acreage burned is approximately 15, 100 acres, or about 52% of the project area. Counting areas that have reburned at least once the total overall acres are approximately 18, 800.The largest fire was in 1889 (9,043 acres), which the Johnson Bar fire perimeter overlays. With the exception of the 1910-1919 reburns, generally the trend in the area appears to be that the reburn potential begins around 20 years after the first fire. This time allows for enough smaller surface fuels and ladder fuels in the form of regeneration to accumulate to actively carry the next fire and become established in the heavier fuels that are amassing as snags fall.



Map 1: Project and surrounding area with reported fires (180) from 1970-2013, fire perimeter and origin. The shaded area denotes the Johnson Bar Fire area.

The 1934 fire denoted in the upper right-hand corner of Map 2 is the Pete King fire. Two fires are referenced (Pete King and McClendon Butte) in the excerpts from eye-witness reports describing the situation.

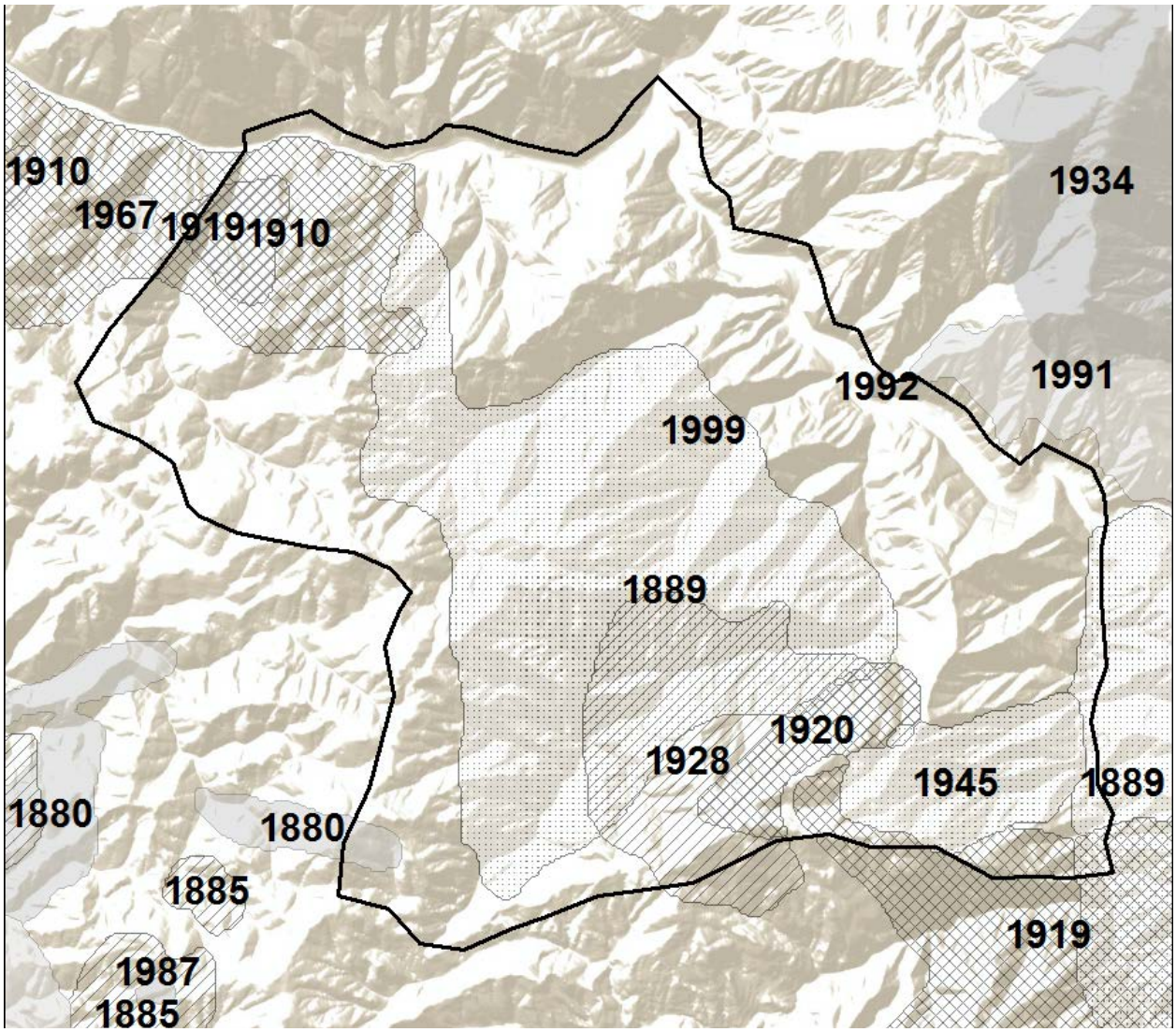
> *The Pete King and McLendon Butte fires both started in single burns of 1919 and 1917 respectively. The points of origin were in areas of cedar snags, down timber and brush. This fuel type covered a large area surrounding the points of origin and was considered one of the worst fire hazards in Region One*. (The Clearwater Story)
>
> *"FIRES INVOLVED: The records show that one man-caused fire of August 7 and 19 lightning-caused fires of August 11 were responsible for the 1934 conflagration.*

"Of the 20 fires concerned, two, the Pete King and McLendon Butte, were directly responsible for over 95 percent of all costs and damages sustained and area burned. They were both lightning fires of August 11. The remainders of the 20 fires were all handled without excessive costs, damages or area burned except two. The Pete King fire surrounded these before they were controlled.

"FUEL TYPES: The types of fuels which existed throughout the area were conspicuously above average both in rates of spread and resistance to control. This situation was the direct result of single burns of the years 1910, 1917, and 1919 and which constituted 75 percent of the area. The balance of the area was green timber—20 percent and multiple burn—5 percent.

"The three major factors which made this area one of the worst hazards of the Region were: (1) large, continuous areas of cedar and white fir snags and windfall intermixed with much fine fuel; (2) exceptionally long, steep slopes exposed to the ever prevalent, deceptive winds and drafts of the Lochsa and Selway River canyons; (3) the astonishing lack of reproduction or other green vegetation of sufficient growth to slow fire spread on ordinary burning days with a consequent over abundance of grass and other fine fuels which greatly increased it."

Both the Pete King and McLendon Butte fires started and continued throughout the first several days in fuels classified high rate of spread and high resistance to control. (Early Days in the Forest Service)



Map 2: Fire history since late 1880s. Only former Nez Perce National Forest data, does not include former Clearwater National Forest data to the north.

While the scope of the Pete King fire was much larger than the Johnson Bar fire, the effects of the Johnson Bar fire should be similar in high mortality areas.

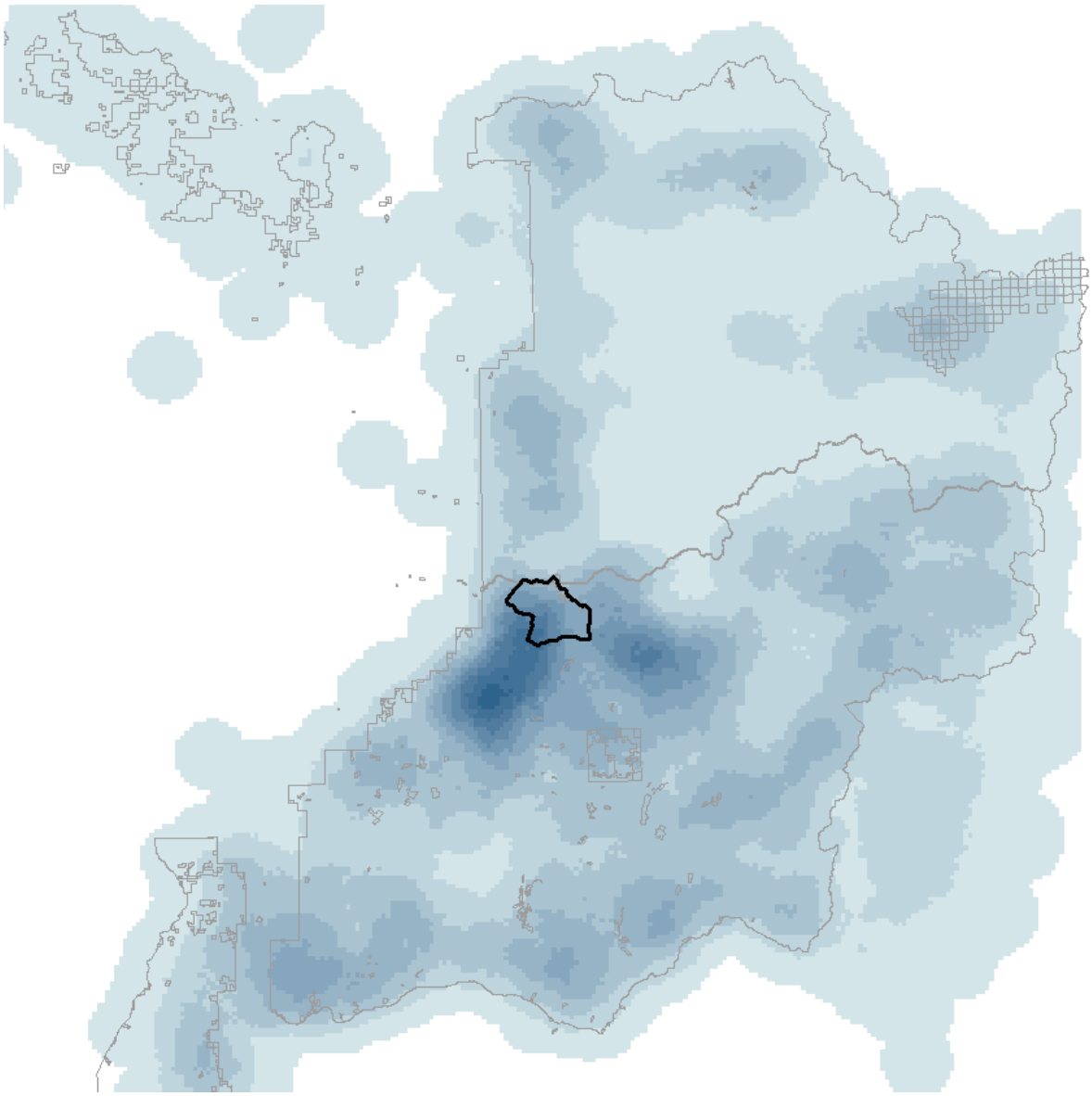
Additionally, the climate of the area in the draws is moist and generally does not support large fire growth except in the more extreme fire weather years (low relative humidities and high air temperatures), of which 2014 was. (Smith, 1997). This concentrates suppression activities to times when they are least effective (Reinhardt *et al*., 2008) because the extreme fire behavior overwhelms suppression efforts.

On August 3, 2014 the Johnson Bar fire started in the Goddard Creek drainage and burned through October, accruing approximately 13,300 acres at a cost of approximately $13, 500, 000 (See Map 1).

Insect and disease mortality in the project area contributed highly to the extreme fire behavior exhibited by the Johnson Bar fire when it burned through these areas. Other

factors hampering suppression efforts were lack of quick access and inability to quickly construct firelines due to high large diameter surface fuel loadings. Fire weakened trees continue to be susceptible to insect and disease mortality and die and fall in addition to the already dead trees.

Generally, lightning storms track across the area from southwest to northeast. Using a point density grid, which shows the relative amount of fire starts per area, it is apparent that the project lies at the northeast end of a distinct historical storm track, the highest density on the Nez Perce-Clearwater National Forest (See Map 4). It is reasonable to assume that this area will continue to have a high fire frequency. If a warming trend in global climate occurs, studies suggest that lightning activity may increase over the western United States, which could amplify ignitions in the local area (Summers, 2011)(Romps, 2014).



Map 3: Fire density of the Nez Perce-Clearwater National Forest with project area in center. Darker colors denote higher fire frequency.

1.2. Proposed Project Area

The approximately 26,788-acre project area is located south and west of Lowell, Idaho within the Middle Fork Clearwater River and Lower Selway Watersheds in Idaho County, Idaho, and would include the Swiftwater, Elk City, Goddard, and O'Hara creeks. The river corridor within this area is classified as a "recreation" segment of the Middle Fork Clearwater Wild and Scenic River System.

The proposed project would be located in portions of Township (T.) 32 North (N.) Range (R.) 7 East (E.), T.32N., R.6E., T.31N., R.7E., and T.31N., R.6E., Boise Principle Meridian. Access would be via Forest Roads #470 (Swiftwater), #9723 (Hotpoint), #1121 (Goddard Point), #9701 (Peterson Point), and #653 (O'hara).

There are no Wilderness Areas, Idaho Roadless Areas, or Research Natural Areas within the proposed project area.

The Johnson Bar Fire Salvage project area is 26,788 acres with the management areas listed below in Table 1-1.

Table 1-1: Management Areas within the Project Area

Management Area	Description of Management Area	Management Area in Johnson Bar Acres
01	Public Safety	25
8.2	Wild and Scenic River	2,308
10	Water	942
12	Timber	10,508
14	Timber/Big Game Visuals	8
16	Elk	9,929
17	Timber/Visuals	2,357
20	Old Growth	2,960
21	Moose	811

*Discrepancies in acres are due to GIS operations and rounding

Map 4: Proposed Project Area

1.3. Purpose and Need for Action

The purpose of the proposal would be to salvage dead and dying timber before it loses its economic value, which would assist in supporting the economic structure of local communities, and to provide for regional and national needs; reduce potential sediment inputs into the aquatic ecosystem from decommissioning approximately 20 miles of roads. Other benefits may include maintaining habitat structure, function, and diversity; improving overall watershed conditions; restoring early seral species on the landscape; and to provide improved forage for big game species. These actions are needed to move resource conditions in the proposed project area from existing conditions toward desired future conditions.

The following resource management opportunities were identified for the proposed project area based upon existing conditions; the applicable Forest Plan management direction; recommendations in the Selway and Middle Fork Clearwater Rivers Subbasin Assessment (USDA Forest Service 2001); and the needs, opportunities, and issues identified by an interdisciplinary team, field reviews, and public input.

1.3.1. Goods and Services

1.3.1.1. *Existing Condition:* The Johnson Bar Fire, started in August 2014, burned over 13,000 acres across the lower Selway and Middle Fork drainages resulting in widespread tree mortality. Much of the mortality occurred in Management Areas allocated as being suitable for timber production.

1.3.1.2. *Desired Future Condition:* The desired condition is to provide a sustained yield of resource outputs as directed by the Nez Perce National Forest Plan.

1.3.1.3. *Need for Action:* Fire killed trees lose economic value quickly. There is a need to utilize the trees so harvested timber can provide materials for local industries.

1.3.2. Fisheries and Watershed Restoration

1.3.2.1. *Existing Condition:* Gravel and native surface roads could contribute sediment to stream channels through surface erosion, ditchline flow into streams, and through road failures. This can negatively affect water quality and fish habitat. Within and adjacent to the fire perimeter are roads that are no longer needed for future management. Most of these roads are either closed year-round to motorized use, or are non-system roads (leftover from past management and not considered part of the current transportation system). There are opportunities to decommission

or store some of these roads in the project area. There are also opportunities to reduce road-related sediment from roads that are needed for future management.

1.3.2.2. *Desired Future Condition:* Maintain road systems that are stable, minimizing hydrologic connectivity to nearby streams and adverse effects to aquatic habitat.

1.3.2.3. *Need for Action:* There is a need to improve watershed function and reduce road-related sediment delivery to streams by removing unneeded roads, and storing or improving roads needed for future management.

1.4. Decision Framework

The Responsible Official for this proposal is the Forest Supervisor, Cheryl Probert. In making her decision, the Responsible Official will review the purpose and need, the Proposed Action and all Alternatives, the environmental effects, and public comments to make the following decisions:

- Should salvage harvesting in the proposed project area be completed, and if so, which environmental and economic considerations should be applied?
- Should temporary roads be constructed, and if so, how many miles of roads should be constructed and where should they be constructed?
- Should any existing roads be decommissioned, and if so, how many miles and which ones?
- What design criteria, mitigation measures, and/or monitoring should be applied to the proposed project?

1.5. Public Involvement

A Notice of Intent (NOI) advertising the scoping period was originally published in the *Federal Register* on October 16, 2014. A corrected NOI was published in the *Federal Register* on October 24, 2014 updating the scoping period from the originally published 30 days to the corrected 45 days.

As part of the public involvement process, the USDA Forest Service (Agency) also listed the proposal in the quarterly Schedule of Proposed Actions (SOPA) beginning October 2014. The proposed project has been presented to the Nez Perce Tribe at quarterly staff-to-staff meetings since November 2014.

The Proposed Action was initially developed as a result of preliminary issues, concerns, and existing conditions that were identified by the interdisciplinary team (IDT). The IDT used issues raised by the public, other agencies, and the Nez Perce Tribe to develop the scope of

the actions, alternatives, and effects to consider in the Environmental Impact Statement (EIS). Many of the issues would be addressed through project design criteria and resource protection measures. Fifteen comment documents were received during the initial 45-day Scoping Period.

The Draft Environmental Impact Statement (DEIS) was advertised for a 45-day public comment period in April 2015. Eighteen comment documents (letters and emails) were received. Those comments have been addressed in this Final Environmental Impact Statement (FEIS).

1.5.1. Changes between the Draft and Final Environmental Impact Statement

The Design Criteria have been updated to include weeds.

In response to comments that were received for the DEIS, Alternative 4 was modified to eliminate harvesting within the Wild and Scenic River Corridor. Some temporary roads were added to Alternative 4 in order to reduce logging costs. Alternative 4 also eliminated some existing helicopter landings from the proposal due to long flights.

Alternative 3 eliminated some new helicopter landings, temporary roads, and swing trails in the Selway. Alternative 3 eliminated some existing temporary roads due to the need to build new landings.

The analyses for economics, fisheries, hydrology, soils, visuals, recreation, and wild and scenic rivers have been updated. The cumulative effects analyses has been moved and included under each respective resource section rather than as a separate section. The cumulative effects analyses have also been updated to include any applicable effects as a result of grazing.

The total amount of acres proposed for salvage harvesting under each alternative have been updated to reflect the removal of landslide prone and riparian habitat conservation area (RHCA) acres.

A Tribal Treaty Rights section has been included in the FEIS.

A list of IDT members and a glossary have been included in the FEIS.

Additional maps have been included in the appendices.

1.6. Issues

The Forest Service separated the issues into two groups: significant and non-significant. Significant issues were defined as those directly or indirectly caused by implementing the Proposed Action. Non-significant issues were identified as those outside the scope of the Proposed Action; already decided by law, regulation, Forest Plan, or other higher level decision; irrelevant to the decision being made; or conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Section 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review

(Section 1506.3)…" A list of non-significant issues and reasons regarding their categorization as non-significant may be found in the project/administrative record.

1.6.1. Issues Used to Develop Alternatives to the Proposed Action

Several concerns raised by the IDT and by the public during scoping were used to develop Alternatives to the Proposed Action. Besides Alternative 1 – No Action and Alternative 2 – Proposed Action, two additional alternatives, Alternative 3 – Reduced Ground Disturbance and Alternative 4 – Economic Feasibility, were developed to address these concerns.

1.6.1.1. *Reduced Ground Disturbance*

Some commenters were concerned about potential sedimentation in the Selway and Middle Fork rivers. As a result the IDT developed Alternative 3 in order to minimize the amount of soil disturbance. Initially Alternative 3 considered no road decommissioning, limited temporary roads and landings, and limited ground based activities; however, road decommissioning was added to the alternative as upward trend analysis is outlined for prescription watersheds in the Nez Perce National Forest Plan Appendix A, and the potential to reduce long-term sediment input into nearby streams. In the Selway portion of the proposed project area, this Alternative would utilize existing roads and landings along with eliminating ground-based yarding systems (i.e. tractor skidding). Some tractor ground in the Selway area would be skyline or helicopter logged. In the Middle Fork portion of the proposed project area, temporary roads would not exceed 500 feet in order to keep road development to a minimum.

Issue Indicators

- Sedimentation;
- Temperature;
- Altered hydrologic processes; and
- Large wood recruitment.

1.6.1.2. *Economic Feasibility*

Some commenters were concerned about the harvest feasibility of the logging systems because of the high percentage of helicopter logging. As a result the IDT developed Alternative 4 in order to minimize these effects. Alternative 4 eliminated helicopter units at or over 5,000 feet yarding distance and units having high logging costs, such as the units with slash hauling along with those units requiring traffic control along Highway 12.

Issue Indicators

- Present net value; and
- Job supported.

1.6.1.3. *Harvesting and Activities Within and Seen from the Wild and Scenic River Corridor*

Some commenters were concerned about activities within the Wild and Scenic River corridor including harvest and helicopter landings and harvest that could been seen from the corridor including US Highway 12, Selway River Road and private residences. A modified Alternative 4 addresses these concerns by eliminating harvest within the Wild and Scenic River Corridor. Design criteria assure visual quality objectives would be met, including for those areas within and seen from the river corridor.

Issue Indicators

- Harvest within the Wild and Scenic River corridor;
- Helicopter landings within the Wild and Scenic River Corridor; and
- Visual Quality Objectives.

1.6.2. Concerns Raised in Response to Scoping

Concerns were raised during the scoping process by the public and the Nez Perce Tribe. The concerns included sedimentation in the Selway and Middle Fork Rivers, harvesting and visual concerns along the Wild and Scenic River, and traffic concerns along Highway 12.

1.7. Regulatory Requirements and Required Coordination

1.7.1. Forest Plan Direction

Although the Clearwater and Nez Perce National Forests were administratively combined in February 2013, management of the lands formerly within the boundary of the Nez Perce National Forest will continue to be guided by direction found in the Nez Perce National Forest Plan until the plan is revised. The Nez Perce National Forest Plan (USDA Forest Service 1987a, as amended) includes goals, objectives, standards, and guidelines that direct management of forest resources. Forest Plan direction is established at 2 scales: Forest-wide direction is applicable throughout the Forest, and management area direction ties specific goals, objectives, and standards to the unique capabilities of given parcels of land.

Nez Perce National Forest Plan standards apply to National Forest System (NFS) lands within the Nez Perce National Forest boundary. They are intended to supplement, not replace, National and Regional policies, standards, and guidelines found in Forest Service Manuals (FSM) and Handbooks.

The proposed project analysis was guided by the goals, objectives, standards, guidelines, and management area direction within the Nez Perce National Forest Plan. This Project would help move the Forest toward desired conditions as described in the Forest Plan and other relevant planning directives.

1.7.2. Clean Air Act

The Clean Air Act, passed in 1963 and amended numerous times since then, is the primary legal authority governing air quality management. This Act provides the framework for national, state, and local efforts to protect air quality. The Montana/Idaho State Airshed Group was formed to coordinate all prescribed burning activities in order to minimize or prevent effects from smoke emissions and ensure compliance with the National Ambient Air Quality Standards (NAAQS) issued by the Environmental Protection Agency (EPA), the federal agency charged with enforcing the Clean Air Act. The USDA Forest Service, including the Moose Creek Ranger District, is a member of this Airshed Group. The proposed project area is within the North Airshed Unit 13. All post-harvest site preparation and timber salvage would be conducted according to the requirements of the Montana/North Idaho Smoke Management Unit guidelines.

1.7.3. Clean Water Act

The Clean Water Act, as amended, stipulates that states are to adopt water quality standards. Included in these standards are provisions for identifying beneficial uses, establishing the status of beneficial uses, setting water quality criteria, and establishing Best Management Practices (BMPs) to control non-point sources of pollution. Executive Order 12088 also requires the Forest Service to meet the requirements of the Act.

Section 313 of the Clean Water Act, as amended, requires Federal agencies to comply with all Federal, State, interstate, and local requirements, administrative authority, and processes and sanctions with respect to control and abatement of water pollution.

Section 303(d) of the Clean Water Act, as amended, stipulates that states must identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). For waters identified on this list, states must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards.

Section 402 of the Clean Water Act, as amended, states that a National Pollutant Discharge Elimination System (NPDES) permit is required for point source discharges including stormwater runoff from logging roads that is collected by, and then discharged from, a system of ditches or culverts. The Forest Service is not currently bound by this decision (Consolidated Appropriations Act, 2012, § 429, Publication L. No. 112-74, 125 Stat. 786, 1046-1047, Dec. 23, 2011); however, if required at the time of project implementation, the permits would be obtained.

Section 404 of the Clean Water Act, as amended, requires permits to dredge or fill within waters of the United States. The US Army Corps of Engineers administers these provisions.

1.7.4. State Water Quality Standards

Environmental Protection Agency regulations require each state to adopt an anti-degradation policy as one component of its water quality standards. The objective of the Idaho Anti-degradation Policy is, at a minimum, to maintain and protect existing instream

water uses and the level of water quality necessary to protect those uses (IDAPA 16.012501,01). Beneficial uses and water quality criteria and standards are identified in the State of Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02).

1.7.5. Region 1 Soil Quality Standards

Region 1 FSM Soil Supplement 2500-99-1 updates and clarifies the previous soil quality supplement (FSH 2509.18-94-1, Chapter 2) based on recent research and collective experience. The analysis standards address basic elements for the soil resource: (1) soil productivity (including soil loss, porosity; and organic matter), and (2) soil hydrologic function. Region 1 Soil Quality Standards (USDA Forest Service 2014) specify that at least 85 percent of an activity area, which is defined as a land area affected by a management activity, must have soil that is in satisfactory condition. These Regional Soil Quality Standards require that detrimental management effects (e.g., compaction, displacement, rutting, severe burning, surface erosion, and mass wasting) to the soil resource not exceed 15 percent of an activity area and that retention of coarse woody material be appropriate for the habitat type. In areas exceeding 15 percent detrimental soil conditions as a result of prior activities, the cumulative detrimental effects from project implementation, including restoration, should not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality. Project design criteria were developed to better meet these soil quality standards.

1.7.6. The National Fire Plan and Healthy Forest Restoration Act

The National Fire Plan (NFP) was developed in August 2000 following a landmark wildfire season with the intent of actively responding to severe wildland fires and their effects to communities while ensuring sufficient firefighting capabilities. The NFP addresses 5 key points: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability. With regard to jurisdiction, direction in the NFP allows for the Forest Service to take NFP action on NFS lands, and for States to take and coordinate action on State and private lands. The Healthy Forests Restoration Act of 2003 (HFRA) (P.L. 108-148) contains a variety of provisions to address hazardous fuel reduction and forest restoration projects on specific types of federal lands that are at risk of wildland fire and/or insect and disease epidemics. The HFRA helps all landowners and managers restore healthy forest and rangeland conditions on those lands, regardless of ownership.

Both the NFP and HFRA provide overarching direction to reduce the threat of wildfire and restore ecosystems. Management actions proposed within the Project area are designed to be consistent with this direction. Particularly, proposed management activities would trend the general landscape condition toward desired fuel profiles and would optimize opportunities to treat hazardous fuels in identified Wildland-Urban Interface (WUI) lands and across the project area landscape.

1.7.7. Endangered Species Act

FSM 2670 directs the Forest Service to conserve endangered and threatened species and to utilize its authorities in furtherance of the Endangered Species Act (ESA), and to avoid actions that may cause a species to become threatened or endangered. FSM 2670 also requires the Forest Service to maintain viable populations of all native and desirable non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on NFS lands. As directed by the ESA, biological assessments and consultation under Section 7 of the ESA will be completed for this decision.

1.7.8. Executive Orders 11988 and 11990

These federal Executive Orders (EOs) provide for the protection and management of floodplains and wetlands . Numerous floodplains and wetlands exist within the analysis area.

EO 11988 (Floodplain Management) requires federal agencies to evaluate the potential effects of actions it may take in a floodplain to avoid adversely affecting floodplains wherever possible, to ensure that its planning programs and budget requests reflect consideration of flood hazards and floodplain management, including restoring and preserving such land areas as natural undeveloped floodplains, and to prescribe procedures to implement the policies and procedures of this EO.

EO 11990 (Protection of Wetlands) requires Federal agencies to take action to avoid adversely affecting wetlands wherever possible, to minimize wetlands destruction and preserve the values of wetlands, and to prescribe procedures to implement the policies and procedures of this EO. The Johnson Bar Fire Salvage project activities have been designed to be consistent with the requirements of EO 11988 and EO 11990 through the retention of PACFISH buffers.

1.7.9. Executive Order 12898

EO 12898 (Environmental Justice) directs each federal agency to make environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. An associated memorandum emphasizes the need to consider these types of effects during NEPA analysis. The Proposed Action and alternatives would not disproportionately adversely affect minority or low-income populations, including American Indian tribal members.

1.7.10. Executive Order 13112

EO 13112 (Invasive Species) was issued on February 3, 1999, to enhance federal coordination and response to the complex and accelerating problem of invasive species . EO 13112 directs federal agencies to work together [as stated in the Preamble] to "…prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health effects that invasive species cause." Project activities have been designed to be consistent with the requirements of EO 13112.

1.7.11. Idaho Forest Practices Act

The Idaho Forest Practices Act regulates forest practices on all land ownership in Idaho. Forest practices on National Forest System administered lands must adhere to the rules pertaining to water quality (IDAPA 20.02.01). The rules are also incorporated as BMPs in the Idaho Water Quality Standards. Project activities have been designed to be consistent with the Idaho Forest Practices Act.

1.7.12. Idaho Stream Channel Protection Act

The Idaho Stream Channel Protection Act regulates stream channel alterations between mean and high water marks on perennial streams in Idaho (IDAPA 37.03.07). Instream activities on NFS lands must adhere to the rules pertaining to the Act. The rules are also incorporated as BMPs in the Idaho Water Quality Standards. Project activities have been designed to be consistent with the Idaho Stream Channel Protection Act.

1.7.13. National Environmental Policy Act, Sections 101 and 106

The National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) was signed into law on January 1, 1970. NEPA establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals within the federal agencies. NEPA also established the CEQ.

Title I of NEPA contains a Declaration of National Environmental Policy that requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony. Section 102 requires federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach. Specifically, all federal agencies are to prepare detailed statements assessing the environmental effect of and alternatives to major federal actions significantly affecting the environment. These statements are commonly referred to as Environmental Impact Statements (EISs).

The public has an important role in the NEPA process, particularly during scoping, to provide input on what issues should be addressed in an EIS and to comment on the findings in an agency's NEPA documents. The public can participate in the NEPA process by attending NEPA-related hearings or public meetings and by submitting comments directly to the lead agency. The lead agency must consider all comments received from the public and other parties on NEPA documents during the comment period.

1.7.14. National Forest Management Act

The National Forest Management Act (NFMA) (16 U.S.C. 1600–1614, August 1974, as amended 1976, 1978, 1980, 1981, 1983, 1985, and 1990) reorganized, expanded, and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on NFS lands. The NFMA requires the Secretary of Agriculture to assess forest lands; develop a management program based on multiple-use, sustained-yield principles; and implement a resource management plan for

each unit of the NFS. It is the primary statute governing the administration of national forests. Project activities have been designed to be consistent with the NFMA.

1.7.15. National Historic Preservation Act

Section 101 of the National Environmental Policy Act requires federal agencies to preserve important historic, cultural, and natural aspects of our national heritage. The legal processes associated with the protection and preservation of these resources is outlined in the National Historic Preservation Act of 1966 (NHPA) (36 CFR 800) and subsequent amendments. Passed by Congress two years before NEPA, the NHPA sets forth a framework for determining if a project is an "undertaking" that has the potential to effect cultural resources. The implementing regulations also outline the processes for identifying, evaluating, assessing effects, and protecting such properties. The coordination or linkage between the Section 106 process of the NHPA and the mandate to preserve our national heritage under NEPA is well understood and is formally established in 36 CFR 800.3b and 800.8. The terminology of "…important historic, cultural, and natural aspects of our national heritage" found in NEPA includes those resources defined as "historic properties " under the NHPA [36 CFR 800.16(l)(1)]. It is thus the Section 106 process that agencies utilize to consider, manage, and protect historic properties during the planning and implementing stages of federal projects. The Forest meets its responsibilities under NHPA through compliance with the terms of a Programmatic Agreement (PA) signed between Region 1, the Idaho State Historic Preservation Office, and the Advisory Council on Historic Preservation.

1.7.16. National Wild and Scenic Rivers Act

Section 10(a) of the Wild and Scenic Rivers Act states:

> *Each component of the national Wild and Scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other such uses that do not interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting* ***aesthetic, scenic, historic, archaeologic, and scientific features****. Management Plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.*

1.7.17. Tribal Treaty Rights

American Indian tribes are afforded special rights under various federal statutes: NHPA; NFMA; Archaeological Resources Protection Act of 1979 (ARPA) (43 CFR Part 7); Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (43 CFR Part 10); Religious Freedom Restoration Act of 1993 (P.L. 103141); and the American Indian Religious Freedom Act of 1978 (AIRFA). Federal guidelines direct federal agencies to consult with tribal representatives who may have concerns about federal actions that may affect religious practices, other traditional cultural uses, or cultural resource sites and remains

associated with tribal ancestors. Any tribe whose aboriginal territory occurs within a project area is afforded the opportunity to voice concerns for issues governed by NHPA, NAGPRA, or AIRFA.

Federal responsibilities to consult with tribes are included in the NFMA; Interior Secretarial Order 3175 of 1993; and EOs 12875, 13007, 12866, and 13084. EO 12875 (Enhancing the Intergovernmental Partnership) calls for regular consultation with tribal governments . EO 13007 (Indian Sacred Sites) requires consultation with tribes and religious representatives on the access, use, and protection of sacred sites. EO 12866 (Regulatory Planning and Review) requires that federal agencies seek views of tribal officials before imposing regulatory requirements that might affect them. EO 13084 (Consultation and Coordination with Indian Tribal Governments) provides direction regarding consultation and coordination with tribes relative to fee waivers. EO 12898 (Environmental Justice) directs federal agencies to focus on the human health and environmental conditions in minority and low-income communities, especially in instances where decisions may adversely affect these populations (see "Executive Order 12898" above). NEPA regulations (40 CFR 1500–1508) invite tribes to participate in forest management projects and activities that may affect them.

Portions of the Forest are located within ceded lands of the Nez Perce Tribe. Ceded lands are federal lands on which the federal government recognizes that a tribe has certain inherent rights conferred by treaty. In Article 3 of the Nez Perce Treaty of 1855, the United States of America and the Nez Perce Tribe mutually agreed that the Nez Perce retain the following rights:

> …taking fish at all usual and accustomed places in common with citizens of the Territory [of Idaho]; and of creating temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing horses and cattle…

The proposed Johnson Bar Fire Salvage project has been presented to the Nez Perce Tribe at the quarterly staff-to-staff meetings since November 2014.

1.8. Scope of the Analysis

The Code of Federal Regulations (40 CFR 1508.25) requires the Forest Service to consider three types of actions (connected, similar, and cumulative) to determine the scope of the analysis.

Connected Actions are those actions that are closely related and are part of a larger action. One action would not occur without the other components. Overall, the Proposed Action and the Alternatives are not an interdependent part of a larger action.

Similar Actions are those actions which, when viewed with other reasonably foreseeable proposed actions, have similarities that provide a basis for evaluating their environmental consequences together, but are not necessarily connected. The salvage harvest and road decommissioning for the Johnson Bar proposal are considered similar actions, due to each having similar time frames, geographic areas, and purposes.

Cumulative Actions are those actions, which when viewed in conjunction with other past, present, and reasonably foreseeable future actions would result in effects having cumulative effects; and therefore, should be discussed in the same analysis. A table listing all known past, present, and reasonably foreseeable future actions overlapping the temporal and spatial bounds of the proposal is located in Chapter 3.

1.9. Availability of Project Files

An important consideration in preparation of this EIS has been the reduction of paperwork as specified in 40 CFR 1500.4. In general, the objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental effects as a result of implementing any of the proposed alternatives and how these effects would be mitigated. More detailed information is located in the project file and is available for public inspection.

1.10. Organization of the FEIS

This EIS includes information necessary for the Forest Supervisor to make a decision based on the environmental effects of the Proposed Action or the Alternatives. Federal regulations specify the types of information necessary for decision-makers to make good decisions. In so doing, this document is organized as follows:

- Chapter One states the purpose and need for the action. The purpose and need is the basis upon which to evaluate any alternatives to the Proposed Action.
- Chapter Two describes the four alternatives in detail, including the No Action alternative, and summarizes the differences between the alternatives, particularly in regards to potential environmental effects.
- Chapter Three describes the baseline (existing) conditions for each resource area that may be affected by the Proposed Action or Alternatives and analyzes the potential environmental effects (direct, indirect, and cumulative) as a result of implementing the proposed alternatives.
- Chapter Four lists those involved in the preparation and review of the EIS, including the IDT and other technical support.
- Other sections include references cited, a glossary, an index, acronyms, and appendices containing supporting technical information.

CHAPTER 2

ALTERNATIVES INCLUDING THE PROPOSED ACTION

2. Introduction

This chapter describes and compares the alternatives considered for the proposed Johnson Bar Fire Salvage Project and includes a discussion of each alternative analyzed in detail and a listing of the alternatives eliminated from detailed analysis. This comparison will address differences between the alternatives and provide a clear basis for decision making by the Responsible Official. Maps for each of the alternatives analyzed in detail are included in Appendix G.

The proposed Johnson Bar Fire Salvage Project was developed as a means in which to capture economic value, where appropriate, in order to offset treatment costs of restoration projects in the fire affected area. The Interdisciplinary Team (IDT) used a restoration based framework to evaluate areas that were suitable for harvesting; first identifying areas of 60% or greater mortality that could be economically accessed, and then removed areas with a high potential for mass wasting (landslides, unstable slopes, etc.) or that could contribute to additional unwanted effects if harvested. Design criteria were developed to address social concerns, such as aesthetics and recreation, as well as to further minimize or avoid adverse effects to Threatened, Endangered, or Sensitive (TES) species.

2.1. Alternatives Considered in Detail

The Forest Service developed four alternatives in response to public scoping and issues raised as a result of IDT input. These alternatives consist of the No Action Alternative (Alternative 1), Proposed Action (Alternative 2), Reduced Ground Disturbance (Alternative 3), and Economic Feasibility (Modified Alternative 4). All alternatives were given equal weight, and any remaining issues considered were used to modify the action alternatives.

2.2. Actions Common to all Action Alternatives

The following actions would be included as a component of all of the action alternatives.

- Harvest activities would include 57.8 miles of maintenance and reconditioning of haul roads, to include removal of brush, clearing of culvert inlets, grading of the roads for water flow control, and the removal of closure barriers as needed;
- 20.2 miles of non-system road decommissioning;
- 1.1 miles of system road decommissioning;
- 4.8 miles of road storage system roads;
- The Design Criteria.

2.3. Alternative 1 – No Action

Under the No Action alternative, neither the Proposed Action nor the other alternatives would be implemented and current management actions would continue to guide management of the proposed project area. Along with this alternative providing a baseline for comparison of the environmental effects as a result of potential implementation of the other alternatives (36 CFR 1502.14), the No Action alternative is potentially an appropriate management option that could be selected by the Responsible Official.

2.4. Alternative 2 – Proposed Action

The Forest Service is proposing to harvest 3,096 acres within the Johnson Bar Fire Salvage Project Area, of which 100 acres would utilize tractor logging, 1,478 acres would utilize skyline logging, and 1,518 acres would be through helicopter logging. Activities would also include 16.9 miles of system haul road reconstruction, to include culvert replacement, spot surfacing, stabilization of Road #470, installation of cross-drainage on Road #9723B, installation of culverts on Road #653A, and opening of decommissioned Road #470B. Any additional haul roads being utilized as part of the proposed project would consist of County and State highways. The Proposed Action would utilize 3.1 miles of new and existing temporary roads and 17 new and existing helicopter landings.

2.5. Alternative 3 – Reduced Ground Disturbance

In response to comments received during the Scoping process regarding potential sedimentation in the Selway and Middle Fork Rivers, the Forest Service developed Alternative 3. Under Alternative 3, the Forest Service is proposing to harvest 2,710 acres within the Johnson Bar Fire Salvage Project Area, of which 18 acres would utilize tractor logging, 921 acres would utilize skyline logging, and 1,771 acres would be through helicopter logging. Activities would also include 16.5 miles of system haul road reconstruction, to include culvert replacement, spot surfacing, stabilization of Road #470, installation of cross-drainage on Road #9723B, and installation of culverts on Road #653A. Any additional haul roads being utilized as part of the proposed project would consist of County and State highways. Alternative 3 would utilize 0.3 mile of existing temporary roads, and 14 new and existing helicopter landings, in order to reduce the amount of disturbances along the Selway River.

2.6. Alternative 4 – Economic Feasibility (Preferred Alternative)

In response to internal and external comments received during the Scoping process regarding economic feasibility, harvesting within or seen from the Wild and Scenic River Corridor, and landings along Highway 12 and the Selway River Road, the Forest Service developed Alternative 4. Under this Alternative, the Forest Service is proposing to harvest 2,207 acres within the Johnson Bar Fire Salvage Project Area, of which 100 acres would utilize tractor logging, 1,352 acres would utilize skyline logging, and 755 acres would be through helicopter logging. Activities would also include 16.9 miles of system haul road reconstruction, to include culvert replacement, spot surfacing, stabilization of Road #470, installation of cross-drainage on Road #9723B, installation of culverts on Road #653A, and

opening of decommissioned Road #470B. Any additional haul roads being utilized as part of the proposed project would consist of County and State highways. Alternative 4 would utilize 3.4 miles of new and existing temporary roads, in order to reduce logging costs, and 14 new and existing helicopter landings.

2.7. Comparison of the Alternatives

Table 2.1 provides a summary comparison of the potential activities of implementing each of the proposed alternatives.

Table 2-1: Comparison of Proposed Activities by Alternative

Activity	Alternative1 No Action	Alternative2 Proposed Action	Alternative 3 Reduced Ground Disturbance	Alternative 4 Economic Feasibility
Fire salvage harvest (Acres)	0	3,096	2,710	2,207
Haul roads; Road maintenance/reconditioning (miles)	0	57.8	57.8	57.8
Haul roads; System road reconstruction (miles)	0	16.9	16.5	16.9
Total haul roads used on USFS administered lands (miles)	0	68.4	67.6	68.4
Temporary roads – existing template (miles)	0	0.7	0.3	0.7
Temporary Roads – New Construction (miles)	0	2.4	0	2.7
Tractor swing trails (miles)	0	4.6	0	4.6
Logging system (acres)	0	Tractor - 100 (3%) Skyline -1,478 (48%) Helicopter – 1,518 (49%)	Tractor – 18 (1%) Skyline – 921 (34%) Helicopter – 1,771 (65%)	Tractor - 100 (3%) Skyline – 1,352 (61%) Helicopter - 755 (36%)
Helicopter landing EXISTING	0	11	11	8
Helicopter landing NEW	0	6	3	6
Site preparation and reforestation (acres)	0	3,096	2,710	2,207

Activity	Alternative1 No Action	Alternative2 Proposed Action	Alternative 3 Reduced Ground Disturbance	Alternative 4 Economic Feasibility
Road decommissioning non-system roads (miles)	0	20.2	20.2	20.2
Road decommissioning system roads (miles)	0	1.1	1.1	1.1
Road storage system roads (miles)	0	4.8	4.8	4.8

2.8. Alternatives Considered but Eliminated from Detailed Analysis

In accordance with NEPA, Federal Agencies are required to rigorously explore and objectively evaluate any reasonable alternatives and to briefly discuss the reasoning should any alternative be eliminated for detailed analysis (40CFR 1502.14). Public comments received during the Scoping process provided alternative suggestions in order to achieve the purpose and need of the proposed project. Each alternative was reviewed to determine if it: (1) met the purpose and need; (2) addressed the issues; (3) whether or not the alternative was feasible; and (4) whether or not the alternative was consistent with the Forest Plan, laws, and regulations. The following alternatives were eliminated from detailed analysis:

- **More harvesting:** Some commenters expressed concerns that the scope of the project was too small; that the proposal does not capture enough economic value of burned trees or treat enough acreage to have measurable ecologic outcomes. The IDT considered additional opportunities but eliminated them from detailed analysis because it would entail harvesting in landslide prone or other ecologically sensitive areas; areas of high burn severity, or other areas not readily accessible which would generate little or no economic return.
- **No harvesting in visual areas:** Commenters expressed concerns over the visual effects of the proposed harvest and “clear-cuts” in particular. The IDT considered alternatives that would avoid harvest visible from US Highway 12, the Selway River Road, and other sensitive viewpoints, but did not analyze them in detail because they did not meet the purpose and need; and were therefore eliminated from detailed analysis. Harvest areas are designed to meet the Forest Plan visual quality objectives for visually sensitive areas through variable tree retention and Design Criteria, which are analyzed in Chapter 3.
- **No harvesting in unroaded areas:** Some commenters requested an alternative be analyzed that avoided harvest in the former Middle Fork Face Roadless area, as designated by the 1987 Nez Perce National Forest Plan. Commenters felt that unroaded areas in the Middle Fork might meet the minimum criteria for Wilderness consideration and that harvest would constitute an irretrievable commitment of resources that must be analyzed. The IDT considered this alternative, but did not analyze it in detail because the Idaho Roadless Rule removed the Middle Fork Face

as a recognized roadless area under the 2008 Idaho Roadless Rule. The remaining unroaded area within the Middle Fork does not meet the minimum size criteria for Wilderness and previous harvest would make unimpaired preservation of the area impractical.

- **Harvesting without constructing any new temporary roads or helicopter landings:** The IDT considered harvesting without developing any new temporary roads or new helicopter landings; however, this was eliminated as this would make any harvesting activities uneconomical; and therefore it was eliminated from detailed analysis.

Table 2-2: Issue and Resource Indicators

Issue and Resource Indicator	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
Economics								
Volume Harvested (CCF)	0		85,300		75,200		60,400	
Volume Harvested (MBF)	0		43,600		38,500		30,900	
Jobs Sustained	0		1,151		1,015		815	
Community Harvest Income	0		32,705,000		28,832,000		23,158,000	
Federal Income Tax	0		4,906,000		4,325,000		3,474,000	
Sale Feasibility (Present Net Value)	0		-(101,600)		-(2,7933,400)		2,216,000	
Fire and Fuels								
Surface fuel loadings (17-32 tons/acre, greater than 3 inches)	Exceeds		Meets		Meets		Meets	
Fisheries								
Predicted increases in cobble embeddedness								
	% Over Base	% CE	% Over Base	% CE	% Over Base	% CE	% Over Base	% CE
Lower O'Hara	1	37	1	37	1	37	1	37
Goddard Creek	5	52	7	52	7	52	7	52
Elk City Creek	15	56	20	57	19	57	19	57
Swiftwater Creek	9	43	11	43	10	43	11	43
Lower Selway River	1	46	2	46	2	46	2	46
Lodge Creek	1	37	2	37	2	37	2	37
Unnamed No.8	1	46	3	46	3	46	2	46
Decker Creek	3	37	6	38	6	38	6	38
Middle Fork Clearwater Face	0	46	0	46	0	46	0	46
Percent Reduction in Winter and Summer Rearing Habitat by Alternative								

Issue and Resource Indicator	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	% summer	% winter	% summer	% winter	% summer	% winter	% summer	% winter
Lower O'Hara	0	0	0	0	0	0	0	0
Goddard Creek	-1	-6	-1	-6	-1	-6	-1	-6
Elk City Creek	-3	0	-3	0	-3	0	-3	0
Swiftwater Creek	0	-4	0	-4	0	-4	0	-4
Lower Selway River	0	0	0	0	0	0	0	0
Lodge Creek	0	0	0	0	0	0	0	0
Unnamed No.8	0	0	0	0	0	0	0	0
Decker Creek	0	0	0	0	0	0	0	0
Middle Fork Clearwater Face	0	0	0	0	0	0	0	0
Watershed								
Net sediment delivery (tons/year)								
- Big Smith Creek-Middle Fork Clearwater River	1.9		0.9		0.9		0.9	
- Goddard Creek-Selway River	4.2		0.4		0.4		0.4	
- O'Hara Creek	0.1		0.1		0.1		0.1	
Percent sediment yield increase over base								
- Decker Creek	7		11		10		10	
- Lodge Creek	4		5		5		5	
- Middle Fork Clearwater Face	0		1		1		0	
- Unnamed No. 8	8		11		11		10	
- Elk City Creek	16		21		20		20	
- Goddard Creek	7		8		8		8	
- Lower Selway River	2		2		2		2	
- Swiftwater Creek	9		12		10		11	
- Lower O'Hara Creek	2		2		2		2	

Issue and Resource Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Road density (mi/mi^2)				
- Decker Creek	0.5	0.5	0.5	0.5
- Lodge Creek	4.5	4.1	4.1	4.1
- Middle Fork Clearwater Face	2.1	2.1	2.1	2.1
- Unnamed No. 8	1.2	1.2	1.2	1.2
- Elk City Creek	2.6	1.0	1.0	1.0
- Goddard Creek	1.7	1.4	1.4	1.4
- Lower Selway River	1.5	1.5	1.5	1.5
- Swiftwater Creek	2.9	2.4	2.4	2.4
- Lower O'Hara Creek	1.6	1.2	1.2	1.2
Percent increase in equivalent clearcut area				
- Decker Creek	28.1	1.5	0.6	0.7
- Lodge Creek	19.7	0.2	0.0	0.0
- Middle Fork Clearwater Face	9.5	0.0	0.0	0.0
- Unnamed No. 8	26.3	1.0	0.2	0.3
- Elk City Creek	32.8	1.4	0.0	0.4
- Goddard Creek	16.1	0.5	0.0	0.2
- Swiftwater Creek	21.4	0.8	0.1	0.4
- Lower Selway River	5.1	0.2	0.0	0.0
- Lower O'Hara Creek	5.8	0.2	0.1	0.1
Recreation				
Number of recreation sites affected by harvest, temporary roads or swing trails (Developed/Dispersed)	0/0	0/3	0/3	0/3

Issue and Resource Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Number of recreation sites affected by log hauling (Developed/Dispersed)	0/0	All	All	All
Number of recreation sites affected by helicopter landings (Developed/Dispersed)	0/0	2/3	2/3	0/2
Miles of trails affected	0	14.9	3.8	3.7
Change in ROS	None	None	None	None
Gathering opportunities	No change	Less	Less	Less
Access (closed to motorized use)	0	1.1	1.1	1.1
Soils				
Acres of harvest on terrain rated as high hazard for surface erosion	0	150 (5%)	137 (5%)	62 (3%)
Miles of temporary road or swing trail construction on soil rated as high hazard for subsurface erosion	0	4.9	0.8	5.4
Total acres of new DSD	0	119	75	100
Number of harvest units requiring specialized project design criteria to meet Regional soil standards	0	1	0	0
Vegetation				
Percent of stand in early seral species component 60% fire mortality	1%	45%	45%	45%

Issue and Resource Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Percent of stand in early seral species component 100% fire mortality	36%	63%	63%	63%
Percent of project area in early seral species component	0%	10%	9%	8%
Visuals				
Meet adopted visual quality objectives (VQOs)	Would meet VQO, but the scenic character of the area would continue to be affected by increases in dead and dying vegetation due to fire activity in the area. The area would also continue to be susceptible to further catastrophic wildfire.	Proposed harvest would meet the VQO of retention in the foreground and partial retention along the Swiftwater Road with the use of design criteria utilized to emulate the effects of natural processes. Areas outside critical viewsheds would meet the VQO of modification. Long term goals of a more healthy and resilient forest would also improve the scenic character over time.	Proposed harvest would be reduced slightly from Alternative 2 with the elimination of Unit 116 within the Selway River road foreground viewing zone. This alternative has the lowest percentage of skyline harvest methods and the highest percentage of helicopter harvest. Harvest activities would be visible from most viewpoints, but proposed units would have the design criteria to ensure that openings have the appearance of openings created by natural processes.	Proposed harvest would be reduced, especially in the U.S. Highway 12 viewing zone. There would be no harvest within the Wild and Scenic River boundaries. Harvest units within the retention VQO of the Selway Road would also be reduced. This alternative has the highest percentage of skyline harvest methods. Harvest activities would be visible from most viewpoints, but proposed units would have the design criteria to ensure that openings have the appearance of openings created by natural processes.
Wildlife				
Acres of species habitat affected as a result of the action alternatives (percent of species habitat affected)				
American Marten	19,243 acres	1,251 (7%)	939 (5%)	1,121 (6%)

Issue and Resource Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Bald Eagle	3,648	487 (13%)	426 (12%)	135 (4%)
Black-backed Woodpecker	11,068	2,604 (23%)	2,231 (20%)	1,824 (16%)
Fisher	20,255	1,349 (7%)	1,306 (6%)	952 (5%)
Flammulated Owl	901	172 (19%)	131 (15%)	172 (19%)
Fringed Myotis	724	95 (13%)	55 (8%)	63(9%)
Gray Wolf	26,788	n/a	n/a	n/a
Long-eared Myotis Long-legged Myotis	2,951	216 (7%)	186 (6%)	191 (6%)
Northern Goshawk Nesting	18,900	1,207 (6%)	1,169 (6%)	833 (4%)
Pileated Woodpecker Nesting	2,175	121 (6%)	100 (5%)	34 (2%)
Pygmy Nuthatch	1,266	222 (17%)	178 (14%)	189 (15%)
Shiras Moose	811	11 (1%)	11 (1%)	11 (1%)

2.9. Design Criteria

Post-fire landscapes can be extremely delicate and fragile, particularly in areas burned at high intensity. As such the Interdisciplinary Team (IDT), in consultation with the US Fish and Wildlife Service, National Marine and Fisheries Service, and the Nez Perce Tribe, developed the following design criteria, which would be included as components common to all action alternatives.

2.9.1. Soils

1. Effectiveness of design criteria are moderate to high based on past monitoring and research (Froehlich and McNabb 1983; Graham *et al*. 1994; Graham *et al*. 1999; Korb 2004; Neary *et al*. 2008; Curran *et al*. 2005a,b). Skid trails, landings, and yarding corridors would be located and designated to minimize the area of increased detrimental soil effects.
2. Landslide prone areas have been mapped and field verified in the harvest units. These landslide prone areas would be further delineated in the field, would be excluded during unit layout, and would receive a PACFISH buffer (Nez Perce National Forest Plan as amended by PACFISH 1995). Indicators of landslide prone areas include: steep (over 60%) concave slopes; hydrophytic vegetation (i.e. sedges, moist site ferns); slumps, draws, and basins; past landslide locations; and obvious soil movement areas (typically indicated by curved and/or buttressed tree boles, soil creep, tension cracks, etc.). No harvest activities would occur in these areas.
3. In all units, to reduce ground disturbance, no ground based skidding would be allowed on slopes over 35 percent.
4. For all harvest units, coarse woody material appropriate to the site would be retained for maintaining soil moisture, soil stability, and other soil physical and biological properties after all unit activities. Regional guidance for organic matter recommends the following guidelines, such as retaining coarse woody material (> 3-inch diameter) to maintain soil productivity (Graham et al. 1994). Moister habitat types require 17–33 tons/acre. Approximately 14–28 standing trees per acre would be retained for future down wood recruitment. Non-merchantable snags or other designated retention trees felled for safety reasons would be left in the unit.
5. Landings, skid trails, and slash piles would be located in suitable sites to avoid, minimize or mitigate potential for erosion and sediment delivery to nearby waterbodies. Skid trails would not be placed within an RHCA or landslide prone areas. Only existing landings would occur within RHCAs.
6. Erosion control and sediment plans would cover all disturbed areas, including skid trails and roads, landings, cable corridors, temporary road fill, water source sites, borrow sites or other areas disturbed during harvest operations.
7. Use suitable species and establishment techniques to cover or vegetate disturbed areas in compliance with local direction and requirements for vegetation ecology

and prevention and control of invasive species. Prevention and control of invasive plants within the project area would be consistent with the Nez Perce National Forest's Invasive Plants Treatment Project Record of Decision (1988).

8. Install sediment and stormwater controls prior to initiating surface disturbing activities to the extent practical.
9. Operate equipment when soil compaction, displacement, erosion and sediment runoff would be minimized (dry or frozen ground). Avoid ground equipment operations on highly erosive, unstable, wet or easily compacted soils and steep slopes as described per Nez Perce National Forest Plan (USDA, 1987).
10. Road blading would only be done when necessary. Ditches would not be routinely bladed, and exposed soil areas on road prisms, ditches, cuts, and fills would be seeded as necessary to control erosion.
11. In areas of high and moderate wildfire burn severity or where the litter and duff layers have been removed by fire, slash would be left on site to provide for erosion and soil productivity protection. A ground cover of 85% should be maintained on site with both fine (approximately 5-10 tons/acre) and coarse woody debris.
12. Winter Logging
    a. Conduct winter logging operations when the ground is frozen or snow covered and depth is adequate to avoid rutting or displacement of soil.
    b. Leave a minimum of 2 inches of snow on road surfaces. Leave drainage points (breaches) in snow berms at regular intervals to avoid concentrated snow melt runoff onto road surfaces.
    c. Avoid locating skid trails on steep areas where frozen skid trails may be subject to soil erosion the next spring.
13. Cable and Aerial Yarding Operations
    The majority of the units would use cable/aerial yarding operations to avoid soil disturbance and erosion risks. Given this method, soil disturbance and erosion risks from these systems are primarily confined to cable corridors and landings.
    a. Any exposed soil resulting from skyline logging corridors would be stabilized by placing slash over the area to achieve at least 95% coverage and by installing waterbars if trenching occurs.
    b. Locate cable corridors to efficiently yard materials with the least soil damage
    c. Use suitable measures to minimize soil disturbance when yarding over breaks in slope (i.e. intermediate supports).
    d. Yarding operations would be postponed when soil moisture levels are high if the specific type of yarding system results in unacceptable soil disturbance and erosion within cable corridors.
14. Ground-Based Skidding and Yarding Operations

For units with potential ground based operations, the following design criteria would be implemented in order to minimize soil erosion and soil productivity effects:

a. Use of designated skid trails and harvest systems as approved by the soils specialist, such as re-use of existing disturbance, operating on a slash mat, and shovel logging systems.

b. Activities would be restricted when soils are wet to prevent resource damage (indicators include excessive rutting, soil displacement, and erosion). Use of heavy equipment would be suspended when soil is too wet to support heavy equipment without detrimental resource damage.

c. Directionally fell trees to facilitate efficient removal along pre-designated yarding patterns with the least number of passes and least amount of disturbed area.

d. For all harvest units, decompaction would be required on skid trails where excavation or ground disturbance has occurred or where successive passes have taken place over the same trail. Decompaction would be conducted to improve soil productivity and meet Regional soil quality standards. Decompaction would span the width of the compacted areas and extend to a depth of 10–18 inches, to effectively loosen the ground to allow water penetration and revegetation and to prevent the rocky sub-surface soils from mixing with the topsoil. The depth of decompaction should be adjusted to avoid turning up large rocks, roots, or stumps. Equipment would not be permitted to operate outside the clearing limits of the skid trail. No decompaction work should be done during wet weather or when the ground is frozen or otherwise unsuitable.

2.9.2. Wildlife

1. All temporary roads would be closed to the public and decommissioned following use.
2. No old growth would be harvested.
3. Maintain a minimum 40-acre yearlong no-treatment buffer around occupied goshawk nest trees. No ground disturbing activities would be allowed inside occupied post-fledgling goshawk areas (minimum distance of 440 acres around the nest stand) from April 15 to August 15.
4. If an active bald eagle nest is detected in or near the Johnson Bar Fire Salvage Project Area, all activities within ½ mile and up to 2 ½ miles from the nest would be postponed during the period of February 1 to August 15. No harvest would occur within ½ mile of an active bald eagle nest. This would allow for the nesting and rearing period of the recent eagle clutch to occur without external disturbances or displacement from project activities.

5. Large snags [≥ 15 inches diameter at breast height (DBH)] should be retained for all units if possible. The modified Northern Regional Snag Guidelines suggest leaving at least 4 snags (15-20 inches DBH) and 1.6 snags (≥20 inches DBH) average per acre (Bollenbacher, *et al.* 2009) across the project area. It would be more favorable for wildlife if the retained snags occurred in clusters. In units that are lacking the sufficient quantity of snags, keep enough possible snags and live trees with large DBH for recruitment snags.
6. If a den, nest sites, or other important habitat feature of any threatened, endangered, or sensitive species were to be discovered within or in close proximity to any treatment unit, project activities would be coordinated with a wildlife biologist so that appropriate conservation measures could be developed.

2.9.3. Aquatics

1. No timber harvest would occur within 300 feet of fish-bearing streams, 150 feet of perennial non-fish bearing water, 100 feet of intermittent streams, 100 feet from landslide prone areas, and a 150-foot slope distance from the edge of wetlands larger than one acre.
2. Contractors would have spill prevention and containment materials on site with stationary equipment and at fueling and maintenance sites to minimize the risk of an accidental spill of petroleum products, as well as to protect water courses and aquatic biota from adverse effects in the event of a spill. Spill prevention and containment materials would be accessible for non-stationary equipment while on National Forest System lands.
3. Helicopter refueling and serving could occur in RHCAs, 150 feet from water bodies on existing helicopter landing sites. These actions are similar to common fire practices and mitigation measures outlined in the Nez Perce National Forest Fire Programmatic (NMFS 1999) and FWS #1-4-99-I-154 would apply.
4. Equipment staging, parking, servicing, and refueling would be outside of Riparian Habitat Conservation Areas (RHCAs) and in designated areas.
5. Dust abatement (chemical and water application) would be used on major haul routes to minimize sediment input to streams from log hauling activities. It would be applied the same year that log hauling occurs and would follow design criteria in the Nez Perce-Clearwater National Forests programmatic road maintenance consultation (1999). Magnesium chloride (MgCl2) typically used during chemical application. For MgCl2 applications, a 1-foot buffer zone would be applied on the edge of gravel allowed by the road width. The source location, quantity, and timing of dust abatement would be approved by the Forest Service before sale, in order to protect water resources during low flows. Water pumps intakes must be screened and no more than 30% of streamflow shall be pumped and water drafting at any site shall not exceed 10 hours per day and not exceed 3 consecutive days.

6. Conduct an IDT review during sale layout and contract preparation to ensure that the BMPs and additional project design criteria are incorporated into the layout and timber sale contract.
7. Riparian Habitat Conservation Areas
    a. Roadside hazard trees within streamside Riparian Habitat Conservation Areas (RHCAs) felled for safety purposes would be left onsite. Roadside hazard trees on landslide prone RHCAs felled for safety purposes would be left onsite, unless it is determined that they would create a hazardous fuels situation, in which case the tree(s) may be removed following coordination with the soils and watershed specialist to ensure they can be removed without causing unacceptable soil effects or creating erosion concerns. Non-roadside hazard trees within all RHCAs felled for safety reasons would be left onsite.
    b. There would be no new road construction adjacent or within RHCAs. All temporary road construction would be on existing road templates or ridge tops. There would be no connectivity to the stream network, which would avoid concentrated flows and sediment transport to nearby waterbodies.
    c. No yarding operations are proposed in/through RHCAs.
    d. Heavy equipment refueling and servicing would be outside of RHCAs.
8. Ground-Based Skidding and Yarding Operations
    a. Locate skid trails to avoid concentrating runoff and provide breaks in grade.
    b. No equipment operations would occur in burned ephemeral draws.
    c. During winter operations, install suitable erosion control on skid trails prior to spring runoff.
9. Landings

    Landing locations are selected for least amount of excavation and erosion potential, where sidecast would neither enter drainages nor damage other sensitive areas.

    a. Locate landings outside of the RHCAs and avoid locating landings on steep slopes or highly erodible soil.
    b. Design roads and trail approaches to avoid overland flow entering the landing.
    c. Existing landings would be used where possible.
    d. Newly constructed landings would be obliterated after use.
10. Haul Routes

a. Haul routes would be maintained to BMP standards, including proper drainage, adequate stream culvert capacity, cleared and functional cross-drains. Space cross drains at 100 feet on either side of stream crossings.

b. Sediment delivery points identified in the hydrology report would be addressed per the report recommendations.

c. Ensure that road drainage would be directed to areas of undisturbed forest floor, and not directly into a waterbody.

d. Avoid hauling and other heavy equipment traffic during road conditions when the road surface rutting would occur.

e. Sediment filtering devices (e.g., wattles, weed-free straw bales, filter fences, etc.) would be used as needed to limit erosion and delivery of sediment from roads into streams and ephemeral drainages.

f. Snowplowing

- Leave a minimum of approximately 2 inches of snow on road surfaces;
- Do not side-cast snow into any stream channel;
- Leave drainage points (breaches) in snow berms to avoid concentrated snow melt runoff onto road surfaces;
- Do not operate vehicles or equipment on snow-covered roads during warm/soft conditions to avoid setting ruts.

11. Temporary Roads

a. Temporary roads would be constructed on or near ridge tops with no stream crossings and would be hydrologically disconnected from any stream network. All temporary roads would be constructed and then obliterated within 2 operating seasons. Obliteration includes de-compaction, re-contouring where needed and the application of woody material onto the de-compacted surface to provide for soil productivity and limit erosion potential. There would be no road construction in RHCAs and roads would be located to avoid adverse effects to soil, water quality and riparian resources.

b. Maintain the natural drainage pattern of the area wherever practical; apply soil protective cover on disturbed areas.

c. Temporary roads would be inspected to verify that erosion and stormwater controls are implemented and functioning and are appropriately maintained.

d. All temporary roads would be scarified and decommissioned (all new construction would be recontoured; existing prisms would be placed in a stable condition through recontouring and/or decompaction). Cut/fill slopes and crossings would be reshaped to natural contours. Available slash and coarse wood material (>3 inches) would be applied to the recontour surface

(slash is considered "available" where the equipment can reach it from the working area where the decommissioning is occurring). Temporary road rehabilitation work shall begin as soon as possible after the timber harvest operations have been completed. They are not intended to be left open for post –harvest treatment activities, such as site preparation, burning or planting.

e. If temporary roads are to be left open over winter, they should be winterized using appropriate soil stabilization methods, including additional erosion control measures that may include seeding, mulching, slash coverage, filter windrows, outsloping, or extra waterbarring.

12. Road Storage

a. There would be measures to close and/or physically block the road entrance so that unauthorized motorized vehicles cannot access the road.

b. Effective ground cover on disturbed sites to avoid or minimize accelerated erosion if needed.

13. Road Decommissioning

a. Road decommissioning and culvert replacements would adhere to the Stream Crossing Programmatic with conservation measures (USFWS W00-20120F-0015, MNFS No. 2011/05875) and Nez Perce-Clearwater National Forests standard road decommissioning protocols. During road decommissioning or culvert replacements, measures to prevent damaging levels of sediment from entering streams would be undertaken, such as: (a) placing removable sediment traps below work areas to trap fines; (b) when working instream, removing all fill around pipes prior to bypass and pipe removal (where this is not possible, use non-eroding diversion); (c) revegetating scarified and disturbed soils with weed-free grasses for short-term erosion protection and with shrubs and trees for long-term soil stability; (d) utilizing erosion control mats on stream channel slopes and slides; (e) mulching with native materials, where available, or using weed-free straw to ensure coverage of exposed soils; (f) dissipating energy in the newly constructed stream channels using log or rock weirs; and (g) armoring channel banks and dissipating energy with large rock whenever possible.

b. Implement suitable measures to re-establish stable slope contours, and surface and subsurface hydrologic pathways where necessary to the extent practicable to avoid or minimize adverse effects to soil, water quality and riparian resources.

c. Implement measures to promote infiltration of runoff and intercepted flow and/or desired vegetation growth on the road prism and other compacted areas.

14. Use of Prescribed Fire

a. Locate slash piles in areas previously disturbed so they do not interfere with natural drainage patterns and limit the damage to residual trees.

b. Jackpot burning for site preparation should only be considered under the following circumstances:

- Areas of low wildfire burn severity with intact litter and duff layers;
- Areas of low soil erosion hazard rating; and
- Slopes less than 55%.

2.9.4. Heritage Resources

Halt any ground disturbing activities if cultural resources are discovered until a Forest Service approved Archaeologist can properly evaluate and document the resources in compliance with 36 CFR 800.

2.9.5. Range

Move livestock away from the Road 1119A area (Unit 114) when harvesting activities are occurring, and for one to three years following reforestation, to eliminate any potential conflicts.

2.9.6. Recreation

1. Use of helicopter landings located within the Lochsa and Selway Wild and Scenic River corridors would be limited to low recreation use periods (November 1 – April 15; this may overlap with Wildlife timing restrictions for bald eagles). Helicopter landings located at Wild Goose and Johnson Bar Campgrounds would be used only one season each. Each site would be fully rehabilitated (debris removed and surfaced returned to pre-use conditions) by May 15. Other landing sites within the river corridors, such as Two Shadows, would be rehabilitated within 6 months of last use, including any required slash removal, grading, seeding, rock replacement and paving.
2. Between June 1 and October 15 of each year's projected activities, at least one access route (Road 286 or 651) to Lookout Butte Rental would be available for Forest visitors to use and access the site.
3. Designated trails 706, 712, 715, and 716 would be identified as protected improvements. Following harvest activities, any effects to these trails would be restored to the same useable condition they were prior to the activity taking place.
4. Where necessary for public safety, recreation access for activities, such as mushroom hunting/collecting, dispersed camping, hunting, and other activities would be restricted during harvest operations.
5. If the groomed snowmobile route is used for winter log hauling an alternate parking location would be provided for snowmobilers. Location would be coordinated with the Idaho County Groomer Board and Valley Cats Snowmobile Club.

6. Dispersed campsites at helicopter landings H17, H18, and H19 would be restored following use. Restoration of campsites may include removal of slash and debris and creation of a relatively flat area suitable for camping, similar to pre-use conditions. These are existing landings that would not be obliterated after use.

2.9.7. Vegetation

1. Tree retention would be based on the Scott Fire Mortality Guidelines outlining ground, bole and crown scorch to determine tree survivability.
2. All live trees would be designated as “leave trees”.
3. Salvage dead trees leaving 14-28 live or dead reserve trees per acre.
4. Plant 300-400 trees/acre of early seral species that are more fire, drought and disease resistant, i.e. western larch, western white pine, ponderosa pine, and Douglas fir in unstocked areas, as funding permits. Consider creating a mosaic of species diversity with planting guidelines.

2.9.8. Noxious Weeds

1. The spread of invasive plants would be minimized by chemically treating any noxious weed populations along the existing road systems before and after project implementation. The Collaborative Forest Landscape Restoration Program (CFLRP) is a partnership between the Forest Service, Idaho County, and local groups that works on containing or eliminating noxious weeds within Forest Service and County roads, camp grounds, trailheads, and administrative sites. Burned Area Emergency Response (BAER) weed treatments will occur in 2015 by Forest Service crews on all weed infested roads within the Johnson Bar Fire Area, whether or not the Johnson Bar Fire Salvage Project is implemented. Herbicide treatments will tier to the Nez Perce National Forest Noxious Weed Programmatic (NMFS No. 2008/03330).
2. Any equipment would be washed of loose dirt and debris prior to entering the project area to prevent “new invader” weed establishment.
3. Project related exposed soils would be revegetated on landings, skid trails, and cut slopes with Certified Weed Free Seed and only use Certified Weed Free Straw as mulch.

2.9.9. Scenic Quality

Harvest unit boundaries that are visible from critical viewpoints, such as Highway 12, Fenn Ranger Station, Fenn Pond, Johnson Bar Campground, Wild Goose Campground, Three Devils Picnic Area, and the Selway River Road, would be designed to meet the Forest Plan visual quality objectives for these visually sensitive areas. Design criteria used to reduce the visual effect of the harvest areas include, but may not be limited to the following:

1. Vertical structure within the harvest units would be maintained and feathered edge treatments would be used to emulate natural openings in areas visible from critical viewpoints and travel corridors. Leave trees that provide vertical structure within the harvest area, may be both live and dead trees emulating the same structure that would remain after a natural mixed severity wildfire. These leave areas would be

grouped in retention areas ranging from ¼ to 3 acres in size and may include leave areas adjacent to unit boundaries. Unit boundaries for openings visible in the foreground would be shaped and feathered to reduce any unnaturally shaped edges and would reduce the hard edges that appear as a man-made features on the landscape.

2. Foreground screening vegetation along the Swiftwater Road would be protected where ever possible. Protection of screening vegetation at these critical areas would be important during harvesting activities.
3. Location of skyline corridors and skid trails would be designed to minimize visual effects.
4. Harvest units would be designed so that the edges of the unit emulate natural edge patterns with a minimum of geometric lines.

2.10. Monitoring

The following monitoring activities would continue or be initiated as a component of the proposed project:

1. Temporary roads would be inspected by the Sales Administrator to verify that erosion and stormwater controls are implemented and functioning prior to log hauling, and are appropriately maintained during the hauling.
2. Implementation monitoring or road reconstruction and reconditioning activities will occur prior to hauling on any reconstructed segments on which hauling is scheduled to occur. The monitoring would verify that the implementation of proposed activities and design criteria has addressed sources of sediment and reduced sediment delivery from these sources prior to hauling activities commencing.
3. Annual Cobble Embeddedness monitoring on Swiftwater, Elk City, Goddard and O'Hara creeks. Habitat surveys are planned to be conducted on the Swiftwater, Elk City, and Goddard creeks in 2016.
4. PACFISH/INFISH Biological Opinion (PIBO) effectiveness monitoring will be ongoing (3-5 year rotation) within the Selway and Middle Fork Clearwater subbasin. There is one PIBO EM site located within the specific Project Area, located on Goddard Creek. Six additional PIBO sites (referenced and managed sites) were added to the Selway River basin.
5. A Forest Plan Monitoring Site has been established on O'Hara Creek. PACFISH riparian management objectives (RMOs) along with fish density are measured on an annual basis through implementation of the project and pre- and post-project implementation.
6. Soil plots were established to measure differences in soil disturbance among varying logging systems by burn severity. Soil plots were also established to measure spatial and temporal changes in soil erosion by burn severity. Monitoring is ongoing, before implementation of the project, during, and post implementation.

7. Post implementation effectiveness monitoring of target stands and Design Criteria would be performed as an interdisciplinary team at selected harvest units.
8. Resource specialists would conduct field evaluations of selected tractor logging units during harvest operations.
9. Specialists would evaluate the effectiveness of soil erosion prevention and control measures.
10. Temperature monitoring would continue in the lower Selway Watershed (Selway River and O'Hara Creek).
11. Evaluation of treatment of invasive plant species monitoring is conducted by the noxious weed program.

CHAPTER 3

AFFECTED ENVIRONMENT and ENVIRONMENTAL EFFECTS

This section summarizes the physical, biological, social, and economic environments of the proposed project area and the potential changes to those environments as a result of implementing the proposed alternatives. It also presents the scientific and analytical basis for comparison of each alternative.

This section also summarizes the potential direct, indirect, and cumulative effects to the Affected Environment as a result of implementing the proposed alternatives. Effects may include ecological, aesthetic, historic, cultural, economic, social, or health. The potential effects may be beneficial or detrimental, and may result from actions possessing both beneficial and detrimental effects, even if on balance the effect would be beneficial (40CFR 1508.8).

Direct and Indirect Effects

NEPA requires that Federal agencies take a "hard look" at significant environmental effects as a result of implementing a proposed action and any alternatives. The "hard look" requirement has been tempered through the "rule of reason", which the Supreme Court has characterized as requiring an agency "to furnish only such information as appears to be reasonably necessary under the circumstances for evaluation of the project rather than to be so all-encompassing in scope that the task of preparing it would become either fruitless or well nigh impossible" [*New York Natural Resource Defense Council, Inc. v. Kleppe,* 429 U.S. 1307, 1311 (1976), citing *Natural Resource Defense Council v. Calloway,* 524 F2d 79, 88 (2d Circuit 1975)].

Direct effects are the result of an action and occur at the same time and place. Indirect effects are the result of an action but occur later in time or are further removed in distance, yet are still reasonably foreseeable (40CFR 1508.8). In order for an affect to be considered reasonably foreseeable, it must be "sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision" [*Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Circuit 1992)].

Cumulative Effects

In accordance with NEPA and the Council on Environmental Quality (CEQ) guidelines, cumulative effects are to be analyzed as a component of any project undergoing a NEPA analysis. Cumulative effects are incremental effects as a result of implementing an action and consist of any past, present, and reasonably foreseeable future actions on any lands regardless of the agency or person undertaking the action, to include Federal, State, and private. Cumulative effects can be individually minor but collectively significant over a period of time (40CFR 1508.7). The time and spatial area for the analysis of cumulative effects is resource dependent.

Table 3-0: Past, Present, and Reasonably Foreseeable Future Projects within the Middle Fork and Selway Drainages

Project Name	Location	Project Type	Miles/Acres	Year(s)
Road Construction (Middle Fork)	Various[1]	Construction	1 mile	1930s
Road Construction (Middle Fork)	Various[1]	Construction	7 miles	1950s
Road Construction (Middle Fork)	Various[1]	Construction	6 miles	1970s
Road Construction (Middle Fork)	Various[1]	Construction	1 mile	1990
Road Construction (Selway)	Various[1]	Construction	6 miles	1920s
Road Construction (Selway)	Various[1]	Construction	19 miles	1930s
Road Construction (Selway)	Various[1]	Construction	6 miles	1950s
Road Construction (Selway)	Various[1]	Construction	33 miles	1960s
Road Construction (Selway)	Various[1]	Construction	34 miles	1970s
Road Construction (Selway)	Various[1]	Construction	21 miles	1980s
Road Construction (Selway)	Various[1]	Construction	5 miles	1990s
Road Reconstruction	653 Road/Lodge Creek Lodge Point Sale	Replace 5 culverts	2.2 miles	2013
Road Reconstruction	286A Road/ Lodge Creek Lodge Point Sale	Replace 4 culverts	0.9 mile	2013
Road Reconstruction	286D Road/ Lodge Creek Lodge Point Sale	Aggregate surfacing	0.2 mile	2013
Road Reconstruction	Road 651; O'Hara Creek Road	Culvert replacement; upgrade to 100 year flow	4 culverts	2015
Road Reconstruction	Upper Road 651; O'Hara Creek Road	Spot surfacing to reduce surface erosion	3 miles	2015

Project Name	Location	Project Type	Miles/Acres	Year(s)
Road Reconstruction	Lower Road 651; O'Hara Creek Road	Culvert replacement; upgrade to 100 year flow	3 culverts	2017-2018
Road Decommissioning	6 segments	Road decommissioning	4.7 miles	1990s
Road Decommissioning	13 segments	Road decommissioning	7.8 miles	1990s
Road Maintenance (Middle Fork)	All system roads	Road maintenance	7 miles/year	2016+
Road Maintenance (Selway)	All system roads	Road maintenance	10 miles/year	2016+
Wildfire	East side of project area	Wildfire	330 acres	1889
Wildfire	Northwest corner of project area	Wildfire	469 acres	1910
Wildfire	Lower $^{2}/_{3}$ of project area	Wildfire	2,157 acres	1919
Wildfire	Southwest corner	Wildfire	117 acres	1880
Wildfire	Majority of Selway area	Wildfire	8,978 acres	1889
Wildfire	Southeast corner	Wildfire	900 acres	1919
Wildfire	South central area	Wildfire	807 acres	1920
Wildfire	South central area	Wildfire	3,124 acres	1928
Wildfire	Southeast area	Wildfire	1,352 acres	1945
Wildfire	Johnson Bar Creek	Wildfire	0.5 acre	1992
Wildfire	Hot Point	Wildfire	15 acres	1999
Johnson Bar Wildfire	¾ of Middle Fork area	Wildfire	2,238 acres	2014
Johnson Bar Wildfire	Majority of Selway area portion of project area	Wildfire	9,854 acres	2014
Johnson Bar Hand Fireline	1 segment on ridgetop	Fireline	1.8 miles	2014
Johnson Bar Hand Fireline	16 segments on ridgetop	Fireline	8.7 miles	2014
Johnson Bar Dozer Fireline	3 segments on ridgetop	Dozer fireline	2.0 miles	2014
Johnson Bar Dozer Fireline	4 segments on ridgetop	Dozer fireline	2.1 miles	2014
Johnson Bar Excavator Fireline	1 segment on ridgetop	Excavator fireline	1.2 miles	2014
Johnson Bar Fuel Break	Road 651, 9701, and 9723B	Install drop inlet structures, including lid at cross drains	31 drop inlets and 7 lids	2014
Johnson Bar fire BAER Work	652 Road	Culvert removal	1 culvert	2014
Wash Wildfire	South of Selway; O'Hara Creek to Horse Creek	Wildfire	35-645 acres	2015

Project Name	Location	Project Type	Miles/Acres	Year(s)
Slide Wildfire	North of Selway; Johnson Creek to Renshaw Creek	Wildfire	10,325 acres	2015
Pre-commercial Thinning	011707A020300087000	Pre-commercial Thinning	13 acres	2005
Pre-commercial Thinning	011707A020300093000	Pre-commercial Thinning	3 acres	2005
Pre-commercial Thinning	011707A020300118000	Pre-commercial Thinning	4 acres	2005
Pre-commercial Thinning	011707A020300121000	Pre-commercial Thinning	11 acres	2005
Pre-commercial Thinning	011707A020200053000	Pre-commercial Thinning	31 acres	2013
Pre-commercial Thinning	011707A130100004000	Pre-commercial Thinning	26 acres	2013
Pre-commercial Thinning	011707A130100006000	Pre-commercial Thinning	20 acres	2013
Pre-commercial Thinning	011707A130100008000	Pre-commercial Thinning	15 acres	2013
Pre-commercial Thinning	011707A140100121000	Pre-commercial Thinning	9 acres	2013
Pre-commercial Thinning	011707A140100126000	Pre-commercial Thinning	6 acres	2009
Pre-commercial Thinning	011707A140100127000	Pre-commercial Thinning	14 acres	2013
Pre-commercial Thinning	011707A140300002000	Pre-commercial Thinning	14 acres	2013
Pre-commercial Thinning	011707A140300010000	Pre-commercial Thinning	10 acres	2013
Pre-commercial Thinning	011707A140300018000	Pre-commercial Thinning	30 acres	2013
Pre-commercial Thinning	011707A140400037000	Pre-commercial Thinning	23 acres	2013
Range	South end (Tahoe-Clear Creek Grazing Allotment)	Cattle grazing	4,907 acres	1930s-foreseeable future
653 Trail Recreation Use	Lodge Point to Two Shadows	Trail maintenance/use	3.5 miles	1930s-1970s
706 Trail Recreation Use	Hot Point	Trail maintenance/use	4 miles	1930s-present
712 Trail Recreation Use	Peterson Point	Trail maintenance/use	8 miles	1930s-1990s
716 Trail Recreation Use	Swiftwater	Trail maintenance/use	3 miles	1930s-1970s
706 Trail Recreation use	Hot Point	Trail maintenance/use	4 miles	2016+
Snowmobile Routes	Roads 286, 286A, and 653	Snowmobile recreation	56 miles (9 miles within project areas)	1970s-foreseeable future

Project Name	Location	Project Type	Miles/Acres	Year(s)
Snowmobile Routes	Roads 289, 470, 651, 1119, 1121, 1129, 9701, and 9722	Snowmobile recreation	52 miles (33 miles within project area)	1970s-foreseeable future
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	80 acres	1950s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	440 acres	1960s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	906 acres	1970s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	49 acres	1990s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	101 acres	2000s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	325 acres	1960s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	680 acres	1970s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	233 acres	1980s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	937 acres	1990s
Clearcut harvesting	Various[2]	Activity 4111, 4113, 4117; clearcut	257 acres	2000s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	26 acres	1960s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	30 acres	1970s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	23 acres	1990s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	121 acres	2005
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	130 acres	1980s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	46 acres	1990s
Seedtree/Shelter Wood	Various[2]	Activity 4131 and 4132	14 acres	2005
Commercial Thinning	Various[2]; include Lodge Point acres	Activity 4220	450 acres	2010
Commercial Thinning	Various[2]; include Lodge Point acres	Activity 4220	135 acres	1980s
Commercial Thinning	Various[2]; include Lodge Point acres	Activity 4220	148 acres	2000
Salvage	Various[2]	Activity 4151 and 4231	286 acres	1970
Salvage	Various[2]	Activity 4151 and 4231	77 acres	1980
Salvage	Various[2]	Activity 4151 and 4231	539 acres	2000

Project Name	Location	Project Type	Miles/Acres	Year(s)
Salvage	Various[2]	Activity 4151 and 4231	13 acres	1960s
Salvage	Various[2]	Activity 4151 and 4231	193 acres	1970s
Salvage	Various[2]	Activity 4151 and 4231	164 acres	1980s
Salvage	Various[2]	Activity 4151 and 4231	190 acres	1990s
Salvage	Various[2]	Activity 4151 and 4231	47 acres	2000s
Lodge Point Sale	Lodge Point	Stewardship sale	598 acres of commercial thinning; open 4.3 miles of old roads and decommission when done; construct 1.1 miles of new temporary roads and obliterate when done; chip/haul 2,800 tons of biomass	2013-2015
O'Hara Hazard	O'Hara Campground	Hazard timber sale	30 dead trees	2014
Iron Mountain Stewardship	Iron Mountain area	Regeneration harvest and watershed improvements	408 acres; 3.5 miles	2014-2016
Clear Creek Timber Sale	Clear Creek	Timber sale and watershed improvements	4156 acres regeneration; 4,551 acres intermediate	2015-2022
Lowell Wildland-Urban Interface (WUI)	North and east of Lowell	Timber sale	160 acres	2016
Private Timber Harvest	Mouth of Selway River	Salvage/regeneration	80 acres	2014
Private Timber Harvest	Selway River face near Elk City Creek	Salvage	120 acres	2015-2016
State of Idaho Timber Harvest	South of Swiftwater Creek	Salvage/regeneration	167 acres; 3 miles permanent roads	2015
Landslide	Stand 01170714040060	Landslide	250 feet by 1,200 feet	1995/1996
Landslide	Stand 01170713020099	Landslide	100 feet by 650 feet	1995/1996
Clear Creek Prescribed Fire	Clear Creek Roadless Area	Prescribed fire	1,371 acres	2015-2017

Project Name	Location	Project Type	Miles/Acres	Year(s)
Fenn Face	North of Fenn Ranger Station	Prescribed fire	1,000 acres	2016
North Selway	Southwest of Coolwater	Prescribed fire	1,000 acres	2017

[1]See GIS layer and historic road data spreadsheet
[2] See GIS layer for stands

3.1 Cultural

3.1.1 Analysis Area

The analysis area consists of the entire Johnson Bar Fire Salvage project area.

3.1.2 Regulatory Framework

The Nez Perce National Forest Plan direction and all Federal and State laws and regulations applicable to cultural resources would be applied to the proposed project.

3.1.2.1 National Historic Preservation Act

The Forest Service is mandated to comply with the National Historic Preservation Act (NHPA) of 1966 (Public Law 89-665) and its amendments. Section 106 of the NHPA requires that Federal agencies with direct or indirect jurisdiction over Federal, federally assisted, or federally licensed undertakings afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity for comment on such undertakings that affect properties included in or eligible for inclusion in the National Register of Historic Places (NRHP) prior to the agency's approval of any such undertaking (36 CFR 800.1). Historic properties are identified by a cultural resource inventory and are determined to be either eligible or not eligible by the cultural resource specialist in consultation with the SHPO. Sites that are determined to be eligible are then either protected in-place or adverse effects must be mitigated.

Each cultural property is evaluated against four strict standards in a process to determine that properties historical significance for possible inclusion in the National Register of Historic Places. These criteria address specific elements that may be contained within that specific property. These criteria are found in the Code of Federal Regulations, 36 Part 60.

Criteria A: the quality of significance is associated with events that have made a significant contribution to the broad patterns of our history; or

Criteria B: that are associated with the lives of persons significant in our past; or

Criteria C: that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

Criteria D: that have yielded, or may be likely to yield, information important in prehistory or history.

3.1.2.2 Nez Perce National Forest Plan

The alternatives would comply with the Nez Perce National Forest Land and Resource Management Plan relevant to Cultural Resources. The 1987 Forest Plan and amendments document goals, standards, and management directions for Cultural Resources within the forest boundary. Forest-wide management direction or standards would apply to this project.

3.1.3 Analysis Methodology

Data presented are the result of reviewing existing information available for the proposed project area. Documents reviewed included previously completed cultural resource inventory reports, historic property site records, historical forest maps, and other historic documents. The indicator used for cultural resources are the number of sites affected by proposed project activities. In accordance with the NHPA, as amended, a cultural resource inventory of the proposed project was completed. The findings of the inventory were submitted to the Idaho State Historic Preservation Office (SHPO) for review and concurrence.

3.1.4 Affected Environment

The project area has seen numerous changes in human land use patterns. From its earliest Native American inhabitants who lived in and traveled through the area utilizing its resources, to the families who homesteaded and settled in the area, to the minerals exploration from the mid-1800s into the early 1900s, the region witnessed several waves of occupation through time. Each group interacted with the environment in their own way, extracting various products and manipulating it to their benefit when possible.

There have been six previous cultural resource surveys conducted in the proposed project area. There are twenty-three previously documented cultural resource properties located within the boundary of the analysis area. Nine of these properties are eligible for the National Register of Historic Places (NRHP), thirteen sites are not eligible, and one site is unevaluated.

3.1.5 Direct and Indirect Effects

The four alternatives would have varying effects on the twenty-three known cultural properties. Alternative 1 would have no effect to historic properties. Historic properties would continue to degrade naturally. There would be no change in effects from the current condition. Under Alternatives 2, 3, and 4, five cultural resource sites would be located within the proposed project activity areas. All five sites have been determined to be not eligible for the National Register of Historic Places (NRHP). As these sites are not eligible for the NRHP there would be no effect to cultural resource properties; therefore, no mitigation would be required. National Historic Preservation Act compliance would be obtained from the Idaho SHPO prior to the project decision.

3.1.6 Cumulative Effects

The cumulative effects area is the entire Johnson Bar Fire Salvage Project area. Project mitigation and design criteria have been identified and would be implemented to avoid effects to all NRHP eligible sites. Because all project activities would be conducted consistent with the National Historic Preservation Act and the Nez Perce National Forest Plan, the implementation of these activities would result in “no effect”. Thus, there would be little potential for project activities to produce or contribute to negative effects that would be cumulative with other actions.

3.2 Economics

3.2.1 Analysis Area

The Johnson Bar Fire Salvage project area is located within Idaho County, Idaho. The economic analysis area includes local towns and communities influenced by the timber sale activities. These towns include Grangeville, Kamiah, Kooskia, Orofino, Pierce, Weippe, and Lewiston, Idaho, plus many small towns in between. The influence is based on their geographic location to the watershed, economic dependence on it, and use of it, dating back to settlement of the area more than 100 years ago. The Nez Perce and Clearwater National Forests have provided wood to local mills since the 1930s. The Forests’ output, along with Bureau of Land Management (BLM) timber outputs, accounted for half of the total timber harvested in Idaho County during the mid-1990s. Most of it was processed in mills located in or near the towns mentioned previously.

3.2.2 Regulatory Framework

The proposed Johnson Bar Fire Salvage project would comply with the Nez Perce National Forest Plan (Forest Plan) direction to develop cost effective projects and with the National Forest Management Act (NFMA) by emphasizing resource management over timber volume output.

3.2.2.1 National Forest Management Act

The NFMA requires that a sale “consider the economic stability of communities whose economies are dependent on such national forest materials, or achieve such other objectives as the Secretary deems necessary” (NFMA Section14, e,1,c) and "the harvesting system to be used is not selected primarily because it would give the greatest dollar return or the greatest unit output of timber” (NFMA, Section 6, g,3,E,IV). The proposed project would meet the requirements of the NFMA by considering the economic community stability through the IMPLAN model evaluation of the alternatives. Also, the harvest systems are based upon ground-truthed silvicultural practices to achieve the desired long-term forest and access needs, and not on the highest dollar return.

3.2.2.2 Forest Service Manual

The Forest Service Manual directs that economic feasibility be considered in project design, during the early planning stages and NEPA documentation. A sale feasibility analysis was completed at Gate 1, which led to consideration of economic adjustments to the alternatives in order to reflect ways in which to lower costs, such as reducing the amount of helicopter logging and high cost development of landing areas. It also highlighted the potential need for funding to cover reforestation needs caused by the Johnson Bar Fire. Since the fire caused the need for reforestation of the land, removal of the dead trees is not required in order to cover the cost of reforesting the ground. However, by removing some of the fire killed trees, there would be an opportunity to generate funds to contribute to the cost of reforesting the areas.

3.2.2.3 Nez Perce National Forest Plan

Forest Plan Goal A.1, page II-1: “Provide a sustained yield of resource outputs at a level that would help support the economic structure of local communities and provide for regional and national needs”. The proposed action alternatives would help meet Forest Plan goals.

3.2.2.4 Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Although not a direct economic requirement, Executive Order 12898 requires that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories.

The Johnson Bar analysis did not reveal any disproportionately high or adverse effects to minority and low-income populations. None of the action alternatives are expected to negatively affect the consumers, civil rights, minority groups, Native Americans, women, or any United States citizen. No environmental health hazards are expected to result from implementation of any alternative. This project would not disproportionately affect income level.

3.2.3 Resource Indicators

3.2.3.1 Timber Harvest Related Jobs and Income

Jobs and income generated from the proposed project would contribute to community stability. The Nez Perce National Forest Plan Final Environmental Impact Statement (FEIS), pages IV-26 and 27, describes the economic effects of implementing the Forest Plan (Forest Plan, USDA-FS 1987a and 1987 as amended). The Forest Plan addresses the economic analysis process and values placed on non-consumptive items, such as recreation opportunities, community stability, cultural resources, habitats, and populations (Forest Plan, Appendix B, pages 51-142). This economic analysis would not revisit the information

presented in the Forest Plan and would focus only on those costs and revenues associated with implementing the proposed activities in the project area.

The Forest Service Micro IMPLAN model would be used to derive the indirect and induced economic effects. Indirect economic effects were derived from mill surveys conducted by the Bureau of Business and Economic Research at the University of Montana. The response coefficients found in Table 3-1 were developed for the 1997 Clearwater and Nez Perce National Forest market area for the Timber Sale Program Information Reporting System (TSPIRS). TSPIRS is a reporting system developed jointly with the General Accounting Office (GAO) and the Forest Service, which has been reviewed and approved by Congress.

Table 3-1: Coefficients from the Forest Service Micro IMPLAN Model to Derive the Indirect and Induced Economic Effects

Harvest Related Jobs Generated	13.5 per 1.0 MCCF
Harvest Income to Communities	$383,406 per 1.0 MCCF
Federal Income Tax Generated	$57,511 per 1.0 MCCF

3.2.3.2 Sale Feasibility

The Region One Gate 1 and 2 spreadsheet and the Quicksilver model, with the Nez Perce-Clearwater National Forest area factors, were used to determine sale feasibility and appraised value. The Quicksilver model uses recent transactional evidence based on local timber sales to determine sale value. The timber stand data base and extensive field reviews were used to determine timber volume and species composition; these are the two primary factors determining gross value of a timber sale. Net value depends on costs for the logging system, haul distance, slash disposal, planting, and cost of mitigation activities. The cost estimates for this sale are based on recent similar sales in the vicinity. However, the value of burned timber is reduced due to the loss of chips and by-products, plus additional handling. Following the Region 1 2007 Salvage Guidelines, $26/ccf ($52/mbf) will be subtracted from the log values for the Johnson Bar analysis. Although the reforestation costs are displayed in this analysis, they are not required to be covered by the timber harvest value because the need to reforest was not caused by the the harvest, instead the need to reforest was caused by the fire. This means that a low value sale could be advertised for sale while relying on supplemental funding to cover the reforestation costs.

3.2.4 Affected Environment

In a report for the Interior Columbia Basin Ecosystem Management Project, titled "Rural Communities in the Inland Northwest," communities are characterized in terms of their ability to manage change and adapt to it in positive, constructive ways - "community resiliency," which is a function of community conditions, such as economic structure, infrastructure, civic leadership, cohesiveness, and amenities.

Resiliency ratings for Idaho County (Kooskia and Grangeville), Lewis County (Kamiah), and Clearwater County (Orofino, Pierce, and Weippe) are low. However, preliminary findings from a study recently completed by University of Idaho sociologists working on the

Columbia River Basin assessment show that many timber-dependent communities tend to be more resilient and able to tolerate change than is commonly assumed. The resiliency rating for Nez Perce County (Lewiston) is high. The towns of Grangeville, Orofino, Weippe, Pierce, and Lewiston all show high to very high historic employment in the wood products manufacturing industry.

As of December 2014, Idaho County had an unemployment rate of 5.1%, Lewis County 3.2%, and Clearwater County 8.6% (highest in Idaho). The Idaho State average unemployment rate is 3.7% and the National average is 5.6%.

Counties dependent on Federal timber receipts as Payments in Lieu of Taxes (PILT) to help fund schools and roads have found that this source of funding has declined due to lower National Forest timber outputs, so they have relied more heavily on taxes to bolster their income. The PILT distribution process was revised under the Secure Rural School and Community Self-Determination Act of 2000, P.L.106-393 (SRS). This revision allowed counties to select “full payment” of the high three years of National Forest Receipts, rather than rely on yearly timber sales or National Forest funds. Currently SRS has not been approved, which means Counties would resort back to the PILT process.

Idaho has been a natural resource-based state since the 1800s, although as natural resource extraction declines, there is some movement toward diversification. Many communities have made impressive strides in achieving Idaho Gem Community status and are working towards diversifying their economies. (The Gem Community program was established by the Idaho Department of Commerce to encourage communities to plan their futures). As reported by the Idaho Department of Labor, the timber products industry went through hard times in the early 1980s, but those firms which survived were streamlined and modernized with the hope of having a consistent supply of timber from National Forest administered lands.

3.2.5 Direct and Indirect Effects

Community Income and Employment

Employment and income effects attributable to Forest Service timber management are derived from the harvesting and processing of timber. Timber harvesting and processing requires the employment of loggers, truck drivers, mill workers, and a variety of workers in logistical support (road grader operators, back hoe operators etc.). In addition, if a project is not cost effective, it would not sell, which then would cause it to not contribute towards the Forest’s timber output and community stability.

The logging contractors, wood processing plants, county road departments, and public schools must purchase materials and labor to perform their functions. These purchases produce indirect effects. Induced effects are the result of spending by workers directly employed in the timber industry and by workers that are in part supported by dollars generated by the timber industry, such as grocery and equipment stores. This chain of purchases travels through the local community until the timber dollars leave the local market area and become part of the national economy.

Table 3-2 displays the Job and Income effects as a result of implementing the timber harvest alternatives. The numbers do not reflect additional jobs and income related to the implementation of the non-timber harvest road decommissioning. The road decommissioning would generate some additional jobs and income, but not to a level like the timber harvest, and would not point to any action alternative as generating more than the other, because the decommissioning is the same for all the action alternatives.

Alternative 1 would not sustain any timber harvest jobs. Alternative 2 would generate the most jobs and revenue, because it generates the most timber volume. Alternatives 3 and 4 would be behind Alternative 2 based upon volume harvested.

Table 3-2: Timber Harvest Jobs and Income under Each Alternative

Alternative	VOLUME (CCF)	Jobs Sustained	Community Harvest Income	Federal Income Tax
1	0	0	0	0
2	85,300	1,151	$32,705,000	$4,906,000
3	75,200	1,015	$28,832,000	$4,325,000
4	60,400	815	$23,158,000	$3,474,000

Sale Feasibility

Each alternative would produce a different level of benefits and costs associated with the timber harvest, road work, fuel treatment, reforestation, mitigation measures, design criteria (skid trail decompaction), and other related timber harvest activities. This part of the economic analysis focuses on the relative differences in these benefits and the associated costs between alternatives by displaying Predicted Bid Rates and Present Net Value (PNV) and is summarized in Table 3-3. The Predicted Bid Rate is the dollar amount, based on recent bidding, that the Nez Perce National Forest anticipates the timber would sell for. The PNV is the anticipated selling value minus the costs of implementing the sale. An alternative having a positive PNV would have stumpage values exceeding costs, where-as an alternative with a negative PNV would have costs in excess of stumpage values and may require supplemental funding in order to complete all of the activities. A sale with a negative appraised value may not sell.

Information provided by the economic models is used as a tool to understand the relative monetary differences between alternatives rather than to predict actual values for each alternative, since the variables may change between now and the time the timber sells.

Alternative 1 would not generate any values nor have any costs associated with the NEPA decision, so its PNV would be zero. However, a No Action alternative would make no effort to offset the $184,000 cost of completing the NEPA analysis. Also, the fire affected trees would continue to deteriorate and decrease the economic timber values to zero. As the trees deteriorate they would fall down and contribute to down fuel loadings over the next 20 years, which would enhance the chance of a reburn. The Johnson Bar fire cost

$13,000,000 to contain and suppress. A higher intensity reburn would likely cost a similar amount to suppress.

Alternatives 2 and 4 are predicted to generate enough stumpage value to cover all of the sale costs, plus reforestation, while also capturing the timber value before it deteriorates. Alternative 3 appraises out deficit; and therefore, would not generate any funding to cover reforestation or other costs. The proposed road decommissioning is planned to be covered using supplemental funding but is shown in Table 3-3 to reflect costs associated with the proposed project.

Alternatives 2 and 4 are feasible and would be sellable. Alternative 2 would likely require supplemental funding in order to cover some of the reforestation costs.

Alternative 3, as presented, would likely not be feasible or sellable. Alternative 3 would use more helicopter logging than the other alternatives to reflect the minimal soils disturbance alternative of not constructing temporary roads in the Selway Subbasin. In many cases, such as Units 115, 122, 125, 129, and others, this would necessitate the use of a helicopter to access the harvest units on the backside of a ridge where a short temporary road is proposed under the other action alternatives in order to allow less expensive skyline logging systems to be used. Alternative 3 would need to eliminate approximately 1,000 acres of helicopter yarding ground to make it a feasible alternative.

Although Alternative 4 would not generate the highest volume of output, it is the most economically feasible alternative and would generate the greatest revenue, primarily because it would include fewer helicopter treatments, which incur the greatest costs.

All of the alternatives would be highly susceptible to market value changes caused by deterioration of the trees, to the point that if the recovery of the trees is delayed too long there would be no economic value remaining, except for some of the cedar as a low value cedar product. Some trees near Hot Point burned so hot that they do not currently have any timber value and would be left in place for other resource benefits. The majority of the fire area proposed for harvesting burned with a hot ground fire that killed the tree roots, which left the tree with needs but without a nutrient root source to sustain the tree. These trees appear green; however, they will begin to turn brown towards the end of 2015 and into 2016.

Only Alternative 4 would generate enough funds to cover the $184,000 NEPA analysis costs; however, the pre-decisional NEPA costs are not an outcome of the NEPA decision and therefore are not included in the economic analysis. They are shown to display the investment made to complete the NEPA process.

Alternatives 2 and 3 differ in costs due to the amount of harvest area being treated. The differences in the area being treated were influenced by the amount of temporary roads planned by the alternatives. The temporary roads planned under Alternative 2 would not only provide access to more area, but would also reduce skidding costs by shortening the skidding distances and allowing the use of less expensive yarding systems.

Helicopter logging is the Forest's most expensive log removal method available, and for this project it would have the greatest effect on an alternative's feasibility. Alternative 4 would have the least amount of helicopter logging (36% would be helicopter logged), which would result in the highest sale value. In response to potential watershed concerns and fisheries effects, Alternative 3 was developed, which would reduce the amount of soil disturbance by not building roads or landings and minimizing tractor logging. This would result under Alternative 3 using more helicopter logging (65% would be helicopter logged), and consequently, would result in the lowest sale value out of the three action alternatives. Alternative 3 would also use skyline logging in areas proposed for tractor logging under Alternatives 2 and 4. A direct bearing on helicopter costs is the amount of time it would take (a factor of distance and time to hook logs to the helicopter longline) to fly from the log pick-up point to the landing where it would drop them off; the longer the flight distance, the higher the cost. For the value of the project area timber, the goal was to provide a helicopter landing within an average of 3,000 feet of the harvest area center and with a maximum flight distance of 1 mile to the back of the unit. Alternatives 2 and 3 exceeded this target distance with an average of 4,600 feet and 4,200 feet respectively.

Another key factor in helicopter logging costs is the size of the logs being hauled, which equates into the amount of time it would take to hook a full payload onto the helicopter; small logs generally take longer to get a full helicopter payload. The tree's top logs would constitute the small logs for this project. In light of the fact that small tree tops would cause higher logging costs, and that the small tops would have less value due to deterioration, plus the need to retain coarse woody debris on site, a design criteria that allows a variable top diameter would enhance the sale feasibility of all of the alternatives, if other resource objectives, such as fuel loadings, could be met.

In addition, reforestation costs would be high for all of the alternatives (Table 3-3). In order to reduce the effects of reforestation costs, natural regeneration could be implemented where possible, and where it is determined to meet the project purpose.

Table 3-3: Predicted Stumpage and Present Net Value Under Each Alternative

Alternative	Volume CCF	Volume MBF	Appraised Total Value[1]	Reforesta-tion[2]	Implementation[3]	Present Net Value	Road Decommis-sioning[4]
1	0	0	0	0	$0	$0	0
2	85,300	43,600	$2,230,000	$2,158,000	$173,000	-($101,600)	$200,000
3	75,200	38,500	$-(755,000)	$1,871,000	$167,000	-($2,793,400)	$200,000
4	60,400	30,900	$3,898,000	$1,524,000	$157,000	$2,216,000	$200,000

[1] Appraised value predicted high bid includes skid trail decompaction and road costs associated with the harvest.
[2] Reforestation costs include planting costs with overhead.
[3] Implementation costs include presale, engineering and administration costs. NEPA costs, which total about $120,000, are not included in this cost total.
[4] Road decommissioning consists of unneeded roads that are not used for the timber harvest. Unneeded roads used for the harvest would be decommissioned as part of the sale and are included in the appraisal costs.

3.2.6 Cumulative Effects

The cumulative effects area of analysis is Clearwater, Idaho, Lewis, and Nez Perce counties in Idaho. The timber sale logging contract would last approximately 3 years in order to

complete the timber harvest and road decommissioning and is proposed for sale in 2016. Post-harvest reforestation, consisting of hand planting, would continue for up to 3 years following the timber harvest, for a total of up to 6 years of activities (some planting would likely overlap with the logging years, thus reducing the total activity period). Operations would continue year-round unless specific conditions of resource damage or consequences are defined. Harvest operations are expected to last 3-4 years, preparation of sites for tree planting would occur 2- 3 years post-harvest, and planting would occur during the growing season after any prescribed fires.

Economic effects for an activity, such as logging and sawmilling lumber, are shown in the previous section. These are described as direct and indirect effects, but they are also cumulative effects due to the additional jobs, taxes, and income they provide throughout the Counties. When considering effects of additional jobs and income created, this sale would contribute towards the Forest's 5-year timber sale plan, but not beyond the level of current employment. The Nez Perce-Clearwater National Forest 5-year timber sale plan is currently projected to be about 60 million board feet (MMBF) per year. Sold or foreseeable local sales affecting the same communities and contributing to the long-term timber flow of these communities include Swede, Preacher Dewey, Lochsa Thin, Clear Creek, Lowell WUI, and Lolo Insect and Disease. The State of Idaho and private individuals have plans to harvest trees in 2015 and 2016 on lands that burned, which would also contribute approximately 60 mmbf to timber flow in the area, in addition to the annual State and private timber outputs. Some of the private lands burned in the fire were harvested during the winter of 2014/2015. This could affect timber prices; however, current market conditions in the Clearwater Basin remain high, which was reflected in the recent bidding on State fire salvage timber. Current mill delivered log values are about the same as what they were prior to the 2015 fires. To avoid having a flooded market of timber, the mills are switching from logging green timber to fire salvage trees from Forest Service, State, and private lands in an effort to supply the mills with the deteriorating fire killed trees and saving the green volume to supply the mills once the dead volume has all been processed (personal communication with G. Danly, Empire Lumber Co.). An additional reflection of the high timber market in the area is the recent notification that CFI Mill in Kooskia is opening up in order to purchase logs in response to the increased availability of fire salvage timber (Idaho County Free Press, 22 December 2015).

3.2.6.1 Alternative 1

Since this alternative would not propose any timber harvest or road decommissioning it would not contribute cumulatively to the local community jobs and income. It would maintain current unmanaged use and related income. It potentially could contribute toward future firefighting costs as the dead trees rot and fall over and contribute to the fuels loading over the next 20 years.

3.2.6.2 Alternatives 2, 3, and 4

The following cumulative effects are common to Alternatives 2, 3, and 4.

Added to the Forest 5-year timber sale plan, these alternatives would contribute to jobs and income. However, these alternatives are not expected to generate an excessive amount of jobs or income from timber harvest or road work to cumulatively effect the local communities beyond the past three year employment averages, because the mills would adjust their timber harvest to match their production goals. This could mean that some sales would be delayed in being harvested, so the purchaser can harvest the higher priority dead Johnson Bar timber before it loses merchantability.

3.2.6.3 Irreversible and Irretrievable Commitment of Resources

None known or suspected. From an economic standpoint, harvest and utilization of the merchantable timber at this time is the lowest risk to loss of economic value. Continued deterioration, fire, insects, disease, and other natural events could reduce the existing monetary value of the trees in the analysis area.

3.2.6.4 Adverse Effects Which Cannot Be Avoided

None known or suspected.

3.3 Fire and Fuels

3.3.1 Analysis Area

The area of analysis is the entire Johnson Bar Fire Salvage project area.

3.3.2 Regulatory Framework

All alternatives would be in compliance with all applicable regulations, guidelines, and plans.

3.3.2.1 Clean Air Act

The Clean Air Act, passed in 1963 and amended numerous times since then, is the primary legal authority governing air quality management. This Act provides the framework for National, State, and local efforts to protect air quality. The Montana/Idaho State Airshed Group was formed to coordinate all prescribed burning activities in order to minimize or prevent effects from smoke emissions and to ensure compliance with the National Ambient Air Quality Standards (NAAQS) issued by the Environmental Protection Agency (EPA), the Federal agency charged with enforcing the Clean Air Act. The Forest Service, including the Moose Creek Ranger District, is a member of this Airshed Group. The project area is in North Idaho Airshed Unit 13. All post-harvest site preparation and fuel reduction treatments would be conducted according to the requirements of the Montana/North Idaho Smoke Management Unit guidelines.

3.3.2.2 Nez Perce National Forest Plan

The proposed project meets the Nez Perce National Forest Plan’s specific fire management goals for this area:

- Protect resource values through cost effective fire and fuels treatment through the utilization of material and using prescribed fire (page II-2).

The modified fuel bed would decrease the probability of high intensity fires and increase firefighter effectiveness, reducing the probability of resource damage at lower cost while utilizing wood fiber.

3.3.3 Analysis Methodology

Two fire affected stands were modeled for resistance to control and fireline intensity based upon tons/acre greater than 3 inches in diamater from stand data collected in 2012 using Field Sampled Vegetation (FSVEG) data collection protocol (Stand 1- Stand ID 01170702040046; Stand 2- Stand ID 01170714010100). Both stands are predominantly cedar and grand fir. Both stands had similar basal area (Stand 1: 186 feet^2/acre, Stand 2: 189 feet^2/acre) but one has a composition of smaller diameter trees while the other is skewed toward larger diameter trees (Stand 1: 1,913 trees/acre, Stand 2: 441 trees/acre.)

Stand 1 is considered a typical tree diameter size stand for the project area while Stand 2 is considered a larger diameter size stand.

For future trend projections across the project area, the Fire and Fuels Extension (FFE) (Reinhardt, 2003) to the Forest Vegetation Simulator (FVS) (Stage1973) was used to simulate the effects of the No Action and Action Alternatives. The First Order Fire Effects Model (FOFEM) (Reinhardt, *et al*. 1997) was also utilized for fire effects, such as smoke production.

Stand 1 was modeled for the No Action and action alternatives using 60% mortality as an average across the actual burn perimeter in order to calculate direct and indirect effects. The Salvage treatment would be the removal of fire killed trees removal, leaving 14-28 trees per acre. The trees left would be in addition to any unburned islands (part of the unburned 60%) or areas excluded due to riparian/wet areas as defined by PACFISH guidelines. Stands 1 and 2 were modeled (S1-All Black, S2-All Black) as high severity burns (100% mortality) for indirect effects.

3.3.4 Resource Indicators

Issue: Fire killed/affected trees would fall over time, increasing surface fuel loadings, which would trend upwards over time from the recommendations for this forest type. This could lead to higher intensity or severity fires that would be difficult and costly to control, such as occurred with the Johnson Bar fire.

Indicator: Surface fuel loading in tons/acre [greater than 3 inches diameter (>3 in)] per Graham 1994 to provide positive values for other affected resources while avoiding excessive fire hazard (Brown, 2003). These levels are 17-33 tons/acre >3 in.

Several fire/fuels related effects may be derived from this indicator:

<u>Fireline intensity</u> is synonymous with the terms “Byram's fire intensity” (Scott, 2007) and “frontal fire intensity.” It is the numerical product of a fire's rate of spread, fuel consumption, and heat yield at a given point on a fire’s perimeter. It is a common method

to show visually the effects of increasing flame lengths on the type of suppression resources and tactics that may be required as surface fuel loadings increase. These categories can be broken up by flame length and displayed on a fire behavior fire characteristics chart (Rothermal, 1972). Lower values are usually beneficial from a fire suppression aspect. Fireline intensity is causally related to severity (Summers, 2011), which measures effects to other resources, such as soils. In general, the higher the intensity the greater the severity.

Related to this is resistance-to-control, which is an estimate of the suppression force required for controlling a unit of fire perimeter. It is a subjective rating meaure, such as 'low' or 'extreme', but is correlated to the size and distribution of fuels based on the time and effort to secure the unit of fire perimeter. A rating, such as 'low' may be easy walking and minimal chainsaw work with few firefighters and no aviation resources needed; whereas, an 'extreme' rating may be very difficult walking and the need for heavy equipment and aviation resources. A broad interpretation would interpret a surface fuel loading of 15-40 as 'medium' (Brown, 2003). Resistance to control would increase suppression costs and firefighter exposure to hazards. Often fires in heavy fuel areas would cause fire managers to fall back to changes in fuels in order to attempt suppression actions because of logistical concerns, getting the equipment needed to the area, and if the increasing fire size has outstripped the on-scene resource suppression capability. Fuel reduction efforts in continuous fuels have shown a resistance to control aids in fire suppression efforts (Moghaddas, 2006).

3.3.5 Affected Environment

The Johnson Bar fire affected over 13,000 acres of forested landscape to some degree, from a light surface fire with little overstory tree mortality to total stand replacement fire with complete overstory tree mortality. These dead trees would contribute to the surface fuel loads and the spread of future fires. Based on fire history and possible future weather changes, the ignition risk should remain the same or higher.

Current Conditions: The habitat groups found within the fire area consist of Groups 5 and 6 from the Nez Perce-Clearwater National Forests Target Stand Groups. The habitat types in Group 5 (moderately cool and moist western red cedar) are characterized by mixed species stands of western red cedar, grand fir, and Douglas fir, with diverse shrub and forb understories. Western white pine, larch, and ponderosa pine are less frequent components. Cedar/Clintonia is the habitat type in this group most frequently found. These habitat types are common in the western portion of the subbasin on lower slopes and northerly aspects, but become increasingly rare toward the headwaters. The habitat types in Group 6 (moderately cool and wet western red cedar) are characterized by stands of grand fir and western red cedar.

Fuel models incorporate fuel characteristics, such as fuel load by size class and category (live or dead), fuel bed depth, etc., to group similar vegetation types for use in fire behavior models.

Prior to the fire, the Fire Behavior Fuel Models (FM) were primarily FM8 (closed short-needle timber litter) and FM10 (mature/over-mature timber and understory). FM8 has

lower surface fuel loadings and flame lengths while FM10 has higher surface fuel loadings and flame lengths. Based on fire severity mapping within the actual fire perimeter (not including the unburned areas incoporated into the remainder of the project area), the following approximate percentages of fire severity were mapped. The Johnson Bar fire burned through an area of approximately 13,000 acres at a cost of approximately $13,500,000.

Table 3-4: Approximate Percentages of Fire Severity within the Project Area

Severity Classification	Percent Area Affected	Approximate Acres
Unburned	12	1,597
Low	41	5,455
Moderate	43	5,721
High	4	532

*High severity represents less than 25% of the remaining overstory alive; moderate severity represents 25-75% of the remaining overstory alive; while low has 75% or greater overstory alive at the time the data was processed. (LANDFIRE, 2013)

3.3.6 Direct and Indirect Effects

3.3.6.1 Alternative 1

Under this alternative, no treatments are planned; therefore, fuels would continue to naturally cycle through decay and growth.

Direct effects: Surface fuels greater than 3 inches (>3 in.) would begin to accumulate to about pre-fire levels after 20 years in modeled Stand 1 (No Action) as the fuels consumed by the fire are replaced by falling snags and remain relatively constant afterwards across the entire area. Levels would remain between 40 and 80 tons/acre over the next 40 years, which are above the recommended 17-33 tons/acre >3 in. (See Figure 1). Fire intensity and severity would be higher than desired, which may have undesirable effects to resources (See Figure 2). Fires established at these fuel loadings are generally sustained until there is a change in fuels, such as a break in continuity occurs. Since no breaks in fuel continuity would occur (See Figure 3) as a result of lowering the surface tons/acre, the No Action alternative and areas of high severity (S1-All Black, S2-All Black) resistance to control would remain high, or above, and would continue to increase, which would increase suppression costs and firefighter exposure.

Indirect effects: Smoke particulate matter (PM 2.5) would increase across all non-treatment scenarios (See Figure 4). PM 2.5 is a measure of fine particles 2.5 microns and smaller that are produced from activities, such as burning of organic matter. Higher levels of PM 2.5 are considered a health risk and can impede visibility.

3.3.6.2 Alternatives 2, 3, and 4

Under the action alternatives, dead trees would be harvested on approximately 3,100 or fewer acres along road systems, primarily located along ridgelines. Live islands of trees and areas within PACFISH buffers would be excluded, leaving a mosaic of treated and untreated

areas within the harvest units. Harvested areas would retain approximately 15 of the largest trees/acre, not including the exclusions listed above.

Direct effects: Surface fuels >3 in. would be reduced to preferred levels and would slowly decrease over time as decaying overtakes growth (Salvage trendline does not factor into mitigation actions in order to maintain minimum levels in Figure 1). Flame lengths would decrease to below 4 feet and fireline intensity would drop in treated areas, allowing the potential for less affective suppression tactics (See Figure 2). Effects to resources from fire severity should be considerably less than under the No Action alternative, although fuels would continue to increase outside of the treated areas (S1-All Black, S2-All Black), which would still have undesirable effects to resources. Barriers to the spreading of fires, utilization of the existing ridge-top road systems, and aerial extraction would lower the resistance to controls in treated areas from fires entering from untreated areas (See Figure 3). This should decrease suppression costs and firefighter exposure by providing areas where escaped fires could be contained on a smaller scale, while allowing for faster access through the utilization of the established transportation system.

Indirect effects: Smoke particulate matter (PM 2.5) would decrease by approximately 60% (See Figure 4).

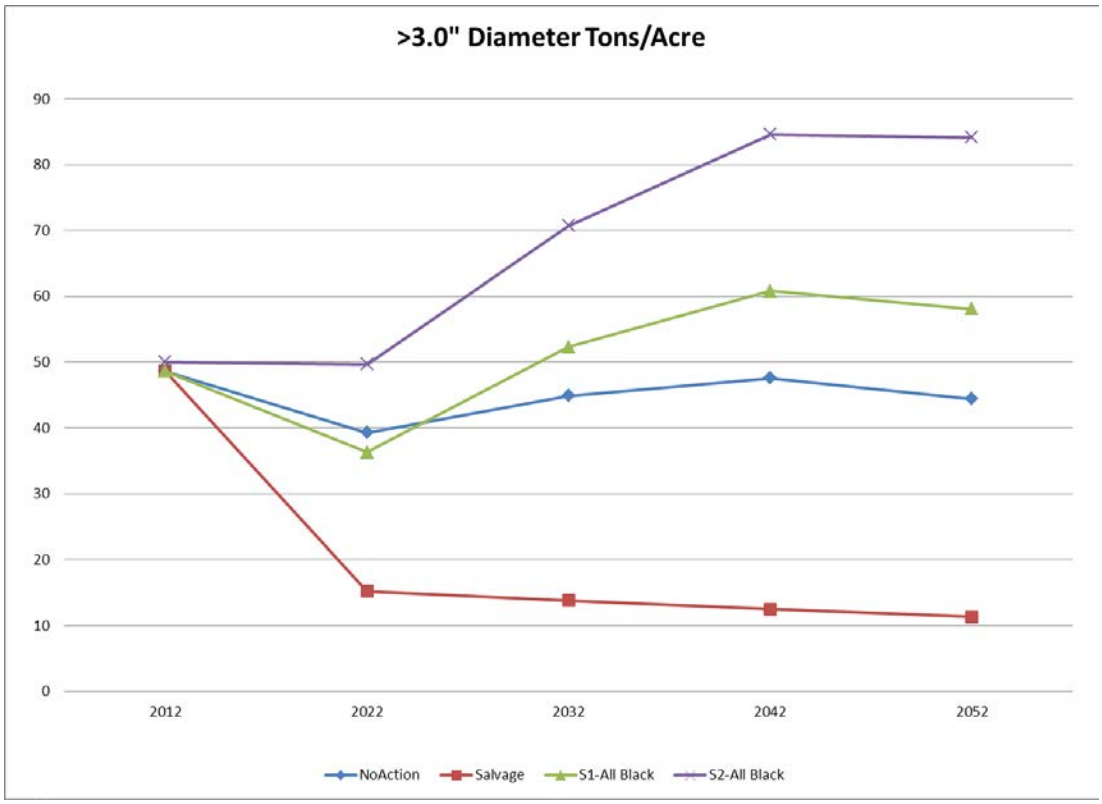


Figure 1: Surface fuels (tons/acre) greater than 3 inches in diameter projected over 40 years. Fuel Model 8 is equivalent to the Salvage treatment; Fuel Model 10 is equivalent to the other scenarios.

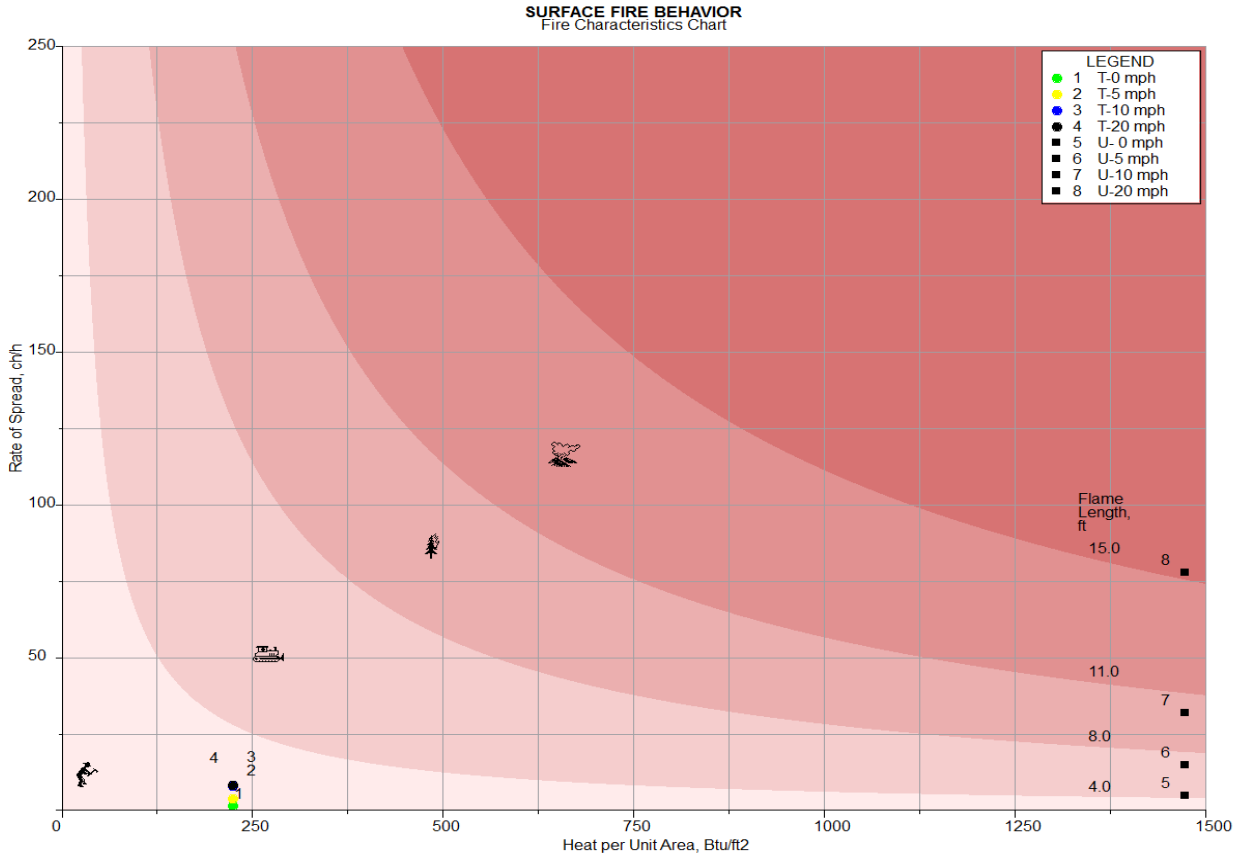


Figure 2: Fire behavior characteristics chart showing treated and untreated stands under the same environmental variables (T-treated, U-untreated)

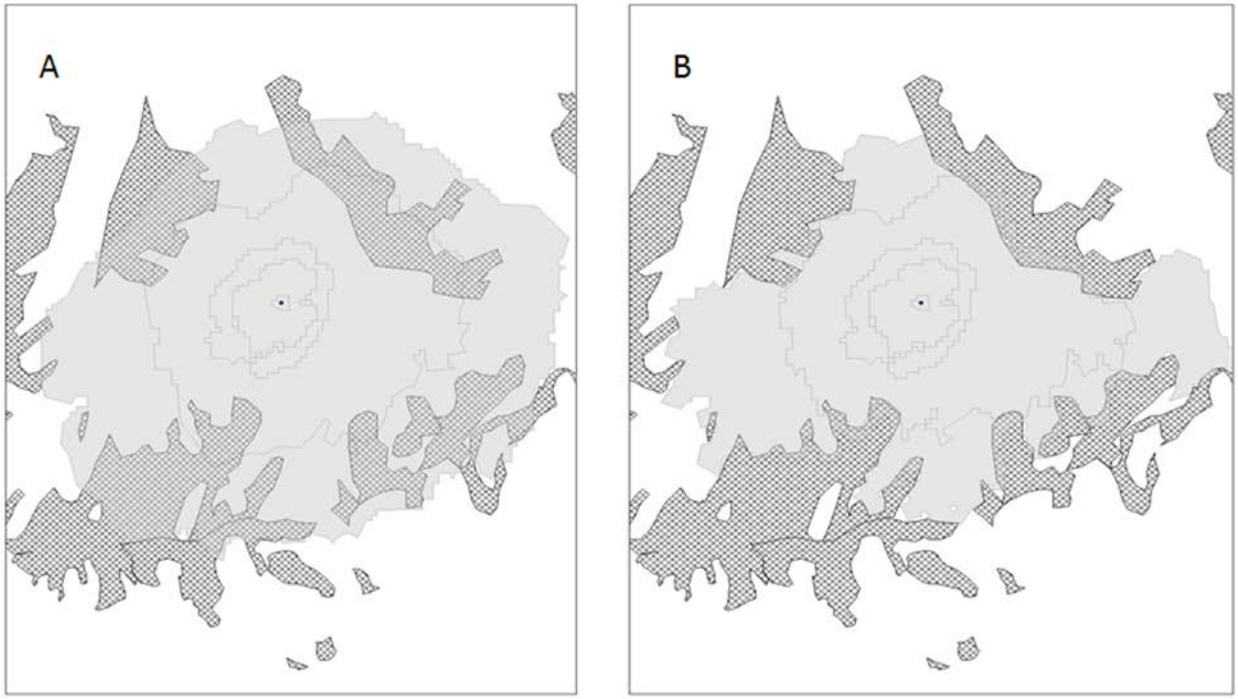


Figure 3: Simulated fire under identical conditions to show effects of treatment units as barriers to fire spread. Solid area is simulated fire spread, cross-hatched areas denote treatment units. Depicted area is in northern portion of project area. A: No Treatment. (Treatment areas shown for reference) Fire spreads in all directions. B: Salvage Alternative 2. Fire is slowed by treatments. Alternatives 3 and 4 are similar but would have fewer barriers to fire spread.

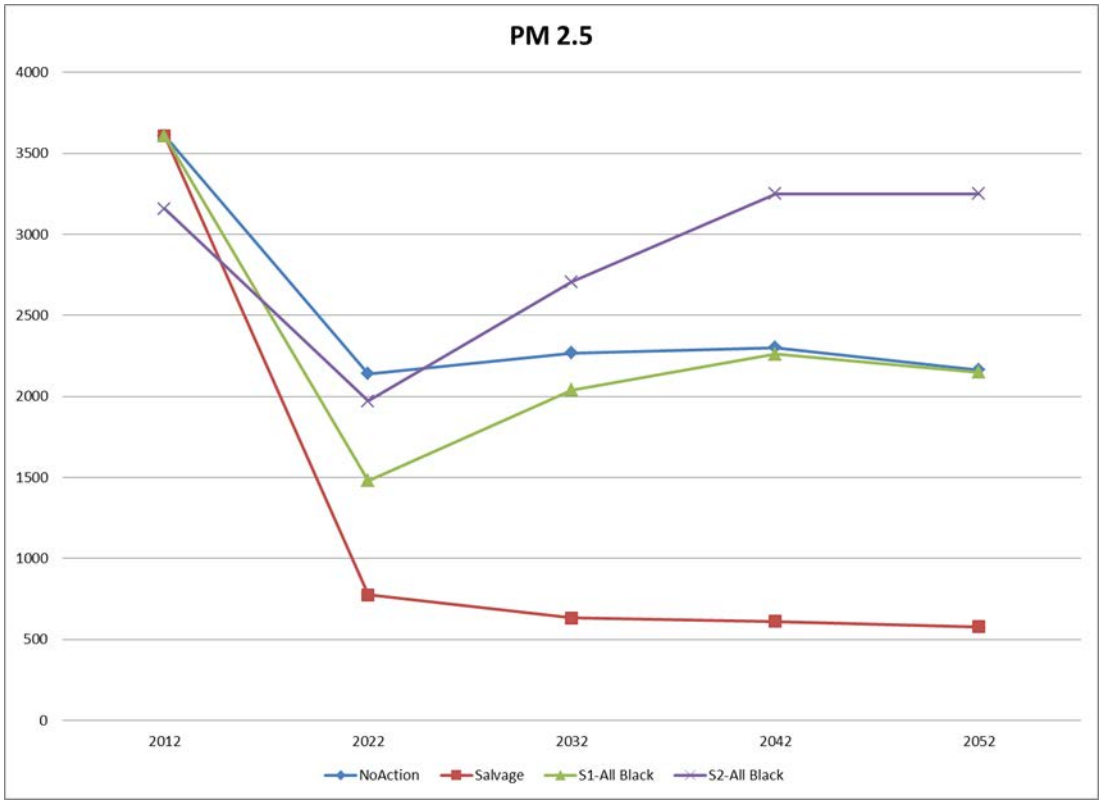


Figure 4: Smoke particulate matter (PM 2.5) over time

3.3.7 Cumulative Effects

The cumulative effects geographic boundary for fuels is the fire perimeter area because project activities would have localized effects on fuels and fuel continuity. This area is sufficient to display effects. The time frame for cumulative effects is 40 years.

The only activities considered for cumulative effects to fuels are those management activities that may increase or decrease fuels over the next 40 years. The only Forest Service activity considered for cumulative effects is fire suppression/exclusion. Until the current Forest Plan changes, this area would remain primarily a full response suppression zone. Fuels would continue to accumulate in the non-treated areas and be well above the preferred levels (See Figure 1).

The Idaho Department of Lands proposal to harvest 160 acres would add additional reductions in fireline intensity and resistance to control as described for the Salvage alternatives. The 80 acres of harvest on private lands would provide the same benefit. There are no current or reasonably foreseeable future activities that would affect fuels within the cumulative effects area.

3.3.7.1 Alternative 1

There would be minimal benefit because of the small size and location of treatments within the valley, although location near private property would be beneficial.

3.3.7.2 Alternatives 2, 3, and 4

There would be a positive cumulative effect associated with the Action Alternatives because this would extend the benefits of the treatments further into the river corridor and onto lands outside of the National Forest System administered lands.

3.4 Hydrology

3.4.1 Analysis Area

The proposed Johnson Bar Fire Salvage project area is located within the Middle Fork Clearwater River Watershed (5th level Hydrologic Unit Code—HUC # 1706030402) and Gedney Creek-Selway River Watershed (5th level HUC # 1706030204). The project area drains to the lower Selway and Middle Fork Clearwater Rivers.

3.4.2 Regulatory Framework

Nez Perce National Forest Plan direction and all Federal and State laws and regulations applicable to watershed resources would be applied to the proposed Johnson Bar Fire Salvage project, including the Clean Water Act, Idaho State Water Quality Standards, Idaho Forest Practices Act, Idaho Stream Channel Protection Act, and Executive Orders 11988 and 11990.

The Johnson Bar Fire Salvage project was designed to meet the Clean Water Act, Idaho State Water Quality Standards, Forest Practices Act, Idaho Stream Channel Protection Act, and Federal Executive Orders 11988 and 11990. As discussed in this report, project activities may result in short-term increases in erosion and probability of sediment delivery (e.g. from road improvement and decommissioning), but would result in long-term reduction in probability of erosion and sediment delivery to streams. In particular, hillslope slash application would act as a burned area emergency response (BAER) treatment to reduce erosion and sediment transport off of burned hillslopes where treatments would occur. Thus, all major streams in the project area are predicted to have maintained or improved water quality conditions as compared to the post-fire existing condition, and would continue to support beneficial uses.

Forest Plan standards for water (pages II-21 to 22 and Appendix A) would apply to this project and would be met.

3.4.2.1 Nez Perce National Forest Plan

Forest standards for water resources are found in the Nez Perce National Forest Plan on pages II-21 through II-22 (USDA 1987) and include:

- Apply best management practices to project activities to ensure water quality standards are met or improved;
- Use R1/R4 sediment and water yield guidelines;
- Evaluate site specific water quality effects and complete cumulative watershed effects analysis; and

- Meet fish/water quality objectives as outlined in Forest Plan Appendix A (including Forest Plan Amendments 5, 11, and 26) - Guidelines for percent sediment yield over base and entry level frequency per decade are established to approximate the maximum sediment yield allowable to meet fish/water quality objectives.

The Nez Perce National Forest Plan was amended in 1995, following a joint decision (commonly called PACFISH) by the U.S. Forest Service and Bureau of Land Management for managing anadromous fish-producing watersheds on Federal lands (Forest Plan Amendment 20). This amendment also includes direction for restoration opportunities and cooperation with other agencies and individuals. PACFISH buffer widths exceed state best management practice standards.

3.4.2.2 Clean Water Act

The Clean Water Act stipulates that states are to adopt water quality standards. Included in these standards are provisions for identifying beneficial uses, establishing the status of beneficial uses, setting water quality criteria, and establishing Best Management Practices (BMPs) to control non-point sources of pollution. Executive Order 12088 also requires the Forest Service to meet the requirements of the Act.

Section 313 of the Clean Water Act requires Federal agencies to comply with all Federal State, interstate, and local requirements, administrative authority, and process and sanctions with respect to control and abatement of water pollution.

Section 303(d) of the Clean Water Act stipulates that states must identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). For waters identified on this list, states must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards. There are no streams in the project area listed for pollutants in the EPA approved 303(d)/305(b) 2010 Integrated report (IDEQ, 2011).

Section 404 of the Clean Water Act requires permits to remove or place fill within waters of the United States. The US Army Corps of Engineers administers these provisions. Culvert removal and replacement activities proposed under the Johnson Bar Fire Salvage project would require authorization under Section 404, through application of either nationwide or site-specific permits.

Section 402 of the Clean Water Act discusses permitting under the National Pollutant Discharge Elimination System (NPDES). In March 2013, the Supreme Court ruled that channeled runoff from forest roads did not constitute a pollutant from industrial activity and did not fall under the provisions of Section 402.

3.4.2.3 Idaho State Water Quality Standards

Environmental Protection Agency regulations require each state to adopt an anti-degradation policy as one component of its water quality standards. The objective of the Idaho Anti-degradation Policy is, at a minimum, to maintain and protect existing instream water uses and the level of water quality necessary to protect those uses (IDAPA 16.012501,01). Beneficial uses and water quality criteria and standards are identified in the

State of Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02, IDAPA 37.03.02).

3.4.2.4 Idaho Forest Practices Act

This Act regulates forest practices on all land ownership in Idaho. Forest Practices on national forest lands must adhere to the rules pertaining to water quality (IDAPA 20.02.01). The rules are also incorporated as BMPs in the Idaho Water Quality Standards.

3.4.2.5 The Idaho Stream Channel Protection Act

This Act regulates stream channel alterations between mean high water marks on perennial streams in Idaho. Instream activities on national forest lands must adhere to the rules pertaining to the Act (IDAPA 37.03.07). The rules are also incorporated as BMPs in the Idaho Water Quality Standards.

3.4.2.6 Federal Executive Orders 11988 and 11990

Provide for the protection and management of floodplains and wetlands.

3.4.3 Analysis Methodology

GIS generated reports and maps, aerial photos, and field reviews were used to analyze effects to water quality and quantity from the Johnson Bar Salvage proposed activities. Resource condition observations were conducted in the field during the fall of 2014, following the Johnson Bar Fire. *Forest stand database* (FSVeg) queries were conducted to identify past harvest activities and the timeframe they occurred. Information from the Selway and Middle Fork Clearwater Rivers Sub-basin Assessment (USDA Forest Service 2001) was used to develop the existing condition and cumulative effects evaluation.

Models were used to provide estimates of existing and project-related erosion and sedimentation, as well as the approximate area absent of mature trees. Model output is not at a level of accuracy that allows for interpretation in absolute terms, but is useful for comparison of the alternatives.

An *equivalent clearcut area* (ECA) analysis was used as a surrogate to assess potential water yield increases resulting from disturbed vegetation. Water yield increases can result in decreased stream channel stability due to sustained increased energy caused by increased streamflows. The ECA method was developed in the 1970s to address concerns regarding water yield increases and potential effects on channel morphology. In the 1970s and 1980s, channel effects (primarily scouring) were often observed, and these effects were thought to be caused by water yield increases. During that period, clear-cutting was common, timber harvest levels were substantially higher, and effects to streams were common. Forest management practices haved changed dramatically since that time. Streams now have no-harvest buffers of 100-300 feet on both sides of the watercourse, and BMPs are implemented for all projects. These changes have greatly reduced the effects of forest management activities on stream channels and aquatic habitats; thefore, actual increases in water yiled may be less than those predicted by the model.

The ECA analysis uses treatment and recovery coefficients from Ager and Clifton (2005) to determine existing ECA. Included in the assessment are past timber harvest, wildfires (including Johnson Bar), and roads. The ECA analysis takes into account the initial percentage of crown removal and the recovery through vegetative regrowth since the disturbances occurred. Existing roads are considered as permanent openings when estimating ECA. The analysis takes a simple snapshot in time with the assumption that all Johnson Bar Fire Salvage project activities are implemented in one year. ECA predictions are used to compare alternatives and are not viewed as absolutes.

The *NEZSED* model was used to estimate existing watershed sediment yield and potential sediment yield increase as a result of the proposed activities under Alternatives 2, 3, and 4. The model's estimates are useful in comparing alternatives to the existing condition, but are not reliable as actual instream sediment loads. NEZSED model results are also required for comparing the proposed alternative to the guidelines of Appendix A of the Forest Plan. A more detailed discussion of the NEZSED model is in the Forest Plan, Appendix A guidance document (Conroy and Thompson, 2011). Sediment yield is calculated in tons/year and reported as "percent increase over base" conditions. Sediment yield is calculated for base conditions (watershed conditions absent of natural or human disturbance), current conditions (cumulative of past and existing management activities and large-scale natural disturbances, such as wildfires, combined with base conditions), and predicted conditions for each of the proposed project alternatives (cumulative of past, existing, and proposed future activities combined with base conditions). The NEZSED model was used in this analysis primarily because it is required by the Forest Plan (1987)—it is no longer considered the best available approach to estimating sediment delivery to streams. Nevertheless, the model's output is useful in comparing alternatives and the existing post-fire conditions of the project area.

The state-of-the-science hillslope and road erosion model most commonly used in western land management applications is the *Water Erosion Prediction Project (WEPP) Hillslope Profile and Watershed Model* (Elliot *et al*. 2000). The Forest Service Road module of the WEPP model was used to predict sediment transport from roads to stream channels. Input data used to run this model were collected in the field at points where roads drain to streams during runoff. Another WEPP module (*Disturbed WEPP*) was used to predict erosion from treatment unit hillslopes. The WEPP-based *Erosion Risk Management Tool (ERMiT)* (Robichaud *et al*. 2007) was used to estimate post-fire erosion from treatment areas with and without project-related erosion mitigation measures. The ERMiT interface was developed in order to improve WEPP predictions of post-fire erosion and sedimentation, as well as the effects of post-fire mitigation measures at reducing erosion. Input data required for the ERMiT interface include hillslope, soil, cover, and management parameters.

The physical basis and performance of the WEPP models is discussed in the model documentation (Elliot *et al.* 2000, Elliot 2004, Robichaud *et al*. 2007), as well as several peer-reviewed papers (Elliot 2004, Laflen *et al*. 2004, Larsen and MacDonald 2007). In general, erosion prediction models have difficulty predicting sediment output with precision from a road, hillslope, or watershed at time scales useful to land managers. This is due mainly to a high degree of variability in site characteristics and climate. An average

erosion/sediment delivery rate prediction can encompass this variability to some degree, but is more useful when combined with a probability that erosion would occur.

The WEPP models incorporate climate data tailored to the individual site using Parameter-elevation Regressions on Independent Slopes Model (PRISM) data (Daly et al. 2000) and simulate daily events for a number of years specified by the user (100 years in this analysis) to determine the probability of sediment leaving the modeled hillslope. The model incorporates individual precipitation event characteristics and moisture conditions, as well as site characteristics into its prediction of average annual runoff, erosion, and sediment yield values.

Accurately predicting erosion is difficult and subject to large errors from various sources because of highly complex processes including spatial variation in slope, soil, and vegetative conditions, and uncertainty in precipitation (Walling 1988). Therefore, applying hillslope estimates across landscapes and watersheds generalizes actual rates of erosion that may occur. Modeled erosion and sedimentation rates are recognized as highly variable. (Neary *et al*. 2005) suggest that the average erosion value produced by a model is likely to be plus or minus 50% of the observed value.

3.4.4 Resource Indicators

3.4.4.1 Water Quality and Quantity

Recently burned forested hillslopes are typically highly susceptible to erosion and elevated runoff in their natural state. Loss of organic material (soil duff) and fine woody debris reduces overland flow resistance, protection from splash erosion, and surface water storage capacity. Soils can become more water repellant, contributing to elevated runoff. Activities associated with the post-fire removal of trees have the potential to exacerbate these conditions through compaction, rutting, and displacement of soils. However, careful mitigation of potential effects and restrictions on where and how work is done can substantially reduce the potential effect of salvage harvest operations. For example, skyline or helicopter yarding of hand-felled trees minimizes soil disturbance, and has substantially less effect on soils than tractor yarding (McIver and Starr 2001, Karr *et al*. 2004). In a treatment similar to BAER post-fire erosion control methods, scattering of fine slash to re-establish extensive ground cover throughout a treatment unit can reduce the potential for erosion below that of the untreated, post-fire condition (McIver and Starr 2001). Avoiding any activities on sensitive ground, such as riparian areas or landslide-prone hillslopes, would prevent damage to these sensitive areas, as well as to areas downstream or downslope (Karr *et al*. 2004, Beschta *et al*. 2006).

Active erosion of the landscape occurs naturally and yields sediment to streams. When chronic or excessive sediment inputs occur, a stream's ability to route the sediment through the system is reduced and water quality and aquatic habitat can be diminished. Harvest and road-related activities have the potential to increase erosion production and sediment delivery into streams.

Roads influence both water quantity and quality. They allow substantially less rainfall and snowmelt infiltration than occurs on undisturbed forest floors, intercept subsurface flowpaths, and concentrate runoff. Where connected to a stream, unpaved roads are often a source of sediment as well. While a watershed road density greater than three miles per square mile (mi/mi^2) is generally considered to be an impaired condition (NOAA 1998), lower road densities with high road-stream connectivity would likely be similarly impaired.

The balance of water yield and sediment yield in a watershed influences the water quality/quantity of a stream system. Water yield refers to stream flow quantity and timing and is a function of water, soil, and vegetation interactions. Changes in amount or distribution of vegetation can affect water yield and ultimately alter stream channel conditions. A general measure of 20-30% ECA is generally recognized as the point where water yield is increased beyond acceptable limits (Gerhardt 2000, MacDonald and Stednick 2003). While this project would remove dead trees, new landing and temporary road construction could potentially clear some green trees. Proposed activities were evaluated to determine whether they would likely contribute to a change in ECA or water yield over the existing condition.

Water Resource Indicators for this project are as follows:

- Net sediment delivery from project area roads and treatment units as modeled using WEPP (existing versus post-project conditions);
- Percent sediment yield increase over base as modeled using NEZSED;
- Watershed road density; and
- Percent increase in equivalent clearcut area (ECA).

3.4.5 Affected Environment

The proposed Johnson Bar Fire Salvage project is located near the headwaters of the Middle Fork of the Clearwater River (Lochsa and Selway River confluence). The proposed project area is encompassed by the Big Smith Creek-Middle Fork Clearwater, Goddard Creek-Selway River, and O'Hara Creek subwatersheds (6th-HUC drainages). These subwatersheds are further delineated into multiple Forest Plan Prescription watersheds. Table 3-5 displays the existing condition of general watershed indicators for watersheds within the proposed project area. The ECA calculations are for post-fire conditions where 2% of the project area burned at high severity, 22% at moderate severity, 21% at low intensity, and 55% was not burned. Watershed boundaries and stream locations are displayed in Maps 5 and 6. There are no municipal water supplies or source waters within or adjacent to the project. Forested seeps and springs are found throughout the project area and often mark the upper extent of perennial flow. Stream channels range from headwater channels that are relatively steep and confined (Rosgen A), to lower gradient Rosgen B and C channels (Rosgen 1996). During the fall of 2014 and spring of 2015, resource technicians evaluated conditions of roads, culverts, headwater perennial and intermittent channels, ephemeral draws, and springs and seeps within and downstream of proposed activity areas. The Fisheries Biological Evaluation for this project details characteristics and conditions of project area streams.

A query of water rights was made for the areas located in the Johnson Bar Fire Salvage project area. Eleven federal and six State of Idaho water rights were identified. Uses included administrative, storage, stock water, minimum stream flow, Wild and Scenic River designation, and irrigation. A summary of the proposed action alternatives discussed in this project would not alter any existing water rights claims nor decrease the available water relative to these claims.

Beneficial uses and water quality criteria and standards are identified in the State of Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02). Designated Beneficial Uses (IDAPA 58.01.02, Section 120) for the Middle Fork Clearwater River Sub-basin (HUC #17060304) and Lower Selway River Sub-basin (HUC #17060302) are cold-water biota, salmonid spawning, domestic water supply, and primary/secondary contact recreation. Designated Beneficial Uses for both the Middle Fork Clearwater River Lower Selway River (major streams in the project area) are cold-water aquatic life, domestic water supply, primary contact recreation, and salmonid spawning. Idaho Department of Environmental Quality (IDEQ) has not completed support status assessments for either streams with the exception of the Lower Selway River is listed as fully supporting cold-water aquatic life (Final Assessment Unit Status Report 2012). The tributaries of the Lower Selway and Middle Fork Clearwater have generally not been assessed but are listed as having beneficial uses including cold-water aquatic life, secondary contact recreation, domestic water supply, and salmonid spawning. The IDEQ direction is to improve or maintain water quality conditions in order to support beneficial uses. No streams within the *Big Smith Creek-Middle Fork Clearwater, Goddard Creek-Selway River,* and *O'Hara Creek* drainages are listed for pollutants in the EPA approved 2012 Idaho Department of Environmental Quality (IDEQ) 303(d)/305(b) Integrated Report (IDEQ 2012).

Table 3-5: Existing Condition Information

Johnson Bar Drainages	Watershed area (acres)	Road length in RHCA (miles)	Watershed Road density (mi/mi²)	Stream-road crossings (#)	ECA† (%)
Big Smith Creek-Middle Fork Clearwater River** *6th field HUC #170603040201*	28,875 (85% Forest Service)	12.0	2.9	36	17
Decker Creek *Forest Plan #170603040009*	1,230 (100% Forest Service)	0.0	0.5	0	28
Lodge Creek *Forest Plan #170603040007*	2,970 (100% Forest Service)	0.6	4.5	6	20
Middle Fork Clearwater Face* *Forest Plan #170603040099*	25,100 (9,750 in HUC) (37% Forest Service)	8.9	2.1	13	10
Unnamed No. 8 *Forest Plan #170603040008*	870 (100% Forest Service)	0.0	1.2	0	26
Goddard Creek-Selway River** *6th field HUC #170603020405*	22,725 (95% Forest Service)	8.6	1.9	33	20
Elk City Creek *Forest Plan #170603020123*	1,800 (97% Forest Service)	0.3	2.6	3	31
Goddard Creek *Forest Plan #170603020122*	9,250 (100% Forest Service)	0.7	1.7	7	16
Lower Selway River* *Forest Plan #170603020125*	12,000 (4,720 in HUC) (89% Forest Service)	6.7	1.5	15	5
Swiftwater Creek *Forest Plan #170603020124*	3,925 (97% Forest Service)	0.6	2.9	4	21
O'Hara Creek** *6th field HUC #170603020404*	37,900 (100% Forest Service)	12.6	1.4	82	3
Lower O'Hara Creek *Forest Plan #170603020121*	9,610 (100% Forest Service)	4.8	1.2	20	6

*Prescription Watershed (Forest Plan Subwatersheds) extends into additional 6th Level HUC
** 6th Level HUC may have other Forest Plan Prescription Watersheds that are not displayed as they are outside of the project's scope
†ECA: Equivalent Clearcut Area

Watershed conditions in the Johnson Bar Fire Salvage project area are a result of both natural processes and human activities. Past human-related activities include recreation, fire suppression, road building and maintenance, and previous harvest activities (1950s to 2014). Past harvest and associated road construction have likely had the most affect to water and sediment yields.

The Johnson Bar fire is the most recent, large-scale disturbance in the hydrologic analysis area. This report uses burn severity to describe potential watershed effects of the Johnson Bar fire, and potential interactions with treatments in the Johnson Bar Fire Salvage project. Burn severity describes the effects of the fire on soil structure, infiltration capacity, and biotic components, and is used to indicate runoff and soil erosion potential from the fire. Burn severity maps were produced and field-verified as part of the BAER assessment for the Johnson Bar fire (USDA, 2014). Burn severity is defined through differences in surface organics, duff cover, and characteristics of mineral soils (Debano *et al*, 1998):

- Low severity – low soil heating, litter scorch or consumption with duff largely intact, mineral soil is not changed.
- Moderate severity – litter consumption with moderately charred or consumed duff, no visible alteration of mineral soil surface.
- High severity – complete consumption of duff and mineral soil surface visibly reddish or orange color.

Figure 10- Forest Plan Prescription Watersheds and major streams in the Johnson Bar Fire Salvage project Area

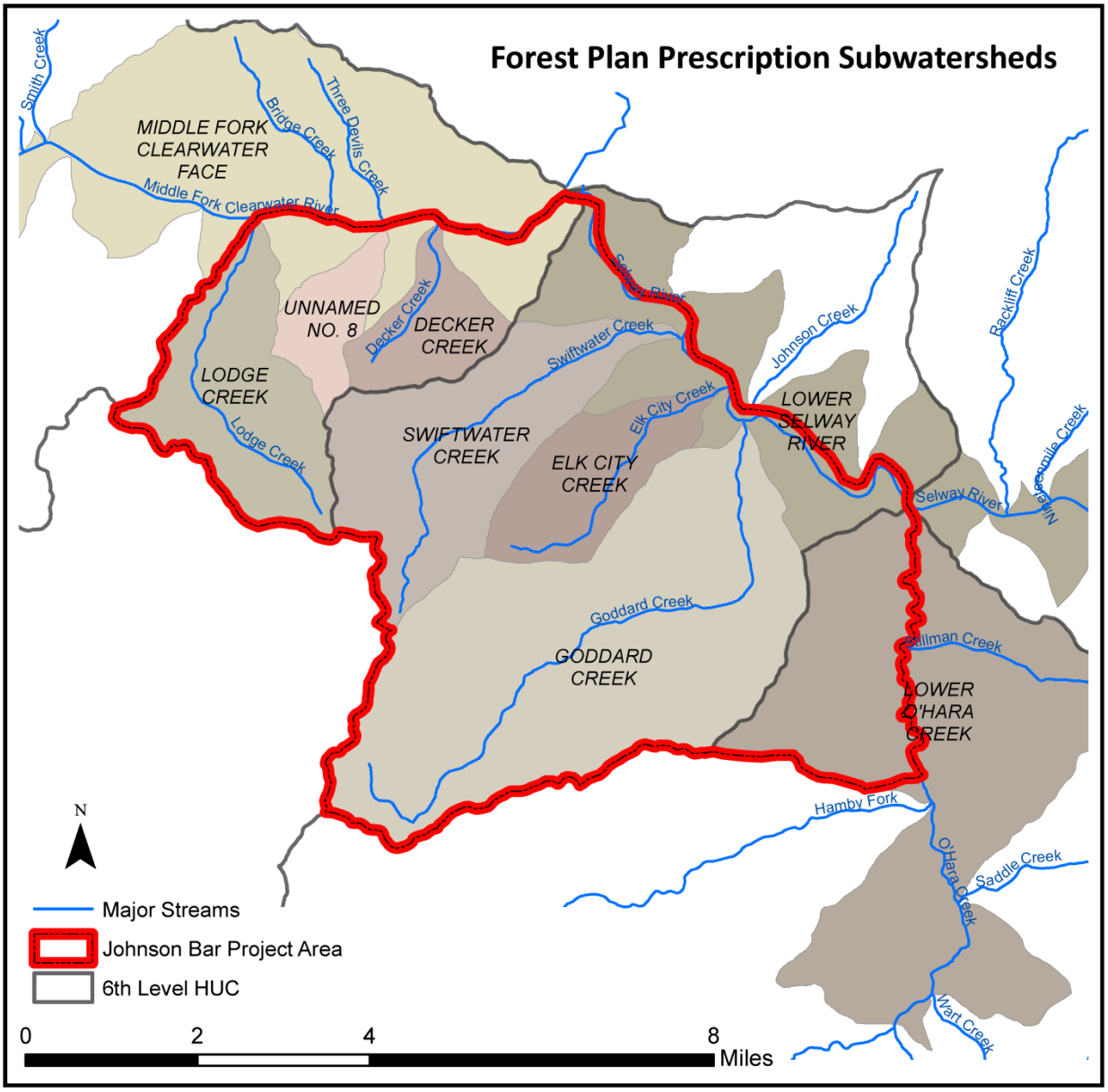
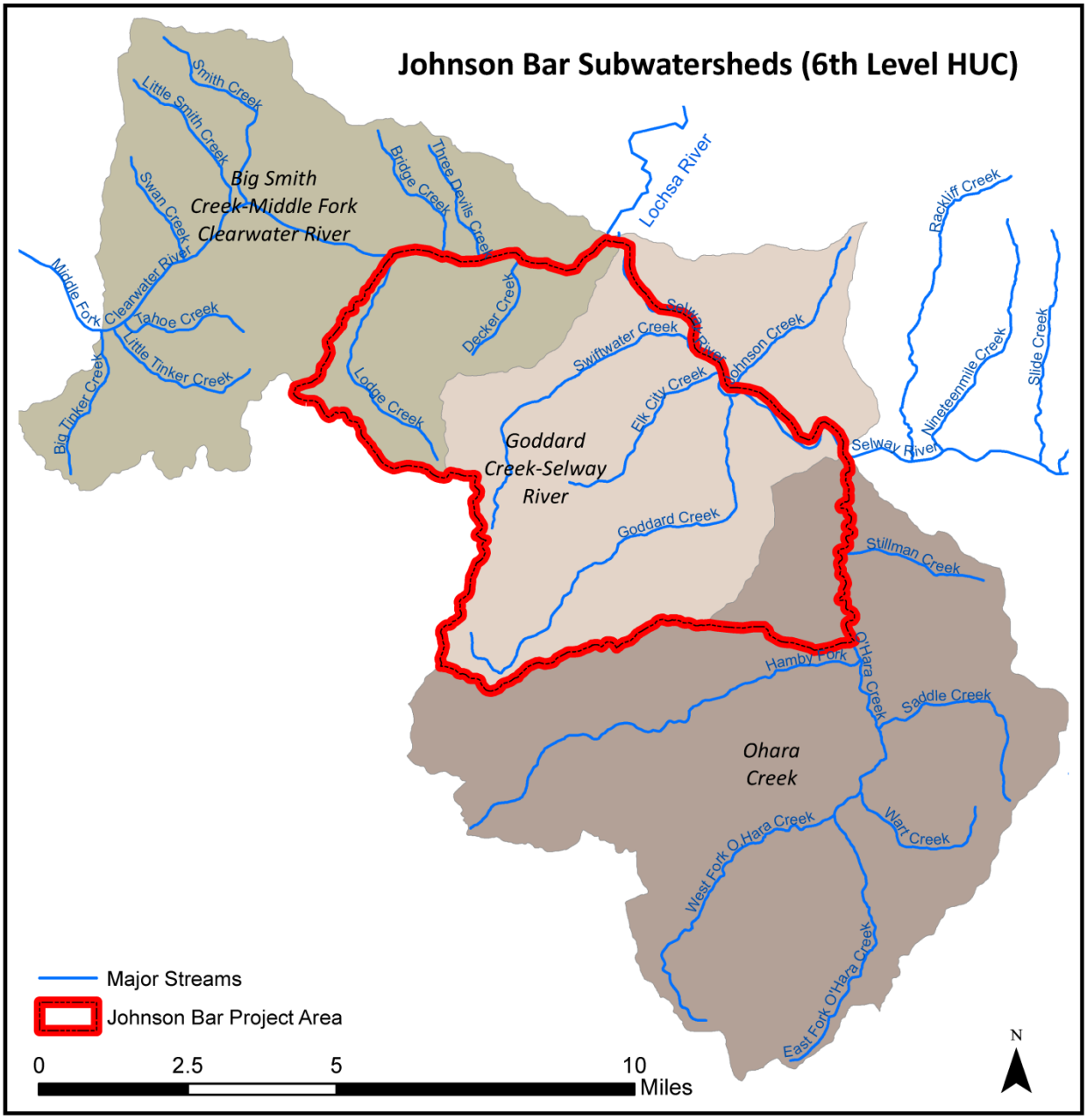


Figure 5– Johnson Bar Fire Salvage project Area Subwatersheds



Water Yield: Water yield refers to the volume and timing of stream flow at a given point. In the absence of major disturbance, a stream channel is typically dynamically in balance with its flow regime, which is a key determinant of the energy available for erosion, transport, and deposition of sediment within channels. Increased water yields may be associated with increased probability of peak flow events, which could lead to increased channel and bank adjustment through scour, bedload movement, or redistribution of sediment in depositional areas.

Water yield can increase after loss of mature trees (e.g. through harvest or wildfire) due to a reduction in transpiration and precipitation interception losses. Removal of forest canopy can also affect snow accumulation and melt processes, often resulting in an increase in snowpack accumulation and melt rates, which can lead to altered timing of peak snowmelt runoff, depending on the size, orientation and total area of clearcuts in a given drainage (Storck et al. 2002, Winkler et al. 2005). There is no Nez Perce National Forest Plan, State of Idaho, EPA, or other National standards governing peak flow increases. The Forest Plan calls for maintaining the stability, equilibrium, and function of all streams on the Forest.

Equivalent clearcut area (ECA) was used as an indicator of potential change in water yield resulting from reductions in live forest canopy (green tree harvest, road building, and wildfires). Lower ECA generally indicates a higher likelihood that stream channels are in balance with their flow regime. An ECA value of less than roughly 15 percent indicates favorable conditions in this regard. An ECA value of 15-30 percent indicates a moderate potential for a channel-flow regime imbalance. A value greater than 30 percent is considered low (poor) condition (NOAA 1998). Moreover, a statistically significant increase in stream flow is generally not measurable until at least 20 to 30% of a watershed's forest cover is removed (MacDonald and Stednick 2003). Baseline ECAs for the 6th level subwatersheds and for the 9 Forest Plan prescription watersheds are displayed in Tables 3-6 and 3-7, respectively. The baseline ECAs are a result of the Johnson Bar and other fires combined with past harvest activities and existing roads.

Table 3-6: Estimated ECA (post-fire conditions)

Subwatershed (HUC6)	Existing ECA (%)
O'Hara Creek	3.1
Goddard Creek – Selway River	19.8
Big Smith Creek - Middle Fork Clearwater River	17.4

Sediment Yield: Active erosion of the landscape occurs naturally and due to human activities, and yields sediment to streams. When chronic or excessive sediment inputs occur, the stream's ability to route the sediment through the system is reduced and water quality and aquatic habitat can be diminished. Harvest and road-related activities have the potential to increase erosion production and sediment delivery into streams.

Prescription watersheds were assigned fishery/water quality objectives in Appendix A of the Forest Plan. These objectives provide management direction in terms of the maximum estimated increase in sediment over baseline conditions that can be approached or equaled

for a specific number of years per decade. Seven of the nine Forest Plan prescription watersheds met their fish/water quality objectives. The remaining two watersheds did not have objectives designated, nor were sediment yield guidelines assigned. Lower O'Hara Creek, Goddard Creek, and Lodge Creek prescription watersheds have an Upward Trend Requirement, which allows timber management to occur, concurrent with improvement efforts, as long as a positive upward trend in habitat carrying capacity is indicated. The sediment yield guidelines (the maximum sediment yield allowable to meet fish/water quality objectives) are shown for each watershed in Table 3-14.

In addition, entry frequency guidelines of 1 to 3 entries were also assigned in Forest Plan Appendix A. Few activities have occurred in any of the watersheds in the past 10 years to qualify as an entry, when considering sediment production. In 2014, about 5 acres of commercial thinning took place from the Lodge Point sale on the ridge top between Lodge Creek and Swiftwater Creek. In the Lodge Creek drainage, there was a 479-acre helicopter salvage sale in 2005. Also in 2005, a 100-acre helicopter patch harvest occurred in Decker Creek. These entries combined with the proposed project would not exceed entry limits requirements for the drainages in question. Other harvest activities identified predate the decade timeframe for the entry frequency guidelines.

Areas adjacent to streams are the most likely to contribute to stream sedimentation. However, upland areas may be connected to the stream network via the road network, through intermittent channels or ephemeral draws. Burned areas are vulnerable to accelerated soil erosion, which can increase post-fire sediment yield (Neary, et al., 2005). Increases in surface erosion following wildfires have been well documented (Helvey, 1980; Robichaud and Hungerford, 2000; Wondzell and King, 2003; and Neary et al., 2005). However, effects are spatially variable based on burn severity, as well as timing and magnitude of precipitation (Robichaud and Hungerford, 2000).

Roads in the project area concentrate overland flow and are potential sources and vectors of sediment to streams. Roads increase the volume of flow during large storm events through overland flow from precipitation on compacted road surfaces, as well as interception of subsurface flow in road cuts. Roads reduce vegetative cover in streamside areas and can accelerate erosion and sedimentation into streams (Megahan and Clayton, 1983). Slope position of roads is a critical factor in the interaction between roads and streams. Ridge-top roads are often disconnected from the stream channel network, but can influence watershed hydrology by channeling flows into small headwater swales, accelerating channel development. Mid-slope roads can intercept subsurface flows, extend channel networks, and accelerate erosion (Gucinski et al., 2001). Roads adjacent to and crossing streams, or otherwise hydraulically connected to streams, have the greatest influence on streamflow, and sediment delivery to the stream system.

Road densities in Forest Plan Prescription Watersheds range from 0.5 to 4.5 mi/mi^2. A watershed in high (good) condition generally has a road density of less than 1 mi/mi^2. Watersheds with 1 to 3 mi/mi^2 are rated as moderate, and greater than 3 mi/mi^2 are rated as low (poor) condition (NOAA 1998). One of the Forest Plan prescription watersheds is

rated as high, seven are rated as moderate condition, and one is rated as low condition (Table 3-5).

3.4.6 Direct and Indirect Effects

The direct and indirect effects area consists of the nine Forest Plan Prescription watersheds in which the proposed project activities would occur (Table 3-5).

3.4.6.1 Alternative 1

Under this alternative, no proposed management actions would occur. Actions occurring on State and private lands would continue. Because no vegetation removal or new ground-disturbing activities would occur, there would be no direct effects from this alternative.

Indirectly, road density and road-related erosion would remain unchanged from existing conditions. Benefits from the reconditioning, reconstruction, and decommissioning of roads proposed in the action alternative would not be attained. The existing road network would continue to be a potential source of sediment, and unneeded roads would remain on the landscape, leaving these sites with impaired soil productivity and hydrologic function. Similarly, post-fire hillslope erosion risk would remain unchanged in the area burned in the Johnson Bar fire. Erosion-mitigating measures planned in the project would not occur.

Alternative 1 does not propose any new activities that would directly or indirectly affect wetlands or floodplains or increase stream temperatures.

3.4.6.2 Alternatives 2, 3, and 4

Water Yield

The effects of the project on water yield would be negligible in the short-term because proposed activities would primarily remove dead trees. Many of the fire-killed trees in the project area have retained their branches, and for the next few years would continue to intercept precipitation (albeit at a reduced rate), as well as provide some shade. However, their primary role in influencing stream water yield—transpiration—no longer occurs, and evaporation of precipitation is substantially curtailed and would further diminish with time as trees begin to fall. Areas where project activities could influence water yield are at the sites of new landings and temporary roads, the construction of which would likely result in the removal of small numbers of green trees. Five percent of the dead tree harvest acres were included in the ECA calculation in order to account for the potential incidental loss of a few green trees. Similarly, 50% of new temporary road and landing construction area was incorporated into the ECA to account for any green trees removed for these activities. The actual numbers of green trees removed in these activities are likely to be substantially lower. In addition, the predicted ECA increases are expected to be less than those shown in Tables 3-7 and 3-8. This is a result of RHCA identification and retention during on-the-ground harvest unit layout. An estimated 30% reduction in harvest acres may occur and is based on the neighboring Clear Creek project, which experienced an average 32% reduction in harvest acres when compared to the NEPA analyzed acres. Regardless, these activities

were estimated to have a negligible effect on water yield as indicated by the change in ECA (Table 3-7).

Table 3-7: Estimated Percent Increase in ECA over Post-Fire Baseline Conditions by Alternative

Subwatershed (HUC6)	Existing ECA (%)	Project-related ECA increase (%)			Total ECA including project activities (%)		
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 2	Alternative 3	Alternative 4
Lower O'Hara Creek	5.8	0.2	0.1	0.1	6.0	5.9	5.9
Unnamed No. 8	26.3	1.0	0.2	0.3	27.3	26.5	26.6
Lodge Creek	19.7	0.2	0.0	0.0	19.9	19.7	19.7
Swiftwater Creek	21.4	0.8	0.1	0.4	22.2	21.5	21.8
Elk City Creek	32.8	1.4	0.0	0.4	34.2	32.8	33.2
Lower Selway River	5.1	0.2	0.0	0.0	5.3	5.1	5.1
Middle Fork Clearwater Face	9.5	0.0	0.0	0.0	9.5	9.5	9.5
Decker Creek	28.1	1.5	0.6	0.7	29.6	28.7	28.8
Goddard Creek	16.1	0.5	0.0	0.2	16.6	16.1	16.3

Alternative 2 proposes 3,096 acres; Alternative 3 proposes 2,710 acres; and Alternative 4 proposes 2,207 acres of salvage harvest. Harvest and temporary road building activities would occur on roughly one to 24 percent of the area in the prescription watersheds (Table 3-8). Between <1% and 9% of the total 6th-HUC drainage area would be harvested, depending upon the watershed and alternative. Depending on the alternative, salvage and temporary road construction would occur on approximately 17-22% of the total area burned by the Johnson Bar Fire. As noted above, harvest activities would remove dead trees, which would have only a minor effect on water yield. Temporary roads would have immeasurable effects due to their associated small acreage (range is 1 to 7.2 acres of the entire project area, depending upon alternative. Alternative 2 would have the greatest number of acres harvested, followed by Alternative 3 and then 4.

Sediment Delivery to Streams—treatment units

The Johnson Bar fire left hillslope conditions conducive to elevated erosion and sediment transport to streams on hillslopes burned with moderate to high severity effects. With diminished or absent canopy, groundcover and litter layers, soils are more prone to erosion. Reduced surface complexity and hydrophobic soils cause reduced infiltration, which can lead to enhanced runoff, carrying eroded sediment to stream channels. Under pre-fire conditions, many project-area ephemeral draws rarely if ever conveyed surface flows to headwater intermittent channels. Reduced infiltration and elevated runoff in the post-fire setting could result in these uppermost headwater drainage features providing ephemeral connectivity (and sediment transport) to stream channels. Compaction and rutting of burned soils by heavy equipment would exacerbate soil issues. Furthermore, removal of

most trees from large patches (treatment units) could result in earlier snowmelt and altered timing of peak flow.

Project activities have the potential to influence erosion and sediment delivery to streams, positively or negatively. In the proposed project, removal and yarding of trees using mechanized equipment would likely temporarily expose mineral soil to erosion, and may create new (or exacerbate existing) vectors for sediment transport to stream channels. Project activities could expose sediment to overland flow in harvest areas, on skid trails, skyline corridors and landings, and at ditch crossings. Project design criteria would greatly reduce the probability that any eroded sediment would reach a stream channel or ephemeral draw. Project activities that could lead to a reduced sediment load to streams include erosion control (scattering of slash) on burned hillslopes, as well as road drainage improvements and road decommissioning.

Table 3-8: Area and percent of prescription watersheds with activities

Johnson Bar Fire Salvage Project 6th HUC Watershed and Forest Plan Prescription Watersheds	Acres of proposed salvage harvest			Proposed temporary roads (acres)			Percent of total watersheds		
	Alt. 2	Alt. 3	Alt. 4	Alt. 2	Alt. 3	Alt. 4	Alt. 2	Alt. 3	Alt. 4
Big Smith Creek-Middle Fork Clearwater River	759	759	440	1.0	0.5	1.9	3%	3%	2%
DECKER CREEK	278	278	216	0.4	0.2	0.8	23%	23%	18%
LODGE CREEK	98	98	98	0.2	0.2	0.2	3%	3%	3%
MIDDLE FORK CLEARWATER FACE	228	228	30	0.1	0.1	0.6	1%	1%	0%
UNNAMED NO. 8	155	155	96	0.3	0.0	0.3	18%	18%	11%
Goddard Creek-Selway River	2,106	1,720	1,541	4.8	0.5	4.8	9%	8%	7%
ELK CITY CREEK	434	298	345	1.1	0.4	1.1	24%	17%	19%
GODDARD CREEK	784	784	678	1.3	0.1	1.3	8%	8%	7%
LOWER SELWAY RIVER	423	320	167	0.2	0.0	0.2	4%	3%	1%
SWIFTWATER CREEK	465	318	351	2.2	0.0	2.2	12%	8%	9%
O'Hara Creek	231	231	226	0.5	0.0	0.5	<1%	<1%	<1%
LOWER O'HARA CREEK	231	231	226	0.5	0.0	0.5	2%	2%	2%

Proposed logging systems would minimize the probability that project activities would result in elevated erosion and sediment delivery to streams. Tractor skidding of logs would occur on skid trails and swing trails, and is typically the harvest activity that has the greatest potential to cause soil erosion, as well as sediment delivery where connected or near to streams. Tractor units in this project would be limited to ridgetop locations that are generally not connected to the drainage network, and are limited in slope. The lack of connectivity to headwater draws combined with soil design criteria should result in no effects to water quality or riparian and aquatic habitat conditions from tractor skidding.

Helicopter and skyline harvest methods are low-affect approaches where trees are cut by individual fallers and rigged to cables which suspend the logs as they are hauled, either partially (skyline) or fully (helicopter), to landings. In helicopter units, ground disturbance

would be minimal. In skyline units, linear soil disturbance would likely occur along the corridors where logs are hauled upslope to landings. Unmitigated, these corridors have the potential to concentrate overland flow given their typical linear arrangement on the fall line of the slope. Project skyline corridors would terminate at considerable distances from stream channels or ephemeral draws, leaving them unlikely to connect to streams. Nevertheless, the probability of erosion and sediment delivery would be substantially reduced by lining corridors with slash, and installing waterbars if needed during and following yarding operations in order to avoid development of preferential surface flowpaths.

Skyline corridors in several proposed units were evaluated using WEPP in order to estimate effectiveness of proposed erosion control design criteria. The results of this evaluation suggest that in the absence of erosion-control design criteria, disturbance in skyline corridors typical of the project would lead to greater erosion and downslope sediment transport than the existing condition (Table 3-9). While no skyline corridors terminate near perennial streams, they could deliver sediment to ephemeral draws, which are more likely to carry runoff in the post-fire setting. The erosion modeling suggests that placement of slash (95% ground cover) on bare soil within skyline corridors would reduce the likelihood of corridor erosion and sediment transport below that of the existing (post-fire) condition (Table 3-10). Adding water bars at 100-foot intervals where bare soil is exposed would further reduce sediment transport. These conclusions apply to each action alternative.

Table 3-9: Estimated sediment delivery (10% probability) from representative skyline corridors

Unit	Length (feet)	Slope (%)	Burn severity	Existing condition (tons/acre)	Skyline corridor (tons/acre)			
					No BMPs	slash 95%	waterbars	slash + waterbars
111	1,300	46	moderate	6.8	13.7	0.3	1.4	0.0
114	1,000	40	low	0.7	2.3	0.2	0.6	0.0
131	700	47	low to moderate	0.8	2.2	0.1	0.7	0.1

As stated above, hand crews falling trees in treatment units is not predicted to measurably influence post-fire erosion or runoff. Nonetheless, the project presents an opportunity to reduce hillslope erosion below the existing conditions present in many of the treatment units. The project would require scattering of fine woody debris (slash) to achieve an 85% surface cover (approximately 5-10 tons per acre) on treatment unit hillslopes burned at moderate to high severity. In addition to the fine woody debris, coarse woody debris (greater than three-inch diameter) would be retained at the rate of 17-33 tons/acre in all units, regardless of burn severity. The fine woody debris requirement specifically addresses erosion concerns. While the coarse woody requirement addresses soil biological function, it too would help to reduce erosion and sediment transport. The ERMiT interface of WEPP was used to estimate the effects of retaining fine slash on treatment units (Table3-10). The

model estimates that this treatment would reduce hillslope erosion by roughly 48 percent on average from existing conditions post-fire (range 37-63%) in treatment units for Alternative 2. Reduction in erosion would be similar under all of the action alternatives. The sediment values shown in Table 3-10 are based on the 10% probability runoff event in the second year after the fire, when the project would likely be implemented. In other words, the evaluated runoff event has a one in ten chance of occurring in the first year following treatment, and a nine in ten chance of being a smaller (lower affect) event. For higher-probability (more frequent) runoff events, the predicted sediment load would be lower under both existing and post-project conditions.

Table 3-10: Model estimates of existing and post-treatment erosion, 10%-probability runoff event (Alternative 2)

Forest Plan Watershed	Existing (post-fire) (tons)	Post-treatment (tons)	Project reduction (%)
DECKER CREEK	196	102	48%
ELK CITY CREEK	315	178	44%
GODDARD CREEK	401	203	49%
LODGE CREEK	27	10	63%
LOWER O'HARA CREEK	61	29	52%
LOWER SELWAY RIVER	48	28	41%
MIDDLE FORK CLEARWATER FACE	72	24	67%
SWIFTWATER CREEK	190	108	43%
UNNAMED NO. 8	35	22	37%
TOTAL	1,345	704	48%

Sediment Delivery to Streams—roads

Haul roads can be a source of sediment to project area streams, particularly where there are existing sediment delivery points (roadside ditches leading to stream channels). Increased heavy-truck traffic related to log hauling can increase rutting and displacement of road-bed material, creating conditions conducive to higher sediment delivery rates (Reid and Dunne, 1984).

Approximately 68 miles of road work is proposed and would include spot application of aggregate, and drainage improvement, including reshaping of road surfaces, as well as cross-drain reconnection, repair, clearing, and new installation, as needed. Application of road maintenance and hauling design criteria (e.g. blading/compaction, drainage improvement, aggregate surfacing) can substantially reduce erosion and sediment transport along haul routes (Burroughs 1990, Grace and Clinton 2006, Switalski *et al*. 2004, Swift and Burns 1999, Ice *et al*. 2004, Montana DNRC 2012). For example, well-designed and maintained road surface drainage, in conjunction with a properly graded road surface, should divert most road-surface runoff to the undisturbed forest floor, where conditions allow for sediment deposition and infiltration (Burroughs and King 1989, Foltz and Burroughs 1990, Montana DNRC 2012). At stream crossings and other areas where proper

road drainage cannot prevent overland flow to a stream, gravel surfacing using high-quality aggregate would minimize sediment transport and delivery (Kochenderfer and Helvey 1987, Burroughs and King 1989, Sugden and Woods 2007). Additionally, properly applied log-hauling BMPs should limit any increase in sediment delivery from roads.

The proposed project would require that all log-haul roads with surveyed sediment-delivery points be improved to reduce delivery prior to commencement of tree removal and hauling. Sediment delivery points were modeled using the WEPP Roads module (Elliot, 2000) in order to estimate existing conditions as well as potential reductions in sediment delivery resulting from project road improvements. Results indicate that project road work would result in a decrease in sediment delivery of roughly 77% on an annual average basis (Table 3-11). The model evaluated existing (often rutted, gravel or native surface with inadequate drainage) conditions and post-improvement (unrutted with improved drainage) conditions. While proposed road BMPs would reduce sediment delivery from project roads during project activities and into the future, blading of native-surface roads temporarily exposes higher levels of sediment to erosion and transport (Sugden and Woods, 2007). Compaction of freshly bladed surfaces prior to rainfall, whether by a roller or by traffic, reduces this temporary road surface susceptibility to erosion.

Table 3-11: Estimated sediment delivery by haul-route road before and after project improvement work, all action alternatives

Drainage (6th-HUC)	Sediment delivery (tons/year)	
	Existing	Project
Goddard Creek-Selway River	4.2	0.4
O'Hara Creek	0.1	0.1
Big Smith Creek-M.F. Clearwater River	1.9	0.9
TOTAL	6.2	1.4

Approximately 3.1 miles of temporary roads would be constructed to access harvest units for Alternative 2, 0.7 mile of which would occur on existing templates. Alternative 3 proposes using 0.3 mile of existing temporary roads. Alternative 4 proposes 3.4 miles of temporary roads, of which 0.7 mile would be located on existing templates.

The proposed temporary roads generally would be located on low gradient ridges or upper slopes and would not connect to ephemeral draws or stream channels. However, several proposed temporary road alignments appear to be on steeper slopes—up to roughly 20%. These slopes were not verified in the field, but could present surface-drainage challenges. Implementation efforts must pay careful attention to road drainage while these roads are in place.

Twenty-two of the thirty proposed temporary roads are in areas of patchy, generally low severity burn or unburned terrain. Any runoff from these roads would drain to forest floors where infiltration and deposition of any sediment load would occur. The other eight

temporary roads would be in low to moderate severity burned upland areas. Given their location, and assuming proper drainage features are installed and maintained, the proposed temporary roads would be unlikely to contribute sediment to project-area streams. Nonetheless, roads should be monitored during project activities, and any instances where concentrated road runoff reaches an ephemeral draw should be slowed and filtered using properly installed straw bales, wattles or sediment fencing. Temporary roads would be closed to public motorized use during project activities, reducing the chance of increased erosion produced when vehicles drive on wet roads and rut surfaces. Finally, all temporary roads would be obliterated following timber harvest activities, which would eliminate erosion potential in the future.

Depending on the alternative, zero to seventeen swing trails are proposed (4.6 miles under Alternatives 2 and 4 and 0 under Alternative 3). A swing trail is a ridgetop skid trail upon which logs are skidded from a skyline site to a haul road. The proposed swing trails would be located on ridge crests, disconnected from stream channels or ephemeral draws, and thus are not expected to contribute sediment to streams. Skid trails would be properly managed while in use to minimize disturbance and compaction, and decompacted and stabilized as described in the project design criteria.

It is unlikely that the proposed activities would lead to increased stream bank erosion, as equipment would not operate near stream channels, other than on existing roads.

Road erosion and sediment yield usually decline over time, but frequently continue at a chronic level indefinitely (USDA, 1981). Approximately 21.3 miles of road are proposed for decommissioning under each action alternative. For these routes, decommissioning is defined as mechanical decompaction, recontouring, and surface stabilization with slash and native vegetation. Stream crossing would be shaped to terrain contours and stabilized with slash and native vegetation, and mulch where needed for short-term erosion control. Where roads are determined by watershed or fisheries personnel to be naturally recovered to a condition of long-term stability, physical decommissioning may not occur. Road removal would reduce road density (Table 3-12) and provide an improvement in the overall watershed condition. Road density would be reduced due to project road decommissioning in five of nine Forest Plan prescription watersheds. Moreover, segments (totaling 3.6 miles) of 25 roads to be decommissioned are within 150 feet of a stream channel. Although sediment delivery from these road segments was not quantified, restoring these segments and crossings to natural contours and vegetation would eliminate these existing or potential chronic sediment sources from the landscape.

Table 3-12: Estimated reduction in road density from project activities, all action alternatives

Forest Plan Prescription Watershed	Existing Road Density (mi/mi^2)	Proposed road decommissioning (mi)	Road density after project activities (mi/mi^2)
DECKER CREEK	0.5	0.0	0.5
ELK CITY CREEK	2.6	4.4	1.0
GODDARD CREEK	1.7	4.4	1.4
LODGE CREEK	4.5	1.9	4.1
LOWER O'HARA CREEK	1.6	5.7	1.2
LOWER SELWAY RIVER	1.5	1.4	1.5
MIDDLE FORK CLEARWATER FACE	2.1	0.1	2.1
SWIFTWATER CREEK	2.9	3.5	2.4
UNNAMED NO. 8	1.2	0.0	1.2

High (good) road density rating < 1 mi/mi^2; Moderate 1 to 3 mi/mi^2; and Low (poor) >3 mi/mi^2 (NOAA 1998)

Road decommissioning activities would benefit water resources by reducing interception of subsurface flow and surface runoff. Where decommissioned roads were hydraulically connected to stream channels, sediment delivery would be reduced or eliminated. Implementation of the proposed road decommissioning projects would remove stream culverts, which would improve streambank stability, width to depth ratio, and floodplain connectivity at these localized sites.

During road decommissioning, short-term, localized sediment delivery is possible where channels bisect decommissioned roads (Foltz *et al*., 2007). Past monitoring of obliteration showed only minor amounts of sediment delivered to headwater streams, mostly in the form of suspended sediment, as indicated by increases in turbidity. Design criteria and BMPs would be applied to each of these activities to minimize increases of sediment delivery to stream channels.

The NEZSED model was used to compare existing watershed sediment yield coarse estimates with estimates of potential sediment yield increase as a result of the proposed activities under the action alternatives. All alternatives for each of the prescription watersheds would remain below the sediment yield guidelines allowable under the Forest Plan Appendix A (Table 3-13). The greatest increase in sediment in the prescription watersheds was estimated to be a result of the Johnson Bar fire.

Implementation of project design criteria, adherence to BMPs, and maintenance of PACFISH buffers would reduce potential erosion and further limit the risk of sediment reaching streams. Any sediment yield increases would be short-term (0-5 years) and beneficial uses in Selway River and the Middle Fork Clearwater River would be maintained.

Other Potential Water Quality Effects

Project activities are not likely to measurably influence stream temperatures. The project would not remove trees within RHCAs, and thus would have minimal effect on stream shading in the project area. The Fisheries section discusses stream temperature in more detail.

Table 3-13: Estimated sediment yield (percentage over baseline)—NEZSED output

Prescription Watershed Name	year 1 including Johnson Bar fire				Appendix A Allowed	Year 10
	existing	Alternative 2	Alternative 3	Alternative 4		Alternatives 2, 3, and 4
LOWER O'HARA CREEK	2%	2%	2%	2%	30%	1%
GODDARD CREEK	7%	8%	8%	8%	45%	0%
ELK CITY CREEK	16%	21%	20%	20%	70	0%
SWIFTWATER CREEK	9%	12%	10%	11%	45	1%
LOWER SELWAY RIVER	2%	2%	2%	2%	NA	0%
LODGE CREEK	4%	5%	5%	5%	60	1%
UNNAMED NO. 8	8%	11%	11%	10%	70	0%
DECKER CREEK	7%	11%	10%	10%	70	0%
MIDDLE FORK CLEARWATER FACE	0%	1%	1%	0%	NA	0%

No activities, other than road work, are proposed in floodplains or wetlands. Although wetlands were not identified in the treatment units, small wet areas could exist in treatment units, especially in ephemeral draws. During project layout, potential wetlands would be identified and buffered to prevent effects to the hydrologic function of the wetlands.

3.4.7 Cumulative Effects

The cumulative effects area consists of the nine Forest Plan Prescription watersheds in which the proposed project activities would occur, plus the 6th-HUC watersheds within the proposed project area: Big Smith Creek-Middle Fork Clearwater, Goddard Creek-Selway River and O'Hara Creek Subwatersheds (Table 3-5).

Cumulative effects arise from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions. Based on the analysis, the Johnson Bar Fire Salvage Project was not predicted to incrementally add to cumulative effects to water resources in the analysis area, because net effects to each management indicator were

predicted to be neutral or positive. Management indicators of sediment delivery from roads and from treatment units and road density all showed short and long-term improvements as a result of project activities. Where road maintenance and decommissioning activities occur near streams, short-term (<1 year) increases to sediment delivery are also likely. Effects to ECA (and water yield) were predicted to be negligible. Given that the project activities in total were predicted to result in net reductions in erosion, sediment delivery to streams, and improvement to the general watershed condition, a quantitative evaluation of past, existing and foreseeable effects was not done—these effects are discussed qualitatively in this section.

Time Frame: The temporal scale of the analysis for direct, indirect, and cumulative effects ranges from one to five years. The potential for short-term increases in erosion and sediment delivery associated with road decommissioning would last as long as soil is disturbed or exposed. Once vegetation and groundcover have stabilized disturbed ground surfaces, decommissioning-related effects would not be expected to persist. For management activities on treatment units, the potential for sediment delivery would be highest during project activities and in the first year following disturbance. The required application of slash during, and immediately after, tree removal activities would lead to substantially higher groundcover than in the existing burned condition of many of the units, and thus would leave units less prone to erosion than in the existing burned condition. Treatment units would generally recover to pre-fire conditions at a similar pace as similar untreated burned areas—within approximately three to five years.

Geographic Boundary: The extent of cumulative watershed effects is dependent on the scale of the watershed. The magnitude of changes in water and sediment yield is inversely proportional to stream order (MacDonald 1989), so potential changes would be more likely to be detectable higher in the watershed. Thus, cumulative effects are analyzed at the scale of the 6th-HUC drainage (Figure 5).

Potential increases in erosion and sedimentation within the analysis area could be attributed to fires (notably the Johnson Bar fire) or other past, present, or future management activities. Past projects and disturbances that affect erosion and sedimentation include timber sales and thinning projects – most recently, post-fire salvage on private lands off of the Swiftwater Creek Road. Roads, trails, and dispersed recreation sites are semi-permanent features within the analysis area that affect erosion and sedimentation. Ongoing and upcoming projects include timber sales and forest restoration, fuels reduction projects, firewood cutting, invasive weed control, and road maintenance. Recent and future restoration projects in the analysis area include BAER treatments for the Johnson Bar fire, and culvert replacement projects on O'Hara Creek. Although there are numerous projects, disturbances, and semi-permanent features within the analysis area, the Johnson Bar fire is the largest factor that could affect erosion and sedimentation within the analysis area.

The burned area itself is at increased risk for elevated runoff, erosion, and sediment delivery to streams. The sediment filtration capacity of near-channel vegetation was reduced along some streams by the fire, which could increase erosion and sedimentation

risk. The proposed project would not add to this effect because no RHCAs would be treated. Moreover, treatment units would have fine and coarse slash scattered to achieve at least an 85% ground cover, greatly reducing probability of erosion and transport of sediment. Increased risk of erosion and sedimentation from tree mortality in RHCAs would generally be of relatively short duration with early seral vegetation providing soil protection within 2-3 years. Roughly fifteen percent of RHCA acreage within the burn perimeter experienced moderate to high burn-severity effects. Given that most riparian areas in the project area were unburned or burned with low-severity effects, riparian buffers would continue to function as sediment filters for potential runoff from surrounding burned hillslopes.

Long-term sedimentation from the road system in the project area would likely be reduced due to approximately 5 miles of roads being placed into storage, 21 miles decommissioned, 17 miles reconstructed, and 58 miles under pre-haul or routine road maintenance as an action associated with the timber sale. Restriction of haul to dry or frozen conditions on hydraulically connected haul routes would minimize risk of sediment delivery from roads as a result of haul operations. Future culvert replacement projects on O'Hara Creek should reduce risk of culvert failure at these crossings. Road improvements through the BAER process, as well as general road maintenance activities would also reduce erosion and sedimentation from the road system and burned area within the project area. Up to 3.4 miles of new temporary roads and up to roughly 4.6 miles of new swing trails are proposed for the project, depending upon the alternative. None of these routes was determined to be hydraulically connected to any stream channel, and were not predicted to be sources of sediment to project-area streams.

Fire line construction from suppression efforts for the Johnson Bar fire could increase erosion and sedimentation risk, especially in areas where concentrated flow from these features could enter the stream system. However, no sediment delivery from firelines was observed after fall 2014 storms. These features were rehabilitated following the fire, and conditions on fire lines should improve as vegetation recovers. Fire lines do not overlap with salvage units.

An increase in ECA for six of the nine prescription watersheds was predicted to result in a water yield increase. Four watersheds would have a <0.4% increase, and one would increase by 0.7%. These increases are considered to be below the margins of detectability. Thus, ECA related peak flow increases and bank instability due to proposed project activities are not expected. Nonetheless, potential increases in water yield and peak flows due to elevated runoff on burned hillslopes in the Johnson Bar burned area could contribute to bank instability. However, the well vegetated condition of the RHCAs and streambanks would likely prevent or inhibit bank instability as high severity fires burned only 15 acres (0.4% of all RHCAs). There were 660 acres (14%) of moderate severity and 1,040 acres (23%) of low severity fire in the RHCAs. The remaining 2,385 acres (52%) were unburned. The combination of low severity and unburned areas make-up 75% of all RHCAs in the project area, and the conditions are considered to be fully functioning as a result.

Sedimentation could also potentially increase in streams within the analysis area from increases in bank instability, peak flows, and increases in overland flow and erosion from

the burned area. However, the Johnson Bar Fire Salvage Project would not affect these parameters because there would be minimal project-related erosion or sedimentation to streams, and project activities were not predicted to affect water yield and magnitude of peak flows.

There would be no project effects to stream temperatures or large woody debris loading from proposed management activities because no harvesting would occur in RHCAs.

Large woody debris loading within streams and RHCAs is expected to increase in the next 1-10 years as dead trees begin to fall. Downed wood adjacent to streams would contribute to in-stream and floodplain large woody debris recruitment, store sediment, and increase channel complexity. A recent study found that in wilderness areas, riparian areas burned at different severities (mosaic) may drive a “fire pulse” that increases aquatic and riparian area productivity (Malison and Baxter, 2010). Increases in large woody debris loading could also increase channel instability in some locations. Over the long-term, large wood recruitment to streams would be reduced as new trees are established. The proposed project would not affect large woody debris recruitment because no trees would be removed from RHCAs.

Approximately five miles of Forest Service roads in the Middle Fork Clearwater River subwatershed and approximately eight miles of Forest Service roads were decommissioned in the Goddard Creek-Selway River subwatershed since 1990. Recent road improvement activities, including culvert upgrades and drain structure installation, have occurred in the Goddard Creek-Selway River subwatershed in 2015. These activities produced localized short-term sediment during implementation, but created long-term sediment reductions and benefits to overall channel conditions.

Present actions include permitted grazing, recreation, fire suppression, road maintenance, and control of noxious weeds using chemical, mechanical, and biological control methods. Recreational activities produce little to no effects to water quality or quantity, or floodplain/wetland functions. Recreation effects on water quality are related primarily to associated road use, especially during wet conditions. Effects from grazing include stream bank instability and reduced water infiltration rates in areas where soil was disturbed or compacted (localized areas). Fire suppression activities are infrequent and limited in scope, and road maintenance has minimal short-term effects and long-term benefits (Burroughs and King 1989).

Forest practices have changed over the last few decades. Project design criteria, BMPs, and Forest Plan guidelines have been developed in order to reduce ground disturbance and subsequent erosion and sediment delivery. Operating under dry or frozen conditions, implementing PACFISH buffers, retention of trees in regeneration harvest units, and limiting ground-based yarding to slopes less than 35 percent are now common practices.

The following foreseeable future or concurrent actions would occur in the Middle Fork Clearwater River (6th-HUC):

- Tahoe-Clear Creek Allotment - continued grazing of 2,150 acres

- Clear Creek Inventoried Roadless Area Prescribed Burn –burning activities (2015-2017) affecting 1,371 acres
- Continued road maintenance on all Forest Service system roads – 7 miles/year
- Snowmobile Recreation – additional 56 miles (9miles in project area) of routes would be added starting 2016

The following foreseeable future or concurrent actions would occur in the Goddard Creek-Selway River and O'Hara Creek subwatersheds (6th-HUC):

- Iron Mountain Stewardship Project – timber harvesting activities (2014-2016) in the Iron Mountain area consisting of approximately 408 acres and road improvements on 346 miles of roads
- Road Improvements – upgrade three culverts on O'Hara Creek Road #651 to accommodate one percent probability (100-year) flood event (2017-2018)
- Range –continued grazing 2,760 acres
- Fenn Face Prescribed Fire – burn activities (2016) north of Fenn Ranger Station affecting approximately 1,000 acres
- North Selway Prescribed Fire – burn activities (2017) southwest of Coolwater affecting approximately 1,000 acres
- Continued road maintenance on all Forest Service system roads – 10miles/year
- Pre-commercial thin – thinning (starting 2016) activities located from Swiftwater to O'Hara Creek

The 145 acre salvage sale on State lands burned in the Johnson Bar fire may have sediment effects based on the severity of the burn and the less stringent BMPs applied on State lands. The area was helicopter logged so effects are expected to be minimal. Some private harvesting activities in order to salvage fire killed trees is also being proposed near Elk City Creek.

3.4.7.1 Alternative 1

Cumulative effects arise from the incremental effect of an action when added to other past, present, and reasonably foreseeable actions. There are no direct or indirect effects from the proposed project; therefore there are no cumulative effects.

3.4.7.2 Alternatives 2, 3, and 4

Water Yield: As discussed above, percent increase in ECA can be used as an indicator of change in water yield resulting from reductions in forest canopy. In this proposed project, removal of live trees would be minimal, but could occur at incidental levels in the construction of temporary roads and skyline corridors. A lower ECA value corresponds to a

lower likelihood that undesirable effects of increased water yield (e.g. elevated channel and bank scour) would occur. An ECA value of less than 15 percent is unlikely to result in measurable changes in water yield, a condition rated as “high” or healthy by NOAA Fisheries (1998). An ECA value of 15-30 percent could potentially result in measurable increases in basin water yield, and indicates “moderate” conditions, while a value greater than 30 percent is considered low (poor) condition (NOAA 1998). Hydrologists of the Northern Region have used an ECA value of 20-30% of a watershed (typically a 6th-HUC drainage), as a ‘yellow flag’ warning of possible deleterious effects (Haupt 1967, Gerhardt 2000, MacDonald and Stednick 2003).

The Johnson Bar fire resulted in the mortality of large numbers of trees, and brought the condition of two of the three subwatersheds evaluated in this analysis from high condition to moderate condition by NOAA Fisheries standards (1998). The highest existing condition ECA (Goddard Creek-Selway River) still remains below 20%, a threshold considered to be below a measurable level of water yield change (MacDonald and Stednick, 2003). The estimated increase in ECA due to project activities is zero in O’Hara Creek, 0.5% in Goddard Creek-Selway River watershed, and 0.2% in Big Smith-Middle Fork watershed. When added to the existing condition ECA, the resulting cumulative ECA after project activities would be 3.1% in O’Hara Creek, 20.3% in Goddard-Selway, and 17.6% in Big Smith-Middle Fork watershed. These remain within the moderate condtion category as indicated in the NOAA matrix table. None of the alternatives would result in a meaningful increase in ECA because all of the alternatives plan only to cut dead trees, with the potential for incidental removal of isolated green trees at landings, temporary roads, and skyline corridors. The small number of green trees potentially removed would not measurably affect water yield. Thus, no stream channel alteration is expected from the proposed project when combined with past, ongoing, and reasonably foreseeable future projects, including harvesting on State and private lands. It is also expected that actual harvest acres, and subsequent effects, would be less (average 30% based on the nearby Clear Creek project) than those analyzed due to on-the-ground identification and implementation of RHCAs. In addition, a small but long-term (after 30 years) reduction in ECA would be expected as a result of 21 miles of system and non-system road decommissioning as the roads would be fully recontoured and would no longer count towards increased ECAs.

Sediment Yield: Although the NEZSED model did predict a modest increase in sediment due to project activities, it was well below that allowable under the Forest Plan Appendix A (Table 3-22). Moreover, the majority of the project-related increase in sediment load estimated by NEZSED was due to decommissioning of roads. Based on a more detailed WEPP analysis of treatment units and roads in the project area, the project is predicted to result in reduced probability and magnitude of erosion and sediment delivery from roads and treated hillslopes. Thus, the cumulative sediment effects of the proposed project would be a net reduction of hillslope erosion and sediment delivery to streams in the analysis area.

Road densities in project-area drainages would be reduced in five out of nine Forest Plan prescription watersheds covered by the Johnson Bar Fire Salvage Project area (Table 3-21). Road densities in the remaining four drainages would remain the same as in the existing condition as there is no road decommissioning proposed in these basins.

3.4.7.3 Irreversible and Irretrievable Commitment of Resources

There are no effects to watershed resources in the Selway or Middle Fork Clearwater River basins from this project that are considered to be irreversible or irretrievable because the amount of sediment expected from the proposed project would remain below Forest Plan standards and water quality objectives. ECAs would not exceed thresholds where stream channel changes might be expected. The proposed project would improve sediment conditions over the long-term (>2 years) as it reduces road density, removed roads from landslide prone areas, and improves road drainage to divert road related sediment away from streams.

3.5 Fisheries

3.5.1 Analysis Area

The Johnson Bar Salvage Project area (approximately 26,788) is proposed within the Lower Selway (HUC 4, 17060302) and Middle Fork Clearwater Subbasin (HUC4, 17060304). The fisheries analysis will use the subwatershed scale to analyze direct, indirect, and cumulative effects. This scale of analysis was selected because effects from the proposed actions and cumulative effects would not necessarily be distinguishable at a larger scale. Subwatersheds that are within the greater Middle Fork Clearwater and Gedney Creek-Selway watershed include O'Hara Creek, Goddard-Selway Creek, and Big Smith Creek-Middle Fork Clearwater subwatersheds. The Nez Perce National Forest Plan (1987) further broke these subwatersheds into smaller prescription watersheds; management areas stratified by specific fishery/water quality objectives (Table 3-14). Some of these prescription watersheds are considered to be functioning below objectives and excess sediment in a few of these streams is a primary limiting factor so, further development activity in these prescription watersheds is contingent upon an improving trend (Table 3-14 footnote 2), refer to Appendix D for a complete Upward Trend analysis.

Table 3-14: Subwatersheds Analyzed in the Proposed Johnson Bar Fire Salvage Project Area

Watershed (HUC 5)	Subwatershed (HUC 6)	Prescription[1] Watershed (acres in project area)	Total Area of Subwatersheds (Acres)	Project Area in Subwatershed (Acres)
Middle Fork Clearwater (1706030400)	Big Smith Creek-Middle Fork Clearwater River	Lodge Creek[2]	28,875	6,513
		Unnamed No. 8		
		Middle Fork Clearwater Face		
		Decker Creek		

Watershed (HUC 5)	Subwatershed (HUC 6)	Prescription[1] Watershed (acres in project area)	Total Area of Subwatersheds (Acres)	Project Area in Subwatershed (Acres)
Gedney-Selway (1706030201)	Goddard Creek-Selway River	Goddard Creek[2]	22,725	17,410
		Swiftwater Creek[2]		
		Elk City Creek		
		Lower Selway River		
	O'Hara Creek	Lower O'Hara Creek[2]	37,900	2,864

[1]Subwatershed within the project area boundary with minimal acreage that would not be analyzed further: Pine Knob (6 acres), Unnamed No. 6 (3 acres), Johnson Creek (2 acres), Brown Springs Creek (17 acres), Clear Creek (9 acres) and Hamby Creek (20 acres).
[2]Streams within the prescription watershed with sediment as a primary limiting factor where management is contingent upon an improving trend. *"Timber management can occur in these watersheds, concurrent with improvement efforts, as long as a positive, upward trend in habitat carrying capacity is indicated."*

3.5.2 Regulatory Framework

The Nez Perce National Forest Plan direction and all Federal and State laws and regulations applicable to watershed and fishery resources would be applied to the proposed project, including the Clean Water Act, Endangered Species Act, and the Magnuson-Stevens Act.

3.5.2.1 Nez Perce National Forest Plan

Forest-wide standards for aquatics can be found within the Nez Perce National Forest Plan (USDA Forest Service 1987a, pages II-18 through 11-20). The Forest Plan directs forest management activities in order to minimize sediment input to streams, meet beneficial uses, apply BMPs to ensure water quality standards are met or exceeded, and manage all water in accordance with the designated standards located in the Forest Plan Appendix A. This project would comply with these directions through the implementation of design criteria and road improvement and decommissioning activities.

3.5.2.1.1 Forest Plan Water Quality

The Nez Perce Forest Plan was amended in 1995 following a joint decision, commonly referred to as PACFISH, by the U.S. Forest Service and Bureau of Land Management for the management of anadromous fish-producing watersheds on Federal administered lands, including the Selway River drainage. The Nez Perce National Forest, along with several other Forests in Regions 1, 4 and 6, consulted on their PACFISH-amended Forest Plans in 1998 in response to the listings of the Snake River Basin and Upper Columbia River steelhead trout. The Biological Assessment (BA) for the Forest Plan included recommendations intended to ensure projects produced under the Forest Plan would minimize adverse effects to steelhead and listed salmon. The Nez Perce-Clearwater National Forests and the National Marine Fishery Service (NMFS) worked cooperatively to meet the intent of the PACFISH recommendations and objectives in the Selway drainage through design criteria in order to

reduce or avoid adverse effects to steelhead and their critical habitat from the proposed salvage harvest. These actions include:

- Low impact harvesting methods utilizing primarily skyline and helicopter yarding;
- Limiting ground disturbing activities, such as ground-based harvesting, keeping temporary road construction to ridge top locations, and prioritizing existing roads for landings;
- No harvesting within RHCAs or landslide prone areas;
- All temporary roads, swing trails, and areas cleared for landings would be decommissioned after use; and
- Existing roads not needed for administrative purposes or that cause unacceptable effects to watersheds would be decommissioned.

3.5.2.2 Endangered Species Act

The Endangered Species Act (ESA) is implemented by the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. The ESA provides a framework for the conservation of threatened and endangered plants and animals and their respective habitats. Bull trout, steelhead trout, and fall Chinook salmon are listed as threatened under the ESA. Consultation is required with the USFWS and NOAA for any projects potentially affecting these species. Design criteria would be utilized to prevent any long-term adverse effects to listed species.

3.5.2.3 Sensitive Species

Sensitive species are those that show evidence of a current or predicted downward trend in population number or habitat suitability that would substantially reduce species distribution. Federal laws and direction applicable to sensitive species (SS) include the NFMA and FSM 2670. The Forest is required to determine the potential effect of proposed activities on SS and to prepare biological evaluations. The Forest Service is bound by federal statutes (ESA and NFMA), regulations, and agency policy (FSM 2670) to conserve biological diversity on NFS lands and to assure SS populations do not decline or trend toward a listing under the ESA. The Regional Forester Sensitive Species List was updated for the Forest February 2011. The list includes the westslope cutthroat trout, interior redband trout, spring Chinook salmon, Pacific lamprey and the western pearlshell mussel.

3.5.2.4 Magnuson-Stevens Act

The Magnuson-Stevens Act (MSA) requires an analysis for effects to Essential Fish Habitat (EFH), specifically for Pacific salmon. EFH includes all streams, lakes, ponds, wetlands, other currently viable water bodies, and most of the historically accessible habitat to Pacific salmon species, including the riparian zone adjacent to these waterways. The riparian zone consists of the shade, sediment, nutrient/chemical regulation, streambank stability, and

large woody debris/organic matter. EFH is located along the Middle Fork Clearwater and Selway Rivers and the O'Hara Creek.

3.5.3 Analysis Methodology

The environmental baseline and effects discussion used Forest Service habitat stream survey data, Idaho Fish and Game (IDFG) survey data, PACFISH/INFISH Biological Opinion (PIBO), and Nez Perce Tribe (NPT) stream survey data, as well as geographic information systems (GIS) analysis. GIS applications included the Terrain Works (NetMap) Steelhead Intrinsic Potential model. Water temperature data was referenced from the Nez Perce-Clearwater (NPCLW) National Forest monitoring records. The seven-day moving maximum and average summer time water temperatures were measured. Stream surveys followed the Region 1 and Region 4 stream survey protocol (following a modified Hankin and Reeves 1988 protocol).

The three major components to the Johnson Bar Fire Salvage Project are commercial harvest (primarily skyline and helicopter), landing and road development, and subsequent road decommissioning efforts. Each of these activities carries potential for effects to some component of aquatic habitat. Water quality, habitat quality, and the ability of the watershed and riparian areas to act as a buffer to harvest activity and its connected actions are components considered in this analysis. Pool frequency and quality, large woody debris (LWD), cobble embeddedness/percent fines, and water temperature are habitat components or indicators that are potentially affected by timber activities and considered in this analysis. These habitat parameters are specifically addressed as PACFISH Riparian Management Objectives (RMOs) (referencing Section 7 Fish Habitat Monitoring Protocol for the Upper Columbia River Basin, USDA Forest Service, 1994), and are summarized in Table 3-17. These objectives are part of determining the complexity of habitat available for fish within the analysis area.

Table 3-15: Rationale for Including Aquatic Habitat Components in the Johnson Bar Effects Analysis

Habitat Component	PACFISH RMO	Habitat Could Potentially be Affected by:		
		Timber Harvest	Road and Landing Construction	Road Improvements/Decommissioning
Water quality				
Temperature	X	X	X	X
Suspended sediment		X	X	X
Chemical contamination		X	X	X
Large woody debris	X	X		
Stream Channel conditions				
Substrate		X	X	X

Habitat Component	PACFISH RMO	Habitat Could Potentially be Affected by:		
		Timber Harvest	Road and Landing Construction	Road Improvements/Decommissioning
Pool frequency/quality (tied to sediment inputs)	X	X	X	X
Flow regime				
Flow timing		X		
Flow volume		X		
RHCA Condition				
Road density and location	Not a habitat parameter. Included because it could affect habitat quality			
Disturbance history regime	Not a habitat parameter. Included because it could affect habitat quality			

Table 3-16: PACFISH RMOs (Nez Perce National Forest Plan as Amended by PACFISH, 1995)

Habitat Feature	RMOs							
Pool Frequency[1]	Wetted width (ft)	10	15	20	25	50	75	>75
	Number pools/mile	96	70	56	47	26	23	18
Water Temperature	Compliance with Water Quality standard or maximum Temp. <64ºF for migration and rearing and <60°F for spawning.							
Large Woody Debris	> 20 pieces/mile, >12 inch diameter, >35 feet length							

[1] Local adaptation of Making Endangered Species Act Determinations of Effects for Individual or Grouped Actions at the Watershed scale, National Marine Fisheries Service, Environmental and Technical Services Division, Habitat Conservation Branch, August 1996.

Under the Section 7 Habitat Monitoring Protocol for the Upper Columbia River Basin (USDA 1994), PACFISH RMOs are intended to apply to Rosgen (1996) C-type channels. For example, monitoring protocol for determining pool frequency requires count of only pools greater than 1 meter (approximately 3 feet) in low gradient (1% -2%) stream channels. Few stream reaches in the analysis area fit these criteria; many stream reaches in the project area and analysis are not located in wide, low gradient, alluvial valley floors. Instead, the majority of stream reaches within these subwatersheds are of mid-elevation and of moderate to high gradient.

Additional habitat parameters that are important for determining complex aquatic habitat and considered in this analysis include habitat accessibility, off channel habitat and refugia, floodplain connectivity, road density and location (measured as mi/mi^2 and percent drainage network increase), and past disturbance to riparian conservation areas.

In addition to stream surveys, Wolman pebble counts and cobble embeddedness surveys were conducted in riffles and intended to characterize substrate composition and percent fines throughout the bankful streambed (Skille and King 1989). Estimates of existing cobble embeddedness combined with NEZSED outputs for peak sediment yield were used to predict changes in summer and winter rearing carrying capacities for trout, salmon, and using the FISHSED model (Green et al. 1991, Nez Perce LRMP). The FISHSED model assumes there is an inverse relationship between the amount of fine sediment in spawning and rearing habitats and fish survival and abundance. In general, when sediment yields are increased over natural rates, especially on a sustained basis, fish biomass decreases (Stowell et al.1983). The FISHSED model should be used in conjunction with NEZSED, see Hydrologist report for NEZSED limitations. FISHSED model should be used to compare alternatives only and cannot be used as a trend analysis tool since trend analysis is beyond the capabilities of FISHSED.

Stream survey data were compared to objectives defined in Espinosa (1992) to determine if streams met their fish/water quality objectives as described in Appendix A of the NP Forest Plan. A one-way analysis of variance (ANOVA, Excel) with a Bonferonni adjustment was used to detect significant differences in mean weighted cobble embeddedness.

Upward Trend in habitat carrying capacity is part of the NEPA analysis because proposed activities are considered entries that would trigger an upward trend analysis, harvest activities or entries are proposed in watersheds with streams determined to be below objective. Fish and water quality objectives in the Nez Perce LRMP (Appendix A) were established considering legal direction (CWA) and public desires to maintain beneficial uses of water. The primary beneficial uses considered in establishment of the objectives were fisheries and municipal water supply. Fish/water quality objectives are stated in terms of percent habitat potential. All the prescription watersheds within the project area that support steelhead and westslope cutthroat were assigned an 80% objective (Swiftwater, Goddard, Elk City, Lodge, Decker and O'Hara creeks). As indicated by Appendix A, several of these streams are sediment limited (Goddard, Lodge Creek, Lower O'Hara) and below objective. Elk City and Swiftwater Creek had limited data at the time of designation to determine if they were above or below objective; current data has indicated that there is salmonid presence and streams are currently not meeting water quality and fisheries objectives given substrate and stream survey data. Per Nez Perce LRMP direction and Amendment #28, these streams are assumed sediment limited and upward trend objectives apply to these two streams. As stated in Appendix A of the Nez Perce LRMP, streams below objective, an upward trend in fish habitat carrying capacity will be established. It is assumed in the Forest Plan, that implementation of instream restoration and other watershed restoration activities would result in an upward trend in carrying capacity and where these projects have been implemented, it could be stated that an upward trend in the habitat condition has been accomplished (Conroy and Thompson 2011). This may be done expressly for this purpose or in conjunction with timber or other resource management. There is no specific requirement that upward trend project be implemented prior to timber harvest activities. Upward trend projects could be implemented through the duration of the timber sale contract and beyond, as long as it is clear the general objective of a concurrent

improving trend is being met (Conroy and Thompson 2011). Appendix A limits the magnitude and timing of predicted peak year sediment yields (Allowable maximum) but, does not address the implications of the long-term lower level sediment yields associated with watershed development activities. In general, the following upward trend analysis applies to prescription watersheds:

Step 1-Assess current trend through stream legacy survey data, watershed analyses, consultation documents, and station cobble embeddedness and compare these summaries to contemporary data such as PIBO data, particularly substrate data that have been collected to determine if the stream meets its fish/water quality objectives. Evaluate disturbance history in the watershed over the past 20 years, including human and natural disturbance and consider any watershed restoration activities that have occurred since 1987. The upward trend analysis must also consider past and ongoing activities affecting current condition and trend. Examination of fish population density overtime including redd counts is also vital information for the Upward Trend Analysis.

Step 2- Assess the effects of project activities to stream trend data.

Step 3-Describe the analysis and rationale, with a detailed analyses included in an appendix. In all cases, discussions of upward trend in project NEPA include: determination of existing trend, importance of streams to fisheries, extent and magnitude of past human-caused effects and natural disturbance, range of actions designed to achieve different levels of upward trend, effectiveness of mitigation measures in compensating for past effects together with reducing effects caused by the project, disclosure of incomplete or unavailable information (40 CFR 1502.22), applicable mitigations and adoption of mitigation measures, any monitoring over and above Forest Plan requirements necessary to demonstrate that an improving trend exists or does not exist, and relative importance and urgency of treating fish habitat and water related resources. Refer to Appendix D for a complete Upward Trend Analysis.

3.5.4 Resource Indicators

Indicators for deposited sediment include the following:

- Changes in cobble embeddedness (as modeled by FISHSED)
- Changes in summer rearing capacity (as modeled by FISHSED)
- Changes in winter rearing capacity (as modeled by FISHSED)

Stream survey data were compared to objectives defined in Espinosa (1992) to determine if streams met their fish/water quality objectives as described in Appendix A of the NP Forest Plan. A one-way analysis of variance (ANOVA, Excel) with a Bonferonni adjustment was used to detect significant differences in mean weighted cobble embeddedness.

3.5.5 Affected Environment

The Middle Fork Clearwater and Selway subbasins are known to support resident and fluvial bull trout populations. Reaches within the proposed project area are limited to migration

corridors and overwintering habitat; rearing and spawning is precluded due to high summer/fall water temperatures. The Selway is a core recovery area identified in the Draft Bull Trout Recovery Plan (USFWS 2014) with 10 local populations. See the Biological Assessment (BA) for a full description of Selway River summer Steelhead, fall Chinook, and bull trout populations within the Middle Fork Clearwater and Selway subbasin. Additional fish species that can be found in the mainstem Middle Fork Clearwater and Selway Rivers include: redsided shiner (*Richardsonius balteatus),* speckled dace (*Rhinichthys osculus),* longnose dace (*Rhinichthys cataractae*), sculpin (*Cottus spp.),* suckers (*Catostomidae spp*.), mountain whitefish (*Prosopium wouldiamsoni*), and the non-native smallmouth bass. No known populations of isolated rainbow/interior redband trout exists in the area. The Nez Perce Tribe is actively restoring Pacific lamprey populations to the Clearwater basin. The mainstem of the Middle Fork Clearwater and Selway Rivers provide migration, rearing, and spawning habitat for the Pacific Lamprey.

Due to the small and steep nature of the Middle Fork Clearwater Face drainages and natural fish barriers, streams such as Lodge and Decker Creek only seasonally support juvenile steelhead (Selway River Steelhead Recovery Plan NMFS 2011), fall/spring Chinook salmon, and Westslope cutthroat trout (WCT) in the lower stream reaches (¼ mile). These lower reaches provide rearing habitat for juvenile salmonids during the spring and summer months; salmonids seek refuge in small tributaries to escape high spring flows and cooler base flows during the summer months. With the exception of portions of Swiftwater, O'Hara, and Goddard creeks, many tributaries in the Goddard-Selway watershed are very small and steep, limiting fish distribution to lower reaches of streams or excluding fish distribution entirely. Steelhead distribution is limited to ¼ mile of Swiftwater Creek with WCT distribution throughout most of the stream. Steep gradients (Rosgen A channel type) and marginal overwintering habitat limit anadromous fish distribution. Steelhead trout have only been detected in the lower portions of Swiftwater and Elk City creeks. Goddard Creek supports juvenile salmonids throughout most of its length with limited habitat in its upper reaches (Rosgen A channel type, gradient > 6-10%) (refer to Steelhead Intrinsic Potential Model, Figures A1 and A2 in Appendix A). O'Hara Creek is designated critical bull trout habitat but, there have been few observations of bull trout (Selway BA USFS 1999 and Appendix A), and summer stream temperatures do not provide adequate rearing habitat for bull trout (Appendix B). O'Hara like, the mainstem Selway and Middle Fork Clearwater Rivers are assumed migratory and overwintering habitat for bull trout only.

Steelhead, WCT, and Chinook are distributed throughout O'Hara Creek, but densities are reduced in these tributaries as compared to tributaries in the upper Selway subbasin (Meadow, Gedney, Bear and Moose creeks). Juvenile steelhead densities have decreased since 1988 surveys with variable density numbers, indicated by a Forest Plan Monitoring Site (Appendix A). While steelhead densities have decreased since the 1988 survey, Chinook and WCT densities have increased, in part due to Chinook supplementation efforts. The

Selway River steelhead populations are part of the Clearwater River Major Population Group (MPG) and of intermediate size; population viability is ranked at high risk and of low spatial structure (Selway River Steelhead Recovery Plan NMFS 2011). Fall Chinook adult returns and fish densities have dramatically increased due to supplementation efforts (Arnsberg and Kellar 2013). Fall Chinook spawn in the lower reaches of the Selway River and throughout the Middle Fork Clearwater River (Appendix A). The Nez Perce Tribal Cedar Flats Acclimation Facility rears approximately 200,000 to 300,000 fall Chinook (April 15 to June 15). These fish are released onsite on the mainstem Selway River. Nez Perce Tribe fall Chinook spawning ground surveys detected 10 fall Chinook redds from the mouth of the Selway River to river mile 31 below Gedney Bridge in 2013. The Clearwater 2013 aerial fall Chinook survey detected 28 redds on the Middle Fork Clearwater River (Arnsberg and Kellar 2013). Spawning numbers increased significantly in 2014 with 31 redds being detected on the mainstem Selway and 82 redds on the Middle Fork Clearwater. The Nez Perce Tribe also releases 400,000 spring Chinook smolts and a few hundred adult outplants just below O'Hara Creek annually. Spring Chinook are reared at the Rapid River hatchery facility.

Table 3-17: Miles of Designated and Occupied Steelhead and Bull Trout Critical Habitat (DCH) and Chinook Essential Fish Habitat (EFH) within the Johnson Bar Fire Salvage project Area by Subwatershed

SWS (HUC 6)	Total Stream Miles	Steelhead DCH [1] (miles)		Bulltrout DCH (miles)		Fall Chinook and Spring/Fall Chinook EFH	
		Designated	Occupied (Spawning and Rearing)	Designated	Occupied (FMO)[2]	Designated	Occupied (Spawning and Rearing)
Big Smith Creek-MF Clearwater	16	0.5	1.4	0.5	0.5	0.5	1.0
Goddard Creek-Selway River	55	14.9	16.8	6.5	6.5	6.5	6.5
O'Hara Creek	11	2.80	2.80	2.80	2.80	2.80	2.80

[1]See Appendix A for steelhead and Chinook redd count data and fish densities
[2]Stream miles provide bull trout feeding, migratory, overwintering only

Figure 6: Fish Distribution within the Johnson Bar Fire Salvage project Area

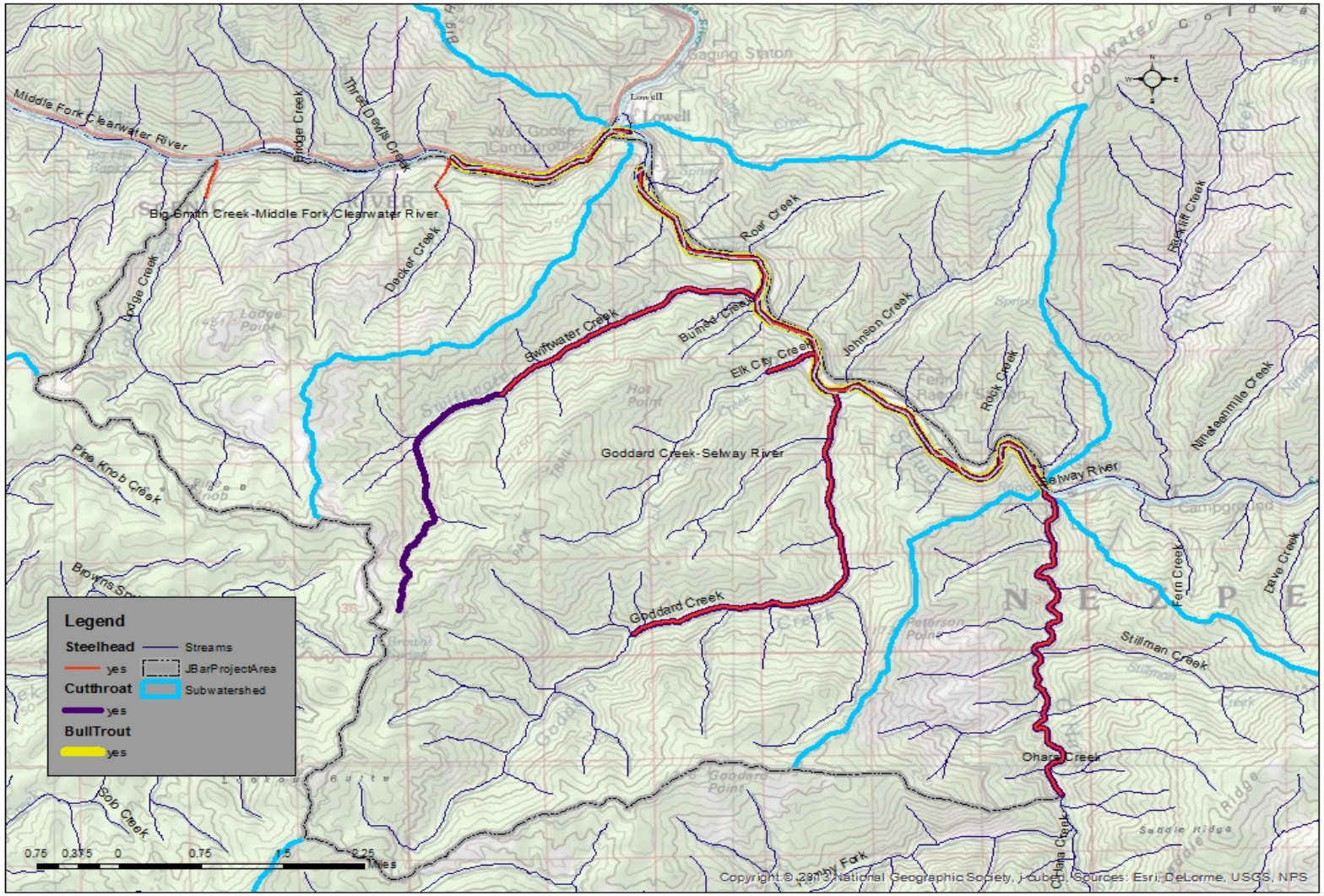
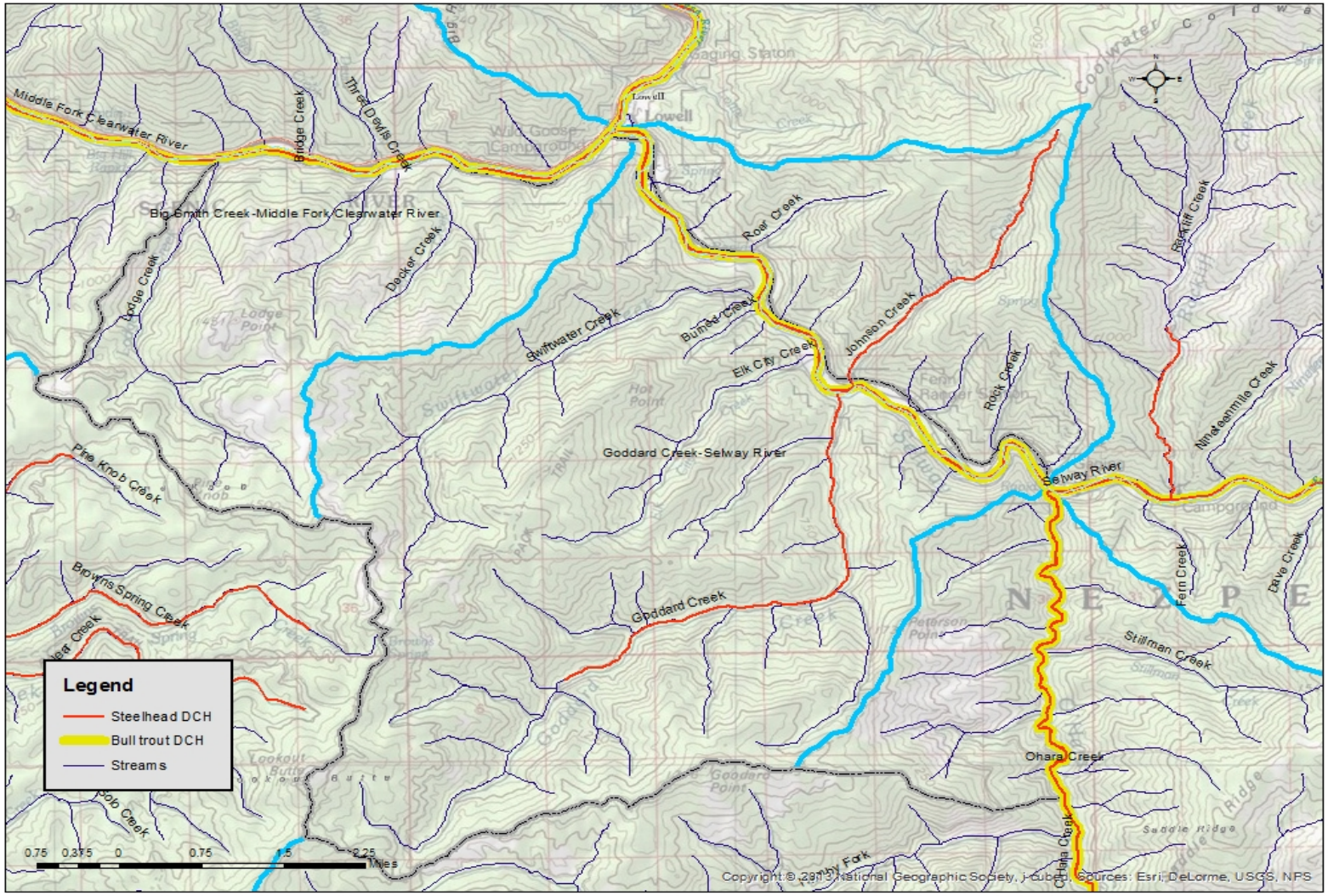


Figure 7: ESA Designated Critical Habitat within the Johnson Bar Fire Salvage project Area



3.5.6 Existing Condition

Elevations within the Middle Fork Clearwater watersheds range from approximately 1,300 – 5,000 feet and average 25-45 inches per year with the majority of it falling during the fall, winter, and spring months. Geology of the watersheds consists of moderately-weathered gneiss, schist and quartzites. The dominant landform in the area is steep stream breaklands with historic slump earthflow topography and debris torrents in channels. A higher occurrence of debris torrents is associated with natural disturbances, such as fire, rain-on-snow floods and human disturbance. Climatic events coupled with fire and past human disturbance have provided a relatively frequent supply of sediment from surface erosion, mass wasting and in-channel scour to stream systems within the project area. The majority of these tributaries are perennial with mean annual flows of 0.31 to 3.93 cubic feet per second (cfs).

The Selway River originates in the Bitterroot Mountains at an elevation of 9,110 feet and drops to 1,469 feet at its confluence with the Middle Fork Clearwater River. Maximum flows on the Selway are approximately 13,540 cfs and a low of 766 cfs with a mean annual flow of 3,765 cfs. Similar to the Middle Fork Clearwater face drainages, breaklands (schist) is the dominant landform in the lower Selway subbasin. Unstable soils and rain-on-snow events primarily during the spring/winter months cause frequent debris torrents and tributaries, such as O'Hara, Goddard, Elk City, and Swiftwater creeks, may be affected by excess levels of sediment deposited by these natural events and human disturbances. Vegetation community is similar to the Middle Fork Clearwater watersheds and was shaped by historic wildfires in the late 1800s to early 1900s. With a large portion of the Upper Selway designated Wilderness, the Selway subbasin supports intact accessible spawning and rearing, where the steelhead population has not been supplemented with hatchery fish. Of all the habitat components in the Selway River, mainstem river temperatures in the summer months is the most limiting habitat factor for rearing salmonids. There is however, a number of tributaries within the Selway subbasin that have quality habitat, with tributaries in roadless/wilderness areas that lack permanent sediment-producing features such as roads that are accessible and considered refugia for steelhead trout. Since many of these tributaries are prone to natural pulse sediment effects given unstable landtypes and climatic events, there are many tributaries that can function as refugia in the event that other streams are affected by natural events as landslides, floods and fires.

Table 3-18: Summary of ESA listed and Sensitive fish species and aquatic invertebrates including status located within the Analysis Area

Species		Threatened	R1 Sensitive	Forest MIS	ESA Critical Habitat (DCH)	Essential Fish Habitat (EFH)
Steelhead Snake River (SR)	*Oncorhynchus mykiss*	X		X	X	
Fall Chinook Snake River	*O. tshawyscha*	X			X	X
Bull trout Columbia River (CR)	*Salvelinus confluentus*	X			X	
Spring Chinook Salmon (SR)	*O. tshawyscha*		X	X		X
Interior redband trout	*O. mykiss gairdneri*		X			
Westslope cutthroat trout (WCT)	*O. clarki lewisi*		X	X		
Pacific Lamprey	*Lampetra tridentata*		X			
Western Pearlshell Mussel	*Margaritifera falcata*		X			

3.5.6.1 Baseline Habitat Conditions

Table 3-19: Prescription Watershed Information

Prescription Watershed	Acres	Fishery Water Quality Objective[1] (% Habitat Potential)	Cobble Embeddedness Objective[2] (%)	Existing Cobble Embeddedness[4] (%) (WCE)	Current Fishery Water Quality Habitat Potential (%)
Lodge Creek[3]	2,940	80	30-35	37	-
Unnamed No. 8	876	70	35-40	-	-
Middle Fork Clearwater Face	1,458	80	30-35	-	-
Decker Creek[3]	1,229	80	30-35	37	-
Goddard Creek	9,232	80	30-35	51	60
Swiftwater Creek	3,924	80	30-35	42	60
Elk City Creek	1,800	80	30-35	55	60
Lower Selway River	2,405	90	25-30	46	60
Lower O'hara Creek	2,867	90	25-30	37	70

[1]NP LRMP Appendix A 1987
[2] Potential and current habitat condition is based solely on collected or estimated substrate data methods based on Espinosa 1992.
[3]Surveyed during the 1989 basin wide surveys
[4] Existing cobble embeddedness is mean Weighted Cobble Embeddedness (WCE).

Cobble embeddedness at many of the sample sites have only been sampled once or twice [Elk City (2013), Lodge (1989), Decker (1989), Swiftwater (1989 and 2013), and Goddard creeks (2013)]; a small sample size can often skew results and a minimum of three samples are needed to determine trend. A Forest monitoring index site is located on O'hara Creek so there is several years of cobble embeddedness data at this location. The site was sampled 6 times between 1988 and 2014 and mean weighted cobble embeddedness ranges from a low of 10% to 47% with an average of 37%, which, is reported above. No trend was identified between mean weighted cobble embeddedness but, a one-way Analysis of Variance (ANOVA) with a Bonferonni adjustment detected significant increased cobble embeddedness in 1990 and more recently in 2014 (p value= 5. 64 E-12.), refer to Appendix B. There are 7 PIBO sites that are located throughout the Selway basin. A 2013 summary report found that habitat conditions in the Selway managed sites were in poorer condition than reference sites. Although wood frequency and bank angle were similar to reference sites, residual pool depth, pool percent, and percent fines exhibited worse condition than reference sites. PIBO effectiveness monitoring began in 2001 on a 5 year sampling rotation, during this time, there was a significant increase in percent fines but, other habitat perimeters remained constant. Results could be somewhat skewed given the small sample size of both managed and reference sites, which, might be the case given both Selway managed and reference reaches were in poorer condition than other sites across the NPCLW Forest and the entire PIBO study area (entire Columbian Basin), refer to 2013 PIBO report in the project file for a full synopsis. Six additional PIBO sites will be added to the Selway Basin in 2015. High cobble embeddedness could be attributed to past management

practices and frequent natural disturbances given climatic events and unstable soil condition. Many of these watersheds have high gradient streams that can transport sediment efficiently although small amounts large wood material and lower gradient stream reaches, where cobble embeddedness sampling takes place can effectively store large proportions of fine sediment possibly contributing to high cobble embeddedness.

Habitat surveys and temperature monitoring data were used to summarize existing habitat condition in Table 7 below. Basin-wide surveys were conducted on Lodge, Decker, O'hara, Goddard, and Swiftwater creeks in 1989. Updated surveys have been conducted on Swiftwater Creek (2013), and O'Hara Creeks (2014).

Table 3-20: Existing Condition by Subwatershed, High, Moderate and Low rankings are extrapolated from the Matrix of Pathways and Indicators of Watershed Condition (NMFS, USFWS 1996). H=High watershed condition, M=Moderate watershed condition, L=Low watershed condition

	Big Smith Creek-Middle Fork Clearwater River	**Goddard Creek-Selway River**	**O'Hara Creek**
Watershed Condition			
Road density[1] (mi/mi^2)	2.90 M	1.90 M	1.40 M
RHCA Road Density (mi/mi^2)	0.01 H	0.2 H	0.21 H
Landslide Prone Road Density (mi/mi^2)	0.11 H	0.15 H	.09 H
Water Quality			
Temperature [2] (Steelhead spawning/rearing)	N/A	Selway >64°F L, Swiftwater 57-64°F M	O'Hara 57-64°F M
Habitat access	Natural barrier on Lodge Cr. 0.4 miles from mouth and a natural barrier on Decker creek 0.80 miles from the mouth.	No barriers documented	No barriers documented
Pool Quantity/ Quality	L-Does not meet RMO, primarily riffle habitat, given high gradient stream channels, and primarily scour pools less than 3 feet in depth, low mean annual flows 1.3 to 3.92 cfs.	M-Meets RMO, there is a large percentage of pool habitat on Goddard Creek with active LWD contributing to pool formation. Swiftwater Creek is below the RMO for pool quantity with primarily riffle habitat. Many pools available are <3 feet deep.	L mainstem O'Hara Creek is below RMO for pool quantity but pool habitat that is available is ~ 3 feet in depth. The 1994 stream survey did not distinguish between pool formations but, pools in Lower O'Hara creek are thought to be 30% mainstem pools from LWD complexes with the remainder in pocket water/alcoves.
Large Woody Debris	L-does not meet RMO, there is potential for LWD recruitment and large	M-levels of LWD are near-natural on Goddard Creek	L-does not meet RMO, there is opportunity future LWD recruitment. During the 1990's

	Big Smith Creek-Middle Fork Clearwater River	Goddard Creek-Selway River	O'Hara Creek
Watershed Condition			
	boulders/bedrock create majority of pool habitat.	and future LWD recruitment is not limiting. L-Swiftwater Creek LWD is below RMO but there is opportunity for LWD recruitment throughout many of its reaches. Boulders/bedrock create a majority of the pool habitat.	a successful large instream habitat improvement project placed several LWD structures to increase pools and side channel rearing habitat.
Off-Channel Habitat/Refugia	Limited side channel habitat streams are A2-A3 channel types with few backwaters.	M - Goddard Creek (B1 channel type) provides adequate off-channel habitat and refugia. There is very little side channel habitat on Swiftwater Creek due to A3 channel type ¾ the length of the stream. ¼ of the stream is B1 channel type providing marginal refugia.	Portion of lower O'Hara creek floodplain have been compromised due to road placement FS 651 Rd. Surveys did not specifically indicate lack of off-channel refugia but, it is assumed limited given valley width and compromised channel dynamics. The mainstem glide habitat and pocket water provide the majority of rearing habitat for juvenile salmonids during the summer months.

[1]Refer to hydro report for water Yield, ECA analysis and sediment yield accounts for FS, private and state roads.
[2] Refer to Appendix B, Selway River avg 7 day Max. 72°F (1993-2014), Swiftwater averages 59°F and O'Hara averages 64°F.

3.5.6.2 Roads

There are approximately 87 miles of roads within the project area, with road densities of 1.4 to 2.9 mi/mi^2 depending upon the watershed. This is rated as a moderate condition when compared to the Matrix of Pathways and Indicators for ESA consultation (NOAA, 1998). Although the condition is rated as moderate, most of the roads are located on ridgetops and have few connections to streams, which would minimize their contributions of sediments or other contaminants to streams.

There are approximately 25 miles of roads within project area RHCAs. Road densities are very low (<0.2 mi/mi^2) and are in a high (good) condition. Landslide prone densities are also very low (<0.1 mi/mi^2). Of the RHCA roads, 4 miles are associated with US Highway 12 and 7 miles are associated with the Selway River Road. Both of these roads are paved and, as a result, may contribute only negligible amounts of sediment to the rivers. They do have the ability to contribute toxins but the effects are expected to be minimal due to well vegetated areas between the roads and rivers that can act as filters. There are 3 miles of Road 651 that may be contributing sediment of O'Hara Creek. The amount has likely been reduced, but not completely eliminated, through the addition of 15 cross-drains, replacement of 10 culverts, and resurfacing of the road that occurred in 2013. Additional work, including 5 culvert replacements

and resurfacing, will occur on this road in 2016. The remaining 19 miles of RHCA roads likely contribute some sediment to the streams but it is expected to be limited due to the relatively few stream crossings over the large area in which they occur. This is reflected in the very low RHCA road densities.

Estimated sediment delivery by haul-route before project improvement work ranges from 0.1 ton/year (O'Hara Creek) to 4.2 tons/year Goddard Creek-Selway River. The low sediment yield per year from O'Hara Creek is due in part to the small percentage of the subwatershed within the actual project area. The Big Smith Creek –Middle Fork Clearwater River Subwatershed was estimated at approximately 2.0 tons/year sediment yield.

3.5.6.3 Temperature

High temperatures on the Selway River are considered a limiting factor for some fish distribution/rearing during the summer months. Temperatures are not considered limiting to steelhead spawning due to timing of spawning during peak flow events in the spring. Temperatures on the mainstem Selway River are marginal for Steelhead rearing during the summer, and juvenile steelhead, cutthroat and spring/fall Chinook likely find coldwater refugia in tributaries such as Swiftwater, Goddard, Elk City and O'Hara creek (Appendix B). All temperatures exceed ideal rearing/spawning for bull trout. This is reflected in snorkel survey data and fish density numbers, refer to Appendix A). The Selway and Middle Fork Clearwater are used primarily as migratory corridors for bull trout during the late spring early summer months but, can provide overwintering habitat for bull trout.

3.5.6.4 Riparian Conservation Areas

There are a minimum of 4,550 acres of RHCAs as defined by PACFISH in the project area. The Johnson Bar fire totaled approximately 13,300 acres and burned in a mixed severity mosaic pattern. The highest severity fire occurred in the Burnt and Elk City Creek drainages, with most of it limited to areas outside of RHCAs. High severity fire burned approximately 15 acres of all RHCAs (0.4% of RHCAs). There were 660 acres (14%) of moderate severity and 1,040 acres (23%) of low severity fires in the RHCAs. The remaining 2,385 acres (52%) were unburned. The combination of low severity and unburned areas make-up 75% of all RHCAs in the project area and the conditions are considered to be fully functioning as a result. Post-fire, riparian areas are still dominated by western red cedar and grand fir with an understory of moist shrubs, forbs, and ferns. Where the high and moderate severity fire occurred, a mosaic of conditions exists, including completely burned and unburned areas. Tree mortality continues to occur in these areas as a result of the fire. Increases in riparian and instream wood are expected to occur over the next decade in headwater tributaries that burned. Very few increases in wood are expected in fish bearing streams as the fire burned very little in these areas. Wood increases in fish bearing streams would likely occur as a result of future landslide activity.

Approximately 381 acres of past timber harvest has occurred within RHCAs on Forest Service administered lands within the project area. This is approximately 8% of all RHCAs. A total of 200 acres occurred within the Big Smith Middle Fork Clearwater area and 181 acres on the Selway side. The majority of this past harvest occurred in Upper Lodge Creek and Swiftwater Creek

during the 1960s and 1970s. All previously harvested RHCAs are currenly well vegetated with trees and shrubs. All harvest activities since 1995 have retained full PACFISH buffers.

There is currently only light RHCA use by cattle in the Tahoe-Clear Creek Allotment. This is mostly due to the existing thick vegetation and steep terrain in the Goddard-Selway and Big Smith-Middle Fork Clearwater subwatersheds that inhibit use by cattle.

Table 3-21: Burn Severity by watershed within the Project Area 1= Unburned, 2= Low Severity, 3=Medium, 4=High

Subwatershed	Burn Severity	Total Acres burned	Acres Burned in RHCAs
Big Smith-Middle Fork Clearwater	1	670	80
	2	1865	234
	3	1046	76
	4	4	0
Goddard-Selway	1	637	121
	2	3059	719
	3	4481	580
	4	519	15
O'Hara	1	135	21
	2	565	84
	3	268	7
	4	4	0

3.5.7 Direct and Indirect Effects

Proposed project activities that may affect the quality, quantity, and timing of streamflows are listed below. Harvesting and any prescribed fire activities would be closely managed; thereby, limiting the potential for effects to ESA listed fish species and their critical habitats. This would be due primarily (but not exclusively) to BMPs and project specific design criteria. The activities considered for potential effects include timber harvest, road construction, maintenance, decommissioning and storage and site preparation for planting. These activities have to potential to contribute sediment to streams and affect fish species.

Design criteria used to minimize or eliminate effects to water quality, aquatic habitat, and fisheries would include:

- Retention of PACFISH buffers adjacent to streams and wetlands would maintain shade (where trees did not burn), provide future large wood recruitment, and stream bank stability;
- No timber harvest or road building would occur on field verified landslide prone areas, which would minimize potential management-related mass failures and subsequent sediment delivery to streams;
- Harvest machinery would not be serviced in riparian areas. This would eliminate potential toxic chemical introductions into streams;

- Danger trees in RHCAs along haul routes would be felled and left in place in order to maintain large woody material in the RHCAs;
- Dust abatement and road improvements on logging haul routes would minimize sediment input;
- Temporary roads would not be constructed within RHCAs;
- All temporary roads would be decommissioned after use; and
- Erosion control measures near stream crossings would be use during road reconstruction, decommissioning, and storage activities.

Direct effects as a result of implementing proposed project activities would be minimal. Road decommissioning activities instream and within the RHCAs would result in short-term indirect effects to fisheries given an increase in water turbidity and downstream sediment delivery to fisheries.

3.5.7.1 Alternative 1

Under Alternative 1, the Forest Service would not change management actions in the project area. There would be no proposed harvest, prescribed fire activities, or road maintenance/construction. There could, however, be direct and indirect effects from the Johnson Bar Fire itself including mass failure, infiltration, peak flow, runoff, and large woody debris recruitment to stream habitat.

Aquatic systems and biota can be extremely resilient to the effects of fire, and even benefit from it, full ecosystem recovery dependent on acres burned and burn severity can take decades. There are very few studies that have examined short-mid and long-term effects of fire on aquatic biota. In general, fire effects on different streams are expected to vary, dependent with intensity, and extent of burning of a watershed and the vegetation previously present. Fire response are most likely to be seen in watersheds where the upper portions were heavily forested and were extensively burned but, effects are expected to vary along a given stream system with the greatest fire effects seen in smaller headwater streams, effects lessening downstream. The slope aspect, elevation, gradient, geology and soil depth along with climatic variables affect runoff and erosion rates (Minshall *et al*. 1989).

Effects of fire on stream ecosystems can be partitioned into immediate or short-term effects directly from the fire such as increased temperatures and poor water quality from the fire itself. Although fires may alter stream temperature by affecting the magnitude of surface and subsurface flows, and rates of evaporation, convection and conduction, the primary driver is increased solar radiation following immediate loss of riparian vegetation (Webb *et al*. 2008). Research has also found that increased debris flow from post-fire peak flow events can result in wider, shallower stream channels that can absorb more solar radiation (Dunham *et al*. 2007). Similar to other studies, Mahlum *et al*. (2011) found water temperature increases were not detected directly after the fire but in subsequent years (1-3 °C increase, 1 to 7 years). These fire effects monitored in the Bitterroot Mountains of Montana found warming stream temperatures associated with only burned areas and were fairly localized. Increases in stream

temperature can be moderated by evaporation, hyporheic exchange and conduction to substrate and return any increased stream temperatures to normal levels within relatively short distances (Moore *et al*. 2005). Water chemistry parameters were not measured directly after the fire but, past research suggests few adverse effects from the Johnson Bar Fire are expected (Minshall *et a*l. 1989, Johnson et al. 2005, Schindler et al. 1980). Any changes in water chemistry would be expected during peak runoff events in the spring and not detectable in the long-term (Bladon *et al*. 2008, Hauer *et a*l. 1998).

Delayed post fire effects have maximum effects within the first one to four years after the fire. These mid to long-term effects can be the most lasting effects to stream habitat and biota and include increased instream sediment and turbidity from post-fire flooding and debris torrents. Debris torrents can reconfigure the stream channel itself and are the primary mechanism for instream large wood recruitment. Rain events shortly after the fire can produce an increase in sediment in the months immediately after the fire. The following runoff from snowmelt is expected to carry abnormally high suspended-sediment loads, decreasing with vegetation, however, and intense summer precipitation several years after the fire could cause departures from this decreasing trend. Increased sediment erosion from burned watersheds with elevated suspended sediment levels during spring run-off events invariably result in increased sedimentation downriver. Long-term effects are closely aligned with the recovery of the forest and understory vegetation. Recovery should result in shading of the streams, decreased runoff and input of nutrients, returning conditions to pre-fire levels. Fallen and fire killed snags continue to accumulate in streams for 20-25 years after fire but, retention of woody debris is a direct function of the size of the material relative to the width and depth of the stream.

Since the Johnson Bar fire burned with mixed severity with little burn intensity in riparian areas, increases in stream temperatures due to the wildfire should be fairly localized. Warming stream temperatures could be detectable in the short-term in headwater streams that burned with moderate to severe fire intensity but, rapid riparian vegetation of forbs, grasses, and shrubs in these low elevation rain-dominated systems, could provide effective shade cover in these smaller stream reaches. Warming temperatures due to widening of the stream channel and loss pool habitat from debris torrents is a possibility but, these effects are assumed to be short to mid-term given the dynamic nature of these small headwater streams. Warming stream temperatures in the larger third and fourth order stream systems such as, Swiftwater, Goddard and Elk City creeks should be less detectable given the mixed burn severity, and watershed size moderates temperature effects.

The unburned RHCAs lend somewhat of a protective buffer from erosional events, however, as suggested above, many of these upper stream reaches that endured severe to moderate burn severity and are characterized by steeper slopes (>45%), shallow soils, unstable geology that endure intense precipitation events and are the main conduits for post-fire sediment transport. The hydrology report (NEZSED) compares sediment yield by year post-fire, this data suggest increased sediment yield above natural condition until 3 years before it returns to normal variation. Post-fire sediment yields from peak flows and altered hydrograph can dramatically change stream channel dimensions. An unpublished study in the Upper Selway Subbasin (Jakober and Dentino, 2003) showed changes in stream channel complexity with no consistent pattern between years. Pool variables did not show consistent trends with frequencies and

depths showing initial declines but, pool areas and volumes later showing large increases in some stream drainages in the six years following the Swet Fire.

Increased sediment yields following debris torrents within the Johnson Bar fire are not all negative and may actually stimulate recovery or compensate for habitat losses that might be enhanced by post-fire disturbance. Post fire hydrologic effects can be characterized as pulsed disturbances redistributing quality rearing and spawning substrate and shifting pool habitat throughout these stream systems. These events are episodic and dispersed through time and space, important for sustained productivity/recruitment of fish after large fire disturbances. It is expected that although habitat complexity such as pool structure can be variable and inconsistent across drainages as identified in the Bitterroot study, there will be newly available habitat that is broadly distributed promoting recolonization and increased fish densities through the stream systems.

Recruitment of large woody debris increased by 60% in Jakober and Dentino's past study and was consistent across the drainages with rapid recovery of bank stability to normal levels (1-2 years post fire). Given the moderate burn severity across many of the drainages within the project area and steep channel slopes there is the possibility of some future large wood recruitment. However, wood recruitment would primarily be focused in these headwater reaches benefitting resident fish community habitat such as Westslope cutthroat trout with limited wood disbursement downstream to the lower reaches of Swiftwater, Goddard and O'Hara creeks.

There was no observation/evidence of direct mortality of fish during or shortly after the Johnson Bar fire. This is not surprising given the majority of RHCAs that burned had none or limited fish distribution/occupied habitat. Due to these possible increases in post-fire habitat complexity, recolonization and juvenile densities are expected to increase in some portions of these stream reaches. Studies have shown that resident fish such as redband, bull trout and westslope cutthroat have the ability to quickly adapt to changes in their environment associated with even the most intense wildfire effects (Dunham et al. 2007, and Rieman et al. 1997, Jakober and Dentino 2003). The steelhead/redband and WCT populations are assumed ecologically diverse and unfragmented from the greater Selway River so, dispersal from local refuge and refounding through complex life history can happen in stream reaches that were disturbed from post fire effects. Table 3-22 below, summarizes indirect effects under Alternative 1.

Table 3-22: Summary of Indirect Effects under the No Action Alternative, common to all subwatersheds

Action	Process Affected	Indicator	Alt. 1
Johnson Bar Fire	Surface erosion	Pulse and Chronic Sediment	0
	Mass failure	Pulse sediment	S-/0
	Infiltration, peak flow, runoff	Hydrologic Process	S-/0
	LWD Recruitment	Potential LWD	S+
	Temperature	Riparian Shade	-/0
	Stream Habitat	Pool Quality/refuge	S-/S+

Action	Process Affected	Indicator	Alt. 1
	Drainage Network	Road density/stream crossings	0

0 = Neutral Indirect Effects
- = Insignificant or discountable negative effects
+ = Insignificant or discountable positive effects
S- = Measurable negative effects
S+ = Measurable positive effects
/ = Short-term/long-term effects

3.5.7.2 Alternatives 2, 3, and 4

The following direct and indirect effects are common to Alternatives 2, 3, and 4. Direct effects as a result of implementing proposed project activities would be minimal. Road decommissioning activities instream and within the RHCAs would result in short-term indirect effects to fisheries given an increase in water turbidity and downstream sediment delivery to fisheries.

Sediment yield increases as a result of implementing proposed activities would be within the water quality objectives as outlined in Appendix A of the Nez Perce National Forest Plan. The NEZSED model results displayed that proposed actions for Alternatives 2, 3, and 4 would not - add to measurable sediment increases above post-fire disturbance levels. FISHSED detected a reduction in the winter and summer rearing capacity for steelhead of 1-6% (Appendices C and D). There were no or only minor differences between the alternatives. These reductions are below the 10% threshold where measurable changes would occur within the stream substrate. FISHSED is strictly a comparison of summer and winter rearing capacity and does not model long-term differences in rearing capacity. NEZSED resulted indicated that long-term effects (>10 years) would not be measurable. Stream gradient, channel size, and the lack of overall pool habitat in many of these drainages prohibit ideal winter rearing habitat.

In general, post-fire sediment increases from the proposed activities would decline to normal conditions after 2-3 years. This has been documented in several other studies that found increases in stream sediment inputs shortly after a fire and 2-3 years post-fire (Chou *et al*. 2004, Larsen *et al*. 2009, Moody and Martin 2001 and 2009, Pierce *et al*. 2004, Robichaud *et al*. 2010, and Stabenow *et al*. 2006). Road decommissioning and road reconstruction would be the greatest source of sediment delivery under Alternative 3, but, would have long-term watershed benefits.

Many studies have attributed increases in soil erosion above post-fire disturbance from salvage operations due to increases in road networks that have hydrologic connectivity with stream networks, additional prescribed burning, harvest on landslide prone areas and ground based harvest (DellaSala et al. 2006, Karr et al. 2004, McIver and McNeil 2006, McIver and Starr 2001, Silins et al. 2009, Smith et al. 2011, Wagenbrenner et al. 2014). All of these studies acknowledge significant differences among logging systems and actual ground disturbance. Tractor logging over ground disturbance has the greatest effects, followed by skidding over snow, cable yarding over bare ground, skyline and finally helicopter with the least amount of affect. Ground compaction and sediment inputs could be easily mitigated by reducing ground based harvest on steep slopes, increasing ground cover with logging slash, eliminating harvest in landslide and riparian areas, and using existing road infrastructure or minimizing new road

construction. This design criterion with duration and timing of logging operations is specific to the Johnson Bar proposed activities under all Alternatives, minimizing any detrimental instream sediment increases and downstream effects to fisheries habitat. Specific design criteria (Chapter 2) limits “jackpot” burning to very small portions of this project and is only used to aid in vegetation efforts through restoration work.

Table 3-23: Indirect Effects, Short- and Long-term, by Action and Alternative (2-4), Common to All Subwatersheds

Action	Process Affected	Indicator	Alternative 2	Alternative 3	Alternative 4	Rationale
Vegetation Treatment	Surface erosion	Pulse and Chronic Sediment	-/0	0	-/0	Tractor units confined to ridge top. No harvest within RHCAs. Refer to Table 3-7 and Appendix C. Sediment yield meets allowable water quality objectives under Nez Perce National Forest Plan Appendix A. NEZSED models display increased sediment yields due to the post-fire sedimentation with proposed activities under Alternatives 2 and 4 slightly increasing sediment yields tons/year for the duration of the project (2 years) than quickly returning to natural condition. Alternative 3 proposes very little tractor logging (2%) and was not modeled to increase sediment yield above natural fire disturbance. Helicopter and skyline units have reduced soil disturbance, 85% soil coverage 17-33 tons of fine and course woody material within units mitigate additional soil erosion.
	Mass failure	Pulse sediment	0-	0-	0-	Landslide prone (LSP) eliminated from proposed units. Skyline and helicopter units dramatically decrease soil disturbance, tractor units under all alternatives refined to ridge top.
	Infiltration, peak flow, runoff	Hydrologic Process	0-	0	0-	Refer to Hydrology report, ECA increase is negligible. Proposed activities under all alternatives would not alter the hydro graph compared to fire disturbance.
	Large Wood Debris Recruitment (LWD)	Potential LWD	-/-	0-	-/-	Target stand density would provide for some future LWD recruitment. No harvest within RHCAs. Given slope and natural disturbance within the project area, there is LWD Potential but, primarily limited to small headwater streams.
	Temperature	Riparian Shade	0	0	0	No harvest within RHCAs, no mechanism to alter temp beyond fire disturbance.
	Stream Habitat	Pool Quality/refuge	-	0	-	Refer to surface erosion comments, increased sediment, would unlikely result in measurable degradation in pool quality/refugia in downstream fish bearing streams.
Temporary Road Construction	Surface erosion	Pulse and Chronic Sediment	-	0	-	Refer to Project design criteria; all temp roads would be decommissioned. Only 0.4 mile is proposed under Alternative 3 within Lodge Creek. There would be no hydrologic connectivity with nearby waterbodies; There would be no new construction within RHCAs and thus no increase in stream crossings.
	Mass failure	Pulse sediment	0	0	0	Project design criteria and BMPs designed to reduce sediment input, no construction on LSP.
	Infiltration, runoff, peak	Hydrologic Process	0	0	0	No mechanism to alter peak flows
	LWD Recruitment	Potential LWD	0	0	0	No construction in RHCAs
	Temperature	Riparian Shade	0	0	0	No construction within RHCAs
	Stream Habitat	Pool Quality/refuge	0	0	0	BMPs, no hydrologic connectivity and no construction within RHCAs

Action	Process Affected	Indicator	Alternative 2	Alternative 3	Alternative 4	Rationale
	Drainage Network	Road density/stream crossings	-/0	0	-/0	A temporary increase in drainage network, road construction is not within RHCAs, all roads would be obliterated after use.
Road Recon/Improvement	Surface erosion	Pulse and Chronic Sediment	-/S+	-/S+	-/S+	Drainage system improvements may temporarily increase sediment to non-fish bearing reaches but, the 57.8 miles of road improvements would significantly decrease long-term sediment loads, refer to Hydrology report.
	Mass Failure	Pulse sediment	-	-	-	Road density is minimal in landslide prone areas
	Infiltration, runoff, peak	Hydrologic Process	0	0	0	No mechanism to alter peak flows
	LWD Recruitment	Potential LWD	0	0	0	No mechanism to alter LWD recruitment, hazard trees within the RHCAs would be felled and left
	Temperature	Riparian Shade	0	0	0	No mechanism to alter temperature
	Stream Habitat	Pool Quality/refuge	+	+	+	Decrease sediment yield from road improvements could have some measurable effects
	Drainage Network	Road density/stream crossings	+/S+	+/S+	+/S+	No change to road density but, improved stream crossings would decrease long-term sediment inputs
Road Decommissioning and Storage	Surface erosion	Pulse and Chronic Sediment	S-/S+	S-/S+	S-/S+	Dependent on proximity to streams, there would be short-term sediment increases with long-term decreases in sediment inputs. Refer to NEZSED model figures in Appendix C.
	Mass Failure	Pulse sediment	0+	0+	0+	Approximately 3.0 miles of road decom is located on LSP.
	Infiltration, runoff, peak	Hydrologic Process	+	+	+	Road decom can increase long-term soil productivity
	LWD Recruitment	Potential LWD	0	0	0	No mechanism to alter LWD recruitment
	Temperature	Riparian Shade	0	0	0	No mechanism to alter Temperature
	Stream Habitat	Pool Quality/refuge	+/S+	+/S+	+/S+	Long-term reduction in sediment inputs due to reduced stream crossings, watershed road density and overall increase in soil productivity could result in potential measurable increases in habitat quality.
	Drainage Network	Road density/stream crossings	S+	S+	S+	Decreases road density and stream crossings, refer to hydrology report

0=Neutral Indirect Effects
- =Insignificant or discountable negative effects
+ = Insignificant or discountable positive effects
S- = Measurable negative effects
S+ = Measurable positive effects
/ = Short-term/long-term effects

3.5.8 Cumulative Effects

Given the size of the proposed project area and the fact that potential effects as a result of the proposed action alternatives would be non-measurable, cumulative effects are being analyzed at the 6th HUC subwatershed level. Only activities that may potentially affect native fish populations and their respective habitats were analyzed for cumulative effects.

3.5.8.1 Alternative 1

Under Alternative 1 of the Johnson Bar Salvage project, there would be no proposed harvest, prescribed burning or related road maintenance/construction or decommissioning in the cumulative effects analysis area, refer to Table 3-0 for ongoing activities. Therefore, Alternative 1 would not incrementally add to past, ongoing, or reasonably foreseeable future activities to cause cumulative effects to ESA listed fish species and their DCH, and R1 sensitive fish species and their habitat.

3.5.8.2 Alternatives 2, 3, and 4

The following cumulative effects are common to Alternatives 2, 3, and 4.

Past vegetation treatments have been conducted over the majority of the proposed project area. Prior harvest activities (1930s-2015) include salvage, commercial thinning, shelterwood harvesting, and pre-commercial/non-commercial thinning. Potential effects of harvesting activities have been summarized in the Environmental Effects section. There were approximately 3,700 acres of past harvesting activities in the Big Smith-Middle Fork Clearwater subwatershed and 3,600 acres in the Goddard-Selway and O'Hara subwatersheds. Approximately 400 acres of past harvesting activities occurred within RHCAs. The majority of this harvesting occurred over 20 years ago with opportunities for regrowth. With the exception of pre-commercial thinning in the Selway-Goddard and O'Hara Creek watersheds, there would be no additional vegetation treatments having temporal/spatial overlap within the analysis area. Given this, the possible increase of sedimentation mobilization, and riparian effects from past vegetation treatments and connected actions would be negligible and offer little opportunity for measurable cumulative effects with ongoing actions for all proposed Alternatives.

There are concerns surrounding the potential increases in sedimentation effects to the Nez Perce Tribe Cedar Flats Acclimation Facility. The facility is located below the O'Hara Creek drainage and above both Swiftwater and Goddard creeks. Approximately 970 acres burned at low to moderate burn severity in lower O'Hara Creek, approximately 2% of the total subwatershed, and an addition 182 acres burned at low to moderate burn severity in the 2015 Wash Creek fire. The majority of moderate to high burn severity was in the Swiftwater and Burned creek drainages downstream of Cedar Flats facility. Given this, it is unlikely that there would be measureable increases in sediment intake at the facility specifically from the Johnson Bar Fire itself or proposed Johnson Bar Salvage actions. However, there was a substantial amount of acres that burned along the lower Selway River at low to moderate burn severity from the Wash Creek fire (3,520 acres) and the Slide fire (3,643 acres). The Wash Creek and

Slide fires burned a combined 47,000 acres as of 15 September 2015. The majority of burn severity was low to moderate, with the exception of Meadow Creek drainage, a tributary to the Selway River, which burned at moderate to high severity in most of its lower drainages. With the amount of acres that have burned in the lower and middle Selway River, the Cedar Flats acclimation site could expect potential sediment increases at the facility over the next few years.

Table 3-24: Johnson Bar cumulative effects to Fisheries common to all subwatersheds

Activity	Past	Ongoing	Future	Direct effects	Indirect effects	Rationale
Johnson Bar Fire Suppression Efforts	X			0	-/0	Approximately 10.5 miles of handline, 4 miles of dozer, 1.2 miles of excavator fireline were constructed and then consequently obliterated after the fire. There was also 3.1 miles of mechanical fuel break. All activities were ridge top and used existing road infrastructure (perimeter of the fire). All handline and mechanical line (39 miles) was rehabbed in Sept/Oct 2014. The majority of the work did not occur within RHCAs. Mechanical dozer line crossed several ephemeral draws to O'Hara Creek. There was no mastication that occurred within RHCAs. Given the location of past activity within the project area, duration of past activity, and past rehab efforts **there would be negligible cumulative effects to fisheries from Johnson Bar suppression efforts.**
Johnson Bar BAER Efforts	X			S-/S+	S-/S+	Culvert removal on lower Elk City Creek, (partial passage barrier, undersized) 2015, direct effects to fisheries and immediate short-term sedimentation effects with long-term benefits to stream channel stability and fish distribution. Road improvements along FS 651 Rd, 9701 and 0723B include 31 drop inlet structures. **There would be no cumulative effects from sedimentation effects because there is no temporal overlap between proposed project work and road improvements were isolated with long-term beneficial cumulative effects.**
Lodge Point Project	X			0	-/0	This 598 acres commercial thin was proposed in upper Lodge Creek. A combination of tractor and skyline methods were used. 4.3 miles of old system roads were reopened. 2.0 miles were decommissioned 2013/2014, and 2.3 miles would be decommissioned in 2015 along with 1.1 miles of new temporary road. Indirect sediment effects are reduced because there were no RHCA treatments, or temp road construction within RHCAs or culvert upgrades on existing road prism. No net drainage increase because all roads are obliterated after use. Any short-term sediment increases would likely have no measurable effects to steelhead rearing and spawning habitat Is located 1.5 miles downstream. **Cumulative effects to fisheries would be insignificant given project design criteria, location to occupied fish habitat and no temporal overlap with proposed activities.**
Middle Fork Vegetation Project	X			0	-/-	2586 acres were treated, it was a mixture of skyline and ground based operations. 3.9 miles of road was constructed, 3.3 miles of road was reconstructed and 3.4 miles of road was obliterated. There was an increase in drainage network. There was no harvest within RHCAs and landslide prone was eliminated from harvest units. **Cumulative effects to fisheries would be insignificant given project design criteria, location to occupied fish habitat and no temporal overlap with proposed activities**.
Private Land Salvage	X			-	S-/S-	80-acre salvage, 2 permanent landings and unknown mileage of road construction/reconstruction. There was harvest of trees within 100 feet of Swiftwater and regen harvest within 300 feet of the stream. There was no landing construction just outside of the RHCA. All landings and permanent road were constructed on unstable soils conditions. There is possible sediment delivery directly to Swiftwater Creek, and the Selway River through steep ephemeral draws. Harvest within the riparian areas would most likely affect short and long-term LWD recruitment potential to lower Swiftwater. Given past harvest activities, unstable soils, spatial and temporal overlap with proposed IDL and Johnson Bar harvest activities, and proximity to occupied fish habitat on Swiftwater, there could be measurable cumulative effects. **Cumulative effects to the Mainstem Selway could be minimal given the size of the Selway and available habitat.** Peak flow events on the Selway would likely dilute any increased turbidity from the project area.
Neil-Walter Private Salvage			X	-	S-/S-	Approximately 121 acres are proposed for salvage harvest and commercial thinning. Ground-based activities would be used in order to harvest 50% of the harvest area, with cable yarding being used for the remainder of the harvest area. Whole tree yarding is being proposed. It is unclear as to what percentage of fine and large woody material would be retained on site for soil moisture and stability to prevent excess surface erosion. There would be no

Activity	Past	Ongoing	Future	Direct effects	Indirect effects	Rationale
						harvesting within 50 feet of the steam channel and no landing development within 50 feet of Elk City Creek. Approximately 0.3 mile of temporary road construction and 2 miles of existing road prism would be brushed, graded, and used for hauling on private lands. 14 new landings are proposed for construction within the harvest area and would be obliterated after use. In high to moderate burned areas, all merchantable timber would be harvested with planting occurring two years following harvest activities. Commercial thinning is being proposed in areas of light to moderate burn severity. All slash and debris would be piled on landings and burned. No skid trails would be used with a slope greater than 45%. Roads would be seeded (weed free) and abandoned after use. Several culverts would be upgraded on existing private roads to improve hydrologic processes in the short- and long-term. Several ditch relief culverts with road improvements on existing private roads is also proposed. Drainage features installed as a result of the new road construction on private lands would be compliant with the Idaho Forest Practices Act. Harvesting within the 300-foot riparian areas would most likely affect short- and long-term LWD recruitment potential to lower Elk City Creek. Given harvesting activities, road construction and reconstruction on unstable soils, spatial and temporal overlap with the proposed IDL salvage and Johnson Bar decommissioning activities, and proximity to occupied steelhead habitat on Elk City Creek, there could be measurable cumulative effects.
IDL Salvage	X	X		-	S-/S-	A 167-acre salvage sale, all units would be harvested by helicopter. Harvest of 100% of the area with 50-foot buffers on perennial non-fish bearing streams and wetland areas and a 100-foot riparian buffer on Swiftwater Creek. Harvest would occur within 300 feet of Swiftwater Creek. There would be low impact ground disturbance with the helicopter logging; however, harvest would occur on some landslide prone areas. Short and long-term effects could include increased surface erosion from harvest units given the unstable landtypes and sensitive soils. It is unclear as to what percentage of fine and large woody material would be retained on site for soil moisture and stability to prevent excess surface erosion. Removal of vegetation within 300 feet of Swiftwater Creek could affect future large wood recruitment short and long-term. Given the proposed activities and spatial and temporal overlap with the proposed Johnson Bar Fire Salvage Project and adjacent private salvage operations and distance to occupied fish habitat and Steelhead DCH, **there could be measurable cumulative effects to fisheries within the analysis area.**
O'Hara Culvert Replacements	X	X	X	-/0	S-/S+	7 total culvert replacements on non-fishing bearing streams. There would be short-term, measurable downstream increases in sediment turbidity to O'Hara creek but, overall long-term reduction in sediment inputs with culvert upgrades and resurfacing of USFS 651 Rd. **There would be negligible CE, given BMPs, duration and isolation of the activity short-term effects would be minimized with overall benefits to the watershed with reduction in sediment.**
Road Decommissioning	X			-/0	S-/S+	Approx. 4.7 miles of past road decom in the Middle Fork Clearwater drainage more specifically Lodge Creek SWS, and approximately 7.8 miles in the Selway-Goddard SWS. **Past road decommissioning and the proposed 25 miles of road decommissioning (system and non-system) and road storage would have positive significant CE, with long-term watershed benefits.**
Road Construction/Reconstruction	X			-/0	-0	Past road construction during the 1960s-1980s. No future road construction is proposed, **CE would be negligible given no temporal or spatial overlap with proposed activities.**

Activity	Past	Ongoing	Future	Direct effects	Indirect effects	Rationale
Road maintenance	X	X	X	-	+	Road maintenance is ongoing, activities are consistent with the Nez Perce National Forest Plan and Road Maintenance and Minor Road Reconstruction Programmatic**. CEs would be insignificant or discountable given BMPs.**
Grazing	X	X	X	-	-	Grazing would be authorized in the Clear-Tahoe Allotment, a small portion of this allotment is accessible to cattle given the steep terrain. Only 466 acres of the allotment are within the fire perimeter. The majority of these acres burned at low to moderate severity. The majority of fish bearing reaches and most riparian areas are wholly inaccessible to cattle, Forest designated monitoring areas (DMA), modified PIBO sites are located in adjacent watersheds. PIBO data as implicated a static or downward trend in some habitat parameters. There is one PIBO EM site located in Goddard Creek. Six additional PIBO sites are proposed in 2015. DMAs are consistent with Nez Perce National Forest Plan standards and guidelines and R1 utilization standards/guidelines. Although there is spatial and temporal overlap, given current utilization standards, rangeland and DMA monitoring for Clear-Tahoe Allotment **cumulative effects would be negligible. Grazing effects are also mitigated by using appropriate BMPs, a small number of cow/calf pairs, topography, and project specific design criteria applied uniformly across the project area.**
Fire Suppression	X	X	X	-/0	S-/S+	Fire suppression would have both short- and long-term negative and positive effects to fishers and aquatic habitat. The greatest effects of fire on channel morphology are increases in water yield, sediment, and debris delivery to streams in the first few years post-fire. Sediment transport could overload channel transport mechanisms and cause changes in habitat. There could be short-term reductions in pool habitat with long-term increases in available spawning habitat in areas of low velocity and pool habitat formation by large wood recruitment. Fire suppression can retard these processes and result in both measurable positive and negative effects to aquatic habitat.
2015 Slide and Wash Wildfires	X			-/0	S-/S+	The Slide and Wash Creek wildfires burned approximately 7,000 acres at moderate to low severity along the lower Selway River and portions of O'Hara Creek. Combined, the fires burned approximately 47,000 acres within the lower Selway basin. With the exception of Meadow Creek, the wildfires burned with mixed severity across the landscape, but primarily burned at low to moderate severity. Increases in surface erosion and sedimentation could be expected over the next few years in drainages within the fire perimeters and downstream sediment delivery to the Selway River. There would be measurable short- and long-term direct and indirect effects to fisheries within the analysis area.
Instream Watershed Restoration	X			-	+	During the 1990s a successful large instream habitat improvement project placed several LWD structures to increase pools and side channel rearing habitat. Instream habitat improvements would continue to benefit fisheries in Lower O'Hara**. Past instream work and proposed culvert upgrades, and proposed road decommissioning could have beneficial CEs to lower O'Hara Creek.**

0=Neutral Indirect Effects
- =Insignificant or discountable negative effects
+ = Insignificant or discountable positive effects
S- = Measurable negative effects
S+ = Measurable positive effects
/ = Short-term/long-term effects

Table 3-25: Determination of Effects by Alternative

Species and DCH	Determination		Rationale
	Alternative 1 Fire Effects[1]	Action Alternatives 2-4	
SR Steelhead and DCH	LAA	LAA	Under Alternative 1, adverse effects to Steelhead are limited to short-term increases in sediment deposition and altered hydrologic process post-fire but, overall post fire disturbance would have long-term benefits to fisheries with increased fish densities and habitat complexity through large wood recruitment and delivery of spawning gravels (Tables 3-9, 3-10, and 3-23). NEZSED modelling indicates that increased sediment yields from proposed activities under all action alternatives are not measurably greater than modeled post-fire sediment effects (Table 3-7). Conditions would return to baseline or below baseline sediment yields approximately 3 years post-fire (Appendix C). Proposed harvest activities with project specific design criteria and BMPs would have negligible direct or indirect effects to steelhead under all Alternatives (Tables 3-8 and 3-9); however, connected actions such as road upgrades/decommissioning could have measurable downstream short- term increases of sediment but, with potential long-term watershed benefits (Table 3-10). The percent decrease in steelhead rearing habitat post-fire and under the proposed actions would be below the 10% potential change threshold designated by FISHSED (Appendix C, Table C4). Cumulative effects specifically, salvage operations on IDL and private lands could have adverse measurable effects to steelhead and their habitat given proposed activities on sensitive/landslide prone areas and the construction of temporary roads and landings, and the reconstruction of existing roads on private lands within the proximity of Elk City Creek. There could be measurable increased surface erosion from harvest units, temporary road/landing construction and reconstruction of existing roads on private lands. Increases of instream sedimentation would affect spawning and rearing habitat for steelhead in Swiftwater Creek and lower Elk City Creek. These proposed activities would be adjacent to past salvage operations on private lands and south of proposed Forest Service activities. FISHSED and NEZSED results did not account for proposed salvage activities on State or private lands.
SR Fall Chinook and DCH	NLAA	NLAA	Fall Chinook distribution is primarily limited to the mainstem Selway and Middle Fork Clearwater rivers. These lower reaches serve as migration corridors and spawning habitat as well. Spawning densities have increased on the Middle Fork Clearwater River substantially, with lower spawning densities in the mainstem Selway (Appendix A, Table A7). Spawning habitat does not appear to be limited in the lower Selway reaches and these numbers are expected to increase with supplementation efforts by the Nez Perce Tribe in the future. There would be limited post-fire adverse effects to fall Chinook given their distribution is restricted to lower portions of the Selway

Species and DCH	Determination		Rationale
	Alternative 1 Fire Effects[1]	Action Alternatives 2-4	
			and Middle Fork Clearwater rivers and the time of spawning (October to December). Stream flows during this time are variable but, in general, base-flows increase with fall precipitation. Post-fire effects are less detectable on these mainstem rivers given their channel size, hydrological regime, and available habitat for salmonids. Sedimentation increases are expected 2-3 years post-fire and would peak during periods of high spring flow and winter rain or snow events. Sedimentation effects would be lessened or diluted with increases in water flow/velocities. NESZED and WEPP modelling indicated a slight increase in sediment yield above the post-fire baseline (Appendix C), and a reduction with the implementation of project design criteria (WEPP analysis). Table 3-13 indicated percent increase in sediment yield as a result of implementing the proposed activities (0-5%), above post-fire conditions, which would be below the percentage allowable under the Forest Plan. NEZSED/WEPP models were not applied to IDL and private salvage actions; therefore, short- and long-term sediment yield from these proposed activities is not entirely known. However, Chinook distribution is restricted to the mainstem Selway and Middle Fork Clearwater rivers and similar to the post-fire effects, sedimentation would be less detectable on these mainstem rivers given their channel size, hydrological regime, and available rearing and spawning habitat for fall Chinook above and below the project area, and the time of spawning. Data (Arnsberg and Kellar 2013) suggests increased adult returns and spawning densities throughout the mainstem Middle Fork Clearwater and Selway rivers, and potentially O'Hara Creek.
CR Bull Trout and DCH	NLAA	NLAA	Similar to fall Chinook, bull trout distribution is limited to the mainstem Middle Fork Clearwater and Selway rivers. The mainstem rivers provide only migratory and over-wintering habitat, with no or limited distribution within O'Hara Creek (Appendix A). Proposed harvesting activities with project specific design criteria and BMPs would have negligible direct and indirect effects to bull trout. Summertime temperatures exclude potential rearing habitat (Appendix B); therefore effects from increased turbidity downstream of the project area after intense summer precipitation events would have minimal effects to bull trout downstream. Although there is the potential for increased sediment yield due to the proposed IDL and private salvage activities in landslide prone areas, measurable effects to bull trout would be difficult to quantify given the short duration (primarily migratory) bull trout are present in the lower Selway and Middle Fork Clearwater rivers. Winter rain-on-snow events could result in increased sediment delivery to the stream channels; however, these turbidity effects would be short-term and limited in size and scale considering the existing habitat in the greater Selway and Middle Fork Clearwater rivers. These large rivers lack the

Species and DCH	Determination		Rationale
	Alternative 1 Fire Effects[1]	Action Alternatives 2-4	
			mechanism, or are more resilient, to greatly alter pool frequency or over-wintering habitat beyond existing conditions.
Chinook EFH	NLAA	NLAA	Proposed harvesting activities with project design criteria and BMPs would have negligible direct or indirect effects to EFH under all Alternatives. Given the location of EFH (mainstem Selway and Middle Fork Clearwater rivers) to proposed activities, post-fire and cumulative effects would be negligible. Spring Chinook are supplemented below O'Hara Creek by the Nez Perce Tribe and spawn in lower reaches of the O'Hara Creek. Approximately 2% of the subwatershed burned at low to moderate severity. Total percentage of watershed disturbance is 1% (Table 3-8) and project related ECA increase would be approximately 0.2% (Table 3-7).Intense precipitation events could increase sediment delivery to the stream channels; however, these turbidity effects would be short-term and limited in size and scale considering the existing habitat in the greater Selway and Middle Fork Clearwater rivers. These large rivers lack the mechanism, or are more resilient, to greatly later pool frequency or Chinook over-wintering or summer rearing habitat beyond existing conditions.

[1]The Effects Determination between Alternatives does not differ because NEZSED and FISHSED models indicate that increased sediment yields from proposed activities under all action alternatives are not significantly greater than modeled post-fire sediment effects under Alternative 1, refer to Hydrology specialist report).

Meeting the Intent of the 1998 Forest Plan Biological Opinion for Steelhead

In 1997, the U.S. Forest Service and Bureau of Land Management completed a Biological Assessment (BA) relevant to all long-range management plans as amended by PACFISH, across the Columbia River Basin range for steelhead trout that were proposed for listing under the ESA. Included in the BA were nine recommended actions to reduce and avoid adverse effects to steelhead, one of which added special management provisions for the Selway River, Middle Fork Salmon River, and South Fork Salmon River. These provisions included additional protective measures above and beyond those in PACFISH because these steelhead populations were considered critical to the conservation and recovery of the Snake River Basin steelhead Distinct Population Segment. In 1998, ESA Section 7 consultation in the form of a Biological Opinion (BiOp) on long-range management plans/forest plan was completed with these provisions included as part of the Proposed Action. The provisions from the BA that pertain to the Johnson Bar Fire Salvage Project include:

- Build new roads only to replace existing roads in RHCAs, or directly repair human-caused damage to steelhead habitat in streams;
- Do not widen roads by increasing cut and fill slopes in order to accommodate more traffic and/or larger vehicles than can presently use the road;
- Do not open closed and revegetated roads for management purposes unless necessary to repair human-caused damage to steelhead habitat;
- Use only existing open roads, with construction of new landings;
- Only use timber harvest methods (such as helicopters, horses, etc.) that result in low levels of ground disturbance or that avoid adverse effects to steelhead.

The 1998 Forest Plan BiOp was a refinement of the 1995 BiOp in which shortcomings of the Forest Plans/Land Resource Management Plans (LRMPs) were identified, including the inconsistent application of PACFISH buffers and timber removal within the buffers. They also noted that road rehabilitation and obliteration, and other restoration activities have been inadequately planned, funded, and monitored thus reducing the ability to improve baseline conditions for listed fish. The concerns have been incorporated into projects and have been funded across the Forest, include the Johnson Bar Fire Salvage Project, since 1998. The fire salvage project would implement full PACFISH buffers and would conduct road related activities that are expected to lead to improvements to steelhead trout habitat. This in turn is expected to meet the intent and objectives of the BiOp in that it implements projects that “directly repair human-caused damage to steelhead habitat in streams” (BiOp page 85), particularly those related to the existing road system.

The Level 1 team (NMFS, USFWS, USFS, and BLM) responsible for consultation on ESA listed species had lengthy discussions in 2013 about potential effects from the Iron Mountain Vegetation Management Project in relation to the additional nine items listed in the 1998 Forest Plan BiOp. The Iron Mountain Project, like the Johnson Bar Fire Salvage Project, lies within the Lower Selway River drainage and conducts timber harvest operations. As a result of

these discussions, it was agreed that projects within the Selway Basin would go through informal or formal consultation depending on the effects determinations made by the Forest Service to determine if individual projects met the objectives of the 1998 Forest Plan BiOp. The overall intent and direction of the BiOp was to avoid management actions that would have adverse effects to steelhead or their critical habitat. The way it was to be accomplished was to recommend ways to minimize or avoid adverse actions and to use Level 1 teams and Biological Assessments to accomplish those recommendations (BiOp pages 24, 74, and 75).

The Johnson Bar Fire Salvage Project has been discussed on multiple occasions at Level 1 since December 2014. This resulted in the Forest Service and NMFS working cooperatively to shape project actions that avoid adverse effects to steelhead and steelhead critical habitat from harvest activities. The general themes related to harvest include, emphasizing low impact harvest methods (e.g. 97% helicopter and skyline yarding); limiting temporary road construction to low gradient ridgetop locations and prioritizing existing roads for landings; landings, swing trails, and skyline corridors were located and designed to be hydrologically disconnected from the stream network in order to avoid mechanisms for sediment delivery to streams. They also include PACFISH buffer retention on all streams and landslide prone areas adjacent to timber harvest units. All design criteria can be found in Section 2.9 of this FEIS.

Design Criteria Effectiveness

The 1998 Forest Plan BiOp states, “it is acknowledged that there are limitations to the best available science and that these limitations play an important role in actual effects to steelhead from management actions. Mitigative measures are intended to provide risk avoidance until such time as better scientific information in available” (BiOp page 84). New scientific information on the effectiveness of design criteria has become available since 1998, including PIBO (PACFISH/INFISH Biological Opinion) and local BMP monitoring.

Preliminary monitoring results from PIBO monitoring acorss the Upper Columbia River Basin indicate improving trends in pool depth, large wood frequency, bank stability, percent fines, and percent undercut banks in reference sites. Negative trends for pool percent and bank angle were observed. In managed sites positive trends in pool depth, wood frequency, percent undercut banks, bank stability, and bank angle were observed. Negative trends were observed in percent pools. There was no significant trend in percent fines at managed sites (USDA Forest Service 2012).

Local BMP monitoring of timber sales on the Clearwater National Forest have been occurring since 1990. Between 1990 and 2008, the Forest had BMP implementation and effectiveness rates of 97% or greater (USDA, 2009). These reports can be found on the internet at: http://www.fs.usda.gov/detail/nezperceclearwater/landmanagement/planning/?cid+stelprdb5408439.

The same BMPs would be applied to the Johnson Bar Fire Salvage Project and are expected to have similar results since the project occurs on similar landtypes, soils, forest types, and stream types as those that were monitored.

Other local monitoring includes a post-timber harvest and burning field review of 23 miles of PACFISH buffers and 5.5 miles of temporary roads. These were conducted on the Lochsa District

in 2014 (USDA Forest Service, unpublished data). The results showed no evidence of sediment moving from harvest units into the buffers or from temporary roads into the harvest units or buffers. The thick vegetation making up the buffers provided an excellent, virtually impenetrable, filtering source for overland sediment flow. The downed wood debris left within the harvest units also provided structures that captured sediment and slowed or stopped its movement down the slope. Similar results would be expected with the Johnson Bar Fire Salvage Project, especially given that 75% of the buffers were unburned or burned at low severity. Also the project area is very similar in landtypes, soils, and forest types as those that were monitored (Pete King Creek and Lolo Creek drainages).

Other studies have shown that no harvest buffers of 100 to 150 feet adjacent to timber sales are adequate in protecting the riparian vegetation necessary to maintain natural stream temperature and wood levels (Anderson and Poage 2014; Ott et al. 2005; Lee et al. 2004; Sridhar 2004; FEMAT 1993). PACFISH buffers surpass these guides on fish bearing streams and meet those on non-fish bearing and intermittent streams.

The design criteria are expected to minimize the effects to streams from harvest activities and meet the objectives of the 1998 BiOp based on monitoring. However, a Likely to Adversely to Affect determination for listed steelhead and their habitat was made due to the short-term sediment effects specifically associated with the road improvement, storage, and decommissioning activities of the project, as well as the cumulative effects associated with timber salvage on the Idaho Department of Lands portion of the fire area. As a result, the Forest pursued formal consultation. Design criteria associated with road related work would be expected to minimize potential effects to steelhead. These include the installation of cross-drain culverts, road surfacing, dust abatement, and practices to reduce sediment delivery during road decommissioning, culvert removal, and culvert replacement (FEIS Section 2.9). The effectiveness of the design criteria associated with roads is described under the Hydrology section of this document (FEIS Section 3.4).

In summary, project related actions are expected to have a minimal potential for adverse effects to listed steelhead or their critical habitat as a result of the following:

- Timber harvest units would occur a minimum of 0.1 mile from steelhead or their designated critical habitat in the Selway River and Goddar Creek. The harvest units closest to these streams would be helicopter logged, which meets the objectives and intent of the BiOp. Due to the distance between the harvest units and occupied steelhead habitat, only immeasurable amounts of sediment could potentially affect individual steelhead or their designated critical habitat.
- The amount of sediment created during timber harvest activities, road work, and culvert work would be discountable downstream where steelhead occur. This is due to the amount of distance between the activities and fish or their habitat, and the design criteria incorporated in the proposed activities that would minimize sediment production and the ability of it to reach streams. Design criteria effectiveness is based on local monitoring and recent science.

- Normal road maintenance, improvement and decommissioning activities would reduce sediment delivery to streams over the long-term by improving drainage, resulting in long-term beneficial effects to steelhead and their critical habitat.

The Forest Service would therefore meet the intent and objectives of the 1998 Forest Plan BiOp for Steelhead with the Johnson Bar Fire Salvage Project. As shown in the analysis, the effects of the proposed activities would have the same effects to listed steelhead and their critical habitat as if the 5 special provisions in the BiOp had been adhered to. The Forest Service is also committed to using the best available science in order to conduct projects that lead to the improvement of aquatic habitats or that minimize the effects to aquatic systems, listed fish species, and their respective habitat.

Table 3-26: Determination of Effects to Regional Sensitive Species

R1 Sensitive Species	Determination		Rationale
	Alternative 1 No Action	Alternatives 2-4 Action Alternatives	
Spring Chinook Salmon	MIIH[1]	MIIH	Proposed harvest activities with Project specific design criteria and BMPs would have negligible direct or indirect effects to Spring Chinook under all Alternatives. Given location of EFH to proposed activities and cumulative effects would have limited or negligible effects to EFH. Any detectable post-fire increases in sediment and turbidity could be intense but of short duration after precipitation events primarily during the summer months 1-3 years post-fire.
Interior Redband trout	NI[2]	NI	No known isolated populations of Interior Redband trout have been documented. Refer to Steelhead Effects Determination.
Westslope Cutthroat Trout (WCT)	MIIH	MIIH	Under Alternative1, adverse effects to WCT are limited to short-term increases in sediment deposition and altered hydrologic process post-fire but, overall post fire disturbance would likely have long-term benefits to fisheries with increased fish densities and habitat complexity (Table 3-22). Project design criteria, BMPs and logging system methods and temp road construction would have negligible direct or indirect effects to steelhead under all Alternatives; however, connected actions such as road decommissioning could have measurable short-term increases of sediment but, with potential long-term watershed benefits. Cumulative effects specifically, salvage operations on IDL and private lands could have negative measurable effects to WCT habitat given proximity, duration and magnitude of proposed actions to occupied WCT habitat in lower Swiftwater.
Pacific Lamprey	MIIH	MIIH	Post-fire effects are less detectable on the Selway and MF Clearwater rivers. Given location of occupied habitat on the Selway and MF Clearwater river, proposed project activities with design criteria, BMPs and logging system methods there would be negligible direct or indirect effects to Pacific Lamprey under all proposed Alternatives.
Western Pearlshell Mussel	MIIH	MIIH	Post-fire effects are less detectable on the Selway and Middle Fork Clearwater Rivers. Given location of occupied habitat on the Selway and Middle Fork Clearwater River, proposed project activities with design criteria, BMPs and logging system methods there would be negligible direct or indirect effects to WPM under all proposed Alternatives.

[1]May Affect Individuals and Individual Habitat but, is not likely to result in a trend toward federal listing, and continued viability is expected on NPCLW NF
[2]No Affect to Individuals and Individual Habitat.

3.6 Native American Tribes

3.6.1 Analysis Area

The Johnson Bar Project Area lies within the aboriginal territory of the Nez Perce Tribe as defined by the U. S. Claims Commission in 1967, and is within the boundaries covered by the Treaty of 1855. The lands within the project area were ceded by the Nez Perce Tribe to the United States under the Treaty of 1863. However, the Treaty of 1863 did not affect any hunting, fishing, or gathering rights reserved under the Treaty of 1855. The area has been used for centuries by members of the Nez Perce Tribe as a source of cultural and traditional resources and for various activities, such as hunting, plant gathering, and practices associated with traditional beliefs. The Tribe still maintains these ties to the area. However, no Native American related archaeological sites have been identified within the project area.

3.6.2 Regulatory Framework

3.6.2.1 Tribal Treaty Rights

The Nez Perce Tribe retains fishing rights at all ”usual and accustomed places” and hunting, gathering and pasturing rights on “open and unclaimed land” as per the terms of their 1855 Treaty with the United States. The Nez Perce Tribe historically used the entire Nez Perce-Clearwater National Forests for such uses. These rights are reserved within the National Forest and Johnson Bar project area.

The Johnson Bar project area is important to the Nez Perce Tribe as an area rich in tribal tradition for gathering, hunting, fishing, camping, and religious activities. The area is important to the Nez Perce people who value access to their traditional land use areas.

3.6.2.2 Nez Perce National Forest Plan

The project is consistent with the Nez Perce National Forest Plan and the National Historic Preservation Act. Specific Forest Plan direction (FP page II-23) requires the protection of Indian Tribal rights as retained in treaties and other agreements, and to protect religious ceremonial sites and hunting and fishing rights. Other agency plans direct the Forest Service to work closely with area Indian Tribes to achieve mutual goals and objectives, to ensure trust responsibilities of Indian treaties are honored, and to ensure Forest Actions are not detrimental to the protection and preservation of Indian Tribes’ religious and cultural sites, practices and treaty rights.

3.6.3 Direct and Indirect Effects

3.6.3.1 Fishing

3.6.3.1.1 Alternative 1

Current recovery trends would continue in the area's streams. However, some sediment would continue to enter the streams from roads. The proposed road watershed improvement activities and reforestation would not take place.

3.6.3.1.2 Alternatives 2, 3, and 4

Proposed activities are not likely to affect the ability of Nez Perce Tribal members to exercise their right to fish within or near the analysis area. Effects upon aquatic habitat are expected to be minimal, and not likely to affect fish populations (refer to the Hydrology and Fisheries reports).

Riparian buffers (PACFISH) and BMPs related to logging and access development would be implemented under each alternative, and watershed modeling shows watersheds affected by proposed activities would meet Forest Plan Standards and would not have an unacceptable effect on fish as required by the 1998 Biological Opinion. Also, the proposed restoration activities, including road decommissioning and the planting of trees would have the potential to benefit fish habitat over the long-term by reducing sediment and providing long-term slope stability, which has been lost due to the fire mortality of the trees.

3.6.3.2 Hunting

3.6.3.2.1 Alternative 1

There would be minimal effects to Tribal hunting. Forage needed for elk and other big game animals is currently limited due to the fire. Access to new foraging areas would decrease as the dead trees fall down and block access to foraging sites. Hunting opportunities for Tribal members should continue at current levels.

3.6.3.2.2 Alternatives 2, 3, and 4

Alternatives 2, 3, and 4 would benefit big game habitat effectiveness because of road decommissioning. Big game hiding cover would be reduced under all action alternatives through the removal of dead trees; however, over the long-term the burned areas would remain useable for big game foraging because the areas would not become blocked by dead trees as they fall down in 5-15 years. Road closures associated with the action alternatives should provide a positive benefit to elk security. Overall, hunting opportunities for Tribal members are not expected to decline below current levels under the action alternatives because big game populations would remain stable; however, some hunting access on old roads would be reduced. Reforestation would provide cover sooner in heavily burned areas than if left to regenerate naturally.

3.6.3.3 Gathering Activities

3.6.3.3.1 Alternative 1

Vegetative crops, such as huckleberries and elderberries, are common throughout the analysis area. All of these sites would remain in their current condition. The fire opened some of these areas up to sunlight, which would enhance the vegetative growth and promote mushroom production.

3.6.3.3.2 Alternatives 2, 3, and 4

Timber harvest activities are not planned within riparian areas, including meadows, which are associated with many Tribal gathering activities. The removal of the over-story dead trees would allow more light into the areas, which would increase shrub growth. Mushrooms would also flourish after the harvest activities. Overall, the effects to Tribal gathering activities should be minimal and potentially beneficial.

3.6.4 Cumulative Effects

Time Frame: 15 years after project implementation.

Geographic Boundary: The aboriginal territory of the Nez Perce Tribe, as defined by the U.S. Indian Claims Commission in 1967 (approximately 7.7 million acres, which includes most of the Nez Perce National Forest and all of the project area).

Past, Present, and Foreseeable Future Actions: Past actions include timber sale activities and grazing. The present actions that could possibly have an effect on fishing, hunting, or gathering activities consists of noxious weed treatment as part of an ongoing District weed program, which should be beneficial by reducing vegetative competition for big game browse plants, herbs, and berries. Reasonably foreseeable future actions include completing the harvesting on the adjacent Lodge Point, Clear Creek and Lowell Wildland Urban Interface (WUI) sales and weed spraying within the project area.

3.6.4.1 Alternatives 2, 3, and 4

The project is designed to minimize cumulative effects to Tribal Treaty rights, because the proposed activities in conjunction with other past, present and reasonably foreseeable future activities in the area are localized, and at such small scales, that they do not add up to many acres being treated. The effects of additional burning would be minimal, due to the limited amount, or lack of, treatments. Watershed improvement projects and soil decompaction would benefit the watershed restoration efforts and provide potential fisheries benefits, but the added effects would again be minimal. The project's soil disturbing activities could promote noxious weeds, but the District has an effective weed eradication program that would mitigate any weed risk, along with timber contract requirements to clean all logging equipment, except trucks. As has been done in the past and is currently being done, consultation with the Tribe would be initiated for each future activity proposal, and design or mitigation measures would be implemented to minimize or eliminate any adverse effects.

The most benefit from present or reasonably foreseeable future activities could come as a result of the District-wide noxious weed program. Noxious weeds compete with native species, some of which are of cultural importance to the Tribe. Reducing or eliminating competition from weeds should have a beneficial effect on forage for wildlife, sediment trapping vegetation, and cultural plant species.

3.6.5 Irreversible and Irretrievable Commitment of Resources

None known or suspected.

3.6.6 Adverse Effects Which Cannot Be Avoided

None known or suspected.

3.7 Rare Plants

3.7.1 Analysis Area

The analysis area for this assessment includes only the approximately 13,000 acres of NFS lands, all of which occur across drainages in the Middle Fork Clearwater River and Lower Selway Watersheds: more specifically, Decker, Swiftwater, Elk City, Goddard and O'Hara Creeks.

3.7.2 Regulatory Framework

Forest Plan direction and all Federal and State laws and regulations pertaining to the management of rare plants on the Forest would be applied to the project, including the NFMA of 1976 and the Endangered Species Act.

3.7.2.1 Endangered Species Act

Threatened and endangered species are designated under the Endangered Species Act (ESA). The four plants listed as threatened that occur in Idaho are Macfarlane's four-o'clock (*mirabilis macfarlanei*), Water howellia (*Howellia aquatilis*), Ute Ladies'-Tresses (*Spiranthes diluvialis*), and Spalding's catchfly (*Silene spaldingii*). According to the U.S. Fish and Wildlife Service, Water howellia (Howellia aquatilis) and Ute ladies'-tresses orchid and their habitat are not found on the Nez Perce National Forest and will not be further addressed. The project area does not contain landscape characteristics, plant community composition, or community structure that would suggest suitable habitat for Spalding's catchfly (*Silene spaldingii*) or Macfarlane's four-o'clock (*Mirabilis macfarlanei*), based on current knowledge of existing habitat for these species. According to the latest U.S. Fish and Wildlife Service Species List Update 8/2013, no federally listed plant species or proposed critical habitat occurs on the Moose Creek Ranger District, therefore these species will not be considered further. Slickspot peppergrass *(Lepidium papilliferum*) has been recently listed as Proposed for Idaho, but this southern Idaho Species does not occur on the Nez Perce National Forest.

3.7.2.2 Sensitive Plants

Sensitive species are those plant and animal species identified by the Regional Forester for which population viability is a concern, as evidenced by substantial current or predicted

downward trends in population numbers, density, or habitat capability that reduce a species existing distribution. Management direction for sensitive species is to ensure that species do not become threatened or endangered because of Forest Service actions and to maintain viable populations of all native species. The most recent update to the sensitive species list was published in 2011 The Forest Service must evaluate effects to sensitive species through a biological evaluation. All Nez Perce Forest sensitive plant species have been evaluated as to their presence, presence of their habitat, and whether the species or habitat may be potentially affected.

3.7.3 Analysis Methodology

Species information is based upon existing information, Idaho Conservation Data Center (CDC) data, GIS modeling of habitat parameters, photo interpretation, and field surveys. Individual species requirements were reviewed and appropriate modeling criteria selected to determine which species or corresponding habitat would be expected to occur in the project area.

Forest Service Botanists conducted TES Plant surveys during the summer of 2013 within the Middle Fork Clearwater River Watershed. These field surveys were a spot check of various habitats (riparian and terrestrial) and proposed “focus areas” that were being considered for possible future vegetation treatments along the Middle Fork Clearwater River. Understory plant species included: Ninebark (*Physocarpus malvaceus*), Ocean spray *(Holodiscus discolor*), wild ginger *(Asarum caudatum*, Sitka alder (*Alnus sinuate*), Western goldenthread *(Coptis occidentalis*), Pearly everlasting *(Anaphalis margaritaceae*), Common yarrow (*Achillea millefolium*), twinflower (*Linnaea borealis*), queen cup beadlilly (*Clintonia uniflora*), Montana golden pea (*Thermopsis montana*), common snowberry (*Symphoricarpos albus*), mountain maple (*Acer glabrum),* prince’s pine (*Chimaphila umbellate*), Pioneer violet (*Viola glabella*) and mountain ash (*Sorbus scopulina*). No Federally Proposed, Threatened or Endangered Plant Species, or potential habitat, were found.

3.7.4 Resource Indicators

Vegetation management, temporary road construction, and logging activities could directly affect some plant species. Indirect effects may include the expansion of weeds and the mitigating treatments of these infestations or changes to the forest canopy that may affect light and temperature regimes. Cumulative effects are the overall effects to species from past, present, and reasonably foreseeable future projects. Historically such effects on individual species was not measured or noted. However, the past effects on general habitat condition can be qualified and matched to species dependent on a particular habitat. For this reason, local landtype classifications (Vegetation Response Units) are used for the direct, indirect, and cumulative effects discussions. The effect on potentially suitable habitat is the primary indicator used in the analysis.

3.7.5 Affected Environment

Habitats within the Johnson Bar Fire Salvage Project area are dominated by the Idaho Batholith Breaklands (VRU 8) with moist western red cedar (*Thuja plicata*) and grand fir (*Abies grandis*). These habitats are generally cooler, wetter and associated with the maritime coastal

disjunction plant species. A relatively small portion is classified as Uplands (VRU 10 and 17), which are generally cooler, above the Breaklands, and have a more rolling topography. Typical potential vegetation in these habitats includes grand fir, western red cedar, and shrubs (alder). Before the Johnson Bar Fire in 2014, ninety percent plus of the analysis area was in a closed canopy condition of various age classes of 40 plus years of age. Structural stages differ by the respective Vegetation Response Units (VRUs) but in general the Breaklands and Uplands trend low in the 0 – 40-age class and are overabundant in the 41-100 year age class. Riparian Habitat Conservation Areas (RHCAs) designated as PACFISH buffers constitute approximately 25% of the analysis area and approximately 4% of the analysis area is old growth.

SENSITIVE SPECIES

Habitat does exist for eleven Sensitive Plant Species found on the Nez Perce National Forest; however, only three of these sensitive species; Pacific dogwood (*Cornus nuttallii*), Clustered ladyslipper (*Cypripedium fasciculatum*), and Constance's bittercress (*Cardamine constancei*), are known to exist in the analysis area. During previous botanical surveys of the site, these 3 Forest Sensitive Plant species were found growing within the areas proposed for treatment across the Middle fork Clearwater River Watershed. Most of the known Sensitive Plant Species growing in the drainage are located in the upper reaches, where some treatments are planned, and several are scattered along riparian areas of the watershed where habitat would be protected by implementation of PACFISH buffers.

According to records from the Idaho Conservation Data Center (ICDC) and field surveys from 2013 and prior years, there are three sensitive plant species known to occur within some of the proposed fire treatment areas. Two of those species, Constance's bittercress (Cardamine constancei) and Clustered ladyslipper (Cypripedium fasciculatum) are found to be much more abundant than previously thought. However, potential habitat exists in the project area for 11 sensitive plant species, Table 3-27 lists those plant species or their habitats that would be affected by the Johnson Bar Fire Salvage project. Sensitive species not included in the table are not known or suspected to occur in the project area, nor is suitable habitat present based upon existing information or habitat modeling. These species are accounted for in the Biological Evaluation. There are no occurrences or suitable habitat for any Threatened or Endangered plant species listed on the Nez Perce Forest and they will not be addressed any further in this document.

Table 3-27: Potential Sensitive Plants within the Project Area

Common and Latin Name	Habitat	Presence	Habitat/Community Type	Elevation (feet)
Deerfern *Blechnum spicant*	Present	Potential	Coastal disjunctive population in Idaho, moist to wet forests, generally heavily shaded	1,500-3,000
Lance-leaf moonwort *Botrychium lanceolatum var.lanc*.	Present	Potential	A wide variety of habitats, including wet to moist grassy and rocky slopes, woods, and edges of lakes, generally at fairly high elevations, soils tend to be cold and subacid.	1,500-6,000
Mingan moonwort *Botrychium minganese*	Present	Potential	Shaded moist sites under mature western red cedar and various conifers, dry to moist meadows	1,500-6,000
Northern moonwort *Botrychium pinnatum*	Present	Potential	Shaded moist sites under various conifers. Dry to moist meadows.	1,500-6,000
Green-bug-on-a-stick *Buxbaumia viridis* (moss)	Present	Potential	Moist grand fir or cedar forests on large decayed logs and ash soils	1,500-5,000
Constance's bittercress *Cardamine constancei*	Present	Known	Occurs in moist coniferous woods along rivers and partial shade under western red cedar	1,500-4,000
Buxbaum's sedge *Carex buxbaumii*	Present	Potential	Wet meadows, small fens and seeps on saturated organic soil.	2,000-5,000
Pacific dogwood *Cornus nuttallii*	Present	Known	Forest openings, gaps in low elevation western red cedar along the Selway River	1,500-3,000
Clustered ladyslipper *Cypripedium fasciculatum*	Present	Known	Partial shade of moist western red cedar, Grand fir or Douglas-fir.	1,500-4,800
Light hookeria *lucens*	Present	Potential	Shaded areas on saturated soil within the warm/moist western red cedar and mixed conifer forests	Below 4,000
Naked-stem rhizomnium *Rhizomnium nudum* (moss)	Present	Potential	In moist mineral soil of low elevation, warm grand fir and western red cedar forests (including along streams)	2,000-5,000

3.7.6 Direct and Indirect Effects

3.7.6.1 ALTERNATIVE 1

No management activities are proposed under this alternative; therefore, there would be no direct effects on plant species or habitats. Indirectly changes in stand structure would be expected through time, some of which would alter suitable habitats for some sensitive plant species. In mixed-conifer forest types, especially with grand fir and Douglas fir, root disease and insects would continue increased tree mortality as the stands age and potentially create a higher degree of fire risk to the stands.

In general, species requiring late successional forests would see an improvement in habitat quality, while those requiring conditions that are more open would decline barring the absence of substantial fire or other forest disturbance agents, such as severe wind or insect and disease epidemics. The increased severity of wildfire is possible due to the increased fuel build up in these areas from increasing insect and disease mortality.

3.7.6.2 ALTERNATIVES 2, 3, and 4

The Johnson Bar Fire of 2014 was located primarily within the Idaho Batholith Breaklands (VRU 8) and reduced ground and ladder fuels with an overall moderate mixed severity burn, with pockets of high intensity soil scarification that created stand openings, which changed light and temperature dynamics substantially enough post burn, to alter the existing potential plant habitat and existing species representation. The proposed salvage harvest treatments would not appreciably change current habitats from a pre-fire closed crown condition to openings with vertical retention of individual and clumps of leave trees. These harvest methods would not increase light and temperature regimes significantly from the current post-fire condition that would alter more early successional, shade intolerant plant and tree species. The implementation of the tractor harvest systems has the potential for moderate mechanical ground disturbance, but the overall habitat conditions likely would not change enough to affect most later successional, shade tolerant plant species. Habitats preferred by late successional, closed canopy dependent species are generally associated with Resource Habitat Conservation Areas (RHCAs), which are excluded from harvest under PACFISH guidelines. Additionally, all alternatives exclude harvesting of old growth.

Road decommissioning and reconditioning would maintain current conditions for sensitive plants. Generally, old roads that are candidates for decommissioning do not provide habitat for these species. Temporary roads are a direct disturbance to suitable habitats. When temporary road segments are sorted by potential habitat for sensitive plant species, it is assumed that for each mile of road constructed, approximately 2.5 acres of habitat would be reduced over the short-term. A total of approximately 6 acres of habitat could be affected under Alternative 2 and 6 acres under Alternative 4. No new road construction is being proposed under Alternative 3. Sites for proposed soil restoration or stabilization generally are not considered suitable habitat, and not considered when determining the effects of this proposed project.

All three of the Forest Service Sensitive Plant Species known to exist within the proposed project area, Constance's bittercress (*Cardamine constancei*), Pacific dogwood (*Cornus nuttallii*), and Clustered ladyslipper (*Cypripedium fasciculatum*), were determined to be potentially affected by alternatives 2, 3, and 4. Timber harvest, road construction, and the associated soil scarification have the potential to disturb existing individual plants. However, due to the relative abundance of known occurrences, low levels of potential habitat negatively affected and the design criteria listed below, it was determined that the action alternatives may affect individuals, but are not likely to cause a trend toward Federal Listing or reduced viability for the overall population or species. Table 3.26 lists a Summary of Effects (Reference TES Plant BA/BE in Project Record).

The following project design criteria would limit negative effects to sensitive plant species:

- No harvest would occur within PACFISH buffers
- No harvest would occur within old growth
- Pre-sale personnel would report any occurrences or suspected occurrences of sensitive plant species to the Zone Botanist to evaluate the need for mitigation measures.

SENSITIVE PLANT EFFECTS DETERMINATIONS

Determination of effects on sensitive plant species by the proposed project are summarized by the checklist below. Only plant species that have potential habitat in the project area are included in the table.

Table 3-28: Summary of Effects for Regional Designated Sensitive Plant Species (Includes all action alternatives)

LATIN NAME	Common Name	CAT.	Species Present	Habitat Present	Species Potentially Affected	Habitat Potentially Affected	Determination
Blechnum spicant	Deerfern	*S*	No	Yes	No	No	NI
Botrychium lanceolatum var.lanc.	Lance-leaf moonwort	S	No	Yes	No	No	NI
Botrychium minganese	Mingan moonwort	S	No	Yes	No	No	NI
Botrychium pinnatum	Northern moonwort	S	No	Yes	No	No	NI
Buxbaumia viridis (moss)	Green-bug-on-a-stick	S	No	Yes	No	No	NI
Cardamine constancei	Constance's bittercress	S	Yes	Yes	No	No	MI
Carex buxbaumii	Buxbaums sedge	S	No	Yes	No	No	Ni
Cornus nuttallii	Pacific dogwood	S	Yes	Yes	No	No	MI
Cypripedium fasciculatum	Clustered ladyslipper	S	Yes	Yes	No	No	MI
Hookeria lucens	Light hookeria	S	No	Yes	No	No	NI
Rhizomnium nudum (moss)	Naked-stem rhizomnium	S	No	Yes	No	No	Ni

Sensitive Species Determination: NI = No Affect; **BI** = Beneficial Affect; **MI** = May Affect individuals or habitat but not likely to cause trend toward federal listing or reduce viability for the population or the species; **LI =** Likely to affect individuals or habitat with the consequence that the action may contribute towards federal listing or result in reduced viability for the population or species.

As stated under the regulatory framework, the objective for managing sensitive species is to ensure population viability throughout their range on National Forest System lands and to ensure they do not become federally listed as threatened or endangered. The Forest Plan supports this direction but does not set specific standards and guidelines for sensitive plants. The alternatives are consistent with this direction to the extent that proposed management actions would not adversely affect the viability of existing sensitive plant populations or their associated habitats.

3.7.7 Cumulative Effects

Discussion of cumulative effects for rare plants is addressed through the general trends of suitable habitat required by these species as a result of past, present, and reasonably foreseeable future management actions.

Geographic Boundary: The cumulative effects boundary includes all lands within the project area. The rationale for this is that the effects are site specific to treatment areas and would not extend beyond the boundaries, and effects from outside the defined area would likewise not affect the resource within.

Time Frame: It is not possible to quantify effects of specific activities that are several years or decades old. The status and occurrence of sensitive and rare plants was completely unknown for much of the management history of the watershed. The historic changes in condition and abundance of specific habitats are also largely unknown. Therefore, the effects of these past projects can only be qualified through general discussions.

Past, Present, and Foreseeable Future Actions: Past and present timber harvesting, grazing, road construction, exotic plant treatments, wildfire suppression, and prescribed fires have influenced rare plants in the project area.

Timber harvesting began in the 1960s and averaged approximately 3,900 acres per decade up until 2000 through 2009 when only 1,400 acres were harvested, primarily through implementation of the Middle Fork Timber Sale. In addition, advancement in harvest operations, logging technology, BMPs, including retention of PACFISH buffers, has significantly reduced timber harvest resource effects. Road decommissioning started in the 1990s and has increased ever since. All of the past regeneration harvests have been regenerated and roads within the project area constructed to support past timber sales are generally well located on the upper third of slopes or on ridge tops, and most of these roads are graveled to reduce sediment. Past timber harvests and associated road construction are considered part of the existing condition.

Grazing is occurring in the proposed project area; however, it is relatively small in scale and consists primarily of transitional range and there are currently no issues in regard to riparian effects associated with grazing. There is very little if any effect from livestock grazing within the late successional, closed canopy habitats because of access and lack of desirable forage. An Adaptive Management EIS is currently being developed for this allotment as part of a larger landscape assessment of grazing that includes 15 grazing allotments covering 350,000 acres. A

decision is expected in 2016 or 2017. Past and current grazing effects are considered part of the existing condition.

Prior to the 2014 Johnson Bar Fire, the largest wildfires burned 27,250 acres between 1870 and the 1931 fire, which burned approximately 11,000 acres, primarily within the Clear Creek Roadless Area. Approximately 150 acres have burned since then up until 2014 because of the emphasis on fire suppression. All past wild and prescribed fire effects are considered as part of the existing condition.

Noxious weed spraying in the project area has been primarily associated with open roads as they represent the highest weed susceptibility in the project area. Noxious weed control or containment has primarily occurred during the past two decades and has generally consisted of spot spraying specific noxious weeds, including common weeds, such as thistle, hounds tongue, and knapweed. Noxious weed management would continue into the future focusing on high susceptibility areas under current Forest direction. Past noxious weed treatments are considered part of the existing condition.

Some activities, such as trail maintenance, road maintenance, recreation site maintenance, access management, and others, are considered routine and ongoing and collectively would have negligible effects on species or habitats of concern

3.7.7.1 Alternative 1

Alternative 1 would produce no additional effects on potential rare plant habitat as compared to past activity levels. The progression of forest succession would improve habitat for most sensitive plant species. However, the decline of successional tree species due to insect-caused mortality may cause localized openings and increases in light and fuel loads, which could lead to more intense wildfires and damage to rare plants.

3.7.7.2 Alternatives 2, 3, and 4

Approximately 25% of the project area has been affected by timber harvest activities in the past sixty years. Proposed Activities under the action alternatives would temporally affect between 5% and 10% of the potential habitat for several sensitive plant species. Alternatives 2, 3, and 4 would add short-term disturbance associated with harvesting and temporary road construction to approximately five to ten percent of the landscape which has not previously been harvested. Retention of PACFISH buffers and all verified and un-verified old growth would continue to provide critical potential habitat for sensitive plant species. The proposed activities under the action alternatives along with ongoing and reasonably foreseeable future management activities would result in only a slight decrease in potentially suitable sensitive plant habitat. Long-term trends would be static; a slight downward trend in habitat quality would not lead to concerns for population viability since these habitats are common across the project area.

3.7.8 Irreversible or Irretrievable Effects

None of the alternatives would implement actions or activities that would result in an irreversible commitment of resources as related to sensitive plants.

3.8 Recreation and Trails

3.8.1 Analysis Area

The Analysis Area for recreation and trail resources includes the entire project area plus an area immediately adjacent to the project boundary that includes developed recreation sites, dispersed camping areas, and roads and trails that meander in and out of the project area.

3.8.2 Regulatory Framework

All alternatives would be consistent with the Forest Plan in regards to recreation and trail resources. Effects to recreation and trail resources would be temporary.

3.8.2.1 Forest Service Manual

Policy and direction for the management of the trail system are found in the Forest Service Manual, Chapter 2350 and Forest Service Handbook 2309.18.

Policy and direction for the management of developed recreation sites are found in the Forest Service Manual, Chapter 2330, Region 1 Supplement 2330, and Forest Service Handbook 2309.11.

3.8.2.2 Nez Perce National Forest Plan

The Nez Perce National Forest Plan (1987) has a number of goals, objectives and standards that apply directly to recreation resources and influence both the current and future landscape of the project area. Forest wide Goals, Objectives, and Desired Conditions for Recreation and Trail resources are provided below. Specific standards are provided in the Regulatory Compliance section.

- **Goals (page II-1, #5):** Provide a wide range of dispersed and developed recreation opportunities and experiences by providing access, facilities, and education necessary to meet public demand.
- **Objectives (page II-2):** The Forest acreage will supply a broad range of recreation opportunities ranging from primitive to roaded natural. Primitive recreation acreage will remain the same at 40 percent of the Forest, semi-primitive motorized and non-motorized recreation acreage will decrease from 39 to 11 percent, and roaded natural acreage will increase from 21 to 49 percent.

  Developed campgrounds will be managed at least to reduced service levels, except for fee campgrounds which will be managed at full service level. Recreation and trail management will emphasize mitigation of health, safety, and resource problems, and will be at levels commensurate with public use.

  Dispersed recreation opportunities in the general forest environment will be emphasized. Minimum affect camping will be encouraged to reduce management costs and resource effects.

  The public will be informed of recreation opportunities through interpretive tools such as a Recreation Opportunity Guide and other recreation materials.

Trail and road development and maintenance by organized groups and other public agencies will be increased. Roads used primarily for motorized dispersed recreation, snow trails used by cross-country skiers, off-road vehicle users, four-wheel drive users, and snowmobilers, as well as the trail system used by hikers, horsemen, and motorcyclists should be considered in Challenge-Cost Share programs, Adopt-A-trail programs, and other user supported maintenance programs. Cooperative education programs will be considered as management options rather than immediately limiting use.

Existing developed recreation site capacity is adequate to accommodate projected use for 3 decades. As use exceeds capacity, the Forest will develop additional sites and expand existing sites in specific locations as public pressure dictates and as private facilities are not able to fulfill the need.

As the roadless area landbase decreases, traditional outfitter operations in previously unroaded backcountry will decrease. Decreases in traditional outfitters will be partially offset as new people enter the field, offering new recreation experiences based upon recreational desires and the area's capability to meet the expressed need.

- **Desired Condition (pages II-13 to 15): (**The Forest in 1997) - The trail system will decrease to 2,300 miles; a 42-mile decrease from the 1980 level of 2,342 miles. Use will have increased slightly for developed, dispersed, and wilderness recreation opportunities.

  (The Forest in 2037) - The trail system will remain stable over time. As road access is restricted, the trail system will provide for user activities. Developed recreation use will have increased 17 percent, dispersed recreation use will have increased 19 percent, and wilderness use will have remained about the same. More extensive recreation programs will have become necessary, and six additional campgrounds will have been constructed to meet demand.

Table 3-29: Forest Plan Compliance

Standard Number	Summary	Compliance Achieved By
2	Provide for appropriate access based on an evaluation of user needs and a transportation analysis.	Access would be temporarily affected with project activities. Motorized access opportunities would be unchanged.
3	Manage for a full array of recreation opportunities, from primitive to roaded natural, as described by the Recreation Opportunity Spectrum (ROS).	The ROS categories for the project area would be unchanged.
4	Create additional opportunities, from primitive to roaded natural, as described by the ROS.	Existing developed and dispersed sites provide a wide range of recreation opportunities consistent with the identified ROS.
6	Mitigate the physical effects of increased dispersed recreation use. Rehabilitation efforts will be based on resource damage to soils, water, and vegetation. Efforts may include closing the site for the short or long-term, revegetation by seed or plants, signing, visitor contact, and printed material.	No rehabilitation needs were identified for dispersed recreation sites.
7	Plan to implement post-project activities, including access prescriptions, within two field seasons of the last land-disturbing activity. Minimize the total time that roads will be open for construction and timber harvest activities.	Met with design criteria
Management Area 1		
FAC-2	Reconstruct and maintain [trails] to meet adjacent management area objectives, provide public safety, and reduce environmental damage.	Met with design criteria
Management Area 8.2		
REC-1	Manage developed campgrounds at least to reduced service levels, except for fee campgrounds which will be managed at full service level. Emphasize health, safety, and resource problems.	Developed campgrounds are managed to appropriate levels that would not be altered by the proposed project.
REC-2	Manage for roaded natural appearing or semi-primitive motorized recreation.	The project area is primarily Roaded Natural and Semi-primitive motorized ROS. The ROS categories would not change.

Standard Number	Summary	Compliance Achieved By
Management Area 8.2		
FAC-3	Maintain or reconstruct [trails] to enhance recreation values, user safety, and reduce environmental damage.	All affected trails would be reconstructed as part of timber harvest activities. Those portions not affected by timber harvest would be maintained on an infrequent schedule.
Management Area 10		
FAC-4	Maintain trails to reduce environmental damage. Design reconstruction projects to mitigate sediment	All affected trails would be reconstructed as part of timber harvest activities. Those portions not affected by timber harvest would be maintained on an infrequent schedule.
Management Area 12		
REC-1	Manage for roaded natural recreation.	The project area is primarily Roaded Natural and Semi-primitive motorized ROS. The ROS categories would not change.
FAC-2	Maintain trails to provide for user safety commensurate with use.	All affected trails would be reconstructed as part of timber harvest activities. Those portions not affected by timber harvest would be maintained on an infrequent schedule.
Management Area 16		
FAC-2	Reconstruct and maintain [trails] to meet adjacent management area objectives, provide public safety, and reduce environmental damage.	All affected trails would be reconstructed as part of timber harvest activities. Those portions not affected by timber harvest would be maintained on an infrequent schedule.
Management Area 17		
REC-1	Manage for roaded natural recreation	The project area is primarily Roaded Natural and Semi-primitive motorized ROS. The ROS categories would not change.
Management Area 20		
	None	
Management Area 21		
FAC-2	Maintain [trails] to provide for user safety.	All affected trails would be reconstructed as part of timber harvest activities. Those portions not affected by timber harvest would be maintained on an infrequent schedule.

3.8.3 Analysis Methodology

Analysis methods include the use of Forest Service databases and GIS coverages for road and trail information. The GIS mileage was used as a relative comparison for analysis for all resource areas. For this analysis, miles of roads and trails open or closed to different vehicles have been

calculated using the Forest Service GIS spatial data. The GIS data does not have the ability to account for terrain changes, experience levels, or trail condition.

Effects to recreation opportunity were evaluated from both a quantitative and qualitative perspective. Quality is unimportant if there is no opportunity. Likewise quantity is unimportant if the quality is poor. This analysis analyzes the quantity of opportunities as represented by total recreations sites available for use and total miles available by the various types of uses and season of use. Quality can be described as the comparison of the recreation settings (or opportunities) provided by managers as compared to the expectations of the users. When a user's expectation of what they would experience is aligned with what opportunity is provided, that user's satisfaction is increased and conflict between users is reduced [referred to as the Recreation Opportunity Spectrum (ROS)].

Determination of effects is primarily based on professional judgment and personal experience.

3.8.4 Resource Indicators

The following resource indicators were developed based on both public comment and internal concerns and are associated with the proposed activities.

- Harvest, timber haul, and helicopter landings are being proposed near dispersed campsites, developed campgrounds, and permitted outfitter areas, which may affect site conditions, access/availability, and user experiences.
    - *Resource indicator:* Number of sites affected by harvest.
    - *Resource indicator:* Number of sites affected by timber hauling.
    - *Resource indicator:* Number of sites affected by helicopter landings.
- Harvest activities are being proposed adjacent to designated trails, which may affect trail conditions, access/availability, and user experiences.
    - *Resource indicator:* Miles of summer trails affected.
    - *Resource indicator:* Miles of winter trails affected.
- Road decommissioning may affect recreational access within the project area.
    - *Resource indicator:* Miles of decommissioned roads by access type.
    - *Resource indicator:* Change in ROS.
- The burned area provides opportunities for gathering of forest products, such as mushrooms and firewood, which may be affected by timber harvest activities.
    - *Resource indicator:* Acres available for mushroom gathering.
    - *Resource indicator:* Miles of roads available for fire wood gathering.

3.8.5 Affected Environment

3.8.5.1 Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) is a method for describing recreation settings and opportunities, and is used to evaluate recreation potential for an area. ROS inventories were updated with Forest Plan Revision efforts in 2012. The Johnson Bar Salvage analysis area is shown to have the following existing acres by ROS category.

Table 3-30: Project Area Recreation Opportunity Spectrum

ROS Category	Acres	% of Analysis Area
Rural	0	0
Roaded Modified	38	<1
Roaded Natural	8,178	31
Semi-Primitive Motorized	2,315	9
Semi-Primitive Non-Motorized	15,254	57
Primitive	0	0
Non-FS	1,005	4

The ROS for the analysis area is influenced primarily by the road systems present along the ridges and rivers, which are characterized as Roaded Natural and Roaded Modified, and the steep undeveloped areas between these road systems, which are characterized as Semi-Primitive Non-Motorized.

3.8.5.2 Recreation Activities

Recreation activities in the project area include driving for pleasure, hunting, firewood and forest products gathering, off road vehicle use, and some camping. Several campgrounds and trailheads are located adjacent to the project area and the Selway and Middle Fork Clearwater rivers are popular for floating and fishing. Private residents are located within the project area and about 60 people reside within the Selway River Corridor. These residents utilize the National Forest administered lands as extensions of their own properties.

3.8.5.3 Recreation Facilities

3.8.5.3.1 Developed Campgrounds

The following developed recreation facilities are present within or adjacent to the analysis area.

Three Devils Picnic Area – located at milepost (MP) 94 on US Highway 12. This site is open year round, weather permitting, and offers 5 picnic tables and grills, a large group fire pit, and 2 toilets. This site is popular for its swimming beach in late summer and is used year round as a rest stop by Highway 12 travelers.

Wild Goose Campground – located at MP 95 on US Highway 12. This campground is open Memorial Day through Labor Day. The campground is popular with local families and has one of few swimming beaches along the Middle Fork Clearwater River. The campground has 7 units, 2 toilets, and a water system. A fee is charged at this campground.

Confluence Interpretive Signs – a large paved turnout located on US Highway 12 just downstream of the County Road 223 intersection at Lowell, Idaho. The site overlooks the confluence of the Lochsa and Selway rivers. This site is also popular with anglers.

Three Rivers Resort – a privately owned and operated resort located at the confluence of the Lochsa and Selway rivers. The resort offers camping, cabins, rooms, a pool, diner, pub, convenience store, and outfitted rafting.

Johnson Bar Campground – located at about MP 2 on County Road 223, this campground is open year round. The site has 7 camp units, a large group site, 4 toilets, and a swimming beach. The swimming beach is popular for day use. A fee is charged for the campsites and group site May through September. There is no fee for day use. This campground was the location of the Fire Camp associated with the Johnson Bar fire suppression efforts and was fully restored following use.

Fenn Ranger Station - located on County Road 223 at about MP 3. The Ranger Station was constructed by the Civilian Conservation (CCC) in the 1940s and is listed on the National Register of Historic Places. There is a small Visitor Center and a self-guided walking tour of the facilities is available.

Fenn Pond Fishing and Picnic Area – located immediately across the road from the Fenn Ranger Station. This site offers accessible fishing and picnicking for people of all ages and abilities. The pond is stocked with trout by Idaho Fish and Game and there is an accessible boardwalk and fishing piers located around the pond. There is a paved parking area, toilet, picnic tables, boardwalk, and fishing piers. The site is currently open but undergoing renovations, which are anticipated to be complete by 2016. No fee is charge at this site.

Cedar Flats RV Dump Station – located on County Road 223 at about MP 3.5 within the Cedar Flats Administrative site. This dump station was recently renovated and was off-line for most of 2013 and all of 2014 camping seasons. It should be fully operational for the 2015 season. The site provides a potable water spigot and RV dumping facilities. No fee is charged at this site.

CCC Campground and Trailhead – located on County Road 223 at about MP 4.5. This site has 3 primitive camp sites and a toilet. The trailhead has a stock loading ramp and hitch rails. This campground is open year round when snow free, and no fees are charged.

O'Hara Campground and Trailhead – located on Forest Road 651 along the Selway River at the confluence with O'Hara Creek. This campground is open mid-May through September. The campground is typically at full capacity on weekends. A Volunteer Camp Host assists with maintenance and upkeep. The campground has 30 units, 7 toilets, and a water system. A fee is charged and sites can be reserved through the National Forest Reservation System. Within the campground is a trailhead for the O'Hara accessible interpretive trail and Stillman Point Trail 335. The interpretive trail is about a 1 mile long, 4-foot wide graveled path with a few benches. The Stillman Point trail is open to motorcycles and travels along the ridge line up to Stillman Point and then connects with Trails 719, 710, and Road 356.

O'Hara Creek Interpretive Site – located on Road 651 along the lower 2 miles of O'Hara Creek. The auto tour, which can also be experienced on foot, horseback, motorcycle, or ATV, provides information about stream restoration efforts that have taken place along O'Hara Creek. Brochures are available at an interpretive kiosk located near the entrance to O'Hara Campground.

Lookout Butte Rental – an old fire lookout tower available for rental June through September is located on Road 1124 between the junctions with Road 286 and Road 1129 on the west edge of the project area. This site is popular with nearly 100% occupancy.

None of the sites were directly affected by the Johnson Bar fire except Johnson Bar Campground, which was used as a fire camp. The site was fully rehabilitated following use. All of the sites were subject to fire traffic, temporary closures, and smoke.

3.8.5.3.2 Dispersed Campsites

Dispersed campsites, also referred to as primitive or undeveloped sites, are those places on National Forest administered lands that are commonly used for camping or day use activities but do not have substantial infrastructure investments (toilets, fire rings, tables, etc.), and what structures may be there are strictly for protecting forest resources, such as sanitation and erosion. These sites are often wide spots along a road or small to moderate alcoves adjacent to open roads. Some of these are routinely used as hunting camps every season and others are only occasionally used. Some sites have user created fire rings, meat racks, or rustic privies. An inventory of dispersed campsites was initiated in 2011 and is ongoing. Twenty-three (23) sites have been identified in and adjacent to the project area. Only 4 of these sites are located within or immediately adjacent to the burn perimeter. The remaining sites were not directly affected by the fire but were subject to fire traffic, temporary closures, and smoke.

3.8.5.3.3 Permitted Outfitter Operations

Three permitted and licensed outfitters operation within the project area. Flying B Ranch generally operates within the northern portion of the project area north of Road 470 and west of Road 464 for big game, bear, and mountain lion hunting. Selway Ridge Runners generally operates in the central and southern portions of the project area south of Road 470 for big game, bear, and mountain lion hunting. ROW Adventures uses specific roads and trails in the project area for hiking and bicycle day trips. None of the permittees have base camps in the project area.

3.8.5.4 Recreation Access

3.8.5.4.1 Roads

There are 87 miles of system road within the project area. About 5 miles are attributed to County Road 223 (Selway River Road), approximately 45 miles are closed year-round to all motorized vehicles, about 30 miles are open year-round to all vehicles (weather dependent), and the remaining 7 miles are open year-round to vehicles less than 50 inches wide (again weather dependent).

The primary roads in the analysis area include US Highway 12, County Road 223, and Forest Roads 651 (O'Hara-Hamby), 470 (Swiftwater), 653 (Lodge Point), 286 (Tahoe Ridge), and 464 (Boundary Ridge). All of these roads are suitable for passenger vehicles and provide easy access to and within the project area. US Highway 12 and County Road 223 are paved and plowed, while the others are 1½ and 2 lane graveled roads, which are not plowed.

Road 286 (Tahoe Ridge) is sometimes referred to as the "back road to/from Kooskia" from the Selway River and is used as an alternate route to US Highway 12 between Kooskia and the Selway River during summer months for those wanting to enjoy a forest drive or pick-up a load

of firewood. This road is also part of a groomed snowmobile system, located outside of, but adjacent to the project area.

The open road system is used by Forest visitors to access the area for a variety of recreational endeavors, including driving for pleasure, hunting, and gathering forest products, such as fire wood, mushrooms, and berries. Forest visitors use a variety of motorized vehicles in the analysis area, including low clearance passenger vehicles, full size pick-ups, jeeps, ATVs, UTVs, and motorcycles. Non-motorized travel, including foot, horseback, and bicycle occurs as well, but at lower levels. Non-motorized travel typically occurs on roads as they provide paths of less resistance in this area, which is characterized as steep, rugged, and brushy, making off-road travel challenging.

3.8.5.4.2 Trails

There are four trails in the project area totaling 19 miles. A variety of motorized and non-motorized uses are allowed on these trails.

Table 3-31: Trails in the Project Area

Trail Number	Trail Name	Miles in Project Area	Access Prescription
706	Hot Point	5.2	RYA
712	Peterson Point	10.0	OYS1
716	Swiftwater Crosscut	2.8	OYM
715	Peterson Burn	1.1	RYA

RYA - **R**estricted **Y**earlong to **A**ll Motorized Vehicles
OYS1 – **O**pen **Y**earlong to **S**mall Vehicles <50 feet
OYM – **O**pen **Y**earlong to **M**otorcycles

The Hot Point Trail 706 originates off Road 1129D and travels toward Road 1119, then down the ridgeline to Hot Point and then to the Selway River. The last approximate1 mile of the trail crosses lands owned by the State of Idaho. There is no trail easement across the State land. This trail is closed to motorized uses. Trail 706, between Road 1119 and the river, was directly affected by the Johnson Bar Fire and was subject to moderate and high burn severity. In the burned area the trail will see increased numbers of downed trees requiring cut-out and possible drainage issues requiring maintenance.

The Peterson Point Trail 712 originates near the mouth of Goddard Creek at the Selway River. The trail travels up the ridge to Peterson Point and continues uphill until it intersects, and is sometimes coincident, with Road 9701. The trail continues toward Goddard Point and intersects with Road 289. This trail is open to ATVs; however, only that portion of the trail that is coincident with Roads 9701 and 289 is accessible to small vehicles, while the remainder of the trail is not physically suited for motorized vehicles and is, for all practical purposes, closed to motorized use and can scarcely be found on the ground. Trail 712, from Road 1121 down to the river, was directly affected by the Johnson Bar Fire and was subject to mostly low and moderate burn severities, and a small amount of high severity. In the burned area the trail will see increased numbers of downed trees requiring cut-out and possible drainage issues requiring maintenance.

The Swiftwater Crosscut Trail 716 is open to motorcycles and originates from Road 470 and traverses the headwaters of Swiftwater Creek to connect with the Hot Point Trail 706. Only a small portion of Trail 716, located near road 1119A, was directly affected by the Johnson Bar Fire.

The Peterson Burn Trail 715 is a short trail located between Roads 651 and 9701. This trail is available for hiker and stock use. The trail was not directly affected by the Johnson Bar Fire.

None of the trails in the project area are considered primary access routes or destinations and do not receive regular use or maintenance. Their condition varies from brushed in to barely identifiable on the ground. There is opportunity for trail maintenance and improvement. These trails have not been recently inventoried for erosion or safety concerns.

There are no developed trailhead facilities within the project area. Trailheads for the above mentioned trails are no more than wide spots in the road and none have trailhead signage. There are a few developed trailhead facilities located on the perimeter or just outside of the analysis area. These sites were described in the Developed Recreation Sites section above and include:

- CCC Trailhead, which includes stock handling facilities and a toilet (on Road 223),
- O'Hara Creek Interpretive Site (on Road 651), and
- O'Hara Campground Trail and Stillman Point Trailhead (within the O'Hara Campground).

3.8.6 Direct and Indirect Effects

3.8.6.1 Alternative 1

3.8.6.1.1 Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum would be unchanged.

3.8.6.1.2 Recreation Activities

The opportunity for driving for pleasure would remain the same; however, the quality of the driving experience may decrease due to changes in scenery and the potential for fallen trees on the road. People would venture into the burned area to see the fire's effects and to travel through to other forest areas. Recreation activities, such as mushroom gathering would likely increase for 3-5 years, and there would be a corresponding increase in traffic on roads and camping in dispersed sites and campgrounds. River use may increase associated with mushroom gathering as gatherers utilize water craft to access river-side burned areas in search of mushrooms. Firewood gathering would likely also increase as additional burned trees die. Firewood gatherers may create off-road routes with their motorized vehicles, although such activity is prohibited by the terms of Firewood Permits and by the Travel Plan Rule. Hunting for big game would likely decrease in the short-term as preferred forage species are reduced from pre-fire conditions. In the long-term, forage for big game may improve and thus opportunities for hunting may increase.

3.8.6.1.3 Recreation Facilities

3.8.6.1.3.1 Developed Campgrounds

None of the identified developed recreation sites were affected by the fire and all would remain open and available, consistent with the funding and resources available. The forested areas seen from almost all of the sites would change over time. The change in scenery would not likely affect use levels.

3.8.6.1.3.2 Dispersed Campsites

Use of dispersed sites, especially those located along Roads 223, 470, 653, 286 and 1129, and US Highway 12 may increase with an increase in the gathering of mushrooms and forest products. As a result, sanitation and encroachment (compaction, vegetation loss, crossings) near streams may become an issue requiring use restrictions.

3.8.6.1.3.3 Permitted Outfitter Operations

All three permitted and licensed outfitters who operate within the project area may be affected. While none of the outfitters use the project area for base camp operations, all use the area for transitory hunting and day use activities. The outfitters would be affected as described under the Recreation Activities and Recreation Access sections.

3.8.6.1.4 Recreation Access

3.8.6.1.4.1 Roads

The amount of roads available for use would be unchanged. There would be increased road maintenance needs associated with falling trees and snags, which may affect unprepared travelers. Opportunities for non-motorized use of roads would also remain unchanged. However, individuals may choose to recreate in non-burned areas.

3.8.6.1.4.2 Trails

The amount of trail opportunities would be unchanged. The Hot Point Trail would be cut out and erosion concerns addressed with BAER. Even after the BAER work, falling trees and snags would continue to be an issue for this trail for about 5 years. The other trails in the project area would continue to be maintained on an infrequent basis. Portions of Trails 716 and 712 were also affected by the Johnson Bar Fire and would see an increase in the number and frequency of fallen trees. Trail use would likely decrease due to numerous snags and the increased likelihood of falling trees on and across trails.

3.8.6.2 Alternatives 2, 3, and 4

The following direct and indirect effects are common to Alternatives 2, 3, and 4.

3.8.6.2.1 Recreation Opportunity Spectrum

Alternatives 2, 3, and 4 propose decommissioning 1.1 miles of system roads. These roads are distributed throughout the project area but are concentrated in areas defined as Roaded

Natural and Semi-Primitive Motorized. The road decommissioning would not affect the mapping of ROS categories. There are four individual road segments and all are currently closed to motorized vehicles, which is a primary factor in assigning ROS.

3.8.6.2.2 Recreation Activities

During project activities, travel on roads adjacent to timber harvest activities and on haul routes would decrease either from self-selection by individuals in order to avoid those areas, or due to restrictions put in place to prohibit public use in order to protect public safety. Similar to the No Action Alternative, recreation activities, such as mushroom gathering, would likely increase for 3-5 years, which corresponds with the proposed timber harvest timelines. Mushroom hunters may be restricted from using some areas during timber harvest operations, which would decrease the amount of area available for these activities. Firewood gathering would be sharply curtailed as it is prohibited in active timber sale areas.

3.8.6.2.3 Recreation Facilities

3.8.6.2.3.1 Developed Campgrounds

All developed recreation sites would be affected by increased traffic associated with mobilization of equipment, worker commutes, and timber hauling activities. Dust, noise, and traffic volume would be the primary influence on campers and developed site users. The toilets at Three Devils Picnic Area, Fenn Pond, and CCC Campground are easily accessible and visible from US Highway 12 and Road 223 and would see increased use associated with the timber sale commuter traffic. This increased use would not interfere with site users but would place a financial burden on the Recreation Program responsible for providing toilet paper, cleaning, and pumping the toilets.

O'Hara Campground, O'Hara Interpretive Site, and Lookout Butte are located on native surface and gravel roads that would be used for timber sale access and log hauling. Dust from these roads would likely increase from increased traffic and waft into the sites; thereby, negatively affecting visitor experiences. Dust abatement (required design criteria) near these sites would mitigate these concerns.

All of the developed sites are located within 300 feet of roads that would be used for timber sale access and log hauling. Visitors may experience decreased satisfaction with their recreation outing due to increased traffic noise and volume. The increase in traffic and noise would be less noticeable for sites along US Highway 12. The types of road noises that campers and visitors would experience would be similar to existing conditions but potentially louder and more frequent. The type of traffic would change from mostly passenger vehicles and recreational vehicles to include more commercial trucks, which could affect a visitor's sense of safety or security, especially for those areas that are immediately adjacent to the road or have little barrier between the road and the site, such as CCC Campground, Fenn Pond, and the O'Hara Interpretive Site.

3.8.6.2.3.2 Dispersed Campsites

All dispersed recreation sites would be affected by increased traffic associated with mobilization of equipment, worker commutes, and timber hauling. Dust, noise, and traffic volume would be the primary influence to dispersed site users. The effects to dispersed recreation site users would be identical to those described for developed site users, except dispersed site users may be even less tolerant because they are choosing to camp and recreate in an area that typically affords more solitude.

Proposed Helicopter landings H17, H18, and H19 would be utilized under Alternatives 2 and 3 and are located where dispersed campsites have been inventoried. H18 would not be used under Alternative 4. These sites would not be available for use during timber sale operations and would be physically changed following harvest activities. Effects to future users could be mitigated with design criteria to restore the campsite following landing use. This would involve removing debris and assuring there is a reasonably flat area for camping similar to what existed prior to use.

3.8.6.2.4 Recreation Access

3.8.6.2.5 Roads

1.1 miles of system roads, or about 1% of the road system, would be decommissioned. None of these roads are currently open for motorized use and there would be no loss of motorized recreation opportunities. The road decommissioning would result in lost opportunities for hikers, bikers, and horseback riders that use these routes.

4.8 miles of system road would be “stored” for future use. None of these miles are currently open for motorized use and there would be no loss of motorized recreation opportunities. The road templates would be retained and culverts may be removed and earth barriers may be placed at the beginning of each road. The roads would still be available for hikers, bikers, and horseback riders but stream crossings may be more difficult to traverse if culverts are removed.

3.8.6.2.6 Trails

The effects to trails would be similar across all of the action alternatives; however, the total affected miles would vary slightly between alternatives.

The Hot Point Trail 706 would be directly affected by timber harvest Units 114, 115, and 116, temporary roads 114B, 114D, 114E, and 114F, and helicopter landing H9 (Alternative 3 would not utilize H9). All of these activities would occur on or over the trail, which would obliterate the trail for all practical purposes during harvest activities. There are design criteria for this trail to be identified as a protected improvement in the contract, which would restore the trail to pre-project conditions.

- Alternative 2 would affect 1.6 miles of Trail 706
- Alternative 3 would affect 0.5 mile of Trail 706
- Alternative 4 would affect 0.8 mile of Trail 706

The Peterson Point Trail 712 would be directly affected by timber harvest in Units 131, 134, and 145, temporary roads 131A, 131B, and 131C, and helicopter landing H22. All of these activities would occur on or over the trail, which would make about 4 miles of the 13-mile trail unusable during harvest activities. There are design criteria for this trail to be identified as a protected improvement in the contract, which would restore the trail to pre-project conditions.

- Alternatives 2 and 3 would affect 2.7 miles of Trail 712
- Alternative 4 would affect 2.2 miles of Trail 712

The Swiftwater Cross-cut Trail 716 would be directly affected by timber harvest in Unit 114 and the associated temporary roads. All alternatives would affect 0.5 mile of this trail.

Less than 0.1 mile of the Peterson Burn Trail 715 would be directly affected in Unit 131. Helicopter landing H19 would be located at the eastern trailhead, where the trail joins Road 651. The trailhead might be avoided depending on site conditions and topography. There are design criteria for this trail to be identified as a protected improvement in the contract, which would restore the trailhead to pre-project conditions if it is affected.

There would be short-term effects to potential users of all trails in the project area as trails would be closed to travel during harvest operations in order to protect public safety. Following harvest operations, trail prisms would be restored through harvest areas and access restored. Those portions of the trails that run through harvest areas would have a changed character, which may affect an individual's experience. The number of trees falling on the trails needing cut out would be substantially reduced from the No Action Alternative.

Snow Trail 286, from its junction with Road 470 west to the Forest Boundary, would be used as a haul route under all alternatives. If winter logging and hauling is authorized, this route would be plowed and unavailable as a groomed snowmobile trail. No alternate route exists and the groomed route may be affected for one to three consecutive years, depending upon contract progress and timing. The effects to snowmobile users could be reduced by providing an alternate winter parking area in the area of the Road 286 and 470 junction or Road 286 and 653 junction, depending on the actual haul routes being used. This would involve plowing snow to accommodate parking and turn-around for at least 5 truck-trailer combinations.

3.8.6.3 Alternatives 2 and 3

In addition to the effects described as effects common to Alternatives 2, 3, and 4, Alternatives 2 and 3 would utilize Helicopter Landings H1 and H6 located at the Wild Goose Campground and Johnson Bar Campground respectively and H18 located at Two Shadows. None of these helicopter landings would be utilized under Alternative 4.

River Related Recreation – Use of helicopter landings located in the river corridor could affect river related recreation such as floating, fishing, and general water play. Use of landings H1, H6, and H18 would be limited to November through April, avoiding the high use recreation times.

Wild Goose Campground – Helicopter Landing H1 would be located in the paved entrance and parking area of this campground. Use would be limited to a single season of use and to the months of November through April. The timing of use would avoid the high use recreation

period and would occur when the campground would normally be closed. The direct effects to campers would be avoided through the use of design criteria. Effects to the facility itself may occur and include damage to the paved surface and trees adjacent to the paved area. Both of these effects were experienced when this location was utilized as a helicopter landing in 2012 during the Interface Fuels Timber Sale. Design criteria require that the site be fully rehabilitated by May 15 of the year of use. Design criteria for rehabilitation of the site would address potential effects.

Johnson Bar Campground – Helicopter Landing H6 would be located in the reservable group use portion (center meadow area) of this campground. Use would be limited to a single season of use and limited to November through April. The timing of use would avoid the high use recreation period but because the entire campground would be closed during operations, campers would be directly affected since this campground is open year round. Effects to the facility itself may also occur and include damage to the group use area, access road, and vegetation near the access road. Design criteria require that the site be fully rehabilitated by May 15 of the year of use. Design criteria for rehabilitation of the site would address these potential effects. But the general character of the site may be altered with tree pruning/trimming along the access road.

Two Shadows Dispersed Site - Two Shadows is a large unpaved turnout adjacent to US Highway 12 at about MP 93 that is used for day use river access and occasionally overnight camping. Within 0.5 mile of this site there are 4 other inventoried dispersed sites. Use of the Two Shadows site would be limited to a single season of use and to the months of November through April. The timing of use would avoid the high use recreation period but individual users wishing to use the site may be affected. Design criteria require that the site be fully rehabilitated within 6 months of use, which would result in this site potentially not being available for use for an entire season.

The 4 dispersed sites located within 0.5 mile of Two Shadows would not be directly affected but would be affected by noise, making these sites less desirable while the Two Shadows landing is being actively used.

3.8.7 Cumulative Effects

3.8.7.1 Alternative 1

Cumulative effects would be similar to the direct and indirect effects.

3.8.7.2 Alternatives 2, 3, and 4

The following cumulative effects are common to Alternatives 2, 3, and 4.

The primary contributor to cumulative effects for Recreation and Trail resources is road decommissioning and its effect on recreation opportunities. The road decommissioning associated with Johnson Bar would be on roads currently closed to motorized uses. The effects would result in lost opportunities for non-motorized users, such as hikers, bikers, and horseback riders that use these routes. The Clear Creek Restoration Project located to the west would decommission 13.2 miles of roads. Approximately 1.6 miles were open to some level of

motorized use and the remainder was closed to motorized uses. These changes in available road miles for motorized and non-motorized uses would result in cumulative reductions in road-based recreation opportunities.

3.9 Soils

3.9.1 Analysis Area

Regional soil standards are based on the premise that productivity is site specific and effects should not be analyzed at a watershed scale (Page-Domroese et al. 2006). Given the premise that soil productivity is site specific, protocols outlined in the Region 1 Approach to Soils NEPA Analysis (USDA 2011) require an evaluation of predicted Detrimental Soil Disturbance (DSD) for specific activity areas; in this case an activity area equals a harvest unit. The areas assessed for soils concerns are the individual treatment units (variable acres) and associated skid trails, landings, and temporary roads within the project area.

3.9.2 Regulatory Framework

Forest Plan direction and the following Federal and State laws and regulations pertaining to the management of soil resources would be applied to the project:

- FSM 2500 Watershed and Air Management – Washington Office (WO) Amendments 2500-2010-1 and 2500-2010-2 and Northern Region (R1) Supplement 2500-14-1 (Regional Soil Quality Standards)
- Soil and Water Conservation Practices (SWCPs) Handbook - FSH 2509.22
- Idaho Forestry Best Management Practices (BMPs)
- Idaho Forest Practices Act (1974)
- National Forest Management Act of 1976 (NFMA) 16 USC 1604(g)(3)(i)
- 36 CFR 219.20

3.9.2.1 Consistency with Nez Perce National Forest Plan and Environmental Law

The Johnson Bar Fire Salvage project was designed to meet the standards set forth in the Idaho Forest Practices Act, FSM 2500 - Watershed and Air Management and Northern Region (R1) Supplement 2500-14-1 (Regional Soil Quality Standards), and FSH of Soil and Water Conservation Practices (FSH 2509.22).

The proposed project complies with 36 CFR 219.20, which requires conservation and protection of soil and water resources and NFMA 16 USC 1604(g)(3)(E)(i), which states “Soil, slope or other watershed conditions would not be irreversibly damaged.”

Region 1 Soil Quality Standards found in FSM 2500 Supplement 2500-14-1 (USDA 2014) specify that at least 85% of an activity area (defined as a land area affected by a management activity) have soil that is in satisfactory condition. In other words, detrimental effects (including past management effects) shall be less than 15% of an activity area. In areas where less than 15%

detrimental soil conditions exist from prior activities, the cumulative detrimental effect of the current activity following project implementation and restoration must not exceed 15%.

Nez Perce National Forest Plan standards listed on page II-22 of the Forest Plan would also be met, including the Forest Plan amendment for the project (Table 3-32).

Table 3-32: Forest Plan Compliance

Standard Number	Subject Summary	Compliance Achieved By
1	Evaluate the potential for soil displacement, compaction, puddling, mass wasting, and surface soil erosion from ground-disturbing activities.	• Landtype identification and evaluation. • Field surveys or office evaluations were conducted on each of the proposed Activity Areas (units) for Regional standards.
2	A minimum of 80% of an Activity Area shall not be detrimentally compacted, displaced, or puddled upon completion of activities.	• Post-project monitoring to verify compliance and to assess if additional mitigation is needed. • Soil improvement activities on areas with prior effects to achieve a net improvement in soil productivity.
3	Maintain sufficient ground cover to minimize rill erosion and sloughing on road cut and fill slopes and sheet erosion on other Activity Areas.	• Project design criteria were developed to minimize erosion. • Temporary road locations were evaluated. Unit-specific design criteria were developed for high subsurface erosion areas.

3.9.3 Analysis Methodology

GIS generated reports and maps, aerial photos, and field reviews were used to analyze effects to the post-fire soil resource from the project's proposed activities. Field sampled vegetation database (FSVeg) queries were conducted to identify past harvest activities and their time frames (see project file). Post-fire field data was collected during the BAER assessment for the Johnson Bar fire. Information collected includes burn severity, soil texture, landslide prone, and hydrophobicity. After this initial field review, existing DSD was determined using LIDAR imagery in accordance with the Region 1 Approach to Soils NEPA analysis (UDSA 2011).

An erosion hazard assessment was used to summarize erosional characteristics based on landtype properties. This assessment described overall erosion hazards in the project area and at the unit scale to aid in the development of project design criteria.

Potential soil restoration opportunities throughout the project area were assessed, with a focus on old skid trails, landings, and roads. Project design criteria describe methods for minimizing effects to the soil and techniques for restoring soil biophysical integrity.

3.9.3.1 Data Assumption and Limitations

The methodology outlined in the Region 1 Approach to Soils NEPA Analysis Regarding Detrimental Soil Disturbance in Forested Areas (USDA 2011) and the Forest Soil Disturbance Protocol (USDA Forest Service 2009b) provides a conservative assessment of existing soil

conditions (Page-Dumroese et al. 2006a), given its inherent assumptions (ocular data and soil pits).

Informal comparisons found that both for single observers and between observers, category calls in this methodology have a variability of 5%. This level of survey leads to a 90%–95% confidence with error bars from 5% to 8%, depending on the amount of disturbance found. The surveys achieve statistical inference for units with either low disturbance (<7%) or moderately high disturbance (>23%) (Page-Dumroese *et al*. 2009).

Field soil survey methodology based on visual observations can produce variable results among observers, and the confidence of results is dependent on the number of observations made in an area (Page-Dumroese *et al*. 2006a). The existing and estimated values for DSD are not absolute and are best used to describe the existing soil condition. The calculation of the percentage of additional DSD from a given activity is an estimate, since DSD is a combination of such factors as existing ground cover, soil texture, timing of operations, equipment used, skill of the equipment operator, the amount of wood to be removed, and sale administration. The DSD estimates for proposed project activities are based on Nez Perce-Clearwater National Forest monitoring compiled, in part, in Archer 2008, and further refined to respond to current research and professional judgment of Forest Soil Scientists (Archer 2008; Reeves et al. 2011). The DSD estimates of proposed activities also assume that BMPs would be implemented and that soil recovery occurs over time.

3.9.3.2 Scientific Uncertainty and Controversy

Site and soil productivity relies on complex chemical, physical, and climatic factors that interact within a biological framework. For any given site and soil, a change in a key soil variable (e.g., bulk density, soil loss, and nutrient availability) can lead to changes in potential soil productivity. Defining the threshold at which productivity is detrimentally disturbed is controversial. The rationale for the 15% limit of change in soil bulk density was largely based on the collective judgment of soil researchers, academics, and field practitioners, and the accepted inability to detect changes in productivity less than 15% using current monitoring methods (Powers 1990). Powers (1990) states that the soil quality guidelines are set to detect a decline in potential productivity of at least 15%. This statement does not mean that the Forest Service tolerates productivity declines at this level, but that it recognizes problems with detection limits.

Soil quality standards are being studied by a cooperative research project called the North American Long-Term Soil Productivity Study (LTSP). The 5- and 10-year results were recently published (Page-Dumroese et al. 2006b; Fleming et al. 2006; Sanchez et al. 2006). The LTSP study is ongoing and provides the best available science to resource professionals. In a 10-year study, no observed reduction in tree growth occurred as a result of compaction or organic matter removal in plots with soils generally similar to those found in the project area (silt loam) (Powers et al. 2005). These results are relatively short-term and involve many site- and soil-specific factors. Future results from the ongoing study should be helpful for assessing harvest practices on soil productivity.

Additional controversy surrounds the use of the term "irreversible" in the NFMA. The NFMA has guidelines that "ensure that timber would be harvested from NFS lands only where soil, slope, or other watershed conditions would not be irreversibly damaged." The DSD described in this analysis does not necessarily result in substantial and permanent impairment.

DSD is reversible if the processes (organic matter accumulation, moisture, topsoil retention, and soil biota) are in place and if time is allowed for recovery. Of particular concern are the ash cap soils, soils derived from the ash deposited after the eruption of Mount Mazama over 7,000 years ago (NPCNF 2014; McDaniel et al. 2007). These ash cap soils are both rich in nutrients and excellent for retaining soil moisture even in drought conditions. Though highly productive, ash derived soils do have extra sensitivities to management activities. In undisturbed areas, the soils are resistant to erosion; but if disturbed, ash derived soils have a high risk of surface erosion and are highly susceptible to compaction (Page-Dumroese et al. 2007). Given the unique conditions under which the ash cap soils are formed, irreversible damage to soils in the project area could result from the loss of these volcanic soils through erosion or removal by excavation for temporary roads and/or skid trails. Soil recovery could still occur in remaining subsurface soils, yet the exceptionally high porosity and water-holding properties of the Mazama ash cap would be irrecoverable.

3.9.4 Resource Indicators

Soil Stability and Erosion Hazard Potential - Soil erosion can result in a loss of soil productivity due to surface soils moving downslope and thus removing the materials with the greatest ability to hold moisture and nutrients. Compared to the subsurface soils, surface soils in the project area contain more organic matter and have a higher volcanic ash-derived mineral content. Ash cap soils are highly resistant to erosion when undisturbed; however, after fire disturbances and removal of the litter and duff layers this layer becomes highly erosive (Robichaud *et al.* 2007). Removal of vegetation and/or ground disturbance associated with timber harvest or fire can increase erosion on certain landtypes.

Indicator: Acres of proposed salvage harvest on landtypes with high surface erosion hazard.

Indicator: Miles of proposed temporary roads and swing trails on landtypes with high subsurface erosion hazard.

Soil Productivity - Past management activities and the fire burn severity in the project area have caused Detrimental Soil Disturbance (DSD) and affected soil productivity. According to the Region 1 Soil Quality Standards, detrimental disturbance (e.g., compaction, displacement, erosion, loss of organic matter) from management activities should not exceed 15% of an Activity Area and coarse woody material retention should be appropriate to the habitat type.

Indicator: Total acres of new detrimental soils disturbance.

Indicator: Number of commercial harvest units requiring specialized project design criteria to meet Regional soil standards.

Table 3-33: Resource Indicators by Alternative

Resource Indicator	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Acres of harvest on terrain rated as high hazard for surface erosion	0	150 (5%)	137 (5%)	62 (3%)
Miles of temporary road or swing trail construction on soil rated as high hazard for subsurface erosion	0	4.9	0.8	5.4
Total acres of new DSD	0	119	75	100
Number of harvest units requiring specialized project design criteria to meet Regional soil standards	0	1	0	0

3.9.5 Affected Environment

3.9.5.1 Landforms and Geology

Soil characteristics in the project area vary according to slope gradient, slope aspect, parent material, texture, depth, vegetative cover, and microclimate. Landforms in the project area are mostly dissected stream and mountain breaklands (70%), low- and moderate-relief rolling uplands (11%), and landslide deposits (11%). Breaklands consist of steep slopes and drainage ways adjacent to rivers and their tributaries. They have straight concave slopes with gradients of 60% or more. The slopes are overly steep as a result of streams down cutting faster than the adjoining slopes could retreat. Bedrock is moderately to weakly weathered. Rock outcrop is common. Soils are colluvial and weakly developed and vary widely in properties. Soils on northerly aspects tend to be deep and skeletal with a mixed ash cap. These lands are the most unstable on the Forests. Breaklands deliver sediment to streams very efficiently because of steep slopes and closely spaced drainage ways. The point where drainage ways converge at the lower apex of the landforms tends to accumulate sediment. This convergence may be a source of debris avalanches and flash floods.

The geologic substrate is primarily Belt Zone and Border Zone metamorphics (95%), followed by Alluvial deposits (3%), Idaho Batholith Border Zone granitics (1%) and Columbia River basalt (1%). Soil parent material is primarily granitic (84%), with colluvium of various types (11%) and basalt (2%). A variety of metamorphic rocks are associated with the Idaho Batholith consisting mostly of the Belt Supergroup rocks of Precambrian Age (more than 600 million years old). The rocks are dominantly schist, gneiss, siltite, argillite, and quartzite that are located near the margins of the granitics and probably represent the metamorphism associated with the intrusions. The Belt Supergroup rocks are laid down in a seabed and subsequently metamorphosed. Surface soils are generally silty or sandy loams. The coarse fragment content in the soils is very low, generally less than 35%, increasing the susceptibility of the soil to compaction and rutting from ground-based machine harvesting. Rock fragment content and hardness depend upon the degree of the rock's chemical weathering. Parent materials derived from metasedimentary rocks are divided into two groups according to the amount and hardness of rock fragments. These properties affect the erodibility of soils formed in these parent materials. Weakly weathered metasedimentary rocks have subsoils and substrata resistant to erosion and can be identified by containing many angular rock fragments. Micaceous schist soils tend to have weak subsoil clay accumulations and are resistant to erosion; however, these soils

are prone to mass wasting. Well weathered quartzite geologies have very highly erodible subsoils and substrata.

Much of the area is overlain by a mixed to intact layer of Mazama volcanic ash, ranging from 8 to 12 inches in thickness. The ash cap is thin or missing in the steeper breaklands (0 to 6 inches). Soil surface layers formed in ash and loess are an excellent medium for plant growth. Ash material is physically highly favorable to root growth, being very permeable and possessing a high ability to hold moisture and nutrients. Soils with the thickest loess surface layers tend to be the most productive. Its presence as an intact layer with little mixing is an indication of relatively stable slopes over the past 6,700 years since the ash deposition. Most soil surface layers are formed from volcanic ash or loess mixed with subsoil material; lower soil layers are formed from materials derived from other sources. An ash influenced surface layer is resistant to erosion when undisturbed; but if disturbed, it has a high risk of surface erosion. These soils are also highly susceptible to compaction.

3.9.5.2 Landslide and Erosion Hazard Potential

Landtypes are ecological land units categorized by similarities in soils, landforms, geologic substrate, geomorphic processes, and plant associations (Cleland *et al*. 1997). These land units have been mapped for the entire Nez Perce National Forest (USDA NRCS 2006). Landtypes were identified for the project area to help focus field evaluations and to pinpoint any erosion hazard concerns.

Landslides are the dominant natural erosion process in the project area. Landslides are most likely to occur in areas where they have already occurred in the past, on roaded landscapes and in area of past wildfires. In many cases, the landscape features surrounding a location where recent landslide catastrophes have occurred and provide evidence of past and ongoing landslide activity. Landsliding is part of the processes behind the evolution of the landscape. Landslides are triggered by earthquakes, major storms, volcanic activity, or other natural or human-induced activities that may cause the earth to move. The additional weight of storm rain or snow melt can cause slopes to fail or reactivate older landslides. Landslide-prone (LSP) areas mapped on the Nez Perce National Forest are located on slopes over 60% and landtypes 50EUU and 50CUU. LSP was further refined for the Johnson Bar Fire Salvage Project area based on a combination of LIDAR analysis and field verification. Areas considered highly prone to landslides comprise approximately 27% of the project area. **All areas identified as LSP have been excluded from proposed activities**.

3.9.5.3 Soil Productivity

Soils in the project area are generally silt loams, formed from loess and overlain with a shallow to moderately deep volcanic ash layer. Past natural and management activities have affected the productivity of these soils.

Fire

The Johnson Bar fire is the most recent, large-scale disturbance in the project area, and effects from the fire are discussed throughout the existing condition, environmental consequences, and cumulative effects sections. This analysis uses post-fire burn severity to describe potential

watershed effects of the Johnson Bar fire, and potential interactions with treatments in the Johnson Bar Fire Salvage Project area. Fire intensity and soil burn severity are often incorrectly used synonymously. Fire intensity relates to the above ground fire effects generally identified through visual observations of changes in the overstory vegetation and ground fuels (type, amount, arrangement, and moisture content). Soil burn severity is the effect of fire at and below the ground surface, specifically how the fire changes the physical and chemical composition of the soils. While fire intensity is not necessarily an indicator for wildfire effects on soils, observed changes from pre- to post-fire vegetation are used as preliminary indicators to estimate soil burn severity as a function of watershed response. Fire severity that detrimentally effects soil conditions leads to further degradation of soil productivity and soil-hydrologic function.

Post-fire preliminary “High”, “Moderate”, and “Low” severity mapping for the Johnson Bar Fire was derived using Burned Area Reflectance Classification (BARC). The initial severity mapping was validated with aerial reconnaissance and on-the-ground surveys.

Soil conditions were evaluated for fire effects that result in hydrophobic (water repellent) soils, changes to litter and duff (vegetative ground cover and slope obstructions), destruction of fine and very fine roots in the surface horizon, changes or loss of soil structure, and susceptibility to erosion. Changes in vegetative ground cover as affected by the fire were noted and compared to pre-fire conditions. Field transect data collected included: thickness and strength of soil water repellency, ash depth and color changes to soil, size and amount of above ground residual vegetation (fire intensity), post-fire effective ground cover and hillslope obstructions based on consumption of coarse woody debris, organic litter cover, soil texture, structure, and gradient. These data provide estimates for fire residence time, depth of litter layer consumed, duration, and amount of radiant heat throughout the litter/duff layer, and ease of detachability of surface soil particles.

The final soil burn severity map was developed in GIS using the BARC and field data. This information became the baseline for predicting soil-hydrologic response of the subwatersheds, including the changes in erosion and sedimentation rates, stream flows, and estimates for vegetative response of the burned area.

While the burn severities shown in the final map are a good approximation of the fire effects, there are discrepancies. The area of the fire above Road 652 along the Selway River was shown as predominately low and unburned. These small face drainages have a much higher proportion of moderate severity than the final severity map reflects. Also the burn severity was based on fire conditions around the first of September.

Burn severity describes the effects of the fire on soil structure, infiltration, capacity, and biotic components, and is used to indicate runoff, soil erosion potential, and detrimental soil disturbance from the fire (USDA FS 2014). Burn severity is defined through differences in surface organics, duff cover, and characteristics of mineral soils (Debano et al, 1998):

- Low severity – low soil heating, litter scorch or consumption with duff largely intact, mineral soil is not changed.

- Moderate severity – litter consumption with moderately charred or consumed duff, no visible alteration of mineral soil surface.
- High severity – complete consumption of duff and mineral soil surface visibly reddish or orange color.

Information collected includes burn severity, soil texture, landslide prone, and hydrophobicity. Burn severity maps were created following the Johnson Bar fire (Map 3). The following table describes the amount of past harvest areas, burn severity, and estimated DSD in the proposed units.

Invasive Plants

Plants contribute to soil productivity through complex above and below ground linkages. In forest ecosystems, when non-native invasive plants replace native grasses and forbs, plant-soil feedbacks that maintain soils productivity can be altered (Putten et al. 2013). In order for invasive plants to significantly alter soil productivity, conditions must be right to allow establishment at a high enough density to change the native species compositions (Suding et al. 2004) Ecosystem disturbances, such as timber harvest and wildfire, can create conditions that favor large-scale invasions of non-native plants (Hobbs and Huenneke 1996). At present, populations of non-native invasive plants are not at the level that would trigger a large-scale invasion in the project area. In order to prevent a large-scale invasion following the 2014 wildfire and proposed harvest, the roadside weeds and isolated areas with higher densities of invasive plants must be regularly treated to control their potential spread and prevent degradation of soil productivity. Plans for invasive plant control are detailed in Section 3.12.

Table 3-34: Existing Conditions by Harvest Unit

Unit Number	Acres	Acres of Past Harvest	Post-fire Burn Severity (%)			DSD (%)
			Unburned and Low	Mod	High	
101	74	5.6	63.9	10.6	0.0	3
102	91	10.6	33.7	57.4	0.4	5
103	169	15.5	80.3	86.8	1.4	5
104	138	0.0	85.9	51.9	0.6	5
105	28	0.0	17.2	10.3	0.0	7
106	56	28.7	43.1	13.1	0.0	4
107	11	25.6	10.6	0.6	0.0	3
108	1	80.5	0.5	0.4	0.0	4
109	13	3.5	6.2	7.2	0.0	5
110	45	4.3	30.1	15.1	0.0	6
111	169	0.0	94.5	74.4	0.2	6
112	3	0.0	0.6	2.5	0.0	6

Unit Number	Acres	Acres of Past Harvest	Post-fire Burn Severity (%)			DSD (%)
			Unburned and Low	Mod	High	
113	16	0.0	7.1	8.9	0.0	5
114	73	0.0	65.8	7.3	0.0	6
115	153	0.0	21.1	89.0	42.6	8
116	263	0.0	20.5	132.0	110.5	7
117	52	0.0	10.7	39.8	1.5	6
118	10	0.0	3.4	6.9	0.0	6
119	24	5.3	0.9	21.7	1.9	7
120	17	1.6	4.2	12.3	0.2	7
121	32	49.5	9.2	23.2	0.0	6
122	219	12.5	66.7	145.2	7.4	6
123	12	3.0	1.3	10.4	0.1	10
124	6	5.6	2.3	4.1	0.0	5
125	117	10.6	22.9	92.1	2.0	6
126	102	15.5	46.3	51.7	4.2	5
127	42	0.0	24.3	17.4	0.0	5
128	33	0.0	9.9	15.8	6.8	6
129	124	28.7	20.4	88.9	15.1	7
130	2	25.6	2.0	0.0	0.0	3
131	144	8.5	48.8	84.1	10.9	6
132	32	3.5	7.6	22.5	1.6	7
133	12	4.3	5.9	6.3	0.0	5
134	91	0.0	42.3	44.6	3.9	5
135	67	0.0	60.9	6.5	0.0	3
136	28	0.0	16.1	11.9	0.0	6
137	27	0.0	23.4	3.7	0.0	3
138	44	0.0	36.7	7.5	0.0	4
139	49	0.0	35.9	13.2	0.0	6
140	24	0.0	9.4	14.9	0.0	6
142	39	0.0	31.9	6.6	0.0	3
143	45	5.3	42.1	2.5	0.0	3
144	93	1.6	84.4	8.4	0.0	3
145	303	49.5	198.1	102.9	2.4	4

Existing DSD was determined using past harvest activity mapping, LIDAR imagery, and burn severity mapping in accordance with the Region 1 Approach to Soils NEPA analysis (USDA FS 2011). Existing detrimental soil conditions within the units range from 3% to 10% (Table 3-34). Soil disturbances discerned during the reviews included old harvest roads, skid trails, landings, and severe burning. The following assumptions were used to estimate DSD for the proposed salvage units:

- Lidar linear disturbances "unknown features" – 2 acres DSD per mile of disturbance
- Past Harvest DSD
    - Tractor – 5% of past harvest area
    - Skyline – 2% of past harvest area
    - Helicopter – 1% of past harvest area
- Johnson Bar Fire DSD (based on USDA FS 2013)
    - Low severity – 2.5% of area
    - Moderate severity – 7% of area
    - High severity – 9% of area

Although not specifically addressed by a Forest Plan standard, the presence of above-ground organic matter or woody material is an important component of soil health. The retention of coarse (>3 inches in diameter) woody material is essential to maintaining soil productivity (Graham et al. 1994). Regional direction (USDA FS 2014) for organic material recommends following guidelines such as those contained in Graham et al. (1994) if more-specific local guidelines have not been developed. Graham et al. (1994) recommend 7–33 tons/acre of coarse woody material (depending on habitat type, moisture regime, and aspect). This amount should provide sufficient organic material for soil productivity over the long-term (100–300 years). Retaining existing coarse wood levels and allowing for recruitment through the natural addition of snags and/or standing trees would facilitate these benefits. Existing downed woody material ranges from 5 to 20 tons/acre in units proposed for project activities (visual observation). Litter and duff layers throughout the project area average 0 to 6 centimeters in depth. In areas of moderate to high burn severity, litter and duff was completely consumed; in low burn severity areas, litter/duff layers average 2 to 4 centimeters; and in unburned areas, duff/litter layers are approximately 4 to 6 centimeters deep.

3.9.6 Direct and Indirect Effects

The spatial scope for direct and indirect effects is the individual salvage harvest units (variable acres) and associated temporary roads. The temporal scope is several decades (30-50 years), covering both the pre- and post-project activities. The only activities analyzed in detail are the salvage harvest units and associated temporary road construction.

Activities Not Analyzed in Detail

Road Maintenance and Reconstruction: Forest system roads are not considered in the determination of potential DSD (USDA FS 2011, 2014). Approximately 58 miles of road maintenance and reconditioning of haul roads are proposed under Alternatives 2, 3, and 4 and would include removal of brush, clearing of culvert inlets, grading of the roads for water flow control, and the removal of closure barriers as needed. Work would improve road drainage and reduce the risk of mass erosion.

In addition, there would be 16.9 miles of system haul road reconstruction under Alternatives 2 and 4 and 16.5 miles under Alternative 3. This would include culvert replacements, road stabilization, and addition of cross drain culverts.

Helicopter Landings: All existing and new helicopter landings for the Johnson Bar project are associated with the permanent transportation system in the project area. As a part of the transportation system these landings are not considered in the determination of potential DSD (USDA FS 2011, 2014). BMPs and design criteria would be used to minimize soil erosion and guide restoration of these sites.

Road Decommissioning and Storage: Forest system roads are not considered in the determination of potential DSD (USDA FS 2011, 2014). Approximately 1.1 miles (5 acres) of system roads would be decommissioned, 20.2 miles (100 acres) of non-system roads, and 4.8 miles of road storage of system roads. Road decommissioning would directly improve soil conditions by decompacting soils and adding coarse woody material and other organic matter to the existing road surface. Road decommissioning would also improve slope stability and reduce the potential risk of mass erosion from culvert failure.

Decommissioned roads are considered as returned to the productive land base through removal from the transportation system. Soil structure, water infiltration, aeration, root penetrability, and soil biological activity improvements are observed with road decommissioning techniques used on the Nez Perce-Clearwater National Forests (Lloyd et al. 2013). Monitoring has shown decommissioning and storage treatments to be effective at reducing surface erosion and mass failure risk and increasing vegetative ground cover (Foltz 2007, Lloyd et al. 2013).

Under Alternative 1, no road decommissioning or storage activities would occur. Soils in these areas would remain in an unproductive or hydrologically unstable condition.

Activities Analyzed in Detail

Salvage harvesting activities and associated temporary road construction are analyzed in detail, as these activities can contribute to DSD calculations, cause erosion, and affect soil productivity.

Salvage Harvest: Alternative 2 proposes 3,096 acres of salvage harvest, of which 100 acres would utilize tractor logging, 1,478 acres would utilize skyline logging, and 1,518 acres would be through helicopter logging. Alternative 3 proposes 2,710 acres of salvage harvest, of which of which 18 acres would utilize tractor logging, 921 acres would utilize skyline logging, and 1,771 acres would be through helicopter logging. Alternative 4 proposes 2,207 acres of salvage harvest, of which 100 acres would utilize tractor logging, 1,352 acres would utilize skyline logging, and 755 acres would be through helicopter logging. Unit prescriptions would follow a

tree retention methodology based on Region 1 tree survival guidelines. All live trees would be left as “leave trees”. In the absence of live trees, a combination of 14-28 live or dead reserve trees would be left per acre. Activity-generated slash piled along roadsides and in landings would be dispatched via sale of biomass materials, chipping, or burning. Slash within the units would be left in place or treated using jackpot burning if conditions outlined in the design criteria are met: low wildfire burn severity, low soil erosion hazard, and less than 55% slopes.

Temporary Road and Swing Trail Construction: Under Alternatives 2 and 4, approximately 2.4 miles of temporary roads would be constructed and 0.7 mile would be located on existing road templates. Alternative 3 proposes using 0.3 mile of existing temporary roads and no new construction. Disturbed width for temporary roads would average 25 feet. In addition, there would be 4.3 miles of new swing trails constructed under Alternatives 2 and 4. Alternative 3 would not entail any new swing trail construction. Disturbed width for swing trails would average 15 feet. Temporary roads and swing trails would be located on low-gradient, dry ridges, or upper slopes and away from water; these roads would have no stream crossings.

Temporary roads and swing trails are considered 100% detrimental disturbance with reduced soil productivity until vegetation, organic matter, and hydrologic functions are restored. The greater disturbance associated with temporary road and swing trail construction is the displacement or mixing of the topsoil, including the Mazama ash cap. Temporary roads and swing trails would be constructed, used, and decommissioned within 1-2 years of harvesting activities. Decommissioning following use would promote restoration of soil structure, water infiltration, aeration, root penetrability, and soil biological activity, as observed with road decommissioning techniques used on the Nez Perce-Clearwater National Forests (Lloyd et al. 2013). These techniques would support recovery of productivity on soils disturbed by temporary roads and swing trails.

3.9.6.1 Alternative 1

This alternative maintains the existing condition resulting from the Johnson Bar fire. Alternative 1 would not alter the current soil erosion or landslide potential and would retain the same amount of coarse woody material, both standing and down. Existing DSD would persist with very slight natural recovery of surface layers of compacted soils. Over time, large woody debris from dead trees would fall on the ground, increasing organic matter and water-holding capacities on-site.

Under Alternative 1, no road decommissioning activities would occur that would directly improve soil conditions by decompacting soils and adding coarse woody material and other organic matter to the existing road surface. Soils in these areas would remain in a less productive condition.

3.9.6.2 Alternatives 2, 3, and 4

Landslide and Erosion Hazard Potential

Landslide-prone (LSP) areas were identified using GIS and LIDAR analysis. All potential landslide prone areas were excluded from the salvage harvest units. If additional landslide prone areas are identified, the area would be excluded from harvest and a PACFISH buffer would be added.

No harvest activities would occur in these LSP areas. Indicators of landslide prone areas include: steep (over 60%) concave slopes; hydrophytic vegetation (i.e. sedges, moist site ferns); slumps, draws, and basins; past landslide locations; and obvious soil movement areas (typically indicated by curved and/or buttressed tree boles, soil creep, tension cracks, etc.).

The project area has been mapped into landtypes, which are areas featuring similar soils, hydrology, and vegetation characteristics. Soil erosion and mass wasting are natural processes and many landtypes across the Forest have high inherent hazards of erosion, mass wasting, and landslides (USDA NRCS 2006). These natural processes have occurred over long time periods and are fundamental factors in creating the present-day landscape. An erosion hazard assessment based on landtype properties was used to determine erosional characteristics of the project units and temporary roads/swing trails. This assessment was used to develop project design criteria to minimize erosion potential. Mass wasting, surface erosion, and subsurface soil erosion potentials were evaluated for the landtypes coinciding within the proposed harvest and burn units.

Surface erosion was rated as high on 150 acres (5%) of proposed units under Alternative 2, 137 acres (5%) of units under Alternative 3, and 62 acres (3%) of units under Alternative 4. Approximately 44-45% of the landtypes located in the proposed units are considered as high mass wasting potential and 87-90% of the units are located on landtypes considered high for subsurface erosion (Table 3-35). Generally, logging in areas with high risk for subsurface erosion is problematic only if the surface soil is removed and the subsurface and parent material is exposed, such as excavated skid trails and landings. By limiting tractor logging and apply design criteria and BMPs to the proposed project, the risk of increased erosion would be minimized.

Table 3-35: Acres of Harvest Activity on Landtype Hazards by Alternative

Hazard	Alternative 2 (acres)	Alternative 3 (acres)	Alternative 4 (acres)
High surface erosion	150 (5%)	137 (5%)	62 (3%)
High subsurface erosion	2,728 (88%)	2,369 (87%)	1,982 (90%)
High mass wasting	1,370 acres (44%)	1,210 (45%)	996 (45%)

Landtype erosion hazards used to assess the effects of the alternatives on soil stability and erosion potentials indicate an overall increase of erosion potential for each of the action alternatives. Surface soil loss through displacement and mixing with infertile substrata has long-lasting consequences for soil productivity. This loss occurs during temporary road construction, excavation of skid trails and landings, and displacement of soils during ground-based harvesting activities. Irreversible damage to soils could result from the loss of the volcanic ash cap. Although soil recovery could still occur in remaining subsurface soils, the exceptionally high porosity and water-holding properties of the Mazama ash cap would likely be irrecoverable. Even though the ash layer is not a significant source of soil nutrient content, loss of the ash layer

reduces water-holding capacity and high-quality tree rooting material. Since volcanic ash is not easily replaced, these effects may be very long lasting.

Less than 200 feet of proposed swing trail is proposed on landtypes rated as high for potential surface erosion under Alternatives 2 and 4, with none under Alternative 3 (Table 3-36). For Alternative 2, approximately 4.9 miles of proposed temporary roads and swing trails would be located on landtypes with high subsurface erosion potential, with approximately 0.8 mile under Alternative 3, and 5.4 miles under Alternative 4. Approximately 0.5 mile of proposed temporary roads and swing trails would be located on landtypes rated as high for mass wasting potential under Alternatives 2 and 4, with only 0.1 mile proposed under Alternative 3. Location on these landtypes is often only problematic if the surface soil is removed and the subsurface material is exposed. Skid trails and landings would be located and designated to minimize the area of soil disturbance.

Design criteria to reduce the potential for erosion include the following: limiting the amount of excavated skid trails and landings; fully decommissioning all excavated skid trails and landings on erosive landtypes; and placing large, woody material over the contoured slope for soil stabilization (design criteria for soils in Chapter 2).

Table 3-36: Length of Swing Trail and Temporary Road on Landtype Hazards by Project Area

Hazard	Alternative 2	Alternative 3	Alternative 4
High surface erosion	200 feet	0	200 feet
High subsurface erosion	4.9 miles	0.8 mile	5.4 miles
High mass wasting	0.5 mile	0.1 mile	0.5 mile

The proposed temporary roads would be located on ridgetops and upper slopes, and only short, discontinuous portions would require some form of excavation. All temporary roads would be decommissioned after use, and large woody material (>3 inches in diameter) would be placed on the surface to aid in soil stability. An increased number of water bars or the addition of slash material to the road bed would be used as necessary to reduce erosion while the road is in use. Even if small segments in these roads cut into the subsurface material and some erosion does occur, the likelihood of sediment delivery to streams would be minimal, because temporary roads would be located on ridgetops far from stream channels.

Soil Productivity

Compaction, displacement, rutting, severe burning, surface erosion, loss of surface organic matter, and soil mass movements can all reduce site productivity. For the purpose of the proposed project, harvest units, temporary roads, and prescribed burn units are all considered Activity Areas.

Much research has been conducted on the extent of ground disturbance from harvest activities. Disturbance has been shown to range from 4% to over 40%, depending on equipment used,

method and season of operation, and silvicultural prescription (Clayton 1981; Clayton 1990; McNeeland Ballard 1992; Tepp 2002). Megahan (1980) documented that the highest amount of disturbance came from tractor yarding, with lesser amounts from skyline and aerial methods. In order to estimate the potential increase in detrimental disturbance created by proposed activities, the following assumptions were made for ground-based skidding, skyline yarding, temporary road construction, and slash treatment:

- Detrimental soil effects from proposed ground-based skidding are estimated at 10% of an Activity Area. Monitoring conducted across the Clearwater Forest in 2008 showed that past ground based harvesting created an average of 14% DSD. This same monitoring report recommended several design criteria that could minimize detrimental disturbance. Based on incorporating the recommended design criteria and requiring rehabilitation of all project created detrimentally disturbed soils, it was determined that ground based effects would be lower than in the past and a 10% estimate was established for use. Design criteria include limiting activities to drier periods, designating skid trails, and limiting the extent of equipment when excavator piling of slash. DSD is generally limited to main skid trails and landings. Soil disturbance can be minimized by using existing skid trails and/or by designating the location of new skid trails (Froehlich and Adams 1984; Froehlich and McNabb 1983).
- Estimated detrimental soil effects from proposed skyline yarding are 4% of an Activity Area, and disturbance is mostly concentrated at landings.
- Estimated detrimental soil effects from proposed helicopter yarding are 2% of an Activity Area, and disturbance is mostly concentrated at landings.
- Effects to soil from temporary road construction are expected to span an average width of 25 feet wherever roads are built. This estimate is based on the assumption of a running road surface 12–15 feet wide and an additional 3–6 feet, cleared of vegetation, on each side of the road, where the soil would likely be displaced and the organic litter layer disturbed and/or removed. Swing trails would have essentially the same effects as temporary roads, due to the extent of soil disturbance and were analyzed the similarly.
- Activity-generated slash piled along roadsides and in landings would be dispatched via sale of biomass materials, chipping, or burning. Activity generated slash would be hand piled and jackpot burned if needed. Treatment of slash is incorporated in the estimated DSD discussed above.

The calculations based on the above assumptions are gross estimations and are best used to compare alternatives and develop design criteria for units that may have particular concern. Based on the above DSD assumptions, the proposed activities could cause soil disturbance on approximately 119 acres for Alternative 2, approximately 75 acres for Alternative 3, and approximately 100 acres for Alternative 4, with the estimated increase of DSD in the harvest units ranging between 2% and 10% (Table 3-37). The estimated increase includes skid trails, landings, swing trails and temporary roads that would be obliterated after project activities, so some measure of improvement would occur in those areas. The highest percent increase in soil

disturbance would occur in units with proposed ground-based yarding methods. Some of these units have existing skid trails and landings that could be reused, thus minimizing the amount of new detrimental disturbance.

Table 3-37: Estimated Increase in DSD per Alternative

Unit Number	Acres	Alternative 1	Alternative 2		Alternative 3		Alternative 4	
		Existing DSD (%)	Acres of New DSD	New DSD (%)	Acres of New DSD	New DSD (%)	Acres of New DSD	New DSD (%)
101	74	3	1.5	2	1.5	2	0	0
102	91	5	1.8	2	1.8	2	0	0
103	169	5	6.9	4	5.1	3	2.7	5
104	138	5	5.2	4	2.8	4	3.4	4
105	28	7	1.1	4	1.1	4	1.1	4
106	56	4	4.4	8	2.5	4	4.4	8
107	11	3	0.7	6	0.7	6	0.7	6
108	1	4	0.0	4	0.4	10	0.1	10
109	13	5	0.5	4	0.5	4	0.5	4
110	45	6	2.3	5	1.0	2	3.3	7
111	169	6	9.4	6	4.6	3	8.6	5
112	3	6	0.1	4	0.1	4	0.1	4
113	16	5	0.6	3	0.6	4	0.6	4
114	73	6	4.9	7	1.5	2	4.9	7
115	153	8	7.3	5	2.4	2	7.3	5
116	263	7	5.3	2	0	0	0.5	2
117	52	6	1.3	2	1.3	2	1.3	2
118	10	6	0.8	8	0.4	4	0.8	8
119	24	7	0.5	2	0.5	2	0.5	2
120	17	7	0.4	2	0.4	2	0.4	2
121	32	6	1.5	5	1.3	4	1.5	5
122	219	6	7.7	3	5.9	3	7.7	3
123	12	10	0.2	2	0.2	2	0.2	2
124	6	5	0.1	2	0.1	2	0.1	2
125	117	6	5.6	5	3.0	3	5.6	5
126	102	5	2.0	2	2.0	2	0	0
127	42	5	1.1	3	1.1	3	1.1	3

Unit Number	Acres	Alternative 1	Alternative 2		Alternative 3		Alternative 4	
		Existing DSD (%)	Acres of New DSD	New DSD (%)	Acres of New DSD	New DSD (%)	Acres of New DSD	New DSD (%)
128	33	6	2.3	7	0.9	3	2.3	7
129	124	7	4.8	4	3.1	3	4.8	4
130	2	3	0.0	2	0.0	2	0.0	2
131	144	6	8.3	6	5.1	4	9.1	6
132	32	7	0.89	3	0.8	3	0.9	3
133	12	5	0.2	2	0.2	2	0.2	2
134	91	5	5.5	6	3.2	4	5.5	6
135	67	3	2.0	3	2.0	3	2.0	3
136	28	6	1.9	0.0	0.6	2	1.9	7
137	27	3	0.5	2	0.5	2	0.5	2
138	44	4	1.4	3	1.4	3	1.4	3
139	49	6	2.3	5	2.3	5	2.3	5
140	24	6	0.5	2	0.5	2	0.5	2
142	39	3	0.8	2	0.8	2	0.8	2
143	45	3	0.9	2	0.9	2	0	0
144	93	3	1.9	2	1.9	2	0.4	2
145	303	4	11.7	4	7.9	3	9.5	5
Total			119.2		74.8		99.8	

Implementation of project design criteria and BMPs would minimize DSD, and the decommissioning of skid trails, landings, and temporary roads would further improve soil condition. Decommissioning activities include decompaction, recontouring, adding organic matter, and seeding/planting. Soil remediation improves water infiltration, reduces potential for weed invasion, stabilizes slopes, and improves tree growth and vegetation establishment.

3.9.7 Effectiveness of Design Criteria

Past monitoring and research indicate that the effectiveness of the project design criteria would be moderate to high (Froehlich and McNabb 1983; Graham *et al*. 1994; Graham *et al*. 1999; Korband *et al.* 2004; Neary *et al*. 2008; Curran *et al*. 2005a, b).

3.9.8 Cumulative Effects

The spatial scope for cumulative effects is the individual salvage harvest units (variable acres) and associated temporary roads.

Areas affected by DSD can take several decades to recover, depending on soil texture, depth of compaction, and loss of organic material (Powers *et al.* 2005; Froehlich *et al*. 1983). Therefore, this analysis considers all activities from the 1950s to the present, as well as 20–50 years into the future.

Conditions in the project area are a result of both natural processes and human activities. Potential DSD within the analysis area could be attributed to fires (notably the Johnson Bar fire) or other past, present, or future management activities, including timber sales, thinning projects, dispersed recreation sites, and grazing activities. Ongoing and upcoming projects within the activity areas include forest restoration, firewood cutting, invasive weed control, and road maintenance. Recent and future restoration projects in the analysis area include BAER treatments and fire suppression rehabilitation for the Johnson Bar fire. Although there are numerous projects, disturbances, and semi-permanent features within the analysis area, the Johnson Bar fire is the largest factor that could affect DSD and erosion within the analysis area.

Ongoing and foreseeable future action within the proposed activity areas (salvage units and wildfire) consist of grazing, recreation, and fire suppression. Grazing effect could increase over a period of up to 10-20 years after a wildfire when more forage is available in the units. This is not expected to account for increased disturbance as livestock would trail along already disturbed skid trails and temporary roads that have been seeded. Recreation activities are not expected to increase in the harvest units, so an increase in detrimental disturbance would not be expected. Fuelwood cutting and access is limited. Fire suppression activities could increase DSD but the timing and extent of such disturbances cannot be predicted.

Timber Harvest - Harvesting methods prior to the 1990s often consisted of hand felling trees, unrestricted tractor skidding, and extensive machine piling of slash. Ground-based logging occurred on slopes exceeding 35% and dense networks of excavated roads and skid trails were commonly constructed. These practices frequently resulted in extensive compaction, rutting, and areas of scraped or displaced topsoil and organic matter. Machine piling of slash often removed small organic material, large coarse wood, and topsoil. Forest practices have changed over the last few decades. Project design criteria, BMPs, and Forest Plan guidelines have been developed in order to reduce the extent of disturbance and maintain soil productivity. Design criteria, such as designated skid trails, retention of woody material, operating under dry or frozen conditions, and limiting ground-based skidding activities to slopes less than 35% are now common practices. Slash treatment techniques have changed from dozer piling to excavator piling along designated trails, so that less soil displacement and compaction occurs, reducing the detrimental effects to soil.

Since the 1950s, 22% of the project area has been harvested. Most harvest activities occurred between the 1960s and 1990s, with approximately 5,869 acres of intermediate and regeneration harvest. The most notable effects from harvest activities were compaction, displacement, and burned areas at landings. In steeper units, effects were more dispersed.

Some harvest on State and private lands is occurring within the project area. This harvesting would be required to incorporate State BMPs. These activities are occurring downhill from any of the Johnson Bar Fire Salvage units and would not contribute to soil concerns within the project area units.

Fire - Approximately 18,236 acres (68%) have burned in the project area between 1870 and 2013. Evidence of past wildfires was noted in many of the units during soil surveys and effects from fire suppression activities were observed.

The Johnson Bar fire burned about 13,000 acres inside the project area. About 527 acres are classified as high burn severity, almost 6,000 acres as moderate burn severity, almost 6,000 acres as low burn severity, and the remainder was unburned or unclassified. High and moderate burn severity areas have 50 to 100 percent bare soil exposed; much of it with reduced capacity for water infiltration.

Roads - Roads also influence soil, with long-term to permanent impairment of soil productivity. Although system roads are excluded in the determination of whether projects meet Forest Plan and Regional standards, these roads are part of the existing condition for watershed function. Within the project area, approximately 59 miles or 360 acres of system roads occur where topsoil and subsoil have been displaced, mixed, or lost to erosion. This acreage represents about 1% of the project area.

Grazing - Effects from grazing are moderate due to most of the area being outside of the allotment, but tend to be highest near meadow areas, seeps, and springs. Effects within the units are transitory (in the form of livestock trails) and are mostly on the edges of units or along old skid roads. Grazing effects would likely be more dispersed through the fire area with the loss of canopy cover and increased ground vegetation.

Approximately 5 miles (25%) of the proposed road decommissioning would fall within the Tahoe-Glear Creek Grazing Allotment. There are potential cumulative effects from livestock use of these restored sites. The decommissioning of the roads would increase soil productivity and restore soil hydrologic function. The restoration rate of these sites may be hindered by the increased use of livestock on these sites but the sites would still be set on a restoration path by the proposed project activities.

Recreation - Recreation activities that were noted during field surveys include dispersed camping, off-highway vehicles (OHVs) and full-size vehicle use, fuelwood cutting, and hunting. Dispersed camping is generally located on already disturbed sites along system roads. Effects from recreation activities are primarily associated with full-size vehicles and OHVs using system roads during wet conditions, creating wheel ruts that concentrate water flow. Disturbance from recreation activities within harvest and burn units is anticipated to be negligible (less than one percent).

3.9.8.1 Alternative 1

This alternative would maintain the existing condition. It would not alter the current soil erosion or landslide potential and would retain the same amount of coarse woody material, both standing and down. Existing DSD would persist with very slight natural recovery of surface layers of compacted soils.

3.9.8.2 Alternatives 2, 3, and 4

The cumulative effects of these Action Alternatives were based on the estimated potential of increased detrimental disturbance (based on Region 1 Supplement definitions) when added to existing disturbance and to evaluate whether the project met Regional and Forest Plan standards.

The cumulative effects of past and proposed activities were determined by adding the estimated disturbance from the project (increase of 2%–10%) to the existing post-fire DSD (3%–10%). Potential cumulative DSD within the harvest units is estimated to be between 4.5% and 13.9% (Table 3-38).

All units would meet Regional soil standards without specialized design criteria. Design criteria were created though, to limit the amount of increased DSD from project activities and reduce the amount of existing detrimental disturbance by obliterating existing skid trails and landings. The project would meet the Regional soil standards by limiting the extent of detrimental disturbance to <15% following project implementation. (Table 3-38).

Table 3-38: Cumulative DSD for all Alternatives

Unit	Alternative1	Alternative 2		Alternative 3		Alternative 4	
	DSD (%)	New DSD (%)	Cumulative DSD (%)	New DSD (%)	Cumulative DSD (%)	New DSD (%)	Cumulative DSD (%)
101	3	2	5.1	2	5.1	0	0
102	5	2	7.3	2	7.4	0	0
103	5	4	9.2	3	8.2	5	9.4
104	5	4	8.5	4	8.6	4	9.1
105	7	4	11.2	4	11.1	4	11.1
106	4	8	11.9	4	8.4	8	11.9
107	3	6	8.8	6	8.9	6	8.9
108	4	4	8.0	4	8.0	4	8.0
109	5	4	8.8	4	8.9	4	8.9
110	6	5	11.1	2	8.5	7	13.5
111	6	6	11.6	3	8.8	5	11.2
112	6	4	10.0	4	10.1	4	10.1
113	5	3	8.5	4	8.5	4	8.5
114	6	7	13.0	2	8.6	7	13.0
115	8	5	13.0	2	10.8	5	13.0
116	7	2	9.5	0	0	2	10.1
117	6	2	8.6	2	8.6	2	8.6
118	6	8	13.6	4	9.5	8	13.9

Unit	Alternative1	Alternative 2		Alternative 3		Alternative 4	
	DSD (%)	New DSD (%)	Cumulative DSD (%)	New DSD (%)	Cumulative DSD (%)	New DSD (%)	Cumulative DSD (%)
119	7	2	9.0	2	9.0	2	9.0
120	7	2	8.8	2	8.8	2	8.8
121	6	5	10.5	4	9.8	5	10.6
122	6	3	9.2	3	8.4	3	9.2
123	10	2	11.6	2	11.5	2	11.5
124	5	2	7.3	2	7.4	2	7.4
125	6	5	10.9	3	8.8	5	10.9
126	5	2	7.0	2	7.0	0	0
127	5	3	8.1	3	8.1	3	8.1
128	6	7	13.4	3	9.2	7	13.3
129	7	4	10.5	3	9.2	4	10.6
130	3	2	4.5	2	4.5	2	4.5
131	6	6	11.4	4	9.1	6	11.9
132	7	3	9.8	3	9.5	3	9.7
133	5	2	6.8	2	6.8	2	6.8
134	5	6	11.0	4	8.5	6	11.0
135	3	3	5.9	3	6.0	3	6.0
136	6	0.0	13.2	2	8.5	7	13.2
137	3	2	5.1	2	5.1	2	5.1
138	4	3	7.5	3	7.6	3	7.6
139	6	5	11.1	5	11.1	5	11.2
140	6	2	8.1	2	8.2	2	8.2
142	3	2	5.3	2	5.3	2	5.3
143	3	2	4.8	2	4.8	0	0
144	3	2	4.9	2	4.9	2	5.0
145	4	4	7.9	3	6.7	5	9.0

3.9.8.3 Irreversible and Irretrievable Commitment of Resources

Loss of the volcanic ash–influenced loess through erosion or removal (excavated temporary roads and skid trails) is irretrievable. Remaining soil materials would eventually develop (over a minimum of several decades) but may lack the water- and nutrient-holding properties of volcanic ash.

Small, localized areas would have reduced soil productivity until vegetation becomes reestablished and organic layers rebuild. These areas include temporary roads, skid trails, and landings. Severely burned areas and areas with deep compaction could take decades to recover (Froehlich *et al*. 1983). Soil improvement activities such as decompacting soils and adding organic matter (woody material) could jump-start this process (Curren *et al*. 2005a, b).

All project activities include BMPs, design criteria, or rehabilitative measures to avoid irreversible and irretrievable commitment of resources on the productive land base. Decommissioning of temporary roads and skid trails, which includes recontouring and recovery of excavated ash cap topsoil, is expected to initiate recovery of soil productivity functions over time, which could be as long as 40-60 years. Design criteria, such as keeping disturbance to less than 15% areal extent, re-use of existing skid trails in units, decompaction of skid trails and landings, and retention of woody debris are intended to avoid loss of the ash cap soil. Several design criteria were developed for inclusion in the proposed project due to the post-fire environment (Design Criteria, Chapter 2). These design criteria focus on erosion prevention by establishing ground cover after activities have ceased.

3.10 Vegetation

3.10.1 Analysis Area

The Johnson Bar Fire Salvage project area of 26,788 acres was used to analyze cover types. Acreage of each management area, size class, and burn severity were identified within the project area.

Old growth was analyzed using Old Growth Analysis Areas (OGAA) that entered the project area (Figure 8). Management Area 20 (MA20) within the project area was noted. Current timber production and reforestation was analyzed at the project scale.

The analysis area for this assessment includes upper portions of the Clearwater River subbasin and portions are in the lower Selway river subbasin. The Selway river basin is 1,288,196 acres and the Middle Fork of the Clearwater River Subbasin is 139,799 acres. Cumulative effects were described using past harvest acres in each watershed.

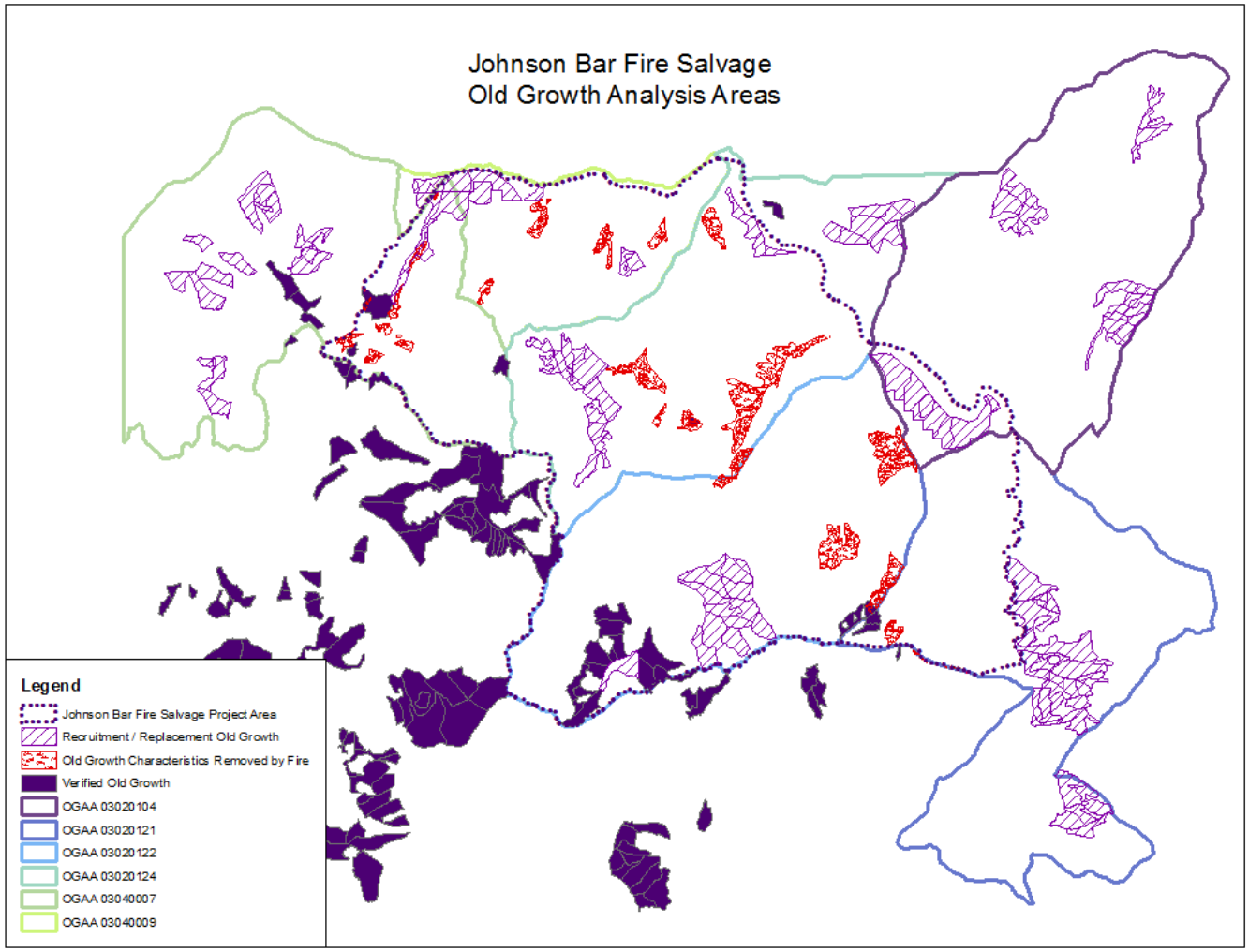


Figure 8: Old Growth Analysis

3.10.2 Regulatory Framework

Forest Plan direction and all Federal and State laws and regulations pertaining to the management of vegetative resources on the Forest would be applied to the project, including the NFMA of 1976. In addition, diagnosis, prescription development, and forest health analysis are guided by Forest Service regulations and policy (FSH 1909.60 and 2409.17; FSM 1920, 2020, 2470, 2471, and 2472) and the Region 1 Integrated Restoration and Protection Strategy.

3.10.2.1 Nez Perce National Forest Plan

Timber Standards

Timber Standard 1: Require silvicultural examination and prescriptions before any vegetative manipulation takes place on forested lands. Final determination of the silvicultural system for areas to be harvested would be made by a certified silviculturist after an on-the-ground, site-specific analysis.

All proposed treatment stands would have been examined on the ground by a silviculturist, wildlife biologist, and fuels specialist. All vegetative treatments would have silvicultural prescriptions approved by a certified silviculturist prior to treatment implementation. Prescriptions would consider site-specific factors, as well as multiple resource objectives, NEPA decisions, other regulatory requirements and Forest Plan goals, objectives, and standards. Action alternative treatments were proposed because they balance the management, operational, soil disturbance, and human dimension requirements and respond to the purpose and need.

Timber Standard 2: Clear-cutting would not occur adjacent to previously harvested areas that are still considered openings.

No harvest is being proposed adjacent to stands that would be considered an opening. All proposed harvest units that are adjacent to previously harvested stands are certified as fully stocked, and the trees are greater than 10 feet in height.

Timber Standard 3: Permit timber harvest on lands classified as “unsuitable” for timber management to accomplish multiple use objectives.

No harvest is being proposed on unsuitable lands.

Protection Standards

Protection Standard 3: Minimize the effects of the mountain pine beetle and other insect and disease infestations to the extent necessary to achieve the overall goals and objectives of this Forest Plan.

Loss of the long-lived early seral components in the ecosystem is a major factor in the lack of ecological resiliency. Salvage and planting treatments would remove dead timber and high fuel volumes, which would trend the project area toward species compositions with increased resilience. Proposed treatments would promote Forest resistance to disturbance agents while promoting Forest resiliency.

3.10.2.2 National Forest Management Act

Vegetation Manipulation [36 CFR 219.27(b)(1)]: Ensure that technology and knowledge exist to adequately restock lands within 5 years after final harvest.

Restocking within 5 years of regeneration harvest is a required design item of the action alternatives. Technology and knowledge do exist to comply with this requirement. This standard is met under the action alternatives.

Silvicultural Practices [36 CFR 219.27(c)]: No timber harvest, other than salvage sales or sales to protect other multiple-use values, shall occur on lands not suitable for timber production.

Guidelines for determining suitability are found in the FSH (2409.13). The proposed harvest units are within the productive habitat types as described in Cooper, Neiman and Roberts, 1991. None of the areas being proposed for treatment as part of the project are designated as unsuitable under the 1987 Forest Plan (USDA Forest Service 1987b). This standard is met under the action alternatives.

Salvage Operations [36 CFR 219.11(4) iii]: The planned maximum size for openings to be cut in one harvest operation shall not apply to the size of openings harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm [16 U.S.C. 1604(g)(3)(F)(iv)].

3.10.2.3 Forest Service Manual 2411.02 – Objective

To provide, the extent possible, a supply of timber to maintain a stable community or communities designated by existing cooperative or Federal sustained yield units agreement or policy statements (16 USC Section 583).

3.10.2.4 Forest Service Manual 2471 – Harvest Cutting

The size of harvest openings created by even-aged silvicultural systems in the Northern Region would normally be 40 acres or less. Creation of larger openings would require 60-day public review and Regional Forester approval.

The public was informed during scoping that regeneration openings in excess of 40 acres were proposed for the project area. Approval to exceed the 40-acre opening size, with appropriate interdisciplinary analysis and documentation, was received from the Regional Forester‘s office on October 24, 2014. The action alternatives would create openings on the landscape that are closer in scale and pattern to the openings developed under historic disturbance regimes for this area. This standard is met under all the action alternatives.

3.10.3 Analysis Methodology

The analysis of effects on forest vegetation resources is based on the following information:

- Best Available Science;
- Review of pertinent scientific literature related to the ecology, fire, insects, disease, reforestation;
- Review of pertinent silvicultural practices for managing timber;

- Geographical Information Systems data available from Nez Perce-Clearwater National Forest databases;
- Collective and professional knowledge of the project area by the Interdisciplinary Team regarding proposed silvicultural practices and the patterns and processes of forest vegetation within the project area;
- Review of Forest Plan for timber resources;
- Review of applicable law and regulations; and
- Modeling using the Forest Vegetation Simulator.

Modeling with Forest Vegetation Simulator (FVS) would be used to compare success of planted early seral species to natural regeneration. The FVS model tends to overestimate volume in small trees and underestimate volume in in large trees. The underestimation of volume increases as elevation increases. The FVS model was used to model planted and natural stands of timber using field data known as stand exams. Stands were grown with pre-commercial thinning treatments at age fifteen. Pre-commercial thinning favored early seral species. The FVS model was used to determine approximate stand composition and trends in stand development.

Pertinent scientific research, best management practices and collective professional knowledge of proposed silvicultural practices was used to determine project operations. Habitat types indicate the productivity of the land and are determined by the group of plants growing on the site. Data was analyzed in reference to Cooper, Neilman, and Roberts, 1991 habitat types to determine Forest productivity and reforestation needs. Reforestation needs were determined by on the ground observations and field data known as stand exams. The tree species growing on the land is referred to as cover type and may change with disturbance agent interactions and plant succession over time within the capability of the habitat type.

Vegetation response units (VRU) were used to describe the biophysical environment and to provide appropriate context for analyzing Johnston Bar Fire Salvage conditions. Agents of change—such as succession, weather, climate, fire, insects, and disease—must also be considered in these discussions.

3.10.4 Resource Indicators

No single indicator is a definitive measure of forest health or resilience, but early seral species are an indicator of Forest resilience (Schantz, 2015). The early seral stand component is the analysis indicator that would be discussed in the existing conditions at the treatment unit scale (see Table 3-49), and at the project level scale (see Table 3-50). This analysis relies on the comparison of existing conditions dominated by western red cedar and grand fir to the percent of early seral species. Stand conditions were compared under the no action alternative and the three action alternatives over 85 years (2102). Early seral species would be restored by planting western larch, western white pine, ponderosa pine, and potentially some Douglas fir.

The analysis of the proposed action alternatives is being conducted at the treatment unit scale and would be based on the stand composition. The salvage treatment alternatives would be compared to the no action alternative on the basis of a 60% fire mortality and 100% fire mortality. The 60% and 100% fire mortality are being utilized as stands with 50% mortality or

less would not be harvested. Field reviews indicated there are no stands with 50%-60% mortality with evenly spaced trees to be salvaged within the project area; therefore, there is no need for further analysis.

The reason for the comparison with the two rates of mortality is to capture the high variability in mortality. Due to the variation of tree mortality, 60% mortality was chosen to represent the low end of the treatment scale and would result in stands with a two aged structure after salvaging operations. Stands with 100% mortality represent the high end of the treatment scale and would result in an even aged structure after salvaging operations. The matrix for comparing stand composition would be:

- No action alternative with 60% fire mortality to salvaging and planting treatments with 60% mortality; and
- No action alternative with 100% fire mortality to salvaging and planting with 100% fire mortality (see Table 3-49).

Current conditions for these indicators were derived from pre-fire data Timber Stand Management and Records System (TSMRS), FSVeg data and using the FVS model.

A forest objective is to increase early seral species on the landscape. Therefore, the project level scale was used to analyze the cover type of early seral species by alternative:

Percent of the project area with forest cover type dominated by the long-lived early seral species (western white pine, western larch, and ponderosa pine) as compared to the percent of the area dominated by grand fir, western red cedar, and Douglas-fir (see Table 3-50).

Data Sources

Trees are managed in units of stands. A stand is defined as a contiguous group of trees sufficiently uniform in species composition, structure, site history, topographic location and condition (Tappeiner, et. al., 2007).

Current post-fire vegetative conditions were summarized using BARC imagery, Forest Service GIS databases from FACTS, and FSVeg. The inventory model also uses the Forest Vegetation Simulator (FVS) to grow the stands to 2102 conditions, starting from the time when the stands last received a stand examination.

The FVS model provided a variety of information that was used in the analysis, including species composition, growth over time, and fire and fuels parameters. Documentation of these FVS attributes is found in Dixon, 2008.

Post-fire field observations by a certified silviculturist were used to determine reforestation needs and verified appropriate silviculture prescriptions. The post-fire field observations and analysis were done to verify old growth mortality and to develop a reforestation plan.

3.10.5 Affected Environment

Biophysical Environment

Much of the vegetation in the Nez Perce-Clearwater National Forests is a result of the productive ash cap soils and the prevailing climatic pattern. The climate is dominated by Pacific maritime air masses and prevailing westerly winds. Within the analysis area, annual precipitation varies from 40 to 50 inches. Over 90% of the annual precipitation occurs during fall, winter, and spring months as a result of cyclonic storms in the form of a series of frontal systems moving east. The elevation of the analysis area ranges from 2,000 to 6,600 feet.

Ecological Setting and Vegetation Response Units

Each ecosection contains broad vegetation and topographic conditions. Local landtype classifications were used to divide each section into three settings. There are two primary settings within the analysis area; the Idaho Batholith Breaklands, and the Idaho Batholith Uplands. Incorporated within each of the resulting settings are five VRUs, as shown in Table 3-39. Two of these VRUs are in the project area, but have no treatment areas, while the other three VRUs have treatment areas within them. These units are broad ecological land sections that contain habitat type groups and terrain that have similar patterns of disturbance and successional processes. Patterns of plant community composition, age class structure, and patch size tend to fall within certain ranges for each VRU. The components used to build the VRU classification system are habitat type groups (potential vegetation), landforms, climate, and pre-settlement disturbance processes (such as fire regimes). The desired conditions, potential natural vegetation that could occupy the project area following a disturbance, successional patterns and stand development are presented below. The VRUs would be discussed in the analysis in terms of cover types and habitat types. Since very little to no treatments would be in VRU 3 and VRU 7, no detailed description of them is being presented.

Table 3-39: Vegetation Response Units in the Project Area

VRU Number	VRU Acres in Project Area
VRU 3	327
VRU 7	5
VRU 8	19,839
VRU 10	2,999
VRU 17	3,861

<u>Idaho Batholith—Breaklands</u>

The Breaklands are characterized by low- to mid-elevation canyons on steep south aspects. The Breaklands setting is dominated by steep slopes and deep canyon walls through which the Middle Fork and Selway tributaries flow. Soils are derived from granite, border zone, and basalt geologies. Landslides and surface creep are the dominant erosion processes. The Breaklands are

known for having inclusions of landslide prone areas and shallow soils. These characteristics make this setting more susceptible to erosion and more sensitive to disturbance.

Wildfire was the primary process affecting plant succession, composition, and distribution. Steep terrain favors rapid, upslope spread of wildfires. Stand-replacing fires are more prevalent on long, steep slopes and less frequent in adjoining moist habitats. Patches on dry aspects are uneven-aged, resulting from nonlethal to mixed-severity wildfire. Patches on moist aspects are even-aged, with uniform vegetation and fuel conditions resulting from stand-replacing fires. Early seral species (shrubs, forbs, and grasses), Douglas-fir, ponderosa pine, and grand fir readily reestablish following wildfire episodes.

VRU 8: 19,839 Acres (74% of the analysis area)

Grand Fir, Douglas-fir, and western red cedar dominate stands in VRU 8 during late successional stages. Early seral stages range from relatively open to densely stocked and are usually dominated by a mix of early seral and mid-seral species, including lodgepole pine, western larch, and western white pine. Ponderosa pine, Engelmann spruce, and Pacific yew may be present. Important elements include coastal disjunctive plant species, early to seral tall shrub and hardwood communities, and old-growth inclusions of western red cedar riparian habitats. Patch sizes are widely variable and result from irregular, infrequent mixed-severity fires and very infrequent stand-replacing fires throughout the landscape. Old-forest habitats dominated by shade-tolerant conifers typically occur in patches of <40 acres and are associated with topographic inclusions (benches, basins, flat ridges, and moist habitats). These smaller patches are a result of stand-replacing fires. About 50%–60% of stands originate from stand-replacing fires. Post disturbance stands include at least 10 live trees per acre (TPA) that are >150 years old. Relict Douglas-fir, western larch, grand fir, and ponderosa pine are common on ridges.

Idaho Batholith—Uplands

The Uplands setting is a mix of gentle-to-steep slopes that form shallow canyons. Surface soils are derived from granite, border zone, and basalt geologies. The warm, moist climate, in combination with deep volcanic ash soils, creates high site productivity for forested stands. Surface creep is the dominant erosion process; mass-wasted areas are local and uncommon.

Fire was the primary landscape disturbance process affecting plant succession, composition, and distribution. The fire regime is variable due to irregular terrain that discourages rapid fire spread. This fire regime creates a mosaic of mixed- to lethal-burned uplands and nonlethal or unburned riparian habitats. Small openings created by the more frequent low- and mixed-severity fires result in a mix of tree species and ages. Stand-replacing wildfire occurs at intervals of 150–250 years or more (Kapler-Smith and Fischer 1997) and is likely associated with strong wind episodes in combination with extended drought.

VRU 10: 2,999 Acres (11% of the analysis area)

The dominant stand structure and cover types in VRU 10 are open-canopied, multi-aged old-forest stands of grand fir, Engelmann spruce, subalpine fir, western red cedar, and Sitka alder. Isolated Douglas-fir, western larch, lodgepole pine, and Pacific yew locally occur on ridges.

Mixed alder, forbs, and grasses are well distributed and persistent as inclusions. Multi-aged, mixed-species stands originate from low- and mixed-severity disturbances, including windthrow. Old-forest habitats are dominated by shade-tolerant conifers associated with moist habitats.

VRU 17: 3,861 Acres (14% of the analysis area)

Mature stands in VRU 17 are dominated by western red cedar and Grand Fir forest cover types in the absence of disturbance. With stand re-initiation, Douglas-fir, western white pine, and western larch occur as isolated relics in mature and old stands. The decline in white pine has led to the increase of grand fir and Douglas-fir, which have a high susceptibility to root diseases. Open-canopied, multi-aged old forest and tall shrub communities are important elements. About 40%–60% of stands evolve with mixed-severity disturbances, and 40%–60% develop following stand-replacing disturbances. Post disturbance stands include at least 10 live trees/acre that are >150 years old. Old-forest habitats are dominated by shade-tolerant western red cedar and grand fir.

Fire suppression and the lack of stand density management, or stocking management, has allowed most of the project area to reach climax species of Grand Fir (GF) and western red cedar (WRC). Sub-alpine fire-spruce (SAF), ponderosa pine (PP), or lodgepole pine (LP) cover types in the project area are so low that they mathematically they round to 0% of the project area. Currently there is no broadleaf or early seral species cover types in the project area. Douglas fir (DF), GF, and WRC cover types vary from 15-28% of the project area. The Johnson Bar fire was the most recent natural event to change stand conditions. The Johnson Bar fire was a mixed severity fire in a young late seral forest (Table 3-40).

Table 3-40: Burn Severity

Burned Acres	Acres
Unmapped	18
Unburned	1,441
Low	5,487
Moderate	5,789
Severe	527
Total	13,262

The Johnson Bar fire Salvage project area is 26,788 acres and consists of the management areas listed in Table 3-41.

Table 3-41: Management Areas within the Project Area

Management Areas	Description of Management Area	Management Area in Johnson Bar Project Area Acres	Alternative 2 Acres	Alternative 3 Acres	Alternative 4 Acres
01	Public Safety	25	0	0	0
8.2	Wild and Scenic River	2,308	185	159	0
10	Water	942	16	0	0
12	Timber	10,508	886	859	868
14	Timber/Big Game Visuals	8	0	0	0
16	Elk	9,929	1,733	1,414	1,061
17	Timber/Visuals	2,357	463	463	463
20	Old Growth	2,960	0	0	0
21	Moose	811	11	11	11

*Variance in acres is due to GIS operations, Management Area overlap, and rounding errors.

3.10.6 Existing Conditions

Vegetative Conditions in the Project Area

The Johnson Bar Fire was largely a wind driven fire that lost momentum when the winds died down. Live fuel moistures of young saplings and brush often function as a heat sink when interacting with wildfire (Incident Operations Standards Working Team, 1998). Post-fire field reviews of the Johnson Bar Fire of previous harvest units indicate that young stands of saplings, referred to as thinning units, function as fuel breaks. Similar findings were found in field observations of the Neola Fire of 2007. The Johnson Bar fire observations were a result of the specific temperatures, relative humidity, topography, wind speed, and wind direction at the time of the fire and was in moist habitat types.

Forest Composition

Forest cover types describe the dominant tree species present in a stand. The forest cover types in the project area are primarily late successional mixed conifers. The Uplands and the Breaklands have relic, long-lived early seral species (western larch and ponderosa pine) but are primarily composed of late-seral, shade-tolerant species. Harvested units are planted with western white pine, western larch and ponderosa pine in the project area. The presence of long-lived early seral components can be used as an indicator of forest health. Early seral species and their composition, structure, and functions have the desired resistance, and resilience to recover from disturbances. Resistance is defined as the ability for a stand to prevent negative impacts from disturbance agents and protect valued resources. Resilience is defined as the capacity of ecosystem to return to desired conditions after disturbance.

Size Class

The pre-fire size classes in the Johnson Bar Fire Salvage project are shown below in Table3-35. A majority of the trees are in the 15 to 19-inch size class, but due to growth rates may only be 80-100 years old.

Table 3-42: Pre-fire Size Classes

Size Class	Acres	Percent
Herb	125	0%
Shrub	393	1%
0-4.9	1,501	6%
5-9.9	3,377	13%
10-14.9	1,480	6%
15-19.9	15,649	58%
20+	3,518	13%
Unknown	745	3%

Tree Survival Determination

Most of the time it would not be difficult to determine if an individual tree in the project area is dead or dying. Dead trees can be identified by blackened boles and the complete absence of needles, crowns having all brown needles, or “fading” or “dry-appearing” (off-color) green needles throughout the crown. At other times, it would be more difficult to determine the survivability of fire-injured trees having partially or completely green crowns. In order to predict the survivability of fire-injured trees, the following information would be used.

Survival probability is determined using *Factors Affecting Survival of Fire Injured Trees: A Rating System for Determining Relative Probability of Survival of Conifers in the Blue and Wallowa Mountains* (Scott et al. 2002, as amended), commonly referred to as the Scott Guidelines. Scott et al. 2002 uses a tiered rating system for which to determine tree mortality. The first tier evaluates fire intensity, time of year down, fuel, bark beetle activity, root rot, etc. Although the first tier is only part of the rating system, within most of the proposed treatment units, fire, insect, and disease characteristics alone predict that the trees have a less than 50% chance of surviving. The second tier evaluates tree damage from the fire, including crown scorch, bole scorch, cambium killed, and organic material removed from under the tree. Based on past fire salvage on the Nez Perce-Clearwater National Forests, cambium kill has proven to be an important indicator of tree mortality, especially for trees with green crowns (Wendover and Trap fire salvage sales monitoring of the survival guidelines found that tree survivability was over-estimated with fewer than 30% of the leave trees surviving). Most of the green needled trees in areas of the Johnson Bar fire that burned hotter are in the process of dying and will turn red as they become stressed due to the summer heat over the next few years or infested with bark beetles. These two tiers are then added together in order to derive a composite survivability rating for the tree.

Live trees would include trees rated as having a high probability of surviving the effects of the fire or having a moderate probability of survival with 50% or greater live basal cambium. Dead trees, including those projected to die within 5 years, would include trees rated as having a low probability of surving the effects of the fire or having a moderate probability of survival with less than 50% live basal cambium.

Field personnel would use the Scott Guidelines to determine individual tree characteristics by species during sale implementation. Scott et al. 2002 does not have any western red cedar ratings; therefore, the project would use the Nez Perce-Clearwater National Forests' field derived information from past fires for cedar, which is similar to the Scott Guidelines for spruce. The Scoring Guide Section below explains how the composite rating score would be interpreted as a survival probability rating (low, moderate, or high). The following criteria would be used to make a final determination as to whether or not the tree is expected to survive over the next few years:

- If a rating score falls within the **High Probability to Survive** range, the tree should be retained as a leave tree.
- If the rating score falls within the **Low Probability to Survive** range, the tree should be designated for removal, if it is not needed to meet other resource objectives.
- If the rating score falls within the **Moderate Probability to Survive** range, cut into the tree bark and check for dead cambium. The cutting should be done on four sides (faces) of the tree and in-between major lateral roots at the root crown or collar region, where the basal cambium is afforded greater protection from heat generated by smoldering duff.
    - If the dead cambium exceeds 50% (3 or 4 of the four faces), it is very likely that the tree would die and should be designated for removal if not needed to meet other resource objectives.
    - If the dead cambium is 50% or less (0, 1, or 2 of the four faces), it is likely the tree would survive and should be retained as a leave tree.
- If the rating score falls between the categories, then the following would be assumed:
    - If the rating is between low and moderate probability, use the low category; and
    - If the rating is between moderate and high probability, use the high category.

Scoring Guide for Rating Tree Survival for the Johnson Bar Fire Salvage Project

- Douglas-fir <20 inches DBH
    - High probability of survival – composite rating score 3-6
    - Moderate probability of survival – composite rating score 8-16
    - Low probability of survival – composit rating score 17-25

- Douglas-fir >20 inches DBH
    - High probability of survival – composite rating score 3-10
    - Moderate probability of survival – composite rating score 11-17
    - Low probability of survival – composit rating score 19-31
- Grand Fir
    - High probability of survival – composite rating score 3-4
    - Moderate probability of survival – composite rating score 5-10
    - Low probability of survival – composit rating score 11-30
- Spruce and Cedar
    - High probability of survival – composite rating score 1-6
    - Moderate probability of survival – composite rating score 9-14
    - Low probability of survival – composit rating score 19-33

Old Growth Forest

Old growth stands on the Nez Perce National Forest are managed by areas referenced as Old Growth Analysis Areas (OGAA). Old growth is discussed in terms of OGAAs which extend beyond the project area.

To understand the Nez Perce National Forest's management of old growth an understanding of the terms used is required. Management Area 20-Old Growth (MA20) consists of verified old growth stands, and replacement old growth stands. Verified old growth stands are stands that have been verified by field data, which are referred to as stand exams. Verified old growth stands have met the minimum requirements of Green et al., 1992 errata 2011 old growth and have been field reviewed by a silviculturist. The Nez Perce Forest Plan Appendix N states that replacement old growth refers to a timber stand that would meet old growth criteria within 100 years (minimum age for old growth is 150 years). The term "recruitment old growth" is used interchangeably with "replacement old growth".

The reader must keep in mind the various scales at which old growth was measured. Acres burned in the fire, is one scale; project area is another scale, and OGAAs is another scale. The OGAA is the scale the Nez Perce National Forest uses for management of old growth.

Data from the 2007 Forest Inventory and Analysis indicate that an estimated 13.4% of the Forest is old growth habitat, as defined by Green et al.., (1992). The lower and upper confidence interval bounds are 11% and 16.1%. The Forest meets the forest-wide old growth standard.

The Forest Plan designates Management Area 20 (MA 20) to retain and to manage for old growth habitats. MA 20 "…is made up of forested lands…and occurs on a variety of landtypes. Approximately half of the area has a timber condition class of over-mature sawtimber (150

years or older). The remainder of the area is comprised of immature stands (40–80 years) that would provide for replacement old growth habitat" (USDA Forest Service 1987b, p. III-56). For the Johnson Bar Fire Salvage Project, a majority of the project area is in the 80-100 year old class.

Appendix N of the Forest Plan describes the preferred distribution requirements and outlines an old growth identification process: "Old growth stands should be at least 300 acres. Next best would be a core block of 150 acres with the remaining blocks of no less than 50 acres and no more than ½ mile away from another old growth block. If existing old-growth blocks are less than 100 acres, the stands between the old-growth blocks should be managed as an old growth complex" (USDA Forest Service 1987b, p. N-2).

Old growth analysis areas were designated across the Forest in order to maintain the minimum Forest Plan requirements for the amount and distribution of old growth habitats. The analysis area includes six OGAAs. The OGAA03020104 is primarily brush fields, and a majority of the timber was assigned as replacement old growth as part of the project development. The Johnson Bar Fire Salvage Project OGAAs had 1,017 acres of verified old growth, and 2,753 acres of replacement old growth for a total of 3,770 acres of old growth before the fire.

The current condition is due to the burn severity, which changed stand characteristics such that old growth characteristics were lost and some stands no longer function as old growth. Stand replacing fires, wind events, insects and diseases have cascading interactions that can lead to reductions of old growth stands, old trees, and shade tolerant species with thin bark. Based on post-fire field data, the Johnson Bar Fire burned 934 acres of old growth to the point at which old growth characteristics were lost, 140 acres of which was verified old growth.

As a result of the old growth mortality from the fire, additional replacement old growth was assigned to MA 20. After reviewing the current inventory of old growth, the silviculturist and wildlife biologist worked together to select the replacement old growth stands. Replacement old growth stands were selected by aerial photo interpretation and field data. Mature stands which would most likely meet old growth conditions were selected within the OGAA. Groups of stands were selected to meet a cohesive and consolidated 300-acre group of stands. As mature stands became limited, younger stands were selected in 300-acre groups as replacement for old growth. By selecting replacement old growth in clumps of 300 acres, future stands of old growth would result in cohesive functional habitat units.

As a result 2,805 acres of replacement old growth was added to MA-20 to replace the 934 acres of burned old growth. Of the 2,836 acres of surviving old growth (MA-20), 877 acres consists of verified old growth and 1,959 acres of pre-fire replacement old growth. By adding 2,805 acres of post-fire designated replacement old growth to the 1,959 acres of pre-fire designated replacement old growth the total acreage of replacement old growth is now 4,764 acres (See Table 3-49).

3.10.7 Desired Future Conditions

In Johnson Bar Fire Salvage project the Forest Service is performing salvaging operations of dead trees. The Johnson Bar Fire's burn intensity was highly variable and tree mortality in

burned areas was also highly variable along the outer perimeter of the burned area. Salvage operations following Scott, Schmitt and Spiegel, 2002 guidelines could result in one of four structure types listed below:

- Even aged with one canopy layer or age class;
- Two aged with two canopy layers or age classes;
- Uneven aged with three canopy layers or three age classes; and
- Continuous canopy with multiple age classes.

It is desirable that stands be resistant to strong winds, fire, insects and diseases. Trees should be vigorously growing as indicated by long leader growth, deep green needle color, long needle length, full crowns, and the appropriate color of bark dependent upon the species (Sherlock, 2007)(Keen, 1940). Early seral species are desirable because they are more resistant to root rot (Trip Report CFO-TR-08-24, 2008). It is desirable that stands be fully stocked. Reaching these goals may take time due to the fire severity and the time it takes for trees to grow to reach desired conditions.

In the Johnson Bar Fire Salvage Project area, the higher mortality areas would be targeted, which would result in two stand types from following Scott et al. 2002 guidelines for salvaging operations. These are the two aged stand and the even aged stand. For both of the prescriptions all live trees would remain after the harvesting operations as leave or reserve trees. There should be 14-28 live or dead leave trees per acre with diameters greater than 14 inches in the over-story. The unit should have five snags greater than 20 inches in diameter of which three snags should be greater than 30 inches in diameter. There should be 17-33 tons of fuel on the ground to provide wildlife habitat and to develop productive soils. There should be 5-10 tons of fuel in the 3 to 12-inch size class and 12-18 tons of fuel should be in the 12-inch plus size class.

Tree retention would consist of:

- The largest diameter trees of species would be used to make up the 14-28 leave trees per acre;
- All live or dead larch, ponderosa pine, and white pine would be the preferred leave trees;
- Non-merchantable snags would be left standing as long as there are no safety hazards in accordance with OSHA regulations;
- All live trees, as determined by the Scott Guide tree survivial criteria, would remain.

Two-Aged Stand (Two-storied)

Portions of the Johnson Bar Fire was a mixed severity fire with mortality ranging from 10-90%, leaving the area with a two-aged stand structure. The two aged stand with reserves consists of

clumps of dead trees being harvested, and approximately 20-100 live trees or more per acre being left standing. The surviving trees would consist of an older age class, while replanted harvested areas would consist of seedlings resulting in a two age class structure that is fully stocked. Leave or reserve trees would be a mix of live and dead trees (snags). Salvage operations that result in a two aged stand prescription should be planted with up to 400 seedlings per acre of early seral species in the harvested areas.

Table 3-43: Two-Aged Vegetation Desired Future Condition Immediately after Treatment (2017)

Moist Mixed Conifer				**Two-aged**			
Structural Stage	**Developmental Stage**	**Age in Years**	**Trees Per Acre**	**Basal Area (feet^2)**	**Average Diameter (inches)**	**Height (feet)**	**Canopy Closure (percent)**
Stand Initiation	Seedling	2	400	N/A	N/A	1-2	0
	Over-story	80-100	20-100	28-218	16-20	120-150	10-50

Table 3-44: Two-aged Vegetation Desired Future Condition in Year 2035

Moist Mixed Conifer				**Two-aged**			
Structural Stage	**Developmental Stage**	**Age in Years**	**Trees Per Acre**	**Basal Area (feet^2)**	**Average Diameter (inches)**	**Height (feet)**	**Canopy Closure (percent)**
Stand Initiation	Sapling	22	400	8-12	2-4	15-25	20-40
	Over-story	100-125	20-100	44-369	20-26	120-150	20-55

Even-Aged (Regeneration Harvest)

Most of the Johnson Bar Fire was a stand replacing fire, if the fire killed all of the trees (90-100% mortality) in the area there is a need to regenerate the forest. An even-aged structure would develop after planting the area. Leave or reserve trees would likely consist almost entirely, if not totally, of dead trees due to the fire's severity. Salvage operations should be planted with up to 400 seedlings per acre of early seral species, such as western larch, western white pine and ponderosa pine.

Table 3-45: Even-aged Vegetation Desired Future Condition Immediately after Treatment (2017)

Moist Mixed Conifer				Even-aged			
Structural Stage	**Developmental Stage**	**Age in Years**	**Trees Per Acre**	**Basal Area (feet^2)**	**Average Diameter (inches)**	**Height (feet)**	**Canopy Closure (percent)**
Stand Initiation	Seedling	2	400	N/A	N/A	1-2	0
	Over-story	80-100	0-20	0-28	16-20	120-150	10-50

Table 3-46: Even-aged Vegetation Desired Future Condition at year 2035

Moist Mixed Conifer				Even-aged			
Structural Stage	**Developmental Stage**	**Age in Years**	**Trees Per Acre**	**Basal Area (feet^2)**	**Average Diameter (inches)**	**Height (feet)**	**Canopy Closure (percent)**
Stand Initiation	Sapling	22	400	8-12	2-4	15-25	20-40
	Over-story	100-125	20-100	44-369	20-26	120-150	20-55

Vegetative Agents of Change

Vegetation is a fundamental part of terrestrial ecosystems. The vegetation that exists across an ecosystem and through time is a function of the climate, the geomorphology, the soil, the plant species available in an area, the disturbance history of the site, and the successional processes that follow disturbance. Most landscapes are a mosaic reflecting the interaction between disturbance and plant succession. Understanding how disturbances, succession and timber harvest interact with forest composition is necessary to understand the current vegetative state.

Weather

While fires can create dramatic changes to the Forest, weather continually modifies the ecosystem. Moisture and temperature are important to characterize the biophysical environment.

Weather is defined as how atmospheric conditions change over a short period of time. Weather disturbances adjust species composition, structure, and function consistently throughout successional development. Wind events, periods of high moisture, or drought determine growth rates, regeneration success and conditions conducive for insect, disease, or fire mortality. Weather is not predictable in terms of ecological timing or landscape arrangement,

but has continual important influences on the ecosystem. The continual effects of moisture, temperature, and weather disturbances define the environment and therefore the compositions, structures, and function of the ecosystem.

Climate Change

Climate is defined as how the atmosphere behaves over long periods of time. Climate change and management of natural resources with a changing climate are both science and social issues. Managing in the face of climate change is a common forest management question, both in terms of the effect climate change will have on the managed ecosystem and the effect the Proposed Action may have on the climate.

The Forest Service has been involved in climate change research for two decades and has a century of science and management experience. The Forest Service has stated its objective regarding climate change as follows:

- The aim is to reestablish and retain ecological resilience of NFS lands and associated resources to achieve sustainable management and provide a broad range of ecosystem services. Healthy, resilient landscapes will have greater capacity to survive natural disturbances and large scale threats to sustainability, especially under changing and uncertain future environmental conditions, such as those driven by climate change and increasing human uses (Forest Service Manual 2020.2).

- The future of forest management in a changing climate is best addressed with approaches that embrace strategic flexibility, characterized by risk-taking, the capacity to reassess conditions frequently, and willingness to change course as conditions change (Hobbs et al. 2006 [cited in Millar et al. 2007]). The appropriate approach is an integrated strategy involving a scientific and social climate change approach that considers predictions/scenarios specific to the local ecosystem as well as analysis of specific ecosystem responses. The Washington Climate Change Effects Assessment1 is the most recent and area-specific tool available to understand potential changes in northern Idaho. Until more scientific details for this approach are available, a conservative forest management approach is reasonable. A conservative approach is based on diversity, resilience and adaptive management in the short, middle and long-

* Fire Severity
- Nonlethal fires – fires that kill 10% or less of the dominant tree canopy. A much larger percentage of small, understory trees, shrubs, and forbs may be burned back to the ground lines.
- Mixed-severity fires – fires that kill more than 10% but less than 90% of the dominant tree canopy. These fires are commonly patch, irregular burns, producing a mosaic of different burn severities.
- Lethal fires – fires that kill 90% or more of the dominant tree canopy. These are often called stand-replacing fires, and they often burn with high severity. They are commonly crown fires.

terms. This is the basis for proposed planting treatments in the Johnson Bar Fire Salvage Project.

Fire

While forests can be disturbed by weather, insects, and microorganisms, all of these interact with fire. Fire can release a large amount of energy in short periods of time, which is why fire is one of nature's most powerful disturbance forces. During summer, the Selway and Middle Fork watersheds experience significant dry periods when vegetation can sustain fires. Lightning was probably the primary ignition source prior to Euro-American settlement. Lightning and human causes are the present-day ignition sources. Fire suppression was considered to be effective at the landscape scale in the 1930s. Understanding fire as an agent of change allows understanding of the functional interactions in a healthy, sustainable ecosystem**.**

Understanding past fire disturbance or vegetation scenarios for an area allows increased understanding of the area's resilience and sustainability.

Currently, fires that start in under-burning conditions are usually extinguished at <1 acre in size. The mid-seral successional stages are, therefore, denser and more uniform over the landscape than those that would have occurred historically. Fire suppression activities were intended to be used in combination with timber harvesting to reduce high fuel volumes. Timber harvests designed to reduce high fuel volumes were reduced in the 1990s and high fuel volumes remain on the landscape. Timber is live fuel and when trees die they become heavy dead fuels also known as snags. When snags fall to the ground they become coarse woody debris which is also heavy fuel accumulations. For a more detailed discussion of fire ecology, refer to the fire/fuels specialist report.

Insects and Disease

In the absence of fire, forest insects and diseases can accelerate or reset forest succession by affecting tree species, size, and stand density. Functions of pathogens and insects in forests can be divided into two parts. First, the action, such as killing trees, decaying heartwood, or reducing growth. Secondly, the outcome, such as changing species composition of stands or changing stand structure from a mature, closed canopy to a pole-size, low-density structure (USDA Forest Service 2000). This level of susceptibility is important because over the last 75 years, insects and disease have replaced fire as the most prominent agent of change.

White Pine Blister Rust: White pine blister rust was introduced into northern Idaho and this analysis area in the early 1900s. Blister rust is a fungal disease that forms cankers on branches or stems of trees. The cankers then weaken the trees and may eventually kill them. Weakened trees also become susceptible to other disease or to insect attack. Historically, western white pine trees were either killed or harvest was accelerated to capture anticipated loss of economic value.

Western white pine that was established following the 1910 fires was greatly affected by blister rust because the white pine had little natural resistance to the western white pine blister rust. The presence of live 50- to 80-year-old white pine is an indicator of some level of natural genetic resistance to blister rust in these survivors. Natural blister rust resistance is thought to

be <10%. The live white pine is an ecologically important component of the resource area, both in terms of its resistance to blister rust and because of its role as a successional component as the stands develop.

Root diseases are a significant factor in stand composition and structure. Root diseases weaken the roots of late successional species facilitating wind throw. Wind throw is defined as trees blown down by wind events. Trees weakened by root rot are also susceptible to bark beetles. White pine and larch have a higher level of resistance to root diseases.

Early seral species have reduced opportunities to re-establish due to the loss of mature seed bearing tree numbers. Early seral species numbers have been reduced due to fire exclusion, natural succession and lack of timber harvesting. Timber harvesting, in combination with planting of early seral species is needed to restore early seral species on the landscape. Western white pine blister rust killed a majority of the western white pine. Remaining white pine were harvested before mountain pine beetle and blister rust reduced timber values.

Major insect change agents in the Nez Perce/ Clearwater National Forest include mountain pine beetle, Douglas-fir beetle, Douglas-fir tussock moth, and fir engravers. Historically, mountain pine beetle played an important successional role in mature white pine and lodgepole pine forests. The presence of mountain pine beetle has led to significant changes in species composition and widespread tree mortality. Mountain pine beetle and Douglas-fir beetle mortality has resulted in fuel buildup and increased fire susceptibility. Historically, short-term increases in fuel loading may have led to increased fire intensity and severity which led to subsequent development of openings conducive to regeneration of early seral species. Root disease stresses trees making them more susceptible to bark beetles. The presence of root disease in many of the Douglas-fir and Grand Fir forest types has resulted in even higher endemic levels of the Douglas-fir beetle and the propensity for rapid beetle population buildups during favorable conditions.

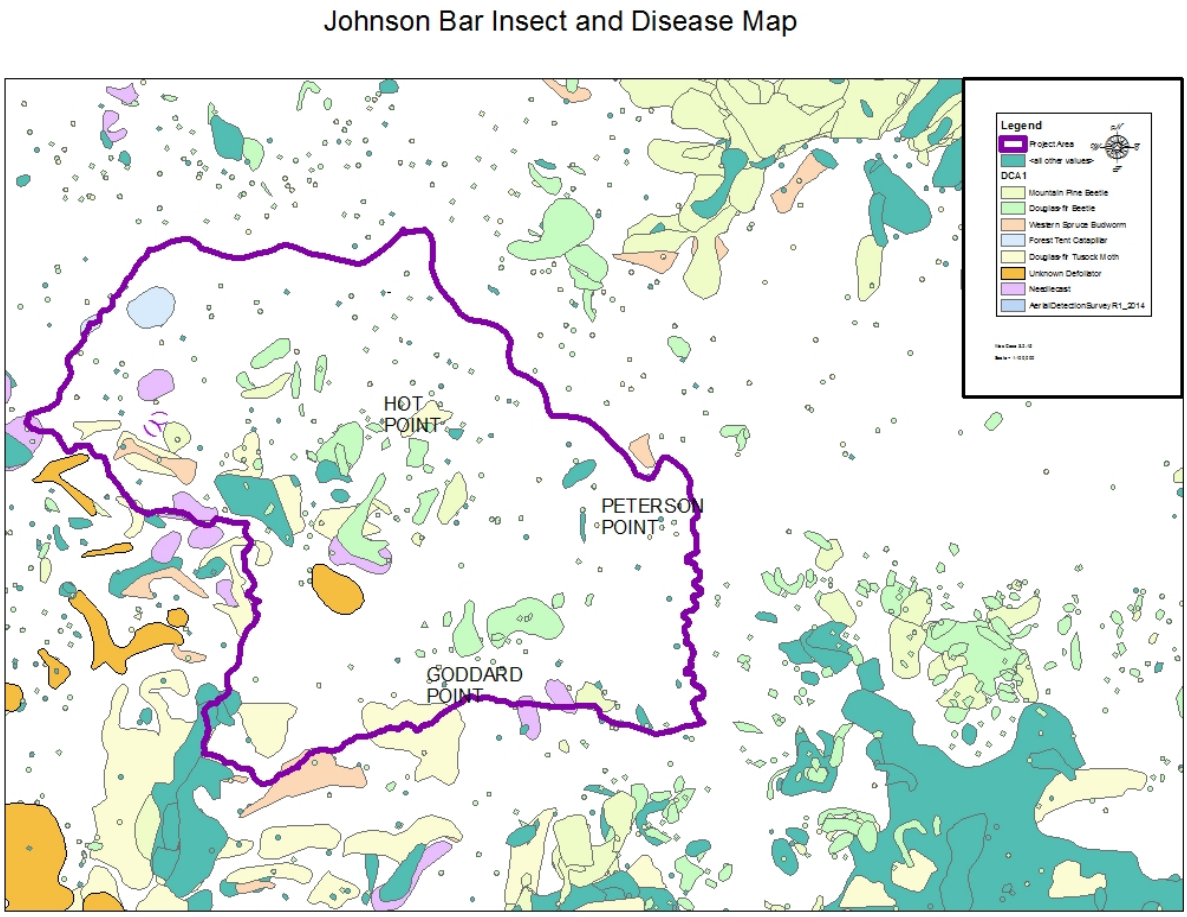


Figure 9: Insect and Disease Map

Harvest

Logging activities were initiated in the area in the 1960s. Known past harvest in the project area has been cataloged and summarized in Table 3-0 Regeneration harvest converted mature stands into early seral species in the stand initiation stage similar to stand replacing fires.

3.10.8 Direct and Indirect Effects

3.10.8.1 Alternative 1

Stand Development and Dynamics

Alternative 1 would allow natural processes to continue because no treatments would be conducted. Fire suppression would continue and the risk of large-scale stand-replacing fires would increase; the size or severity of such an event cannot be predicted.

The Forest would continue to be altered by natural events such as succession, insect, disease, and wildfires. Some mixed-conifer habitats would mature and develop old-growth habitat characteristics, including multiple canopies, snags, and large downed wood, which would

provide habitat for a variety of wildlife species. Canopy openings created when snags fall would allow sunlight to reach the forest floor, providing for shrub, forb, and grass growth, which would become forage for ungulates and small mammals.

The risk of an intense fire would increase with increasing surface and ladder fuels. A wildfire under these conditions could convert some of the burned timbered area to brush fields, such as what occurred during 1934 in the Pete King drainage. Fires of this nature would further reduce the amount of old-growth habitat available to species, such as fisher, pileated woodpecker, goshawk, and American marten.

Wild and Scenic Rivers MA 8.2 would not be harvested. Snags and fire scars would be seen from the river corridor until the snags fall and the area naturally recovers from the fire over 25 to 50 years.

Regeneration and Forest Composition

The No Action alternative would favor grand fir and western red cedar regeneration. Grand fir is susceptible to root rot, which inherently makes the stand susceptible to strong winds. Stands would likely have heavy fuel loads, and multiple age class structures.

In the project area, regeneration would consist of Douglas-fir, grand fir and western red cedar. Lodgepole pine would regenerate in the few stands where lodgepole has been established in the past or is currently present. Douglas-fir would regenerate with higher percentages on the ridgelines and some ponderosa pine would develop. Without root rot the stands would naturally regenerate in 10-25 years.

Natural regeneration would have positive and negative implications. Natural regeneration would likely be better adapted to local conditions, and would likely have some genetic resistance from the parent trees. However, there has been very little natural western white pine regeneration since the introduction of white pine blister rust; therefore, this component would not be established.

Natural regeneration is not always successful. Natural regeneration would require a good seed crop, soil disturbance, and properly timed rainfall at the same time. Often the three requirements for natural regeneration do not align properly and there is a reforestation failure. Grand fir and cedar would be the only seed trees available in areas where shade tolerant species dominated the site. Therefore, grand fir and cedar natural regeneration would continue to dominate in areas previously dominated by shade tolerant species. On ridgetops where Douglas-fir and western larch survived, early seral species may naturally regenerate but early seral trees would have tough competition from brush species. Given the competitiveness of shrubs, as well as the historical variability in natural regeneration success, tree planting after salvage operations would better ensure the desired density, species, and distribution of conifers (Newton et al., 2006).

Stands with root rot may not develop into mature stands. Root rot may suspend forest succession by killing regeneration before it reaches pole size (Hagle, Kegley, and Williams, year unknown). Regeneration with root rot may take 10–40 years to become established. Douglas-fir and grand fir would be susceptible to root rot and the stand would be in poor health.

High severity wildland fires can consume organic matter on the soil surface, which would negatively affect nutrient cycling, killing soil microorganisms and releasing carbon dioxide into the air. This would negatively affect soil productivity (Smith et al. 2005, Smith 2000, Stoof et al. 2011a). Soil organic matter acts as a soil stabilizing factor and nutrient source. High severity wildland fires can negatively affect soil productivity due to high losses of carbon and nitrogen from combustion of surface soil organic matter (Homann et al. 2011).

Typically one ecological event prepares the conditions for the next ecological event. Catastrophic fires are often blamed on drought while the underlying cause is the high fuels buildup of overstocked forests (USDA, 2004a). With no treatment, the remaining snags from the Johnson Bar Fire would function as high fuel loads like insect mortality and over stocked Forests. Leaving large quantities of snags would:

- Allow high hazardous fuel to build up and may lead to catastrophic fires; and
- Promote resistance to wildfire containment increasing fire suppression costs.

3.10.8.2 Alternatives 2, 3, and 4

The direct effect of the project would be the conversion of 8%-10% of the project area to early seral cover types. The primary vegetative difference between the No Action and Action alternatives would be the acres planted with early seral species. Alternatives 2, 3, and 4 would increase early seral species by 10%, 9%, and 8%, respectively. The conversion of treated acres to early seral species would make the Forest more resistant to wildfires, strong winds, and root rot. As a result of the treatments the Forest would be more resilient to the agents of change.

Management Areas

MA 8.2 and 17:

Treatment areas would accelerate forest recovery after the fire. Fall colors from interspersed planted western larch may enhance visuals.

MA 14, 16 and 21:

Fire mortality opened up the stands allowing more sunlight to reach the ground. Increased sunlight would encourage the growth of grass, forbs and brush species which will provide browse for big game species (Tappeiner et al. 2007). As the stands develop the saplings would function as hiding cover for big game.

Stand Density and Forest Composition

Approximately one half of the stand replacing fire would not be treated due to landslide prone areas and non-merchantability. In the approximately 3,000 acres of treated acres, design features would maintain wildlife habitat. Harvesting operations would leave 14-28 live and dead trees (snags) for wildlife habitat and 17-33 tons of coarse woody debris. Woody debris would facilitate soil development in the future (Graham et al., 1990), would provide forage for woodpeckers, and would provide nesting areas for small mammals. The salvage operation would have no direct effects on live trees, because only dead trees are being removed. The

remaining live trees would also provide wildlife habitat. Remaining live trees would provide nesting, and foraging habitat for some wildlife species.

The project would have multiple direct effects on snags. Snags would be removed from the project area reducing the foraging area for birds that primarily feed on wood borers, ants and bark beetles. Snags used as nesting locations for small mammals, and birds would be reduced in the two-aged treatment areas, while snags in the even-aged treatment areas would be reduced to 14-28 live or dead trees per acre. However, the safety threat of the snags to people using the area would be greatly reduced. Snags are standing dead fuel. Removing snags will reduce standing dead fuels by 75 tons per acre of fuels greater than 3 inches in diameter. The removal of the snags represents a substantial reduction in heavy fuels (refer to fuels report). The reduction of heavy fuels substantially reduces the resistance to control of fires and reduces fire suppression costs.

The potential effects due to salvage logging would be:

- Long-term reductions of large diameter fuels;
- Accumulations of slash that would provide ground cover and develop the soil (Graham, Harvey, Page-Dumroese, Minore and Jurgensen, 1990);
- Soil disturbance that functions as site preparations for natural regeneration (Tappeiner et al. 2007) (Hobbs, Tesch, Owston, Stewart, Tappeniner and Wells, 1992); and
- Create open stands that are susceptible to strong winds (Agee, 1993) (Tappeiner et al. 2007).

As a fuels treatment, salvage logging would restore the forest to surface fuel levels consistent with mixed severity fire regime (Petersen, Dodson and Harrod 2015). Salvage logging removes heavy fuels reducing the risk of “re-burn” with high fire intensities which can reduce soil nutrients (Grier 1975).

Thinned stands are at risk to being blown down by strong winds, also referred to as windthrow. Salvaging or thinning trees would increase wind speed in the stand (Agee 1993) which may blow down trees that are newly exposed to the wind. Trees resistant to wind have good root systems, and proper height to diameter ratios. Trees released from competition with greater than 40-50% crown can grow in diameter and increase wind resistance. However, large canopies may catch the wind and facilitate windthrow. Most stands become windfirm about five years after treatment, however even stable stands can be blown down during extreme wind storms.

Regeneration

The multiple effects of harvesting operations on regeneration are listed below:

- Soil disturbance needed for natural regeneration (Tappiener et al., 2007);

- Limbs would form a mulch retaining moisture for regeneration planting success (Graham, Minore, Harvey, Jurgensen, and Page-Dumroese, 1994);
- Removing the snags during the harvesting process reduces shade and microsites; and
- Excessive slash may prohibit planting.

Site preparations are needed for successful tree regeneration. There is a difference between soil disturbance and soil degradation (Tappiener, et al. 2007) and early seral species need bare mineral soil to naturally regenerate. Slash would act like mulch and maintain soil moisture. Soil disturbance would create planting locations for seedlings. The planting success rate of individual trees after harvesting operations is over 90%. Planting western larch, western white pine, and ponderosa pine would ensure planting units would be regenerated in five years.

The seedlings would have little effect on transpiration rates the first two decades because they are small. However, planting would shorten the time frame of forest establishment by 5-20 years. Planted trees grow more vigorously than natural regeneration because they are at least two years older and more capable of dominating the vegetation surrounding the planted tree. The larger stem size and root systems of the planted seedlings allows 2-4 more years of competitive advantage over natural seedlings (Hobbs, Tesch, Owston, Stewart, Tappeiner and Wells, 1992.). Planted seedlings' higher competitive edge allows faster growth rates to successfully compete with brush and big game browse.

There are many benefits to artificial reforestation. Artificial regeneration ensures species diversity, proper soil conditions, and is not dependent upon a good seed crop. Proper planning can ensure proper timing sequence of planting site preparations, best adapted seed available, proper species to plant, species diversity and proper timing of planting. Artificial regeneration is more likely to have success establishing a new stand as opposed to reverting to a brush field like the Pete King Fire.

Stands with a higher proportion of white pine, western larch, and ponderosa pine would be more resistant to fires, strong wind, and root rot than natural stands regenerating as western red cedar and grand fir. Grand fir is highly susceptible to root rot (Hagle, Tucker, and Anderson, 2011; USDA, 2004b). Mature western larch and mature ponderosa pine are the most fire resistant species and mature western white pine is an intermediate resistance to fire (USDA, 1965). The resistance to root rot would inherently improve resistance to strong winds.

Succession has naturally promoted shade tolerant species and decreased early seral species on the landscape. Surviving western red cedar and grand fir trees would naturally regenerate. Planting western larch, ponderosa pine and western white pine would ensure the presence of early seral species on the landscape, increase species diversity, and move the landscape composition closer to historical range of variation.

Insect and Disease

Only dead trees would be salvaged. Dead trees with bark beetles in them may be harvested but the current treatments are insignificant to affect insect populations, because of the amount of trees being left in riparian and landslide prone areas.

Planting preferred species would make a healthy forest in the future. Western larch, ponderosa pine and western white pine are resistant to root rot (Trip Report CFO-TR-08-24, 2008). These trees would grow faster without the infection of root rot. The preferred planted species would be more resistant to fires, strong winds, and diseases.

Whitebark Pine

Burned areas are not in whitebark pine habitat and would provide no opportunities for whitebark pine regeneration. In effect, the project would not harm individual whitebark pine and would not push the population towards federal listing as an endangered species.

Old Growth

The current project would not affect old growth conditions because the acres being treated are salvaging dead trees. No live trees would be harvested so there would be no effects to the size, diameter, or age of the stand. Most stands in the Johnson Bar project area are not old enough to meet old growth requirements. The young forest conditions are likely due to insects, disease, and the fire regime. Fires in 1889, 1910, 1920, 1928, 1945, and 2014 have burned large portions of the project area. The project area has not had enough time to develop old growth after the wildfires of the early 1900s.

To address Forest Plan requirements, the silviculturist and the wildlife biologist selected old growth replacement stands through field reviews and photo interpretation that appeared to be nearing old growth conditions. All 6 OGAAs are in compliance with the Forest Plan direction as shown in Table 3-47. To determine spatial reference refer to the old growth analysis area map in Appendix G.

Tables 3-47 and 3-48 shows the post-fire condition for old growth and Forest Plan compliance.

A series of natural events and interactions can lead to a loss of old growth habitat. Forest health researchers from Coeur d'Alene found root rot can stall succession (Hagle, Tucker and Anderson 2011). Natural successional processes and the agents of change have natural progressions with multiple interactions including stand replacing fires. Douglas-fir beetle and the mountain pine beetle tend to attack the larger, less vigorous trees [(Weatherby and Their) as cited in Kegley 2004, USDA, 2004]. Trees killed by root rot and insects, or wind thrown trees can developed large volumes of fuel (Tappeiner et al. 2007). In some cases, insect infestations may have contributed to large stand-replacing fires (USDA Forest Service 1998a).

Structural diversity is a long-term goal. Silvicultural treatments are designed to promote individual tree, stand, watershed, and Forest health. Natural events can prevent old growth from developing or remove old growth characteristics from the Forest. Stands that are resistant to strong winds, fire, and disease are more likely to live and reach old growth stage in order fill the ecological niche needed by old growth dependent species. The resiliency of early seral

species allows for healthier forests that can live longer and meet old growth objectives. Therefore, early seral species are likely to provide the structural diversity in future old growth habitats.

Table 3-47: Post-Project Old Growth Analysis

	Old Growth Analysis Area							
	Post-Project Old Growth (Which Includes Verified Old Growth and Replacement Old Growth)							
Old Growth Analysis Units	Old Growth Analysis Areas (Acres)	Old Growth Pre-Fire (Acres)	Old Growth Burned by Fire (Acres)	*Old Growth Post-Fire (Acres)	Verified Old Growth Post-project (Acres)	**Replacement Old Growth Post-project (Acres)	Total Old Growth Post-project (Acres)	Percent Old Growth Post-project
OGAA03020104	9,963	2	2	0	0	986	986	10%
OGAA03020121	9,608	432	6	426	64	1,110	1,174	12%
OGAA03020122	9,251	1,381	340	1,041	438	691	1,129	12%
OGAA03020124	9,078	678	425	253	61	908	969	11%
OGAA03040007/09	14,000	1,277	161	1,116	314	1,069	1,383	11%
Totals	51,900	3,770	934	2,836	877	4,764	5,641	11%

***Old growth post fire includes 877 acres verified old growth and 1,959 acres of replacement old growth**

**** Includes 1,959 acres of replacement old growth which survived the fire and an additionally assigned 2,805 acres of replacement old growth**

Table 3-48: Johnson Bar Fire Salvage Old Growth Analysis Summary

Johnson Bar Fire Salvage Old Growth Analysis Summary				
	Verified Old Growth (acres)	**Replacement Old Growth (acres)**	**Total (acres)**	**Percent of OGAA**
Old Growth Before the Fire	1,017	2,753	3,770	7%
Old Growth Burned in the Fire	140	794	934	2%
Old growth After the Fire	877	1,959	2,836	5%
Additional Replacement Old Growth	0	2,748	2,748	5%
Additional Replacement Old Growth for Adjusting to Stand Boundaries	0	57	57	0%
Old Growth After Project Completion	877	4,764	5641	11%
Salvage of Stands That Have Lost Old Growth Characteristics	99	110	209	0%

3.10.9 Cumulative Effects

Acres in a particular age class, habitat type, and size class would not change because treatments would only harvest dead trees. Verified old growth acres would not change from the post-fire condition. However, it should be noted that 140 acres of verified old growth was lost due to the Johnson Bar fire.

3.10.9.1 Alternative 1

The No Action Alternative, in a mixed severity fire of 60% mortality, would allow natural grand fir and western red cedar to dominate the site. A stand replacing fire would favor early seral species regeneration, but grand fir and western red cedar would still dominate the site in an early successional stage.

The No Action alternative would allow a majority of the project area to be dominated by grand fir, western red cedar, and Douglas-fir. Grand fir and Douglas-fir are both susceptible to root rot, which weakens the trees roots (Trip Report CFO-TR-08-24, 2008). Trees with poor root systems are susceptible to strong winds. Wind thrown trees become heavy fuels that increase fire risk. Western red cedar is also susceptible to heart rot and is often hollow from disease. Currently there are safety cautions when entering the project area due to rotten cedars falling down. The fallen cedar and grand fir would develop large fuel accumulations, and place the project area at risk to severe re-burn.

Without fire, the No Action alternative would result in high fuels, which would eventually develop fertile soils (Graham et al. 1990). Western red cedar and grand fir would develop into multi-storied old growth. However without planting in the Selway drainage, the burned areas would likely return to closed canopy grand fir and western red cedar stands that are susceptible to root rot and wildfires. Grand fir stands often die before becoming old growth stands because of root rot (Hagle, Tucker, and Anderson 2011).

If no action is taken by the Forest Service, early seral species components may only increase by 1% if State and private land owners were to plant early seral species. Otherwise, in order for the No Action alternative to produce early seral species, wildfires would need to burn severe enough to leave a majority of the landscape with bare mineral soil. Bare mineral soils favor early seral species; whereas, soils covered in timber litter and other ground cover favor late successional species, such as grand fir and western red cedar.

Although fire has benefits, wildfires create several problems. First, wildfires are very expensive to suppress. Secondly, wildfires damage infrastructure (Graham, McCaffrey, and Jain 2004), timber, houses, power lines, and roads. Thirdly, high severity wildland fires can consume organic matter on the soil surface, which would negatively affect nutrient cycling, killing soil microorganisms, and releasing carbon dioxide into the atmosphere, which would negatively affect soil productivity (Smith et al. 2005, Smith 2000, Stoof et al. 2011a). Soil damaged by fire may result in reduced water holding capacity and sedimentation. Fourthly, restoration costs are extremely high and not all restoration work can be funded. When fires burn the timber there is

less funding from timber harvests to pay for the planting of trees to restore the forest and sustain forest productivity. Fifthly, fires would reduce or completely eliminate timber values, which would reduce the capability of sustaining local socio-economic viability.

Natural stands could reach the old growth stage of succession. Western red cedars naturally live in moist conditions, which is resistant to wildfires. Cedar stands may grow to reach old growth conditions; however, high stand densities and ladder fuels would encourage stand replacement fires. Currently, a majority of stands in the Johnson Bar area are likely to be less than 100 years old due to natural fires, insects, and diseases.

Typically one ecological event prepares the conditions for the next ecological event. Catastrophic fires are often blamed on drought while the underlying cause is the high fuels buildup of overstocked forests (USDA, 2004). With no treatment, the remaining snags from the Johnson Bar Fire would function as high fuel build ups like insect mortality and over stocked Forests. Leaving large quantities of snags would:

- Allow high hazardous fuel to build up and may lead to catastrophic fires; and
- Promote resistance to wildfire containment increasing fire suppression costs.

3.10.9.2 Alternatives 2, 3, and 4

Past harvesting indicates that only 9% of the project area has been harvested. Past harvesting in the Middle Fork River basin (139,799 acres) has had 12,464 acres, or 9%, of the Middle Fork drainage treated. The Selway River basin (1,288,196 acres) has had 4,117 acres, or less than 1%, of the drainage treated. The Johnson Bar Fire Salvage project would treat 3,096 acres under Alternative 2, 2,710 acres under Alternative 3, and 2,207 acres under Alternative 4. Current harvest operations consist of 268 acres on State and private lands. These activities equate to less than 1% of the drainage.

Cumulative effects of road closures are as follows. All alternatives would decommission 20.2 miles of temporary roads and 1.1 miles of system roads. Road 119 and 119F bisects the verified old growth stand 01170714030137 and would be decommissioned. Road 470E1 would also be decommissioned, which would reduce traffic to replacement stand 01170702020034. The width of the road is currently not much more than the natural width of the trees and stand improvement from a spacing perspective is limited. Less traffic may improve wildlife habitat.

Treatment units would maintain early seral species, which promote forests that are resilient to fire, strong winds, and root rot. Young stands in the seedling to sapling stage are unlikely to be attacked by mountain pine beetle or Douglas-fir beetle. The cumulative effects of past, present, and reasonably foreseeable future treatments would be healthier forests on 1% of the Selway River basin and Middle Fork of the Clearwater River basins. The cumulative effects indicate more harvesting treatments that promote early seral species are needed.

Forest Service BMPs and timber sale provisions are designed to promote forest health, and reduce sediments, but can be difficult to verify. Cumulative effects of fires followed by logging can be difficult to separate and measure [McIver and Starr 2001 (cited in Page-Dumroese,

Jurgensen, Abbott, Rice, Tirocke, Farley, and DeHart 2006)]. Sedimentation from fires is difficult to measure and can vary dramatically depending upon rain events. Weather, fire intensity, soil type, and soil moisture at the time of the fire can result in highly variable sediment yields.

The effects of Alternatives 2, 3, and 4 are salvage and planting treatments that vary by the acres treated. Salvaging would reduce heavy fuels and prepare the site for planting. Planting would increase early seral species on the site as shown in the last line of Table 3-49. In a mixed severity fire of 60% mortality, early seral species composition would increase in the stand as shown in Table 3-49. In a stand replacing fire planting early seral species would substantially increase the percentage of long lived early seral species. Early seral species would naturally succeed out of the stand composition if the area was not planted.

There are many benefits of planting early seral species. Ponderosa pine and western larch are the two most fire resistant species (USDA, 1965). Other early seral species are considered to be resistant to fire as well. Root disease is the leading cause of tree mortality on the Nez Perce National Forest (22% of all mortality), and the Clearwater National Forest (49% of all mortality). Root disease causes more mortality than fires, insects, and timber harvesting combined. Early seral species are considered resistant to root rot (USDA, 2004, Hagle, Gibson, Tunnock 2003). Ponderosa pine is the most drought resistant species (Schantz, 2015). Early seral species provide the best opportunity for Forest resistance to fires, drought, and root rot.

In the long-term, early seral species are more likely to be adapted to climate change. Early seral species provide better opportunity for old growth stands to develop over the landscape due to their greater resistance, and resilience to fires, drought, wind, and root rot. By planting these species at 200-300 trees per acre, which would be less than traditional planting, the lower densities would increase tree vigor and bark beetle resistance.

Through planting, treatment areas previously dominated by Douglas-fir, grand fir, and western red cedar before the fire would become a more species diverse stand. Planting would increase early seral species, such as western white pine, western larch, and ponderosa pine, on the landscape moving the Forest towards historical range of variation. The early seral species are resistant to fire and root rot, which would increase forest health on the treated acres.

Alternatives 2, 3 and 4 would improve forest health on 10%, 9%, and 8% of the project area, respectively.

Forest management would provide the best opportunity for the burned areas to recover from the fire. Failure to plant seedlings may lead burned areas to be converted to an unproductive brush field or a closed canopy multi-storied grand fir stand that would be susceptible to fires. A closed canopy grand fir stand may also develop limiting wildlife foraging opportunities. Western larch, white pine, and ponderosa have fairly open crowns, which would allow more sunlight to reach the ground. The increase in sunlight would provide more vegetation diversity and diverse habitats for wildlife species. Early seral species would be more likely to survive a fire and promote an open canopy forest that would promote early successional forbs and shrubs.

Benefits of Johnson Bar Fire Salvage Project would include:

- Western white pine restoration;

- Move the project area closer to historical range of variation by 10%, 9%, and 8% under Alternatives 2, 3, and 4 respectively;
- Restoration of heavy fuels to historical range of variation through fuels reduction (Petersen, Dodson and Harrod 2015);
- Fuel breaks;
- The sustaining of early seral trees species that are resistant to fire, and root rot (Trip Report CFO-TR-08-24, 2008);
- Sustaining the socio-economic viability of rural communities;
- Tree species diversity, which would encourage wildlife species diversity; and
- Greater potential to successfully regenerate burned areas (Newton et al. 2006).

The project as planned would meet Forest needs. Planting western white pine, ponderosa pine, and western larch would restore needed early seral species on the landscape. Between 14 and 28 live and dead trees per acre would remain in order to meet wildlife snag needs now and in the future. Snags would eventually fall to the ground meeting coarse woody debris needs. Soil productivity would be maintained when the CWD decomposes. Soil maintenance would be encouraged by leaving 17-33 tons of slash and coarse woody debris.

Table 3-49: Alternative Comparisons of Early Seral Species Composition at the Unit Scale

Individual Stand Scale				
	60% Mortality		100% Mortality	
Species	**Planted**	**No Treatment**	**Planted**	**No Treatment**
Western white Pine	12%	0%	18%	0%
Western Larch	7%	Trace	24%	1%
Douglas-fir	19%	18%	0%	64%
Grand Fir	17%	25%	5%	0%
Western Red cedar	19%	54%	32%	0%
Ponderosa Pine	26%	1%	21%	25%
Lodgepole Pine	0%	Trace	0	10%
Engelmann Spruce	0%	1%	0	0%
Sub Alpine Fir	0%	1%	0%	0%
Percent of Species Resistant to Root Rot	45%	1%	63%	36%

Table 3-50: Cover Type Comparison of Alternatives

FEIS	Percent of Cover Type in Johnson Bar Fire Salvage Project Area			
Cover Type	**No Treatment**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Aspen	0%	0%	0%	0%
Birch - Green Ash, Boxelder, Red alder	0%	0%	0%	0%
Subalpine Fir - Spruce	0%	0%	0%	0%
Western Red Cedar	28%	24%	25%	25%
Grand Fir	25%	23%	23%	23%
Douglas-fir	15%	12%	13%	13%
Ponderosa Pine	0%	0%	0%	0%
Lodgepole Pine	0%	0%	0%	0%
Non Forest	0%	0%	0%	0%
Early Seral (Western Larch, Western White Pine and Ponderosa Pine)	0%	10%	9%	8%
Unknown	32%	30%	30%	30%

3.11 Visuals

3.11.1 Analysis Area

The landscape encompassing the Johnson Bar Fire Salvage project area is located to the east of U.S. Highway 12 and south of the Selway River road at the confluence of the Selway and Lochsa Rivers. It is within the Nez Perce–Clearwater National Forests, approximately 20 miles east of Kooskia, Idaho. The Fenn Ranger Station is located in the northeast corner of the project area. Within the area of interest is the Middle Fork of the Clearwater River, the Selway River, Swiftwater Creek, Elk City Creek, Goddard Creek, O'Hara Creek and many smaller water courses. Of greatest concern for scenic quality are the views from the major road and trail access corridors, campgrounds, and concentrated use areas found in and adjacent to the area of interest. The Johnson Bar Fire Salvage Project proposes management activities to improve vegetation resources and forest resiliency at the landscape level; utilize dead, dying and high risk trees in a timely manner; manage forest vegetation to restore natural disturbance patterns; improve watershed conditions; improve elk habitat effectiveness; improve early seral wildlife habitat; and maintain habitat structure, function, and diversity.

3.11.2 Regulatory Framework

General direction for scenery management is provided in Forest Service Manual 2380 (Landscape Management). Specific visual resource management direction is provided by the 1987 Nez Perce National Forest Plan and is described in terms of visual quality objectives (VQO). Forest Plan VQO standards and guidelines were based on the Visual Management System described in Agriculture Handbook Number 462, National Forest Landscape Management, Volume 2 (PF-Doc. PI-R02). The visual management system was revised in 1995, and is now known as the Scenery Management System. The revised guidelines are provided in Agricultural Handbook 701, Landscape Aesthetics: A Handbook for Scenery Management (USDA Forest Service 1995; PF Doc. VIS-R01). While the terminology of the VQO system would be used to describe the project, the techniques and methodologies described in the Scenery Management System would also be used to analyze the project.

3.11.3 Analysis Methodology

Although the Visual Management System (PF Doc. VIS-R02) has been replaced by the Scenery Management System (PF Doc. VIS-R01), this analysis uses terminology used in the Forest Plan, which was developed and written under the former. A crosswalk between the two systems is found in Agricultural Handbook 701, Appendix A (PF Doc. VIS-R01). Visual quality objectives (VQOs) are based on the area seen from sensitive viewpoints, such as travel corridors, urban areas where the forest background scenery is important and other features where there may be a high visual sensitivity level. These visually sensitive viewpoints are outlined in the 1987 Nez Perce National Forest Plan. A variety of tools were used in the visual resource analysis including analyzing VQO maps, field visits, and visibility modeling.

Using ArcMap 10.2 (ESRI Inc., 1999-2009), GIS shapefiles of harvest units were overlaid on spatially rectified VQO displaying scenic variety class, distance zones and sensitivity levels, and quality objectives across the area of interest. Original VOQ maps were prepared for the 1987 Forest Plan using the process outlined in the Agriculture Handbook Number 462 (1976; PF Doc. VIS-R02).

Treatment units and their associated VQOs were evaluated in relation to visually sensitive viewpoints identified in the Forest Plan to determine the extent to which proposed activities would likely be seen, and the likelihood that those activities would adversely affect VQOs. VQO maps prepared under the Forest Plan are very general in nature. Scenic class and sensitivity level can provide a general understanding; however, the maps can’t always illustrate how visible specific treatments would be from locations of concern, or the extent to which treatments are likely to stand out or blend with existing scenic features.

Initial field reconnaissance was done to further assess the visibility of potential treatments in the context of the current landscape. Points on VQO maps with direct line of site to treatment units were identified. Units were observed from these locations, using unit maps. Proposed harvest activities are found in all viewing zones when viewed from key viewpoints. To assist in determining unit visibility, the analysis used Google Earth (Google Inc. 2015). Treatment units for each alternative were imported into Google Earth and draped over the landscape. Units were then viewed from ground level or “street view” at a variety of representative sensitive locations, including: U.S. Highway 12 and its associated recreation sites, the Selway Road and its associated recreation sites, Fenn Ranger Station, Forest Road 470 and Lookout Butte Lookout. This 3-D modeling gives a different perspective on how visible a given area is from a specific

geographic location. A limitation of using Google Earth for determining visibility is that near view screening from adjacent trees cannot be taken into consideration. For instance, if you are on a trail or road, the 3-D imaging cannot place you down amongst the trees, where your view might be obscured by trees and other vegetation in the foreground. These areas were then field verified and digital photography was compared to the Google images to determine the final effects on the visual resource.

After establishing relative sensitivity of affected areas when viewed from key viewpoints, Agricultural Handbooks 462 and 701 were used as references to determine if proposed activities were likely to modify the landscape to the extent that visual quality objectives could not be met.

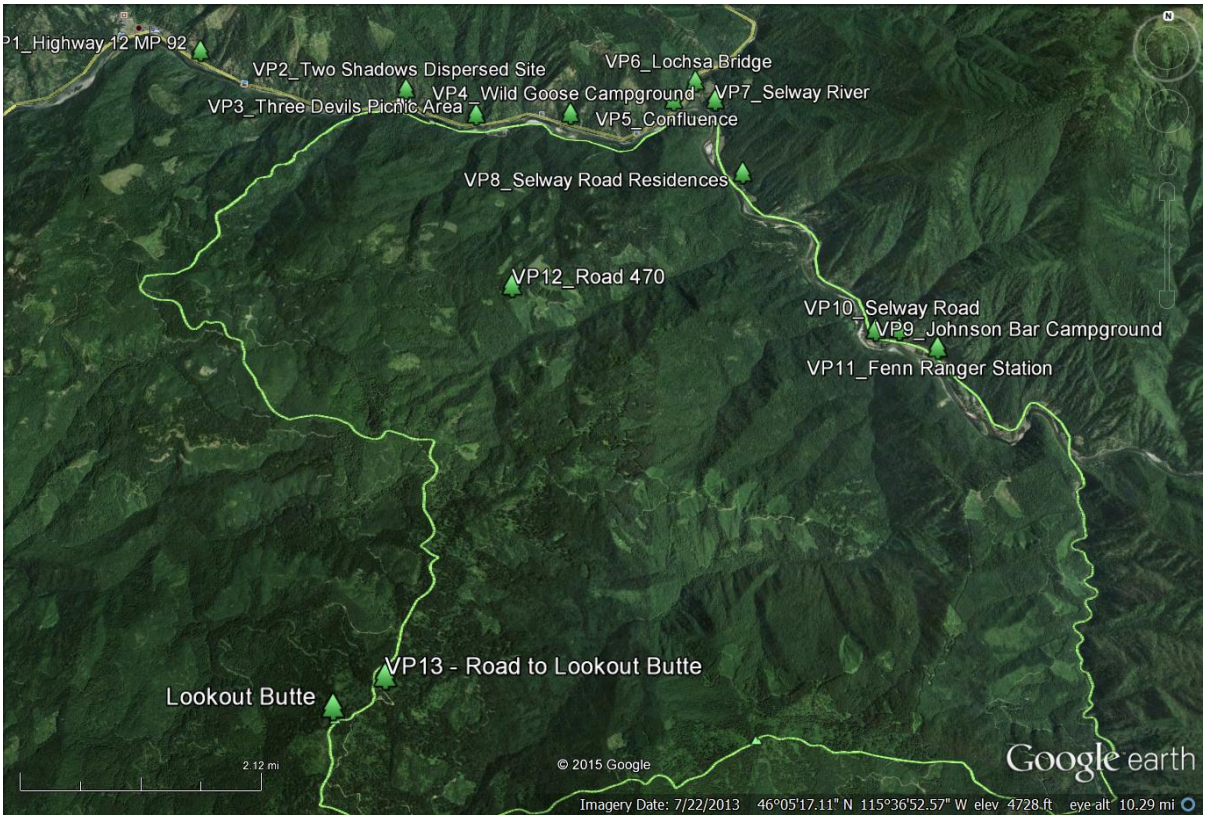


Figure 10: Critical viewpoints included for the Johnson Bar Fire Salvage Project

3.11.4 Resource Indicators

Visual Quality Objectives (VQOs) provide measurable standards for scenery management in conjunction with demands for goods and services from the forest. Visual resource management is integral to all management areas and implied in all management goals. The Forest Plan standard relevant to the project area for the Johnson Bar Fire Salvage project area visual resources are:

1. Meet adopted visual quality objectives (VQOs). Exceptions occur in unusual situations: these are identified through the project planning process involving an interdisciplinary team. Design criteria should be developed for areas when VQOs are not met.
2. The visual resource has been evaluated based on visual sensitivity levels assigned to travel routes, use areas and water bodies in and adjacent to the Nez Perce-Clearwater National Forests. Adjustments in the VQO boundaries based on project level analysis would conform to principles in FSM 2380.

The analysis considers the character and appearance of the surrounding natural landscape and the VQOs of areas proposed for treatments as assigned under the current Forest Plan. VQOs are a desired level of scenic quality and diversity of natural features based on physiological and sociological characteristics of an area, and refers to the degree of acceptable alterations of the landscape. Management activities such as commercial timber harvest and road construction can alter the scenic character of the landscape. There is a potential concern that activities proposed under Alternatives 2, 3 and 4 could adversely affect visual resources to the extent that the VQOs established by the current Forest Plan (1987) would not be met.

Effects to the visual resource are discussed in general terms; however, the indicator used to measure effects is whether or not VQOs are achieved. Visual quality objectives for the Johnson Bar Fire Salvage Project are listed in Table 3-51. Below is a brief description of each objective level.

- ***Preservation***: In general, human activities are not detectable to the visitor.
- ***Retention***: Human activities are not evident to the casual Forest visitor.
- ***Partial Retention***: Human activities may be evident, but must remain subordinate to the character of the landscape.
- ***Modification***: Human activities may dominate the characteristic of the landscape but must, at the same time, utilize naturally established form, line, color, and texture.
- ***Maximum Modification***: Human activity may dominate the characteristic landscape, but should appear as natural occurrences when viewed as background.

3.11.5 Affected Environment

The geographic scope of the scenery analysis for the Johnson Bar Fire Salvage Project includes areas visible from key locations both within and outside the area of interest. The spatial context takes in both the Middle Fork of the Clearwater and the Selway Wild and Scenic River Corridors. Key visual points bounding the visual resource area include the components of both these road

corridors. Table 3-51 shows all key viewpoints or viewing corridors and their sensitivity levels identified in the 1987 Nez Perce National Forest Plan that are relevant to the Johnson Bar Fire Salvage Project's scenic quality analysis. Direct and indirect effects analysis focuses on the viewshed and viewpoints from which the proposed activities can be seen, and the extent proposed treatment units affect the visual quality objectives assigned to that piece of ground.

3.11.6 Existing Condition

The Johnson Bar area of interest is located approximately 20 miles east of the community of Kooskia, Idaho. The analysis area is part of the Bitterroot Mountain range and is large rivers, moderately steep canyon walls to rolling uplands. The Middle Fork of the Clearwater canyon has a river course with larger rock features and fairly rapid flowing river. It has steeper canyon walls with a mix of coniferous and deciduous vegetation. The Selway River canyon is broader, with a relatively shallow, slower flowing river. Both the Middle Fork of the Clearwater and the Selway River are designated wild and scenic rivers.

The canyon walls are less steep with more of the rolling uplands visible to the viewer traveling the river corridor. The vegetation in the Selway River corridor is mixed coniferous species with deciduous vegetation along the river's edge, especially surrounding the private residences that are located along the river. Many of the river corridors and much of the lower elevation areas have significant populations of western red cedar. Other mixed conifers, composed mostly of grand fir and Douglas fir, are found across the rolling hills adjacent to the streams. There are beach areas and some distinctive rock outcrops along the river corridor. While most of the hillsides have a continuous canopy of coniferous vegetation there are areas of open grass and patches of deciduous shrubbery along the steeper hillsides.

During the late summer and early fall of 2014 this area experienced a wide ranging fire event that burned nearly 13,000 acres across the rolling uplands, down most of the major ridgelines of the area of interested and created some fire corridors that reached as far down the ridges as the actual river. The intensity of the fire ranged from minimally damaged areas that did not kill the larger trees to areas where no live trees were left in significantly sized areas. This would create a mosaic of openings where there would be just a thinning of the trees to areas where there would be large openings visible.

Recreation users visiting the Lochsa and Selway River areas participate in wide variety of recreation pursuit ranging from dispersed recreation activities such as berry-picking, dispersed camping, driving for pleasure, historical exploration and enjoying the various winter and summer trails in the area to highly organized developed camping, outfitted river experiences and educational group tours. These popular destinations bring thousands of visitors every year. The river canyons form the backdrop of the visitor's recreational setting and scenic quality is of major concern to many of the visitors and residents of the area. Both U.S Highway 12, which makes up the northern border of the area of interest, and the Selway Road #223, found along the north east boundary of the area, are considered travel corridors with a high concern for scenic quality. The Swiftwater Road #470 is used moderately for recreation purposes and has a moderate concern for scenic quality. Trails 706, 712, 715, and 716 are lightly used and may not

still be evident in some areas. Concern for scenery from these corridors would not be considered to be critical.

There is evidence of past harvest activities within the area of interest. Most of these past harvest activities are still visible but have vegetated to the point that they often don't appear as distinctive openings. While some openings are still evident, they do not tend to dominate the existing landscape character. These openings are in various stages of regeneration but most would take at least 10 to 15 years to appear as only natural timber stands without man-made openings.

Some of the recent fire activity occurred within past harvest units, but the majority of the fire occurred in the heavily forested areas adjacent to past harvest activities or in areas that had no past activity. In the northern portion of the area there are a number of small openings found above the Middle Fork of the Clearwater River which can been seen, but meet the VQO of *Partial Retention* in the middleground viewing zone from Highway 12, the river corridor and recreation sites along the river. Larger openings can be found along the Swiftwater Road, but are located in the rolling uplands and are not generally visible from either of the river corridors. These openings are evident from the Swiftwater Road itself. While they are evident they do meet the criteria for *Partial Retention* and *Modification* for that road corridor. Additional large openings area found along the ridgeline above Goddard Creek in the southern portion of the area of interest, these openings were created in the 1980s and 1990s and are still evident although they are beginning to appear more natural. This area meets the VQO of *Modification*.

3.11.7 Desired Future Condition

The desired condition for scenic quality within the area of interest would be to retain the existing landscape character and maintain the designated visual quality objectives of *Retention, Partial Retention, Modification* and *Maximum Modification* from travel corridors and use areas. The foreground viewing zone of U.S. Highway 12 and the Selway road is *Retention*. These roads roughly make up the northern and northeastern borders of area. Views from the river corridors, road corridors and campgrounds within these important travel ways should maintain a visual condition where openings do not appear man-made. The Swiftwater Road #470 roughly bisects the area of interest and has a sensitivity level of 2. This corridor has the VQO of *Partial Retention* in the foreground and *Modification* in the middle and background views. Harvest activities within the viewing zone of this road can be evident but should not dominate the landscape character of the area.

Table 3-51 outlines the visual quality objectives listed in the 1987 Nez Perce National Forest Plan.

Table 3-51: Listing of key viewpoints, their sensitivity level and visual quality objectives found within the Johnson Bar Fire Salvage Project area. Viewpoints or viewing corridors come from the 1987 Nez Perce National Forest Plan

View Point or Viewing Corridor	Sensitivity Level	Foreground 0 – ¼ mi.	Middleground ¼ mi. – 3 mi.	Background 3 mi. – 5+ mi.
U.S. Highway 12	1	Retention	Partial Retention	Modification
- Three Devils Picnic Area	1	Retention	Partial Retention	Modification
- Wild Goose Campground	1	Retention	Partial Retention	Modification
Selway Road #223	1	Retention	Partial Retention	Modification
- Johnson Bar Campground	1	Retention	Partial Retention	Modification
- O'Hara Campground	1	Retention	Partial Retention	Modification
- Cedar Flat	1		Partial Retention	Modification
- CCC Trailhead	1	Retention	Partial Retention	Modification
Fenn Ranger Station and VC	1	Retention	Part. Retention	Modification
Lookout Butte Lookout	2	Partial Retention	Modification	Maximum Modification
Road 470 (Swiftwater Road)	2	Partial Retention	Modification	Modification
Trails 706, 712, 715, 716*	3	Modification	Modification	Maximum Modification

*A sensitivity level of 3 with a corresponding VQO of Modification in the foreground viewing zone, Modification in the middleground and Maximum Modification in the background viewing zone from these corridors is appropriate for these trails.

All alternatives propose harvest activities within the *Retention* VQO adjacent to the Middle Fork of the Clearwater and Selway Wild and Scenic River corridors. There are a number of proposed harvest units along the Swiftwater Road that would be within the Partial Retention VQO, but the majority of units being proposed for activity are within the *Modification* VQO which forms the middleground and background viewing areas from all the sensitivity viewing areas.

3.11.8 Direct and Indirect Effects

Table 3-52: Summary of how the alternatives address key issues

Issue Indicator/Measure	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3	Alternative 4
Meet Forest Plan VQOs	Would meet VQO, but the scenic character of the area would continue to be affected by increases in dead and dying vegetation due to fire activity in the area. The area would also continue to be susceptible to further catastrophic wildfires.	Although activities would be visible from critical viewsheds, the harvest proposal would meet the VQO of retention in the foreground and partial retention along the Swiftwater Road with the use of design criteria utilized to emulate the effects of natural processes. Areas outside critical viewshed would meet the VQO of modification. Long-term goals of a more healthy and resilient forest would also improve the scenic character over time.	Proposed harvest would be reduced slightly from Alternative 2 with the elimination of unit 116 within the Selway River road foreground viewing zone. This alternative has the lowest percentage of skyline harvest methods and the highest percentage of helicopter harvest. Harvest activities would be visible from most viewpoints, but proposed units would have the design criteria to ensure that openings have the appearance of openings created by natural processes.	Proposed harvest would be reduced, especially in the U.S. Highway 12 viewing zone. Harvest units within the retention VQO of the Selway Road would also be reduced. This alternative has the highest percentage of skyline harvest methods. Harvest activities would be visible from most viewpoints, but proposed units would have the design criteria to ensure that openings have the appearance of openings created by natural processes.

3.11.8.1 Alternative 1

With no harvest activity planned to occur under Alternative 1 (No Action) there would be no direct or short-term effects to the scenic condition of the area. The openings in forest cover that are visible as a result of past forest management would continue to recover tree growth, and over time would fill in unnatural appearing openings. The existing man-made openings would remain visible for another 10 to 15 years. Processes affecting forest dynamics would continue, including continuing changes related mortality from the wildfire event. Dead and dying trees,

which would appear as individual and groups of dead trees scattered across the landscape would be found throughout the area. This may increase further risk of wildfire as the amount of dead and dying vegetation increases. While for some, this may have a negative effect on the scenic quality of the area, these activities are considered natural processes, and the resource area would continue to meet assigned VQOs.

3.11.8.2 Alternatives 2, 3, and 4

Transportation System – New temporary road construction is proposed under Alternatives 2 and 4 ranging from 2.4 miles under Alternative 2 to 2.7 miles under Alternative 4. The development of temporary roads using existing road templates would range from 0.3 mile to 0.7 mile. These roads would be visible from roads and trails within the area of interest, but would be naturalized after the project is complete and would therefore have no long-term effects on the scenic quality of the area. Short tractor swing trails would be required in a few areas. The limited extent of this activity would have limited visual effects within the overall area of interest.

Reconstruction, reconditioning, and system road maintenance of existing roads would have minor evidence of disturbance in the short-term, but would have no visual effects in the long-term.

Road decommissioning would occur for both system (1.1 miles) and non-system roads (20.2 miles). While there may be short-term visual affects related to decommissioning, the long-term effects of this activity would be positive for the scenic resources of the area. Putting roads in long-term storage would have no significant effects on the scenery of the area.

Site Preparation and Reforestation – All of the proposed harvest areas would be prepared for reforestation and then replanted with appropriate coniferous species. These activities would have a positive long-term effect on the area because it accelerates the process of revegetation.

3.11.8.3 Alternative 2

Alternative 2 proposes harvesting approximately 3,096 acres within the area of interest using regeneration harvest methods. This harvest would be designed to restore seral species, such as western white pine, western larch, and ponderosa pine to areas burned during the mixed severity 2014 Johnson Bar fire. The proposed harvest activities would remove dead and dying trees while leaving both individual and clumps of trees, retaining legacy trees wherever possible. These techniques would emulate openings created by natural processes of the moderate intensity fire exhibited by the Johnson Bar fire.

Approximately 3% of the harvesting would be done using tractor logging, 48% using skyline logging, and 49% using helicopter logging. This alternative would also use 11 existing and develop 6 new helicopter landings to accommodate the large amount of helicopter based harvest activities.

This analysis is mainly concerned with the landscape that can be observed from viewpoints identified in the Forest Plan (See Table 3-51 and Figure 10). Proposed activities that are blocked from these viewpoints by terrain are considered to be in compliance with VQOs. Proposed management actions that have concern from a scenic resource standpoint are evaluated for how they conform to naturally occurring features that exist or could be created by natural events. Many of the proposed management features have short-term visual effects, but would

not have long-term scenic effects. Road maintenance is an example of a management action that rarely has a long-term effect on scenic resources and is covered in actions common to all action alternatives.

The Johnson Bar Fire Salvage area of interest is located within the foreground, middleground, and background viewsheds of U.S. Highway 12 and the Selway River Road and their associated recreation facilities, the Fenn Ranger Station, the Swiftwater Road, and other related viewing areas. All of the proposed units would be visible from one or more of the viewpoints found within and surrounding the area of interest.

U.S. Highway 12 – Following the Middle Fork of the Clearwater River from Syringa to Lowell, Idaho, there are numerous views of the units located on the north-facing portion of the slope. These units include 143, 144, and 101 across the canyon from Three Devils Picnic Area; units 101 and 102 viewed from Wild Goose Campground and unit 103 viewed from the confluence interpretive site. All of these units lie across major ridgelines that are roughly perpendicular to the river corridor. The lower portions of these ridgetop units fall within the *Retention* VQO and the upper portions are generally within the *Partial Retention* VQO. Harvesting would occur, but more stand structure would be retained in the lower portions of the units that fall within the *Retention* VQO. Two helicopter landing sites are proposed within the U.S. Highway 12 corridor. These sites have been used previously and restored. These would be restored to their original condition when the project is complete.

Harvesting would occur along ridgelines affected by fire in the area, but would use natural breaks and retention of groups of trees to more closely emulate the natural openings found within the drainage. Existing roads would be used so no new roads would be evident. Changes would be visible, but would mimic natural openings and be designed to reduce the visual effect of the harvest methods so the openings would not dominate the existing landscape character of the area of interest. With design criteria in place, these units would meet the VQO of Retention and Partial Retention in the foreground and middleground viewing zones from U.S. Highway 12.

Selway River Road – Along the Selway River the canyon is more open and the canyon walls less steep creating a more open landscape character. Larger portions of the canyon can be viewed for longer periods of time from the roadway and the river. There are numerous residential lots along this corridor in addition to the recreation sites found here. Foreground views of units 103,104, 126 and 145 would be of greatest concern. These are also areas where the fire was more active, coming down as far as the river in several places. There would be openings created from the fire both within the harvest units and from the fire activity itself.

Harvest units 103, 104, 126, and portions of 116 are within the *Retention* VQO. Again enough stand structure would be retained so that the management activities are not evident to the forest visitor. Area further up the slope, within the *Partial Retention* or *Modification* VQO can have evident man-made openings but must remain subordinate to the inherent scenic character with the retention of stand structure and the natural shaping of the openings.

Swiftwater Road – Harvest units are located along the entire length of the Swiftwater Road #470 and within the viewshed looking east across the Swiftwater Creek drainage. The Swiftwater Road is a significant travel corridor for recreation use and has a foreground VQO of *Partial Retention* and a middleground VQO of *Modification*. The road passes through units 103,

104,105, 106, 107, 108, 109, 110, 110, 136, 138, and 139. There are also views from the road of units 113, 114, 115, 116, 140 and 142. Within the foreground zone, harvest activities can be visible, but should not dominate the existing landscape character. Retention of live trees along the roadway as screening vegetation and use of design criteria for development of unit boundaries would be critical to maintain the VQO of *Partial Retention* in the foreground. Units viewed from the roadway across Swiftwater Creek would be designed to appear as natural openings through retention of live trees where possible. Areas of intense fire activity would have larger openings along the ridgetops so harvest activities may begin to dominate the existing landscape character. This would still meet the VQO of *Modification* in the middleground.

Elk City and Goddard Creek Drainages – These two large drainages have large areas of intense fire activity, especially along the ridgetops. There are no major roads or trails that are recreation destinations and therefore have a VQO of *Modification* throughout. Units within these drainages would have unit boundaries that appear as natural openings, but they would be larger and would have fewer tree retained. Units within this area include 117, 118, 119, 120, 121, 122, 123, 124, 125, 127, 128, 129, 130, 131, 132, 133, 134, 135, and 145.

Table 3-53: Effects of harvest units and proposed treatments on Scenic Quality under Alternative 2

Units	Proposed Treatment	Range of Canopy Cover (percent)	Seen from Critical Viewpoint?	Forest Plan Visual Quality Objective
U.S. Highway 12 – 101, 102, 103, 143, 144	Fire Salvage	Varies depending existing dead and dying vegetation	Yes; U.S. Highway 12, Three Devils Picnic Area, Wild Goose Campground, and the confluence interpretive site.	Retention in the foreground, partial retention in the middleground and modification in the background
Selway River Road – 103,104, 116, 126, 145	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	Yes; the Selway River road, Johnson Bar Campground, Fenn Ranger Station and VC, CCC Trailhead and O'Hara Campground.	Retention in the foreground, partial retention in the middleground and modification in the background
Swiftwater Road and Lookout Butte - 104, 105, 106, 107, 109, 109, 110, 111, 112, 113, 114,	Fire Salvage	Varies depending on severity of fire and existing dead and dying	Yes; from Road 470 and the Lookout Butte access road.	Partial Retention in the foreground and Modification in the middle and background

Units	Proposed Treatment	Range of Canopy Cover (percent)	Seen from Critical Viewpoint?	Forest Plan Visual Quality Objective
115, 116, 136, 137, 138, 139, 140142		vegetation. Areas affected are larger and more prevalent in this drainage.		
Misc. roads and trails within the Elk City and Goddard Creek drainages – 117, 118, 119, 120, 121, 122, 123, 124, 125, 127, 128, 129, 130, 131, 132, 133, 134, 135	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	No; activities viewed from minor roads and trails	Modification

3.11.8.4 Alternative 3

Alternative 3 proposes to harvest approximately 2,710 acres within the area of interest using regeneration harvest methods. This harvest would be designed to restore seral species such as western white pine, western larch, and ponderosa pine to areas burned during the mixed severity 2014 Johnson Bar Fire. The proposed harvest activities would remove fire affected trees while leaving both individual and clumps of tree, retaining legacy trees wherever possible. These techniques would emulate openings created by the natural processes of the moderate intensity fire exhibited by the Johnson Bar fire.

Approximately 1% of the harvest would be done using tractor logging, 34% using skyline logging, and 65% using helicopter logging. This alternative would also use 11 existing helicopter landings and develop an additional 3 landings to accommodate the large amount of helicopter based harvest activities.

This alternative is very similar to Alternative 2. Harvest activities have been reduced with the elimination of Unit 116 and reduction of Unit 104, located adjacent to the Selway Road. This unit was within the *Retention* VQO. There was still fire activity within the area of the unit so it still may appear as an opening as the fire damaged trees die and fall to the ground, but the change would occur over a longer period of time. There are also more areas proposed for helicopter harvest reducing the area that would be harvested using skyline methods.

Table 3-54: Effects of harvest units and proposed treatments on Scenic Quality under Alternative 3

Units	Proposed Treatment	Range of Canopy Cover (percent)	Seen from Critical Viewpoint?	Forest Plan Visual Quality Objective
U.S. Highway 12 – 101, 102, 103, 143, 144	Fire Salvage	Varies depending existing dead and dying vegetation	Yes; U.S. Highway 12, Three Devils Picnic Area, Wild Goose Campground, and the confluence interpretive site.	Retention in the foreground, partial retention in the middleground and modification in the background
Selway River Road – 103,104,126, 145	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	Yes; the Selway River road, Johnson Bar Campground, Fenn Ranger Station and VC, CCC Trailhead and O'Hara Campground.	Retention in the foreground, partial retention in the middleground and modification in the background
Swiftwater Road and Lookout Butte - 104, 105, 106, 107, 109, 109, 110, 111, 112, 113, 114, 115, 136, 137, 138, 139, 140142	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation. Areas affected are larger and more prevalent in this drainage.	Yes; from Road 470 and the Lookout Butte access road.	Partial Retention in the foreground and Modification in the middle and background
Misc. roads and trails within the Elk City and Goddard Creek drainages – 117, 118, 119, 120, 121, 122, 123, 124, 125, 127, 128, 129, 130, 131, 132, 133, 134, 135	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	No; activities viewed from minor roads and trails	Modification

3.11.8.5 Alternative 4

Alternative 4 proposes to harvest approximately 2,207 acres within the area of interest using regeneration harvest methods. This harvest would be designed to restore seral species such as western white pine, western larch, and ponderosa pine to areas burned during the mixed severity 2014 Johnson Bar Fire. The proposed harvest activities would remove fire affected trees while leaving both individual and clumps of tree, retaining legacy trees wherever possible. These techniques would emulate openings created by the natural processes of the moderate intensity fire exhibited by the Johnson Bar fire.

Approximately 3% of the harvest would be done using tractor logging, 61% using skyline logging, and 36% using helicopter logging. This alternative would also use 8 existing helicopter landings and develop an additional 6 landings to accommodate the large amount of helicopter based harvest activities.

Harvest activities have been reduced with the elimination of units 101, 102, 143, and 144 within the viewshed of U. S Highway 12. Within the Selway River viewshed Unit 116 would be greatly reduced and Unit 126 eliminated altogether. These units are within the Retention VQO. All harvest activities within the Wild and Scenic River boundary have been eliminated. There was still fire activity within the area of the unit so it still may appear as an opening as the fire damaged trees die and fall to the ground, but the change will occur over a longer period of time. There are fewer areas proposed for helicopter harvest and the area harvested using skyline methods would be increased.

Table 3-55: Effects of harvest units and proposed treatments on Scenic Quality under Alternative 4

Units	Proposed Treatment	Range of Canopy Cover (percent)	Seen from Critical Viewpoint?	Forest Plan Visual Quality Objective
U.S. Highway 12 – 103, 142	Fire Salvage	Varies depending existing dead and dying vegetation	Yes; U.S. Highway 12 at the confluence interpretive site.	Retention in the foreground, partial retention in the middleground and modification in the background
Selway River Road – 103,104,116, and 145	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	Yes; the Selway River road, Fenn Ranger Station and VC, CCC Trailhead and O'Hara Campground.	Retention in the foreground, partial retention in the middleground and modification in the background

Units	Proposed Treatment	Range of Canopy Cover (percent)	Seen from Critical Viewpoint?	Forest Plan Visual Quality Objective
Swiftwater Road and Lookout Butte - 104, 105, 106, 107, 109, 109, 110, 111, 112, 113, 114, 115, 136, 137, 138, 139, 140, and 142	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation. Areas affected are larger and more prevalent in this drainage.	Yes; from Road 470 and the Lookout Butte access road.	Partial Retention in the foreground and Modification in the middle and background
Misc. roads and trails within the Elk City and Goddard Creek drainages – 117, 118, 119, 120, 121, 122, 123, 124, 125, 127, 128, 129, 130, 131, 132, 133, 134, and 135	Fire Salvage	Varies depending on severity of fire and existing dead and dying vegetation	No; activities viewed from minor roads and trails	Modification

3.11.9 Cumulative Effects

The cumulative effects area is similar to that for the direct and indirect effects, except that it takes into account the whole viewshed, as opposed to focusing on the individual units and surrounding area. The temporal scope of the analysis is limited to the 30 to 35 years following harvest activities. This time period is the length of time openings created by regeneration harvest are likely to be evident given the growing conditions of the area.

Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

Openings created by timber harvest activities from past projects are still evident within the area of interest. Although most openings have regenerated, some still appear as distinctive openings with lineal edges. A few well-defined geometrically shaped openings are found along the Swiftwater Road and to the north of Goddard Creek. Smaller and less noticeable openings are still visible along the ridgeline above the Middle Fork of the Clearwater River from viewpoints along U.S. Highway 12. The larger harvest units that are visible in the Swiftwater and Goddard drainages occurred during the late 1980s and early 1990s and now have vigorously growing regeneration in most areas. The smaller units along the Middle Fork were harvested in early 2000 and are more open, but not very evident because of the small size of the openings. It is anticipated that these openings would no longer be evident within the next 10 to 15 years. Other management activities such as pre-commercial thinning, commercial thinning, salvage

logging, road construction, and road maintenance have not had a significant visual effect on the viewsheds within the area of interest and therefor have not had a long-term effect.

Present and foreseeable management projects that may affect scenic quality include: Clear Creek Burn, Tinker Bug Timber Sale, Wooden Rat Timber Sale, Clear Creek Restoration, Lowell WUI, Horse Creek, and three prescribed burns – Fenn Face, North Selway, and West Meadow. All of these projects have been or would be designed to meet the VQOs designated for its particular areas of interest. While none of the harvest units from this project are immediately adjacent to units proposed in this project, there are some within a mile of the Johnson Bar Fire Salvage Project. The visual effect of the harvest proposed in these projects on the Johnson Bar Fire Salvage area of interest would be minor due to the design criteria that would be developed for the roads and trails within the Middle Fork of the Clearwater and Selway River areas. The size and shape of the openings within the listed projects would be design to reflect the existing landscape character. There would therefore be no effect on the visual condition of the viewshed from these present and foreseeable future projects.

Other past, present and future activities including tree planting, public use, road reconstruction and maintenance, trail construction and maintenance, pre-commercial timber stand improvements, and private land activities would have no significant effect on the visual condition of the area of interest because they do not create large enough man-made openings to alter the inherent landscape character to the degree that it would become a dominate visual element within the viewshed.

3.11.9.1 Alternative 1

There would be no man-made change in the scenic quality of the area of interest under Alternative 1 in the short-term, but the evidence of wildfire would increase with time as more trees succumb to the effects of the 2014 fire. The existing man-made openings would continue to re-vegetate and within 10 to 15 years would no longer appear as distinctly as openings, while the fire affected areas would begin to collapse and new openings created from the fire would be evident. Alternative 1 would not change the existing landscape character of the geographic area encompassed within the Johnson Bar Fire Salvage area of interest.

The effect on the scenic resource under Alternative 1 in the long and short-term would be that of the changes related to a natural fire event. These changes would include creation of large and small openings where the fire burned hot enough to kill the trees. The natural openings currently found in the area of interest would continue to increase in size and number as more areas collapsed due to the effects of the 2014 fire. The younger stands within existing harvested areas would continue to regenerate, with the man-made harvest areas no longer appearing as openings within 10 to 15 years.

3.11.9.2 Alternative 2

Past harvest activities are visible throughout the area of interest and are viewed from U.S. Highway 12, the Selway River road, the Swiftwater road and associated recreation and residential sites. Most proposed units within the Johnson Bar Fire Salvage Project will be also be visible to some extent from the road, trails and recreation sites within the area of interest. With

design criteria, the openings while visible, will emulate openings created by natural fire events. Openings will be visible but will reflect the size and shape of natural fire activity, since only dead and dying trees from the 2014 fire will be removed. Use of helicopters to harvest critical units within retention areas will reduce the visual effects of the harvest activities and will leave more natural openings. In critical viewshed more stand structure will be retained and logging activities such as skyline logging pathways will be minimize. Given the aspect and growing history of the area, the openings created by this proposal would no long appear as openings within 30 to 35 years, but should appear as an area that has experienced the natural process of wildfire rather than man-made, geometric openings.

3.11.9.3 Alternative 3

The cumulative effects of Alternative 3 would be the same as Alternative 2 with the exception of the reduction of harvest activity within the foreground viewing area of the Selway Road (Unit 116) and the use of approximately 10% more helicopter harvesting methods rather than skyline yarding. Use of helicopters to harvest critical units within retention areas will reduce the visual effects of the harvest activities and will leave more natural openings.

3.11.9.4 Alternative 4

The cumulative effects of Alternative 4 would be the similar to Alternative 2 and 3 in the Swiftwater Road area and the Elk City Creek and Goddard Creek drainages. There would be significant changes in the U. S. Highway 12 corridor and the Selway corridor with the elimination of the units within the foreground viewing area (*Retention* VQO). Alternative 4 would also use more skyline harvest methods, which may be more evident from viewing corridors.

3.12 Weeds

3.12.1 Analysis Area

The analysis area for this noxious weed assessment includes approximately 13,000 acres of National Forest System administered lands, all of which occur across drainages in the Middle Fork Clearwater River and Lower Selway Watersheds, more specifically, Decker, Swiftwater, Elk City, Goddard and O'Hara creeks.

3.12.2 Regulatory Framework

Analysis and evaluation of noxious weeds in this project is based on direction contained in the Federal Noxious Weed Law (1974) as amended (1975), Executive Order13112 for Invasive Species. Forest Service Policy (FSM 2080.5), Nez Perce National Forest Plan (II-7, II-20, II-26, III-6), and Idaho State Noxious Weed Code (title 22, chapter 24) and Forest Service Handbook 2109.14 (Chapters 10, 40, and 50).

In general, the Forest is directed to implement an effective weed management program with the objectives of preventing the introduction and establishment of noxious weeds; containing and suppressing existing weed infestations; and cooperating with local, State, and other Federal Agencies in the management of noxious weeds.

3.12.3 Analysis Methodology

This assessment addresses the presence of noxious weeds relative to expansion risk, susceptible habitats, and spread vectors. The effects are considered within the Johnson Bar Fire Salvage Project area.

Susceptible Habitats

Habitats were classified as having low, moderate, or high susceptibility based on habitat type group (HTG) characteristics and known ability of weeds to colonize in these habitat types. Highly susceptible habitats can be colonized and dominated with exotic plants even in the absence of intense and frequent disturbances. HTGs with a low rating are only slightly susceptible to weed colonization.

Weed Expansion Risk

The risk of weed expansion was determined by assessing the following factors; susceptibility of HTGs, the presence of weed infestations (seed source), the amount of fire and harvest activity (site disturbance), and the density of roads (spread vectors). Weed risk is the indicator of weed expansion in the project area. Geographic Information Systems (GIS) data were used to display and calculate acres of activities occurring in each weed expansion risk zone.

While it is well known that risk of weed invasion increases with disturbance and is variable depending on specific habitats, management activities and variable seasonal climate, making exact determinations of weed response would be extremely difficult if not impossible. In any scenario, the best predictions of weed response would be based upon local parameters of the particular project area. The weed risk model used by the Nez Perce National Forest is based upon local habitats, weed occurrences, disturbance levels, and available vectors. The logic and framework that this model has been based upon has been widely respected and adapted for a broader regional-level prediction model sanctioned by the Region One office of the U.S. Forest Service.

Exotic Plant Inventory Data

Inventory of existing exotic plant populations has been ongoing in the project area for several years. Surveys have been conducted, but generally these have been of limited scope. Where noxious weed populations have been documented, treatments have occurred and the data is accurate and reliable.

A noxious weed assessment/survey was conducted during the first week of September 2014 by Forest Service personnel, as part of the Johnson Bar Fire B.A.E.R. (Burned Area Emergency Response) Team, by driving all roads and observing any invasive species currently growing within the fire perimeter. No large, continuous populations of weeds were documented, only small and scattered satellite groups, mostly confined to the road rights-of-way, in ditches, and along the disturbed cut banks. Two noxious weed species from the Idaho State List, Spotted knapweed and Canada thistle, were found growing within the proposed project area transportation corridor along Forest Service Roads 470, 470B, 470C, 470D, 1121, 9701, 9723, 651, 1119, and 1119A. Noxious weed control with herbicides was recommended and funded to treat all existing, along with any new invader infestations within the Johnson Bar Fire Perimeter

during the Spring and Fall seasons of 2015. Weed monitoring was also recommended and funded for populations within and adjacent to the fire, to determine if any increases in densities occur, along with post treatment monitoring effectiveness.

3.12.4 Resource Indicators

Weed expansion risk in the analysis area was determined by assessing the susceptibility of habitat type groups, the presence of weed infestations (seed source), the amount of recently burned or harvested areas (site disturbance), and the density of roads or trails (spread vectors). The largest portion of the analysis area is dominated by the Idaho Batholith Breaklands, a local landtype classification or Vegetative Response Unit. VRU 8 (Stream Breaklands) is characterized by relatively warm/moist Western red cedar and grand fir habitat types. These habitat types are moderately susceptible to weed colonization. Cooler grand-fir and mixed conifer habitats which occur over the rest of the Breaklands and all of the Uplands (VRU 10and17) tend to be moderate to low with regard to weed expansion risk. Areas at risk to expanding weed populations were calculated using GIS data and the following results were given for the Johnson Bar Analysis Area.

Acres and Expansion Risk Probability Percent:

- High – 910 (7%)
- Moderate – 11,700 (90%)
- Low to Closed - 390 (3%)

Approximately 3% of the project area habitat can be characterized as having a low or closed susceptibility to invasive plants, these are the hardened road surfaces, water and gravel. Moderately susceptibly habitats encompass about 90% of the project area in the moist low elevation canyons, while highly susceptible habitats make up only 7% (these tend to be southern exposures along the dry open slopes). Overall, the project areas can be characterized as having a mostly moderate to low susceptibility to invasive plants, with moderate areas making up the largest majority of acres within the proposed Johnson Bar Fire Salvage area.

3.12.5 Affected Environment

Idaho's noxious weeds are plant species that have been designated "noxious" by law in the Idaho code (title 22, chapter 24, "Noxious Weeds"). There are currently 64 noxious weeds on the State List. These 64 weeds are separated into three Categories based on the level of concern, which affects how they are managed. **Statewide Early Detection Rapid Response (EDRR)** category is top priority, as these are the new invaders and pose the greatest risk. No weeds in this category are in the project area. The next level is **Statewide Control**, these plants can be eradicated, but in most cases they are managed to reduce the infestations within 5 years. No weeds in this category are known to exist in the project area. The last category is **Statewide Containment**, most plants in this category are established populations and managed locally depending on the size and density of the infestation. Current noxious weed inventories in the analysis area identify 2 species form the Statewide Containment Category, Spotted knapweed (*Centaurea stoebe*) and Canada thistle (*Cirsium arvense*) as the most widespread.

These two weed species can be found primarily along roads and in the open, drier habitats within the project area. Two other weed species on the Statewide Containment Category, Houndstongue (*Cynoglossum officinale*) and Oxeye Daisy (*Leuxanthemum vulgare*), also exist in small numbers within the analysis area, but are not inventoried. These last two species are sporadically dispersed throughout the entire Moose Creek District, mostly by animals, and rarely occupy continuous areas, which makes mapping almost impossible.

Currently the Moose Creek Ranger District conducts integrated weed management strategies that deal with weed infestations within the project area based on priorities outlined in the Annual Operating Plan for the Clearwater Basin Weed Management Area, a community based cooperative (CBWMA). The area has and would continue to receive high priority for invasive weed control work prior to and throughout the life of the proposed project. Noxious weed treatments are currently conducted with crews from the Forest Service, County, private contractors, and Idaho Backcountry Horseman. Monitoring and inventory of these weed populations would occur in conjunction with these treatments.

Weed expansion in the analysis area is greatly influenced by habitat susceptibility, seed availability, seed or propagule dispersal, and habitat disturbance. The probability that weeds would expand in the project area depends on the interaction of these four factors. Weed expansion begins with the dispersal of seeds from existing weed infestations adjacent to uninfested areas. Roads and trails are the primary means by which people and animals interact with the environment and therefore are an important spread vector. These linear corridors act as dispersal networks for exotic plants. The majority of documented infestations within the analysis area are along the transportation corridors.

Disturbance creates spatial and temporal openings where sites become suitable for plant establishment, and where usable light, space, water and nutrients are available to meet the specific growing requirements of the plant. Disturbance may increase the susceptibility of an otherwise intact plant community to weed invasion by increasing the availability of a limited resource. Natural or human caused fires along with timber harvest and grazing are broad scale disturbances that influence the amount of available habitat for weed establishment.

3.12.6 Direct and Indirect Effects

3.12.6.1 Alternative 1

Under this alternative, management practices and use of the project area would continue under current management, with no further actions proposed. The risk of noxious weed expansion would continue at current levels.

3.12.6.2 Alternatives 2, 3, and 4

All of the action alternatives have the potential to spread weeds to some degree because of ground disturbing activities associated with timber harvesting and temporary road construction. The risk of noxious weed introduction is greater when the proposed project activities are within close proximity to existing infestations and a seed source. The level of expansion depends directly on how well design criteria are followed. Pioneering weeds, such as

thistles, can be initially expected to occur in any burned areas with bare soil. Accurate data on exactly how fast each weed species would spread in response to ground disturbing actions is not available as weed models do not distinguish between differing categories of disturbance. It is estimated, however, that 1 to 10 percent of the activity acres would experience weed establishment following treatments. With rigorous application of design criteria and monitoring, the expansion would be closer to 1 percent. With poorly implemented design criteria, expansion would be closer to 10 percent.

Of the action alternatives, Alternative 2 would result in the most disturbed acres (3,096) and the greatest potential for weed expansion. Alternative 4 at 2,207 acres would have the least potential to spread weeds, and Alternative 3 would be somewhere in between at 2,710 acres. The difference between the 3 action alternatives is minor when it comes to total acres of disturbance; therefore, the relative risk of weed expansion in the proposed project area would be somewhat similar for all three. This is a relative ranking of alternatives based on total acres of disturbance. It is recognized that the actual treatment acres or actual amount of ground disturbing activity would likely be less than the gross acres displayed.

Levels of herbicide application through the Clearwater Basin Weed Management Area Cooperative would be expected to increase initially under all action alternatives as existing weed populations are treated and design criteria for other activities are developed and implemented in accordance with the programmatic herbicide application document. Alternative 2 would carry the highest levels of potential herbicide application. Assuming weed management actions are effective, herbicide application levels would taper off over time. Complete eradication of all weeds would not be attainable under any alternative. Weeds such as Spotted knapweed and Canada thistle would be contained and managed locally.

3.12.7 Cumulative Effects

The No Action alternative would continue some ground disturbing activities common to all Alternatives. Weeds would continue to invade and spread across the landscape. The cumulative effect of these activities combined with ongoing human and natural disturbances create the existing rate of weed spread. Additionally, the level of weed colonization currently observed would be expected under the No Action Alternative 1.

Activities proposed under the Action Alternatives 2, 3, and 4, when combined with ongoing disturbances associated with livestock grazing, recreation use, and road maintenance have the potential to increase the rate of noxious weed spread more so than the No Action Alternative.

Past and present disturbances associated with vegetation treatments added to reasonably foreseeable actions would create a cumulative effect on weed expansion by the combination of distribution of weed seed, ground disturbance, and creation of spread vectors. The degree of the cumulative effects would vary depending upon the number of entrances over time, distribution of disturbance across the analysis area, and acres disturbed. The cumulative effects incurred by the Action Alternatives 2, 3, and 4 to the risk of weed expansion would be eased with the implementation of the design criteria.

With increased disturbance within and outside of the analysis area, opportunities for the spread of new invaders increase. As vehicles, equipment, animals, and humans move through the landscape, each has the potential to carry weed seed to new and currently uninfested areas. This spread really has no limit other than the susceptibility of receiving habitats. Though proposed activities from this project would increase overall weed risk for a short time, habitat readily available for weed invasion in the long-term should decline due to overall trends in habitat management, increase in landscape restoration, advancement of succession, and progressive weed management.

Effects from past actions are represented within the existing condition. Reasonably foreseeable activities include:

- Proposed Clear Creek Integrated Restoration Project (2016 and beyond)
- Proposed Eastside Grazing Allotment (2016/2017)

3.13 Wild and Scenic Rivers

3.13.1 Analysis Area

The Johnson Bar Fire Salvage project area is located south of the Middle Fork Clearwater River and west of the Selway River near the confluence of the Selway and Lochsa Rivers. The Analysis Area for the Wild and Scenic River includes that portion of the Wild and Scenic River within the project area, plus the adjacent Wild and Scenic River area located on the opposite side of the river.

3.13.2 Regulatory Framework

3.13.2.1 Wild and Scenic Rivers Act

The project area includes a portion of the Middle Fork Clearwater (including the Lochsa and Selway Rivers) Wild and Scenic River. This river is managed consistent with its designation in accordance with PL 90-542, as amended, and 16 U.S.C. 1271-1287.

Management direction is found in Section 10(a) of the Wild and Scenic Rivers Act:

> *Each component of the national Wild and Scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other such uses that do not interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting* ***aesthetic, scenic, historic, archaeologic, and scientific features****. Management Plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.*

The Middle Fork Clearwater Wild and Scenic River has a River Plan as required by the Wild and Scenic Rivers Act (Section 3) and outlines site specific management direction for the river corridor. Management Guides and a River Management Plan were prepared in 1973 and 1969

respectively, to guide management of the river corridor. The proposed project would be in compliance with the Forest Plan and River Plan standards.

There are no other eligible Wild and Scenic Rivers within or adjacent to the Johnson Bar Salvage area.

Forest-Wide Standards Wild, Scenic and Recreation Rivers (Forest Plan pg. II-22-23)		
1	Maintain or enhance the recreation, visual, wildlife, fisheries, and water quality values of the existing and proposed "Wild," "Scenic," and "Recreation" Rivers.	Design criteria developed for the Johnson Bar Fire Salvage project would provide adequate protections for these resources. In most cases the project would have no effect or no adverse effect. Effects to recreation would be temporary and primarily associated with log haul on main roads within the corridor (Selway Road 223 and US Highway 12). Use of helicopter landings within the corridor for Alternatives 2 and 3 would be limited to avoid the high recreation use periods. Alternative 4 would not utilize helicopter landings within the corridor. Effects to visual resources would be primarily associated with Units 103 and 104 located near the confluence of the Lochsa and Selway Rivers. Design criteria would assure the visual quality objectives established for those areas would be met. Effects to Wildlife and Fish habitat and populations would not be adversely affected (see Wildlife and Fisheries reports). Water quality within the Selway and Middle Fork Clearwater Rivers would not be adversely affected (see Fisheries, Hydrology and Soils Reports).
3	Generally, no management practices are scheduled in the waterway corridors which are normally defined as the seen area up to ¼ mile either side of the channel.	Alternatives 2 and 3 would harvest 185 and 160 acres respectively. Alternative 4 would not harvest within the river corridor. Portions of these units would be seen and have been addressed in the Scenery Management report. Design criteria assure the visual quality objectives would be met. See also Management Area 8.2 Timber standards below.
4	New road construction and timber harvest are excluded in the “Wild” River Corridors, and very limited in ”Scenic” and “Recreation” River Corridors.	No new roads are proposed within the “Recreational” corridor. Alternatives 2 and 3 would harvest 185 and 160 acres respectively within the Wild and Scenic River corridor. Alternative 4 would not harvest within the river corridor.

6	Manage for recreation experiences in context with the existing or proposed designation. "Wild" - primitive or semiprimitive nonmotorized. "Scenic" - semiprimitive motorized or semiprimitive nonmotorized. "Recreation" - semiprimitive motorized or roaded natural.	The portions of WSR within the project area are classified as Recreational. The Recreation and Trails report describes the existing Recreation Opportunity Spectrum and that there would be no effect or change to ROS.
Management Area 8.2 Standards (Forest Plan pg. III-19-21)		
Recreation 2	Recreation Segment: Manage for roaded natural appearing or semiprimitive motorized recreation.	See Forest-wide Standard #6.
Recreation 4	Identify and protect historic, scenic, geologic, and archaeological sites.	The Cultural Resources report identifies historic and archeological sites that require protection. Design criteria for the project require that these sites be avoided, therefore they are protected. The Scenery Management report addresses the visual effects of harvest within the WSR corridor. Design criteria would assure Visual Quality Objectives are met. No geologic sites are in the project area.
Recreation 5	Recreation Segment: Manage for retention visual quality objective.	The Scenery Management report addresses how Retention VQOs would be met for the harvest units located within the WSR corridor.
Wildlife and Fish 1	Restore degraded anadromous and resident fish habitat.	See Fisheries report. The Forest Plan Appendix A requires an upward trend in habitat conditions for certain watersheds in the project area. A suite of road decommissioning projects would lend progress toward the required upward trend. None of those projects, however are located within the WSR corridor.
Timber 1	Lands are classified as "unsuitable" for timber management; do not schedule timber harvest.	The Johnson Bar Fire Salvage project was not scheduled as part of the annual sale quantities. This project is in direct response to the wildfire and opportunities to respond to landscape conditions.

Timber 2	Recreation Segment: Exclude timber harvest except for (a) public safety and/or recreational purposes in selected areas; (b) **control of fire, insects and disease** when such cutting is the only practical method of control; (c) approved access facility locations.	The Fuels and Silviculture reports reveal the potential for portions of the project area to reburn if no action is taken to address the existing burned timber. The Johnson Bar Fire Salvage is designed to address future fire control issues associated with increased fuel load caused by the wildfire.
Water 1	Meet established fishery/water quality objectives for all prescription watersheds as shown in Appendix A.	See Wildlife and Fish Standard #1 above
Facilities 3	Recreation Segment: Maintain or reconstruct [trails] to enhance recreation values, user safety, and reduce environmental damage.	See Recreation and Trails Report. Portions of two trails (706 and 712) are located within the WSR Corridor. The portion of Trail 706 within the WSR corridor is located on State land without a trail easement. It is unknown whether the trail would be reconstructed. The portion of Trail 712 located within the WSR Corridor would not be affected by harvest activities and would be maintained on an infrequent basis.
Protection 1	Recreation Segment: Treat infestations [of insects and disease] that threaten recreation values or adjacent "suitable" or private lands.	The Johnson Bar Fire Salvage project is not designed to address existing or potential future insect and disease populations. Indications are that the fire itself burned over many of the insect population areas that existed prior to the fire. Increased insect populations are not expected with No Action or any of the alternatives.
River Plan **General Coordinating Requirements (River Plan pg 5-10)**		
Recreation 4	Identify and protect historic, scenic, geologic, archaeologic and similar sites or areas.	See Management Area 8.2 Recreation #4 above.
Timber 1	Consider timber for recreation, watershed protection and esthetic values rather than for commercial production.	Approximately 1,300 acres of the 2,100 acre Wild and Scenic River Corridor was burned. Alternatives 2 and 3 proposed to harvest about 185 and 160 acres respectively. Alternative 4 would not harvest within the Wild and Scenic River Corridor. Approximately 90 percent of the burned area would be retained untreated to provide trees on the landscape for other purposes. These burned trees will likely fall down over the course of the next few years and may contribute to increased risk for re-burn. See Fuels Report.

Timber 2	Commercial timber harvest will generally be confined to areas outside the boundaries of the river area. Commercial operations could be needed to meet objectives under recreational river coordinating requirements.	See Recreation River Coordinating Requirements Timber #1 below.
Water 2	Protection of rivers will include controlling pollution, debris accumulation and siltation to the degree necessary to maintain the water quality within defined parameters or measurable units.	See Management Area 8.2 Wildlife and Fish Standard #1 above.
Transportation 2	Locate roads and trails to avoid encroachment on river banks and to harmonize with objectives for which the river area is established.	No new roads or trails would be constructed in the WSR Corridor.
River Plan **Recreation River Coordinating Requirements (River Plan pg 10 - 14)**		
Timber 1	Timber cutting will be done only for the following: a) Public safety and/or recreational purposes in selected areas. b) Control of fire, insects and disease when such cutting is determined to be the only practical method of control. c) [with]Approved road and trail locations.	See Management Area 8.2 Timber #2 above.
Timber 2	Timber cutting will be compatible with or enhance key recreational and scenic values	See Forest-wide Standards #1 above.

Timber 3	The value of standing trees for watershed, aesthetic or other recreational purposes will be considered in the choice of measures for controlling fire, insects and disease.	There are 2,100 acres of Wild and Scenic River Corridor within the project area Approximately 1,300 acres (60%) of that area was burned. Alternative 2 would harvest 140 acres (14%) of the burned area within the corridor. Alternative 3 would harvest about 160 acres (12%) of the burned area. Alternative 4 would not harvest any burned areas within the corridor. Approximately 85-90 percent of the burned area would be retained untreated to provide trees on the landscape for other purposes under Alternatives 2 and 3, and 100% under Alternative 4. These burned trees will likely fall down over the course of the next few years and may contribute to increased risk for re-burn in about 20 years. See Fuels Report.
Water 2	Coordination with all agencies, State and Federal, private landowners and water users will be necessary to protect water quality.	See Management Area 8.2 Wildlife and Fish Standard #1 above.
Water 3	Modify projects within the river system if necessary to ensure high water quality	See Management Area 8.2 Wildlife and Fish Standard #1 above.
Water 4	Gullied, eroding stream, polluted water and vegetation and soil disturbed by humans, domestic animals, wildlife, large burns and landslides are examples of undesirable watershed conditions in classified river areas. Where these conditions have a major effect on river values they should be restored.	See Silviculture Report. See Scenery Management Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternatives 2 and 3 would harvest then plant jump starting tree recovery. Natural processes would dictate stand recover under Alternative 4.
Water 5	All watershed improvement projects will be designed as to location, type of treatment and work methods to ensure compatibility with the free-flowing intent of the Wild and Scenic Rivers Act.	No projects are proposed that would affect free-flow.
Wildlife and Fish 1	Provide an appropriate habitat to sustain a variety of wildlife for public enjoyment	See Wildlife Report. No adverse effects to any wildlife population or habitat component are anticipated.
Management Guides Guidelines (pg 32 – 43)		

Recreation 12	Shorelines must remain essentially primitive in Wild River zones and fully protected within the Recreation River zone.	Design criteria for the project include PACFISH buffers on stream-side zones. No harvest is proposed within 300 feet of the Selway or Middle Fork Clearwater River.
Timber 1	Timber cutting in the Recreation River areas will be for recreation, fire control, and for other essential management purposes rather than for commercial production.	See Silviculture Report. See Fuels Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternative 2, 3 and 4 would harvest then plant jump starting tree recovery. See also River Plan Recreation River Coordinating Requirements Timber #3 above.
Timber 3	Timber harvest and any other vegetative changes in the Recreational River zone are to be directly toward maintaining a viable, attractive forest environment.	See Silviculture Report. See Scenery Management Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternative 2, 3 and 4 would harvest then plant jump starting tree recovery.

Timber 4	When cutting is necessary, the actual cutting practices are to be determined on an "area by area" basis. A thorough analysis of stand conditions, soils, topography, and especially the effect on scenery and other recreational values will be required in each case. The following general requirements apply: a) Cutting units are to be designed to avoid large openings in the canopy unless such openings will enhance the landscape. b) Treat all slash and debris promptly and completely to reduce the hazards of fire, insect and disease and to protect visual values. c) Control; timber harvest methods that leave the least possible visual affect. Avoid locating logging roads and skid trails within river boundary viewing areas. d) Special measures will be provided for intensive slash cleanup on or adjacent to occupancy sites or developments e) The above requirements favor logging systems that have a minimum effect on the natural appearing forest as viewed by the traveler along the river or from a vista area. Utilizing helicopter, skyline, and horse logging.	a) Design criteria for meeting visual quality objectives would result in no large openings within the Wild and Scenic River Corridor. b) Design Criteria provide for timely treatment of slash and debris. Some slash would be intentionally left within harvest units to provide cover and protection of soils. See Soils Report. c) See a above. No roads or skid trails would be located within the WSR corridor. d) Design criteria require intensive clean up and rehabilitation of landings located at Two Shadows, Wild Goose and Johnson Bar. e) Alternatives 2 and 3 would harvest 185 and 160 acres respectively within the WSR corridor. Alternative 4 would not harvest within the WSR corridor. Logging systems within the WSR corridor would utilize helicopter and skyline logging methods. There would be no tractor logging within the WSR corridor.
Timber 5	Reforestation or other planting in the absence of natural revegetation shall be carried out where necessary to restore landscape appeal and protect watershed values.	See Silviculture Report. See Scenery Management Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternatives 2 and 3 would harvest then plant jump starting tree recovery. Natural processes would dictate stand recovery under Alternative 4.

Timber 6	Timber stand shall be kept as healthy as possible both to protect the zone and to protect adjoining lands.	See Silviculture Report. Insect and disease processes are evident in the project area and throughout the WSR corridor. Future management actions will need to be explored to assure healthy forests over time.
Timber 7	Require timely erosion prevention measures wherever timber is cut. Funds to minimize erosion will be provide for all timber sales and in the amount needed for maximum control.	See Soils Report. See Hydrology Report. Design Criteria for the project would assure implementation of Best Management Practices to minimize erosion.
Water 3	It will be necessary to restore areas where watershed deterioration is in evidence due to prior activities of man, flood conditions, domestic livestock, wildlife, fire or landslides. Interdisciplinary planning teams are to be utilized to plan these projects.	See Silviculture Report. See Scenery Management Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternative 2, 3 and 4 would harvest then plant jump starting tree recovery.
Water 8	Individual projects may require modifications to ensure maintenance of desired water quality. Modifications will be made when it has been determined that such uses or activities cannot be made compatible with the river.	See Management Area 8.2, Wildlife and Fish Standard #1 above.
Wildlife and Fish 1	Provide for the perpetuation of the anadromous fishery in all project plans	See Fisheries report. No adverse effects to the anadromous fishery is anticipated.
Soil 1	Special soils studies and evaluations will be required whenever attempting complex projects or developments within the River system boundaries.	See Soils report.
Soil 2	Revegetation projects, providing a protective soil cover crop, will be required for all applicable projects and following large fires.	Following the Johnson Bar, fire mulching and seeding was considered under the BAER efforts but deemed unnecessary. This project has specific design criteria to retain fine and course woody debris within treatment areas rather than seeding with a cover crop. This woody debris would protect soils from erosion. See Hydrology Report.
Fire Control 6	Provide for the restoration of fire damage immediately after the fire is controlled. Include mulching and planting of fire lines and other erosion measures as necessary and appropriate within each river class.	See BAER report. Fire lines, drop points and roads used for fire suppression efforts were rehabilitated immediately following the fire. See Soil #2 above.

Management Guides Prescriptions (pg 44 – 54)		
Recreation 2	Project activities which create noise, dust, air pollution, etc., are to be restricted or otherwise controlled. Special project constraints will be required during the recreation season.	See Forest-wide Standards #1 above
Timber 1	Timber management programs within the river boundaries are to be directed at the maintenance of an attractive forest environment. An attractive forest environment is defined as the associated external factors; flora, fauna and etc., which in total make the river system a pleasing experience to the visitor. It can include many vegetative types and open areas if in total these features add beauty to the landscape and protect its soils, waters, and wildlife.	See Silviculture Report. See Scenery Management Report. One of the objectives of harvest is to accelerate the rate of tree recovery over natural processes (no action). Alternative 2, 3 and 4 would harvest then plant jump starting tree recovery.
Timber 2	Forest management on the river is to be directed at sustaining a balanced vegetative cover suited to environmental, aesthetic and wildlife purposes.	See Scenery Management Report. See Wildlife Report. See Silviculture Report.
Timber 3	Management emphasis on the river lands suited to timber production will not be on the reforestation of cutover or denuded tracts, but on sustaining a vegetative cover on the landscape.	See Management Guides – Prescriptions, Timber #1 above.
Timber 4	Selective cutting and shelterwood silvicultural methods will be used.	See Silviculture Report. Design criteria for meeting visual quality objectives would result in silvicultural systems with variable retention levels however the goal would be to regenerate harvest areas through planting.
Timber 6b	Modify timber management practices …to meet or enhance aesthetic and recreational values.	See Forest-wide Standard #1 above.

3.13.3 Analysis Methodology

Effects to the Wild and Scenic River resources are based on effects to:

- Identified outstandingly remarkable values (ORVs),
- Free flow,
- Consistency with the applicable River Plan, and

- Consistency with the Nez Perce National Forest Plan.

The proposed project does not propose any activities within the normal highwater of the Selway or Middle Fork Clearwater Rivers or their tributaries located within the designated boundaries of the Wild and Scenic River. Free flow would not be affected by this project and is not discussed in detail.

The identified ORVs for the Middle Fork Clearwater Wild and Scenic River are:

- Scenery
- Recreation
- Geology
- Fish
- Wildlife
- Historic and Cultural
- Water Quality
- Vegetation/Botany

All of the ORVs have been addressed in other resource reports except Geology. This project would not affect the underlying geology or any geologic features within the project area and therefore is not discussed in detail. This report summarizes the findings in context of Forest Plan and River Plan consistency.

3.13.4 Resource Indicators

The resource indicator for the Wild and Scenic River as a whole is consistency with the River Plan and Forest Plan. There are no specific metrics to be evaluated, above those indicated for each individual resource area.

3.13.5 Affected Environment

There are approximately 21,600 total acres within the designated boundaries of the Middle Fork Clearwater Wild and Scenic River. This land area is identified as Management Area 8.2 in the Nez Perce National Forest Plan (pages III-19 to 21). A portion of the Middle Fork Clearwater Wild and Scenic River System is located within and adjacent to the project area. Approximately 2,100 acres of designated river corridor would be located within the proposed project area and another 2,000 acres are adjacent (Map 1).

The existing condition of the individual ORVs is contained within the sections for those specific resources:

- Scenery is addressed in the Visual section
- Recreation is address in the Recreation and Trails section
- Geology is not addressed

- Fish are addressed in the Fisheries section
- Wildlife are addressed in the Wildlife section
- Historic and Cultural are addressed in the Cultural section
- Water Quality is addressed in the Fisheries, Hydrology, and Soils sections
- Vegetation/Botany is addressed in the Fuels, Vegetation, Botony, and Weeds sections

Approximately 1,300 acres (60% of the acres within the designated boundaries) were burned by the Johnson Bar fire. Most (82%) of those acres were moderate to high severity. Mixed severity fire burned down to the river on almost the entire length of the river within the project area. Fire effects primarily include burned and downed trees readily visible along the river-edge and throughout the river corridor and potential for increased erosion due to loss of organic matter.

3.13.6 Direct and Indirect Effects

3.13.6.1 Effects Common to Alternatives 2 and 3

Alternative 2 would harvest 185 acres and Alternative 3 would harvest 160 acres within the Wild and Scenic River Corridor.

- Under Alternative 2 approximately 65 acres of the harvest would be helicopter logged in units 102, 103, 104, 126, 143, and 145 and 120 acres would be skyline logged in units 103, 104, and 145. Harvest units 103 and 104 account for over 80% of the harvest activity.
- Under Alternative 3 approximately 97 acres of the harvest would be helicopter logged in units 102, 103, 126, 143, and 145 and 62 acres would be skyline logged in units 103, 104, and 145.

Unit 103 is located along the ridge west of the Lochsa/Selway River confluence at Lowell. Unit 103 is readily visible from US Highway 12 and the businesses and residents of Lowell. Most of Unit 104 is located on the backside of Swiftwater Ridge but a portion of the unit is positioned on the slope facing the river and Road 223. The other units located within the Wild and Scenic River corridor are ridge top fingers that would be difficult to see from the Middle Fork Clearwater or Selway Rivers, Highway 12 or Road 223. Alternative 2 would utilize more skyline logging techniques Design criteria would be applied to harvest activities to meet Visual Quality Objectives as described in the Scenery Resources report.

Harvest in these areas would reduce the number of standing dead trees and would replant those areas with fire tolerate species (see Silviculture Report) which would accelerate the stand regeneration process compared to natural processes.

Alternatives 2 and 3 would utilize Helicopter Landings H1 and H6 located at the Wild Goose Campground and Johnson Bar Campground respectively and H18 located Two Shadows, all located within the Wild and Scenic River corridor. Use of these landings would affect river residents and Forest visitors as described in the Recreation and Trails Report. Alternatives 2 and

3 would utilize log haul routes within the Wild and Scenic River corridor including the Selway River Road 223, US Highway 12, the Swiftwater Road 470 and O'Hara Creek Road 651. Use of these roads would affect river residents and Forest visitors as described in the Recreation and Trails Report.

3.13.6.2 Alternative 4

Alternative 4 would not harvest or utilize helicopter landings within the designated Wild and Scenic River Corridor. Alternatives 4 would utilize log haul routes within the Wild and Scenic River corridor including the Selway River Road 223, US Highway 12, the Swiftwater Road 470 and O'Hara Creek Road 651. Use of these roads would be less than for Alternatives 2 and 3 due to the reduction in total volume being removed from the project area. The effects would be similar to Alternatives 2 and 3 but slightly less.

3.13.7 Cumulative Effects

Very few of the projects listed in Table 3-0 (Past, Present and Reasonably Foreseeable Future Projects) have occurred in the designated Wild and Scenic River Corridor. Ongoing road and trail maintenance, the presence and operation of campgrounds and administrative sites all occur within the corridor. Other projects that have occurred within the corridor and adjacent to the project area include Bridge Creek Timber Sale (2009), Interface Fuels Timber Sale (2012), private fire salvage (2015), and the transport of oversized loads on US Highway 12. Bridge Creek and Interface Fuels projects conducted timber harvest and used Wild Goose and Two Shadows helicopter landings. Both projects implemented design criteria to protect river resources, and did so successfully. Future projects with potential activities within the corridor include Lowell WUI, Fenn Face, North Selway Face, and Idaho Department of Lands fire salvage. These future projects also include design criteria for protecting river resources.

While direct effects to river resources have been minimized with design criteria, there has been a cadence of short-term activities occurring in the corridor that could be perceived as industrial intrusion within the otherwise pastoral environment, particularly the use of helicopter landings and the transport of oversized loads on US Highway 12. Vegetation treatments have been minor, well less than 1% of the river corridor in the past decade. Decreased forest health and increased insects and disease are evident that may warrant future management action

3.14 Wildlife

3.14.1 Analysis Area

The Project Area includes 26,788 acres and supports various wildlife species. The latest fire has affected habitat for those species in the area resulting in the current condition.

The following wildlife section would show analysis on individual species that may be considered rare, or their population trend may be declining, and other species that represent wildlife in specific types of forest habitats. Direct, indirect, and cumulative effects consider a species occurrence in a project area, habitat requirements, habitat availability, and habitat quality for the analyzed species. In most cases, the direct, indirect and cumulative effects analysis area is

the 26,788-acre project area, which includes all proposed activity areas. It is large enough to assess the effects of proposed activities, but not so large as to make habitat changes undetectable. Effects were based on the acres of potential habitat treated by proposed activities. The timeframe for direct and indirect effects is 5 years (unless otherwise stated), which is the estimated time needed to complete harvest activities. Cumulative effects may range up to 150 years for stands to develop mature or old growth characteristics that are preferred by some of the wildlife species analyzed in this report. For old-growth and elk, predetermined analysis units were used as required by Regional or Forest Plan direction. There are 6 old growth analysis areas and 3 elk analysis areas (EAAs) in the analysis area.

3.14.2 Regulatory Framework

3.14.2.1 Nez Perce National Forest Plan

The 1987 Forest Plan documents goals, objectives, standards, and guidelines for managing Forest wildlife species and habitats. Goals (pages II 1-2) described in the Plan include:

> *Provide/maintain diversity and quality of habitat to support viable populations of wildlife. Support the recovery of ESA listed species or sensitive species by providing habitat of sufficient quantity and quality.*

The Forest Plan objectives (pages II 5-6) are more specific to acres managed for elk, Pacific yew and old growth. Specific wildlife species that were considered rare in the late 1980s were addressed with forest compliance in their recovery. Habitats are to be managed to provide for population viability of sensitive species. Forest Plan standards and guidelines for wildlife (pages II 18-20) outline management, coordination, cooperation and some design considerations that the wildlife program would implement or comply to.

3.14.2.2 Endangered Species Act

This Act directs that actions authorized, funded, or carried out by federal agencies do not jeopardize the continued existence of any threatened or endangered species, or result in the adverse modification of habitat critical to these species. It is also the responsibility of the Forest Service to design activities that contribute to the recovery of listed species in accordance with recovery plans developed as directed by the ESA (50 CFR part 402). Section 9 of the ESA of 1973, as amended, requires threatened and endangered species be protected from “harm” and “harassment” wherever they occur, regardless of recovery boundaries.

The latest list of threatened and endangered species (August 14, 2014) shows the Canada lynx as the only listed (threatened status) terrestrial species on the forest. The analysis area of the salvage project is not located in any lynx habitat or in a Lynx Analysis Area (LAU). Thereby, no lynx habitat would be affected by project activities. It is determined that all proposed alternatives for the Johnson Bar Fire Salvage project would create no effect to lynx or its habitat. All Action Alternatives are consistent with the Northern Rockies Lynx Management Direction (NRLMD) and are in compliance with the ESA and FSM 2670. Informal coordination with the USFWS on this Project was initiated on December 2, 2014.

3.14.2.3 National Forest Management Act (NFMA, 1976)

This Act requires the Forest Service to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives [16 USC 1604(g)(3)(B)]. The Forest Service's focus for meeting the requirement of NFMA and implementing its regulations is on assessing habitat to provide for diversity of species. All alternatives would be consistent with NFMA direction for diversity of animal communities. Although the Action Alternatives analyzed in the Project may affect individual animals, the Project's proposed activities would not affect the viability of any species across its range.

Sensitive Species: Sensitive wildlife species are those that show evidence of a current or predicted downward trend in population numbers or habitat suitability that would substantially reduce species distribution. Federal laws and direction applicable to sensitive species (SS) include the NFMA and FSM 2670. The Forest is required to determine the potential effect of proposed activities on SS and to prepare biological evaluations. The Forest Service is bound by federal statutes (ESA, NFMA), regulations, and agency policy (FSM 2670) to conserve biological diversity on NFS lands and assure SS populations do not decline or trend toward listing under the ESA. This document fulfills the requirements of the biological evaluation for sensitive species. The Proposed Actions would not affect sensitive species viability on federal lands, nor would it cause SS to become federally listed as threatened or endangered.

Species Viability: The Proposed Action, in combination with past, present, and reasonably foreseeable future management actions in the Analysis Area, would not affect population viability or distribution of native and desired nonnative vertebrate species on the Forest. The Idaho Comprehensive Wildlife Conservation Strategy (IDFG 2015) contains information on species of concern or interest including range-wide and state-wide status and known population information. At the Forest-wide scale, this Project would not disturb, agitate or bother populations to a degree that causes, or is likely to cause, a measurable decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior.

Habitat status and population viability at the Forest level is presented for some species based on Forest Service Northern Region analyses (Samson 2006a,b; Bush and Lundberg 2008). This provides a broader scale context relative to the Analysis Area. Samson's Conservation Assessment (2006a) work was based on literature reviews, habitat use in the Northern Region, estimates of habitat per national forest, short and long-term viability evaluations for 4 species (northern goshawk, black-backed woodpecker, flammulated owl and pileated woodpecker). The conservation assessment is based on a principle-based approach to population viability analysis (PVA). The methods and background for this approach uses point observation data and vegetation inventory information based on Forest Inventory and Analysis (FIA) data to build wildlife habitat relationship models and analyze short-term viability. FIA produces statistical reports and analytical information on status and trends in forest area and location; species, size, and health of trees; total tree growth, mortality, and removals by harvest; wood production and utilization rates for various products; and forest land ownership during the period 1975 through July 2001. The Samson (2006b) habitat estimates added analyses on the fisher and American marten with the four previously mentioned species, and uses data through

2005. Estimates of forested habitat for each national forest in the USDA Northern Region were developed by remote sensing to provide estimates of forest versus non-forest habitats. He discusses threshold habitat amounts, home ranges of species and minimum viable population for six species. Bush and Lundberg (2008) review Samson's work and document updates to his habitat models (metric units, habitat types, formatting errors and so on) used in Region 1 and provide estimates of habitat amounts. All three of these documents and their authors are referred to in the wildlife sections for the concerned species. Their work is referred to as the potential amount of forest scale habitats for these species.

Discussion of the regional analyses is to compare project effects to the calculated amount of forest available habitat produced by the region. Viability of the concerned species is at a much larger scale than the project level.

3.14.3 Analysis Methodology

Wildlife analyzed for management actions on the forest include Threatened and Endangered species (identified by the USFWS), Regional sensitive species, management indicator species (MIS) and neotropical migratory birds. The Nez Perce forest has one threatened species, Canada lynx, which is presumed to be on the forest. The USFWS recognizes the Forest as secondary habitat for the predator, as well as unoccupied habitat for threatened Canada lynx. The Nez Perce National Forest Plan designated 11 management indicator species (MIS). The Forest Service Northern Region (R1) has identified 22 sensitive species (SS) that are suspected or known to be on the Forest. Wildlife analyses include the baseline conditions (created by all past management practices and natural events); direct, indirect and cumulative effects of the proposed actions; and cumulative effects of reasonably foreseeable projects. Region, Forest, local, and Idaho Fish and Game records were consulted on presence of species in the Project area. Modeled vegetation layers (from GIS applications) were used for interpretation of species habitats or potential habitat for the animals' life stages. Data related to model vegetative features as potential habitat include species, age, size, density, canopy cover and harvest history: queried from GIS layers containing database information from TSMRS, FSVEG, V-MAP and FACTS.

Summary of Models and Methodology

Data Sources

GIS data layers used to develop wildlife effects analysis include burn severity maps created by the BAER team (Hydrologist Section 3.4), riparian buffered areas around streams according to PACFISH (Fisheries Section 3.5), roads and trail layers showing Forest Service roads including year-round to seasonal public motorized access, decommissioned roads, roads closed to motorized access, and all trails (motorized and non-motorized) that the agency manages for public access. In addition, fire, timber harvest and other silvicultural activities (tree planting, pre-commercial thinning, etc.) based on queries of TSMRS, FSVEG and/or FACTS were used to analyze past disturbances of vegetation, and remotely censused vegetation data (V-Map).

Boundaries of proposed activities for each Action Alternative created by the Interdisciplinary Team were used to evaluate proposed effects on each resource. These Action Alternative layers

include polygons for where the units would be located, size, and proposed management activities (regeneration, commercial thinning, prescribed fires, etc.). Additionally, layers were created for depicting temporary road construction and helicopter landing sites. Old growth determinations and designation of replacement old growth is discussed in Vegetation Section 3.10.

Modeling

Exam data from FSVeg is the preferred data source for vegetative information utilized in the development of wildlife habitat models, as it represents an accurate documentation of the vegetation within a specific stand location at the time of the exam. However, for reasons mentioned above, stand exam coverage is not complete for the entire Forest. To address gaps in FSVeg data availability within the Project Area the Biologist utilized the Region 1 Existing Vegetation Mapping Program (V-Map), a vegetation model produced to provide a Forestwide geospatial database of existing vegetation.

"*V-Map is a remote sensed product which uses a combination of satellite imagery and airborne acquired imagery. The image data (i.e., pixels) are put through a process of aggregation to derive spatially cohesive units (i.e., polygons). A small portion of these polygons are then sampled through aerial photo interpretation and field data collection to determine their composition and through spatial statistics, unsampled polygons are given labels based on an analysis of the sampled polygons. Draft map products are then field verified and appropriate changes are made in the labeling algorithms. Final results are then used to populate the V-Map base-level feature class. A variety of post-processing algorithms are then used to create the mid-level feature classes of the V-Map database*." (Brown and Barber 2012)

The advantage to such an approach is that large areas can be evaluated for lifeform, tree dominance, tree size class, and tree canopy cover class. Therefore, areas not covered by stand exams can still be analyzed for forest type and some structural attributes. A 2015 accuracy assessment of V-Map derived Lifeform, Tree Canopy Cover, Dominance Type (DOM_40), and Tree Size for the Nez Perce-Clearwater National Forest yielded 91%, 88%, 84%, and 99% overall accuracy respectively (Brown 2015). Obtaining high accuracy however also leads to one of the disadvantages of V-Map which is the lumping of attributes into a few classes. For example: the tree canopy cover class has 4 sub-classes- 10-24.9%, 25-39.9%, 40-59.9%, and ≥ 60%. In some cases, the biologist intersected stand data with V-Map to filter out age classes for certain species in Table 3-56. Another example in the limitation of V-Map is the "given" sub-class of V-Map's tree canopy cover class. Flammulated Owls are mostly found with a canopy cover of 35-70%, but the biologist chose the closest subclasses of greater than or equal to 40%. This created an over-estimate of owl habitat, from 40-100%. Another disadvantage of V-Map is the lack of detail, such as tree ages and heights found in stand exams. Lastly, V-Map fails to capture effects of vegetation disturbances post 2011. The Biologist utilized data queries from sources referenced above (FACTS) to speak to and analyze the habitat effects of those disturbances which occurred after imagery was captured. With the habitat type modeled inferences can be drawn from the current habitat after the disturbance. For example, a 20-year old fire or harvest unit would currently provide habitat for some, but not all of the analyzed species. This is contrary to claims the Forest Service often relies on stand exam queries to determine acres of

suitable habitat, but then makes no interpretation as to what that loss of habitat means to the species (Schultz 2010).

Modeling for vegetation is different for wildlife and silviculture. In this FEIS the Silviculturist used Vegetation Response Units (VRUs) as a large scale analysis of ecological units on the Forest (Chapter 3, Section 3.10.5, page 181-183). At the finer scale, the FSVeg Spatial queries were used. FSVeg Spatial provides data from stand exams, tree height, size class, tree age, basal area, etc. However, stand exams have not been completed for every stand within the Project Area and as a result one row in Table 3-42: Pre-fire Size Classes (Chapter 3, Section 3.10.5, pg. 185) and Table 3-50: Cover Type Comparison of Alternatives (Chapter 3, Section 3.10.9.2, pg. 205) contain a row for "Unknown". As outlined above the Biologist uses some of the same data as the Silviculturist; however, where data from FSVeg is lacking it is augmented with data from V-Map to develop a representation of habitat types across the entire Project Area.

Overall, the Forest incorporates information derived from a range of scientific research, observed evidence, and model projections utilizing the best data available at the time. Despite this, uncertainty is inherent in all scientific results. However, it is felt that this combination is the most valid approach for wildlife analysis until proposed or future models and/or field techniques are verified.

Finally, thresholds for disturbance of wildlife or its habitat are established by the ESA, NFMA, Forest Plan goals and standards. Additionally, the biologist summarizes the analysis for T&E species and sensitive species by a determination statement on the effects of the project, other projects past, present and foreseeable, at the end of each wildlife species section. For those species not analyzed in detail, see Wildlife Appendix E.

Table 3-56 displays the habitat criteria used to identify suitable habitat for most species. Suitable habitat considered includes areas that would be necessary for breeding, nesting, rearing, and foraging activities. Suitability is based on stand characteristics such as tree species, tree size, and tree canopy cover. Other habitat quality considerations include patch size, snag numbers and size, downed wood, riparian habitat, and security areas. Stand criteria used to assess species' habitat suitability were interpreted from peer-reviewed technical literature on species specific research.The column for Suitable Habita includes the existing condition (post-fire), after the effects of the Johnson Bar and Wash fires of 2014 and 2015, respectively. Some species are not necessarily dependent on coniferous trees for their habitat needs: American peregrine falcon, black swift, Coeur d'Alene salamander, common loon, harlequin duck, long-billed curlew, North American wolverine, and Townsend's big-eared bat. These species are not described in the following table.

Table 3-56: Habitat Criteria Used To Identify Suitable Wildlife Habitat in the Analysis Area

Wildlife Species	Primary Tree Species[a]	Tree Diameter (inches dbh)	Tree Canopy Cover (%)	Age Class (years)	Suitable Habitat (Acres)
Canada Lynx (Threatened)	Denning Foraging	–	–	–	0 0
American Marten	SAF, S, LPP, GF, WRC	>10	>40	>100	12,977
Bald Eagle	All mature species, near open water	>20	20-60	>100	3,648
Bighorn Sheep	All Species with openings	-	-	-	0
Black-backed Woodpecker	PP, DF, GF, WRC, MH, LPP, diseased, insect infested, or burned	>5	>10	>40	17,363
Flammulated Owl	PP, DF	>15	>40	>80	269
Fisher	WRC, GF, DF, LPP, SAF, S	>10	>40	-	13,988
Fringed Myotis	PP, DF	>10	<60	>100	678
Gray Wolf	All species	-	-	-	26,000+
Long-eared Myotis Long-legged Myotis	All species	>15	<60	>100	2,883
Mountain Quail	All habitats in VRU 3	-	-	-	192
Northern Goshawk Nesting	PP, DF, LPP, GF, WRC. SAF. S	>15	>40	-	12,640
Pileated Woodpecker Nesting	PP, DF, GF, WRC, MH	>20	>60	-	1,662
Ringneck Snake	VRU 3	–	–	–	192
Western Toad	RHCAs	All	<30	–	4,635
White-headed Woodpecker	PP	>15	25-40		0.5
Shiras Moose Winter (MA 21)	Mapped MA 21	–	–	–	799

[a] PP- ponderosa pine; DF- Douglas-fir; WL-Western larch; WWP-Western white pine; LPP- Lodgepole pine; GF- grand fir; WRC- Western red cedar; S- Englemann spruce; SAF- Subalpine fir; MH – mountain hemlock

ArcMap GIS was used for modeling, mapping, and quantifying habitats and Project effects. National Agricultural Imagery Program (NAIP) images were used to validate information gathered from other sources. The V-Map model was re-run for the FEIS analysis and wildfire effects to species habitats were updated to the present status resulting in some differences as compared to the past documents.

Field collected information provided updates to the severity of burned areas, which created some changes to all alternatives. Units were eliminated or modified with a loss of potential harvest, as live trees would not be harvested, as well as dead trees with little to no economic value for timber operations.

The Idaho Comprehensive Wildlife Conservation Strategy (ICWCS 2015) is a storehouse of sensitive or rare wildlife species survey and observation data. ICWCS data was mapped within the Project area boundary to identify sensitive species potentially using the Analysis area. Some of the IDFG maps were last completed in 2005. Additional wildlife sightings from federal and state historical records were used in this section.

Population trend information for elk and wolf was synthesized from data available from the Idaho Department of Fish and Game research reports.

This analysis incorporates the effects on terrestrial sensitive species and fulfills the requirements of the required Biological Evaluation, per direction pertaining to the FSM and streamlining process (USDA Forest Service 1995). The streamlined process for doing biological evaluations for sensitive species focuses on the following two areas:

- Incorporating the Effects on Sensitive Species into the NEPA Document
- Summarizing the Conclusions of Effects of the Biological Evaluations for Sensitive Species

The following Regional Forester sensitive species and MIS may occur or be affected by proposed activities in the Project area: American marten, bald eagle, black-backed woodpecker, fisher, flammulated owl, fringed myotis (bat), gray wolf, long eared myotis, long-legged myotis, northern goshawk, pileated woodpecker, Rocky mountain elk, and Shiras moose.

3.14.4 Species Dropped from Detailed Analysis

The following species were dropped from detailed analysis as suitable habitat is not present, or the project would not affect individuals or their habitats: American peregrine falcon, black swift, Canada lynx, Coeur d' Alene salamander, common loon, grizzly bear, harlequin duck, long-billed curlew, mountain quail, north American wolverine, pygmy nuthatch, ringneck snake, Townsend's big-eared bat, yellow-billed cuckoo, western toad and white-headed woodpecker. Appendix E includes a table displaying these animals and the reasons why they were not further analyzed.

Special Features for Wildlife

Some features in the forest provide unique habitats for some of the Sensitive or management indicator species. These features are snags, old growth and riparian areas.

Snags

Snags have been recognized by the scientific community as critical habitat for numerous vertebrate wildlife species (McClelland 1977; Thomas et al.1979). Standing dead trees provide some of the most suitable nest and roost sites, owing to characteristics of wood and its decay patterns (Bull et al., 1986). Snags provide forage opportunities for woodpeckers and other cavity nesters to feed on insects and other invertebrates that are boring holes in the trees or digesting tree cambium.

Species that depend on snags and analyzed in this section include bats, black-backed woodpecker, fisher, American marten and pileated woodpecker. These species use snags for nesting, roosting, perching or foraging, and/or a combination of uses.

Natural effects to recruitment of snags include fire events, insect and disease outbreaks.

Natural factors affecting the loss of snags include fire, wind or snow events, soil slumps or landslide events and decay. Human effects that increase snags are from man-made fire. Likewise, snags are lost from timber harvest operations, prescribed burns and firewood cutting.

The management for snags is found in Appendix N-3 of the Forest Plan. The Nez Perce Snag standards include:

- Riparian areas- manage to support 80% of maximum populations of snag-dependent species by maintaining a minimum of 1.8 snags/acre, with 1 snag per 10 acres ≥20 inches dbh and the remainder ≥12 inches dbh. Due to windthrow or other causes, in riparian areas, 5 green trees/acre must be retained: 1 ≥20 inches dbh and the others ≥12 inches dbh.
- All other areas outside of riparian areas are to support 60% of maximum populations of snag-dependent species by maintaining a minimum of 1.4 snags/acre; with 1 snag per 10 acres ≥20 inches dbh and the remainder ≥12 inches dbh. Due to windthrow or other causes, in riparian areas, 4 green trees/acre must be retained: 1 ≥20 inches dbh, the others ≥12 inches dbh.
- Clumps and individual trees should consider safety, resistance to windfall, efficient logging operation, ease of slash treatment and protection from firewood cutters.
- Unit prescriptions for all of the Johnson Bar proposed salvage units under all alternatives would retain an average of 14-28 trees/acre; of which 6 snags would be ≥20 inches dbh, with at least 3 of the snags ≥30 inches dbh. Therefore, all units would retain more snags than required under the Forest Plan standard.

Old Growth

Old growth indicator species are wildlife dependent on or find optimum habitat in old growth stands for at least part of their life cycle. Primary indicator species are the pileated woodpecker, northern goshawk, and fisher; while the American marten is considered a secondary indicator species as it inhabits both mature and old growth stands.

Forest Plan standards (Appendix N) are to maintain viable populations of old-growth dependent wildlife species by maintaining a minimum of 10% of total forested acres should be managed as old growth, with ≥5% of the forested acres managed as old growth within each prescription watershed or combination of watersheds (5,000 to 10,000 acres). Appendix N also describes how old growth stands are to be identified, desired stand or block sizes, and to provide interconnecting corridors using riparian zones.

The Johnson Bar Project contains 11% old growth, as shown in the Vegetation Section of Chapter 3. No treatments would occur in old growth. This project meets the Forest Plan standards in Appendix N.

Riparian Areas

Riparian areas are important to many wildlife species for forage, water, cover, nesting, in some cases denning, movement corridors, and vegetation diversity or structure. Kauffman and Krueger (1984) present a rich list of referenced authors that discuss the value of riparian ecosystems to wildlife. Olsen et al. (2007) discuss the importance of stream-riparian areas for

amphibians. Knopf et al. (1988) explain that less than 1% of the western landscapes in the US are covered by riparian vegetation, yet this habitat provides for more species of breeding birds than surrounding uplands.

All wildlife species analyzed by the forest are known to use riparian areas sometime in their life cycle. Forest Plan goals mention maintaining a diversity and quality of habitat to support viable wildlife populations (Goal 3), provide habitat and contribute to recovery of T&E species (Goal 4), stream channel stability and water flow (Goal 20), water quality (Goal 21) and protect or enhance riparian-dependent sources (Goal 22). Forest Objectives address managing riparian areas for the betterment of wildlife and other values Page II-5, FP. Standard 1 for the Wildlife and Fish resources is to maintain viable populations of existing native and desirable vertebrate wildlife species; which would include the habitats of such.

Forest Plan Standards for Riparian Areas (Page II-22): abbreviated interpretations

1. No management in riparian areas that causes detrimental changes/conditions in water quality or fish habitat.
2. Preferential consideration to riparian-area dependent resources (wildlife, fish, plant). Protect and if applicable, improvement of such resources.
3. All effects on wetlands or floodplains must be considered in all alternatives during the environmental analysis process.
4. Delineate and evaluate riparian areas in project areas prior to activities.
5. Manage riparian areas for cover and security for riparian-dependent species with emphasis on Threatened and Endangered species.

No treatments in riparian areas are planned in the Johnson Bar Salvage Project; thereby, the proposed actions are meeting Forest Plan standards.

3.14.5 Affected Environment

Past disturbances that have affected the vegetation in the project area prior to the Johnson Bar fire include historic wildfires from 1880 to 1945. These fires ranged in size from a hundred to 9,000 acres (Table 3-0, cumulative effects). Additionally past harvest affected about 5,870 acres in the project area. Harvest (2,980 acres) and other disturbances that occurred more than 30 years ago would now be supporting a young forest of pole size (4-12 inches dbh) or larger trees. The size and canopy structure of these recovering forests would provide hiding cover for big game, forage for small mammals and a prey base for fisher, marten, wolf, and goshawk. The tree boles and structure are not likely to support large nests or cavities for pileated woodpeckers, goshawks or roosting for bats.

A portion of the Project area lies within the Tahoe –Clear Creek cattle allotment. This permit allows 70 cow/calf pairs to graze on the forest from June through September each year. Three proposed units are within the allotment; two of which are not readily accessible to livestock due to the steep slopes. The effects of cattle (presence, competition for big game forage) are analyzed for elk habitat effectiveness. The permit also defines limits to allowable use by cattle of riparian and upland areas.

3.14.6 General Effects to Wildlife

The existing condition of the project area was created by natural events [wildfire, insect and disease outbreaks, weather events (drought, climate change, and so on)]. Human-caused events are considered as well: harvest history, roads. These events are explained in other sections of this chapter (vegetation, fuels, aquatics, noxious weeds, rare plants, soils and watershed.)

The 2014 Johnson Bar fire burned with mixed severity in the affected area. Fire models and on the ground reports show a mortality rate for trees ranging between 10-100%. Areas that burned terrain at low fire intensity likely retained more vegetation and structure than areas of high intensity (such as stand replacing fires). Overall, the burned areas have altered the composition of wildlife communities.

Fires may create short-term increases in food that may contribute to population increases of some wildlife species (Smith 2000). The author mentions that potential increase of species depends on the animals' ability to succeed in the altered post-fire environment. When fire frequency increases or decreases substantially or fire severity changes from pre-settlement patterns, habitat for many animal species declines. (Smith 2000).

Huff and Smith (in Smith 2000) noted one mixed-severity burn that showed less bird species turnover than the stand-replacement burn in the first 2 years post-fire. Some birds typical in unburned areas occurred in the mixed severity burn, but were absent from the stand-replacing burn. An increase in seed-eating bird species after crown fires is related to the available seeds from cones that have opened from response to the fire (Hutto 2006). Another study showed that after mixed-severity and stand-replacement burns in central Idaho, seed-eating birds were the most abundant songbirds (Saab and Dudley 1998). Raptor populations remained neutral or responded favorably to burned habitat as prey became more exposed to predation as their hiding cover was reduced (Lyon et al. 2000). As the vegetation recovers during the post fire period, raptors benefit from the increase in prey that forages on the regenerating vegetation.

Ream (1981) reviewed about 240 references on small mammals and fire. She concluded that populations of ground squirrels, pocket gophers, and deer mice generally increase after stand-replacing fire. Rabbits, snowshoe hare, red squirrel, northern flying squirrel, and voles generally avoid recent stand replacement burns (Ream 1981). Recent burns can increase food and nutrition for ungulates over the short-term (3-20 years). Lyon et al. (2000) noted that "*ungulates are sensitive to alterations in vegetation structure, and their net response to fire depends on its severity and uniformity. Moose also rely on seral shrubs in many areas, especially where shrub-fields are interspersed with closed-canopy forest. Large carnivores and omnivores are opportunistic species with large home ranges. Their populations change little in response to fire, but they tend to thrive in areas where their preferred prey or forage is most plentiful—often, in recent burns*."

Fire-caused changes in plant species composition and habitat structure influence reptile and amphibian populations (Means and Campbell 1981; Russell and others 1999). Amphibians in forested areas are closely tied to debris quantities—the litter and woody material that accumulate slowly in the decades and centuries after stand-replacing fire. (Lyon et al. 2000).

3.14.7 Effects Common to Analyzed Species

Old growth in the Project Area was calculated by adding MA 20 (designated old growth) and verified old growth (ground surveys that confirmed old growth) for a total of 2,836 acres. The Johnson Bar fire burned 934 acres of old growth at moderate to high severities, thereby compromising much of the characteristics that contribute to a stand's status as old growth. Replacement old growth was designated to augment existing verified old growth, bringing the total old growth up to 5,641 acres (see Vegetation Section on Old Growth). Therefore, an estimated 11% of old growth is present for consideration as habitat for certain species that utilize older or mature forests in the Project Area.

Timing of project activities is planned for year-round, up to the end of 2020. Any concerns from wildlife and other resources that are addressed in the design criteria would alter timing of planned activities, and would be incorporated into the planning and implementation of the timber contract. Examples of such concerns would be soil conditions, fog, active bald eagle or northern goshawk nests, and so on.

Common effects from the action alternatives to the following analyzed species would be potential disturbance from project activities. This would include noise from machinery and other human activities. Those species dependent on current habitat may be displaced to other areas by the proposed activities. Other species may move to unharvested areas during daylight hours and return during hours of darkness. The latter species may continue to visit units between the time periods of different activities. Upon completion of the activities (roadwork, timber harvest, prescribed burning, tree planting) in the units, some wildlife species would return as soon as the following vegetation growing season. The time frame of return depends on the species and its preference for the various stages of vegetative succession that would occur over time.

Some studies have discussed how salvage operations have reduced structure and loss of habitat for snag dependent species (Hutto and Gallo 2006, Peterson et al. 2009). In general, arboreal species associated with closed forest canopies decline following crown fires, and species associated with open forest conditions and snags increase (Hutto 1995, Kotliar et al. 2002, Pilliod et al. 2006, Saab et al. 2005). The silvicultural prescriptions acknowledge the importance of snag retention for wildlife and other resource values. Snag retention would be a minimum of 6 snags/acre of 20 inches dbh or greater. However, in areas that experienced hotter burns, all unmerchantable snags would be left. So the 14-28 live/dead trees to be retained per acre may all be snags. This is far above the recommended 6-8 trees/hectare- the minimum number believed to support maximum densities of most cavity-nesting species (Thomas 1979).Providing a mix of open and dense snag stands, either through retention of natural patchiness or by logging, may increase the abundance and diversity of cavity-nesting species over the short-term (circa 5 years) (Haggard and Gaines 2001; Saab and Dudley 1998).

All harvested units would be planted with native tree species found on the forest. The advantage of tree-planting is that trees and their root systems would become established and contributing to the nutrient cycle, adding stability to soils and reducing erosion or sediment loss. Yes, under natural regeneration the above benefits are present, but it may take 5-20 years later for this to occur. During such a lag period, soil loss is imminent from erosion and loss of

nutrients. Wildlife would not return to the affected areas until the vegetation component is there to provide habitat for them.

Recent or foreseeable activities adjacent to Forest Service lands include those by private interests and the state of Idaho. Two private land owners salvaged approximately 200 acres of their land in 2014 and 2015.The State salvaged about 144 acres of their land in 2015. These operations would create disturbance to terrestrial wildlife in or near the affected units. Some of the wildlife may have been displaced to areas on the national forest. It is expected that these projects on adjacent lands will be finished before any proposed activities by the Forest Service begins.

Fire suppression is the foreseeable management action that would occur in the project area that could affect species habitats. It is the only foreseeable action considered in the cumulative effects analysis for all species. Cumulative effects would vary among the analyzed species, as each has needs for various stages of vegetative growth and structure. Generally, short-term effects vary by species, and long-term effects would range up to 150 years: the time span for a tree seedling to grow to a mature or old growth status. All past activities are considered as part of the existing condition, and present activities on private and state lands are occurring. The state's activities would be evaluated by the Idaho's guidelines for analysis on wildlife that may occur in their project area. Logging operations on private lands must abide by the Idaho State Forest Practices Act. Wildlife in the state and private lands that are affected by harvest operations may be displaced to federal lands. Due to the lack of information on present or foreseeable activities, the cumulative effects of fire suppression to the analyzed animals in this report would be immeasurable.

3.14.8 Region 1 Sensitive Species

3.14.8.1 Bald Eagle

The bald eagle is one of the largest raptors in the U.S. and is mostly found in habitats adjacent to large water bodies: rivers, lakes, and seashores. The eagle is an opportunistic predator which subsists mainly on fish, but it may hunt waterbirds (ducks, herons, and seabirds), small mammals and reptiles. It also scavenges dead animals, and has been detected on carcasses of deer and other small mammals during winter bald eagle surveys on the Central Zone of the Nez Perce-Clearwater National Forest.

Eagle populations had declined in the twentieth century to a point where the bird was listed on the endangered species list in 1978. After conservation and management efforts began to show an increase in populations, the eagle was determined as "recovered" and removed from the list in 2007 (USFWS Federal Register 2007). It is on the Region 1 sensitive species list (February 2011).

For nesting, the eagle selects a dominant or codominant tree that is in proximity to a large water body. The tree species is less important to the eagle pair than the tree's height, composition and location (Suring 2013). Roost trees (mature trees with strong limbs and well-developed canopies) are also used during winter as groups of eagles gather to forage, perch and provide security to one another (IDFG 2008).

The most sensitive time for disturbance of eagles, as is all birds, is during the nesting period. The IDFG anticipates this period may last from mid-January through August for Idaho.

Bald eagle winter surveys have been conducted by Biologists and other Forest Service personnel from 2007 to 2014, and 1990 to 1997. The surveys were conducted along river sections of the Selway, Middle and South Forks of the Clearwater River prior to January 15. No nesting activities were detected during any of the surveys. In March 2015, the biologist observed a pair of bald eagles in and a around nest near the Selway River, and in the project area. The fledglings had already left the nest and were accompanying the adults along the Selway River in early August.

The timing restrictions were established as a result of observed eagle activity along bald eagle winter survey routes adjacent to the Johnson Bar project area and the fact that nest building and courtship have not been observed prior to February 1. Additionally, eagle fledglings are out of the nest and foraging with adults by August 15. Combined observations from winter surveys (20 years of observations) and eagle activity during other seasons led to the rationale for the timing design criteria for bald eagle nesting activities. Eagle nesting activity along the river systems of the Forest may be different than eagle habitats along the Snake River or other parts of Idaho.

"Bald eagles can live with human activities if land managers consider the birds' needs. Appropriate timing and location of farming, logging, construction and recreation can be essential to nesting success. A pair of bald eagles may become accustomed to a tractor working in a field near the nest site or may tolerate traffic moving along a nearby road. However, they may become disturbed during the most sensitive part of the reproductive period (courtship through incubation) if human activities intensify, become unpredictable, or come too close to the nest site or feeding area." (IDFG 2008)

Besides the timing of activities near active bald eagle nests, activities may be restricted with proximity of the nest as well. Management zones ranging from 0.25 to 2.5 miles around the nest are developed to define the space and privacy for a nesting pair, and the size and shape of the radius around the nest is influenced by topography, vegetation and food sources (IDFG 2008). Project activities for the Johnson Bar Fire Salvage Project would be affected by these timing restrictions and management zones.

Population Trends

Range wide status of the bald eagle is apparently secure (G4/G5) and statewide status indicates it is vulnerable during breeding and apparently secure during non-breeding season (S3B/S4N) (CWCS 2011). Breeding Bird Survey trend data show the eable population increasing by 4% in the western part of the country during the period of 1966 to 2013 (Sauer et al. 2014). The raptor is a sensitive species and MIS on the Nez Perce Forest. Currently, no bald eagle nests have been recorded along the boundary of the project area. Annual winter surveys since 1980 have shown presence of eagles along the boundary of the project area.

Affected Environment

There are approximately 4.5 miles of the Middle Fork of the Clearwater and 7 miles of the Selway River that flow along the boundary of the project area. Estimated potential bald eagle habitat is approximately 3,650 acres. In March 2015, one occupied eagle's nest was detected along the Selway River, within the project area. Another observation detected a pair of eagles on a nest about one and a half miles west of the project boundary in 2014; however, this nest was outside of the project area and was not active in 2015. Three eagles were seen along the Middle Fork of the Clearwater River and boundary of the area during the 2015 winter bald eagle count. One eagle was observed (near present unit 145, about ½ mile from river) during 2013 by a forest wildlife crew.

The Johnson Bar event was a mixed severity fire. Most of the burned areas near the rivers were low to moderate severity, but some isolated patches of high severity occurred. The latter intensity would kill all the trees, leaving snags, scorched soil, and openings as the snags fall over in time. The low intensity burns would have reduced grass, shrub and small tree species. Areas affected by moderate severity burns may have some remnant understory and mixed tree species that survive. Most of the surviving trees would be of larger size with thicker bark. Eagles would be able to use the surviving trees in low or mixed burns for perching. The largest trees may be able to support a nest.

3.14.8.1.1 Direct and Indirect Effects

Alternative 1

No access management changes would occur. The mixed severity fire would offer potential nest or perch trees in areas of unburned or low burn intensities. In general, tree canopy cover has been reduced in the burned areas, which may reveal exposed prey or carcasses for eagle foraging opportunities.

Over time, potential nest trees that are dead or dying would lose the ability to support the large and heavy nests that eagles construct. Wintering eagles would continue to use the riparian habitat as perch trees, while foraging for fish or scavenging for dead animals.

Alternatives 2, 3, and 4

All action alternatives propose to salvage harvest in the project area. Large trees and/or snags would be left in all units as per the target stand prescriptions. No harvest would occur in the RHCAs buffering the rivers.

Ground based logging (tractor or skyline) would create noise or activities that may disturb eagles. Harvest in units would be at least 200 yards from the rivers' edge; leaving burned or unburned vegetation between the river and project activities. Foraging eagles may relocate their perch sites and hunting activities along other river stretches during activities in units that are visible to the bird(s). However, eagles appear to be somewhat tolerant of mechanical noise as traffic along Highway 12 has been occurring for decades. The one active nest in the area and any others that are detected prior to or during activities would be accommodated by buffer distances and timing restrictions found in the project design criteria (see Chapter 2).

Helicopter logging would create effects on eagle activities. Two studies detected that 36% to 11% of bald eagles were flushed from their nests when helicopter distances were between 490 - 2,190 yards away (Watson 1993). The author points out that disruption of nesting activities by aircraft may cause reduced breeding and feeding of the young, which may lead to diminished attentiveness and nest failure. The article primarily focused on helicopter presence/activity around eagle nests, but foraging eagles during the winter period may also be displaced by helicopter activities.

The potential eagle habitat in the project area that may be affected by proposed activities was calculated as all area within one half-mile from the rivers' edge/bank. This distance is considered as the primary use area of a bald eagle's nest. Alternative 2 would affect approximately 487 acres, Alternative 3 (426 acres) and Alternative 4 (135 acres). Both Alternatives 2 and 3 propose four helicopter landing sites adjacent to the rivers: 2 along the Middle Fork of the Clearwater, one at the confluence of the Middle Fork and Selway Rivers, and one along the Selway River. Alternative 4 proposes one helicopter landing site at the confluence of the rivers.

The harvest salvage would not affect eagle habitat. The units are too far inland to offer perch sites along the rivers, and all live and large trees would be retained. Potential nesting trees remain abundant along the rivers and were largely unaffected by the wildfire. Timber salvage within the buffer would remove dead trees, opening the area up for potential eagle scavenging opportunities on carcasses that may occur in the areas.

Potential affects from the action alternatives would be noise and disturbance. All action alternatives would include helicopter activity encompassing noise, low flight altitudes above the tree canopy and repetitive trips across the rivers during daylight hours. The known active nest would be protected from logging activities and timing restrictions would curtail harvest activity up to 2.5 miles of the nest to a period when the eagle nest would not be occupied. The same would apply to any more recently discovered nests in the Project Area.

Foraging eagles would likely be displaced from perching areas that are in or near the flight zones of helicopter activity. This displacement would not be long-term; rather the effects would last for the period required to complete the harvest of the units associated with the helicopter landing site. Estimated time span of disturbance would be year-round, for up to 4 seasons. Bald eagles that are affected would shift their foraging up or downstream along the river sections that are not being disturbed by rotary-wing activity. Upon conclusion of the helicopter activity, eagles would resume occupancy of perches and foraging areas that were avoided during the periods of disturbance.

3.14.8.1.2 Cumulative Effects

Alternative 1

Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions may disturb individual eagles that are foraging near road sections adjacent to the rivers. Recently completed timber projects include a State salvage on 144 acres and two private sales totaling 200 acres. These may have disturbed eagles that were foraging in the project areas adjacent to the rivers. Forest timber projects include the Clear Creek Integrated Restoration

(CCIR) and Lowell Wildland Urban Interface. Both projects occur in areas where nesting habitat for the eagle is less than desirable. A 14-acre spot fire from the 2015 Wash Fire burned in the project area, but did not affect any bald eagle habitat. Prescribed fires in the timber projects and 2,000 acres of planned fires of the North Selway and Fenn Face would generate smoke that may disturb eagles. However, the habitat in riverine areas would be unaffected. Alternative 1 does not propose any activities; therefore, it would have ***no impact*** on bald eagles or their habitat.

Alternatives 2, 3, and 4

Alternatives 2, 3, and 4 would generate disturbance (noise) from the proposed activities of timber harvest. Alternative 2 would harvest approximately 10% of potential eagle foraging habitat, while Alternative 3 would affect about 8% and Alternative 4 would affect about 6%. Alternative 4 has no helicopter landing sites proposed along the rivers. Alternatives 2 and 3 propose 3 such sites. Helicopter operations involving these landings along the rivers include flight paths and aerial traffic that may disturb and flush bald eagles from perch and foraging areas that lie in, or are adjacent to the activities. Foraging eagles that are disturbed by aerial operations would re-locate their presence to areas not affected by such. Timing and proximity of proposed activities near eagle nests would be restricted and previously discussed. Upon completion of the harvest activities occurring along the rivers, eagles would resume using the areas that they were temporarily displaced from.

Fire suppression near rivers may disturb eagles by activities, especially if aerial suppression is included. As mentioned earlier, helicopter activities may displace eagles from their nest.

All Forest Plan standards that apply to the bald eagle and are being met by this proposed project include standards 1, 2, 3, and 17 on pages II-18 and 19 (USDA, 1987). The effects of the fire salvage project from Alternatives 2, 3 and 4 ***may impact individuals or habitat,*** but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of bald eagle.

3.14.8.2 Black-backed Woodpecker

The black-backed woodpecker is a Nez Perce Forest sensitive species. The woodpecker's primary food source, woodborer beetles and their larvae, are most abundant within burned forests. In unburned forests, woodborers and bark beetles are found primarily in areas that have undergone natural disturbances, such as wind-throw, and within structurally diverse old-growth forests (Bull et al. 1986, Goggans et al. 1988, Hoffman 1997). Black-backed woodpeckers occur at highest densities in one to six-year-old burns that possess an abundance of snags for nesting and beetles, as well as wood-boring insects, for feeding (Hutto 1995, Saab et al. 2004). Burned forests are believed to act as source habitats from which birds emigrate once post-fire conditions become unsuitable. Nappi and Drapeau (2009) found high nest densities and reproductive success in a severely burned spruce forest. As the surviving tree tissue declines over time, the dependent beetles depart. Black-backed woodpecker nest success declines, and the bird moves on.

Old forests may produce an insect food source that allows woodpecker populations to persist between fires in regions with long fire intervals. Hutto (2008) also found black-backed

woodpecker presence was primarily influenced by the occurrence of high severity burn patches. Hoyt and Hannon (2002) detected black-backs in a burned area, but not in old growth or mature stands within 30 miles of the 2-year-old burn. However, the woodpeckers did occupy old coniferous stands located 45 to 90 miles from the recent burn. Old forests offer habitat for black-backed populations to persist between fires in regions with long fire intervals (Bonnot et al. 2008).

After stand-replacing fires, forests consist almost entirely of standing dead snags. Within weeks to months after the fire, these snags are colonized by wood-boring beetles which attract woodpeckers. Black-backed woodpeckers seem to depend on one- to six-year-old burns, and their numbers may peak in just two to three years after fires (Hejl and McFadzen 1999, Murphy and Lenhausen 1998). In a western Montana study of salvage-logged and unlogged recently burned forests, Hejl and McFadzen (1999) found that over 75% of the nests of black-backed woodpeckers were located in the unlogged portions of burned forests. In southwest Idaho, during the first five years after a fire in ponderosa pine/Douglas-fir forest, four pairs of black-backs consistently nested in a 1,200 acre unlogged area, and another four nesting pairs nested in a different 1,200 acre unlogged area (Dixon and Saab 2000). Goggans et al. (1988) recommend that in recently fire-disturbed areas, 30-50% of burned acres be retained, depending on the size of the fire, in large, contiguous and interconnected blocks, in order to provide sufficient habitat for black-backed woodpeckers.

Bull et al. 1986 found the majority of black-backed nests in dead trees of Ponderosa Pine, lodgepole pine and western larch in their northeastern Oregon study. Nielsen-Pincus (2005) found a preference for Ponderosa pine in her study. Bull et al. (1986) suggest the black-backed woodpecker prefers dead Ponderosa pines because the trees have a thicker layer of sapwood than do other tree species of the same size. However, nests have been detected in grand fir, Douglas-fir, Engelmann spruce, mountain hemlock, and western red cedar.

Population Trends

According to NatureServe, the black-backed woodpecker is globally ranked as a G5 (globally secure), with state ranks of S3 (vulnerable) in Idaho (NatureServe 2006). Breeding bird survey (BBS) data show a long-term upward trend of >0.25% per year since 1966 in northcentral Idaho (Sauer et al. 2011). Idaho Partners in Flight estimates a population of 4000 birds in Idaho. The state-wide population objective is to increase bird numbers to 4400 (Rosenberg 2004). No records of black-backed woodpecker detection have occurred in the project area prior to the Johnson Bar fire.

In Region 1 of the Forest Service, the black-backer woodpecker is considered a sensitive species (2011). Samson (2006b) indicates 29,406 acres of suitable habitat are required to maintain a viable black-backed woodpecker population in Forest Service Region One. Bush and Lundberg (2008) show over 700,000 (38%) suitable acres on the Nez Perce Forest alone. As of September 2012, the very active and prolonged fire season on the Nez Perce and Clearwater National Forests has created over 200,000 acres of burned habitat. Recent wildfires in 2015 burned over 190,000 acres on the Nez Perce-Clearwater National Forest. From the amount of disturbance and thresholds for viability, there appears to be adequate black- backed woodpecker habitat across the Forest.

A discussion of Samson's work and Bush and Lundberg's (2008) modelling is located under the Species Viability section. Bush and Lundberg (2008) used their criteria for black-backed potential habitat: if the plot ≥8 recently dead trees/acre between 8-16 inches dbh. However, not all of these snag areas would have suitable habitat for the woodpecker if the trees have been dead 8 years or longer.

Affected Environment

The Johnson Bar and Wash fires burned approximately 11,722 acres of forest habitat. All of this would be considered a potential habitat for nesting and foraging black-backed woodpeckers. Another 5,641 acres of old growth stands are also considered as potential habitat for the species, due to the wood boring insects that are attracted to dying trees and decaying wood in snags and downed woody material from wind and other elements. Therefore, the existing potential habitat for black-backed woodpecker in the Johnson Bar Fire Salvage Project area is approximately 17,360 acres.

3.14.8.2.1 Direct and Indirect Effects

Alternative 1

The recent fire has increased potential habitat for black-backed and other fire associated species. The increased pulse of insect activity that would forage on the decaying trees would be present from 1-8 years after the fire. Under Alternative 1 no activities are planned and no new management actions would occur. Public road access in the area would not change, and fire suppression would continue.

Alternatives 2, 3, and 4

All of the action alternatives propose to harvest in potential black-backed woodpecker habitat. Alternative 2 would salvage harvest 2,604 acres, Alternative 3 (2,231 acres), and Alternative 4 (1,824 acres). The alternatives would comprise removal of the following percentages of potential black-backed habitat: Alternative 2 (15%), Alternative 3 (13%) and Alternative 4 (11%). No harvest would occur in verified old growth stands. All of the action alternatives would retain over the 50% of burned areas recommended by Goggans et al. (1988).

Project activities would produce disturbance to the woodpecker. Noise and activities from ground or aerial logging systems are likely to cause woodpeckers to avoid the affected harvest units during operational periods. Unit harvests would not be conducted simultaneously. Instead, units would be grouped into timber sales that focus on time intervals to be completed for each sale. This would allow woodpecker activity to occur in undisturbed areas throughout the duration of the project.

Some black-backed woodpeckers may nest and forage in proposed units that are undergoing harvest operations. Some nests may be lost, creating a direct effect of injury or mortality to the young in the nest. Foraging woodpeckers may be displaced to other areas unaffected by logging operations, and may even return to harvested units after operations have been completed. Silvicultural prescriptions would leave a quantity of leave trees (14-28 trees per acre) that would offer foraging and maybe nesting opportunities. Additional discussion on the rational for maintaining snags may be found under Section 3.14.7.

3.14.8.2.2 Cumulative Effects

Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions would not affect the woodpecker. Recently completed timber projects include a State salvage on 144 acres and two private sales totaling 200 acres. Combined, the removal of 344 acres of potential woodpecker habitat would amount to an additional 2% loss of habitat. These latter projects may have disturbed woodpeckers in the affected areas. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. Both projects occur in unburned areas. The Lowell project would not affect the woodpecker as there is no habitat (few snags, no recent burns, no insect or disease patches). The CCIR may affect the woodpecker or its habitat, but would not displace it. Less than 20% of black-backed woodpecker habitat would be affected by harvest activities under the CCIR Project, while landscape burning would create an additional 229 acres of new habitat for the species. Prescribed fires in the timber projects for slash disposal or restoration would create snags and potential habitat. The adjacent 2015 wildfires are still being evaluated, buth thousands of acres were burned and 2,000 acres of planned fires of the North Selway and Fenn Face would create potential habitat for the black-backed woodpecker.

Firewood cutting would reduce snags along public roads that provide motorized access. Most woodcutters chose to avoid cutting burnt or blackened trees.

Alternative 1

This alternative would not create cumulative effects, as no activities would occur in the burned area. All burned areas would offer potential habitat for the woodpecker to forage and nest in. Alternative 1 would have ***no impact*** on the black-backed woodpecker or its habitat.

Alternatives 2, 3, and 4

The Johnson Bar fire created potential habitat for the black-backed woodpecker. During mid-summer 2015, personnel conducting layout of unit boundaries have reported observations of 2 black-backed woodpeckers. Literature reviews and the mixed severity conditions in the burned areas lead the wildlife biologist to presume that the species will be present in the affected area for the next 1-8 years. High and moderate intensity burned areas would offer immediate food sources for beetles coming to the area, which should begin during spring of 2015. Less severely burned areas would continue to create food sources for beetles as trees die from stressed conditions (failing root systems, falling snags that damage bark and structure to living trees and so on). Therefore, these future declining trees will become susceptible to beetle attack, and forage for the black-backed woodpecker.

The action alternatives have potential direct effects (disturbance, fatality, displacement) and indirect affects (species avoidance during periods of project activities) to some individual black-backed woodpeckers. All harvested areas would retain some snag and forage structure for the woodpecker by leaving an average of 14-28 trees per acre. Finally, the action alternatives would leave over 60% of potential habitat for the woodpecker unaffected by salvage operations. The latter habitat would provide forage, nesting and areas for displaced woodpeckers.

Forest Plan standards being met by the project for the black-backed woodpecker include Standards 1, 7, and Page II-6, paragraph on viable populations. The effects of the fire salvage project ***may impact individuals or habitat,*** but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the black-backed woodpecker.

3.14.8.3 Fisher

The fisher is a Nez Perce National Forest sensitive species and MIS, and an Idaho species of greatest conservation need (IDFG 2005). Fishers are closely associated with riparian habitats (Jones 1991; Ruggiero et al. 1994). Jones (1991) found that over 80% of his fisher relocations were within 100 meters of riparian habitats. Fisher favor areas with canopy cover over 40% and are dependent on mature and old forest in mesic (wet/moist), low elevation habitats (Ruggiero et al. 1994). Some researchers found that fishers did not select dry forest types with a large representation of ponderosa or lodgepole pine (Schwartz et al. 2013; Olsen et al. 2014). Many authors mention that the predator avoids open areas (Powell 1993; Buskirk and Powell 1994; Weir and Corbould 2010; Schwartz et al. 2013; Sauder 2014; Sauder and Rachlow 2014). Examples of such open areas include grassy openings, meadows, and areas logged within the past 12 years.

Fishers use large trees, snags, logs, and the dense canopy structure of late-seral forests (Raley et al. 2012). Cavities in large-diameter (>30 inches dbh), live or dead trees are the most commonly reported sites for natal dens, but hollow logs and rock substrates may also be used (Heinemeyer and Jones 1994, Aubry and Lewis 2003). Natal dens are typically situated 20 to 40 feet above the ground, and females may use multiple natal dens during the whelping period (Banci 1989, Heinemeyer and Jones 1994, Aubry and Raley 2002). Potential fisher habitat is abundant in the analysis areas in mesic upland, mature and old growth forest, and in riparian areas associated with old and late forest. Potential habitat is well connected by a dense network of RHCAs and closed canopy (>40%) forest.

Fishers exhibit a preference for structurally complex areas with multiple canopy layers, including understory shrubs and large amounts of woody debris (Powell 1993). Ruggiero et al. (1994) concluded that riparian zones, high elevation old growth grand fir, and subalpine fir stands are important habitat components for fisher (Powell 1993). Fishers appear able to use "many different habitats for hunting as long as these areas provide overhead cover at either the stand or patch scales" (Weir and Harestead 2003, p. 9). Sufficient overhead cover in foraging habitat may be provided by either tree or shrub cover. Although fisher home ranges are consistently characterized by moderate to high proportions of mid- and late seral forests, there are few overarching patterns of selection for particular seral conditions or species compositions (Sauder and Rachlow 2014). Raley et al. (2012) hypothesized, and Sauder and Rachlow (2014) support, that when fishers select home ranges, they benefit from including a diverse array of available forest conditions by increasing access to a greater diversity and abundance of prey species while still attaining habitat features important for reproduction and thermoregulation.

Population Trends

Fishers have a state rank of S1 (critically imperiled). Fisher presence has been documented throughout much of the Nez Perce Forest, although the initial population information appeared to indicate a low level (Buskirk and Ruggiero 1994). Current fisher population numbers or trends were unknown in Idaho (IDGFG 2005) until some relatively recent research occurred. Historic records show a single detection of a fisher in the project area during 1994.

Samson (2006b) indicates 74,380 acres are required to maintain a viable fisher population in Forest Service Region One. Bush and Lundberg (2008) show over 440,000 suitable acres of summer habitat and over 700,000 acres of winter habitat occur on the Nez Perce National Forest. For descriptions of the above acreages estimated by the authors, please refer to the paragraphs following Species Viability in the early part of the Wildlife Section.

Affected Environment

Prior to the fire, modelled potential fisher habitat in the project area was at 20,255 acres. The Johnson Bar and Wash fires burned approximately 6,267 acres at high or moderate intensities. These areas would no longer support the ≥40% canopy cover preferred by the fisher. Results of the fire have dropped potential fisher habitat to about 13,988 acres in the project area (includes old growth).

3.14.8.3.1 Direct and Indirect Effects

Alternative 1

This alternative would have no direct effects to mature or old growth habitat since no activities are proposed. Habitats would continue to be altered by natural events such as succession and insects/disease. Fire suppression would continue. Snag and large down wood habitat elements would remain available as trees die (and fall) from natural causes. A wildfire and/or insect and disease activity would leave greater numbers of snags and large down wood than exist now but would also reduce canopy cover. These more open areas would provide unsuitable conditions for fisher for a few years, but would recover with tree succession and offer foraging habitat in 15 years, and nesting habitat in 80+ years. Ongoing fire suppression may help maintain mature and older habitats on the landscape longer. Winter habitat would continue to be available across the analysis area. Connectivity across the landscape would continue to be provided by RHCAs.

No access management changes would occur. Along open roads, large snags would be removed by firewood cutters. Snags would remain available in the less accessible areas.

Areas within the fire perimeter that were unburned or of low burn intensity may still provide the percentage of canopy cover associated with the fisher. Burned areas would regenerate and grow to favorable conditions in 30-40 years. In the absence of future moderate to high severity fires or large outbreaks of insects/disease, habitat suitability would increase as the quantity of mature and old growth habitat increases. Connectivity would continue to be provided by riparian habitat conservation areas. Large burned or dying trees or snags would offer potential denning sites. Insects and disease would continue to cause tree mortality and produce snags and large down wood used by fishers for denning and resting.

Alternatives 2, 3, and 4

Forested areas that burned at moderate to high intensities were considered as not providing the canopy cover (≥ 40%) preferred by the fisher. The acreages in the proposed units of the action alternatives where such burn severities occurred were subtracted from each alternative. So Alternative 2 would harvest 1,349 acres of potential fisher habitat, Alternative 3 (1,306 acres) and Alternative 4 (952 acres).

Proposed regeneration harvest would simplify suitable fisher habitats in the short-term (<40 years) by eliminating canopy cover and layering, reducing large down wood, and reducing standing snags in treated areas. Snags and down wood would be provided for over the long-term (100 years or later) through tree retention design criteria: average 14-28 trees/acre; 6 of which would be snags or snag recruits. Canopy cover would increase to suitable levels after about 30 years. Harvest activities would leave live trees. No trees over 25 inches dbh would be harvested (see Section 3.10).

Noise and other disturbances from machinery and human activities may affect a fisher, and cause the animal to relocate to areas where the mammal perceives safety from disturbance. Upon completion of the project activities, the treated units and other burned areas would regenerate and begin to offer favorable conditions for the fisher in 30-40 years. No harvest would occur in surviving old growth or any riparian areas.

Maps of the proposed units are located in Appendix G and depict where harvest are or are not being proposed. The majority of salvage harvest would occur in burned areas that do not provide fisher habitat. Only dead or dying trees would be harvest, and the tree structures to be left standing can be found under the Wildlife and Vegetation design criteria. Thereby, cover and contiguous corridors would remain available across the project area for the fisher to move and forage. The cover and corridors include riparian areas, ridgelines, and old growth/mature stands.

3.14.8.3.2 Cumulative Effects

The cumulative effects area for fisher is the 26,800-acre project area. The time frame for cumulative effects is 100 years which is the approximate amount of time required for stands to develop into a mature or older vegetative state and snags to develop into a condition that provides habitat for old growth and snag dependent species.

Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions may disturb an individual fisher, but would not affect its habitat. Recently completed timber projects include a State salvage sale on 144 acres and two private harvests affecting approximately 200 acres. These projects may have disturbed an individual fisher in or near the affected areas, but as the salvage sales were in moderate to high severity burned areas, the activities did not reduce potential habitat. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. Both projects occur in unburned areas. The Lowell project would not affect the fisher due to its small size, nearby human presence and a well-used road bisecting the area. The CCIR Project alternatives would reduce the amount of fisher summer habitat (over 10,000 acres) by 602 acres. The amount of

winter habitat (approximately 13,600 acres) would be reduced by up to 1,646 acres. The CCIR project would disturb individual fisher near activities and would temporarily reduce a small amount of habitat. The Project may affect the fisher and/or its habitat. Old growth is above Forest Plan standard and riparian areas would not be treated, allowing good connectivity of habitat for the fisher. Prescribed fires in the timber projects and 2,000 acres of planned fires of the North Selway and Fenn Face may disturb a fisher by human presence and smoke. These burns would reduce ladder fuels and create openings that a fisher would avoid.

Alternative 1

No direct or indirect effects are anticipated with this alternative. Outside of future wildfires and fire suppression activities, no other cumulative effects are expected. Recovery of potential fisher habitat in burned areas is expected to occur in 30-100 years. Therefore, this alternative would have ***no impact*** on the fisher.

Alternatives 2, 3, and 4

The fire affected about 31% of potential fisher habitat. Of the 13,988 remaining acres (unburned or low severity) the action alternatives would reduce potential habitat under Alternatives 2 by 10%, Alternative 3 by 9%, and Alternative 4 by 7%. Upon completion of project activities, vegetation would regenerate and small mammals would increase to forage on new vegetation, seeds and other invertebrates. As time passes, shrubs and trees would produce cover over bare ground and create better habitats for rabbits, hares, squirrels and grouse. The spike in the prey base for the fisher would last from 5 to 30 years. Snags and large trees surviving the fires and harvest operations would be available as nesting or resting habitat. As mentioned, burned or harvested areas would become potential fisher habitat in 100 years after disturbance.

This project meets Forest Plan standards for snags, old growth and no disturbances in riparian areas: all important habitat features for the fisher. The following forest plan standards applicable to the fisher are met: 1, 3, 7, on pages II-18 and 19 of the forest plan.

The effects of the fire salvage project ***may impact individuals or habitat,*** but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the fisher.

3.14.8.4 Flammulated Owl

The flammulated owl is a small owl, considered a neotropical migrant, nests in tree cavities and preys on insects (Hayward and Verner 1994, Powers et al. 1996). The diet of this owl consists mostly of nocturnal moths and insects gleaned from open tree branches, taken on the wing, or picked up from the ground. Linkhart et al. (1998) observed in Colorado that 80% of intensive foraging areas were in old ponderosa pine and Douglas-fir mixed forest. The owl forages in stands with low stem densities, moderately open canopies (35-65%), and very open understories. However, flammulated owls use dense foliage for roosting (Hayward and Verner 1994). Roost sites may be found in multi-layered, mixed-conifer forests with a ponderosa pine or Douglas-fir component and pockets of dense foliage. Flammulated owl habitats in Idaho are

typically mid-elevation mature or older open ponderosa pine and/or Douglas fir forest (IDFG 2005).

Nesting territories are documented between 20-60 acres in size, but flammulated owls have been known to forage as much as 0.5 miles from their nest (Reynolds and Linkhart 1992). There is also some evidence to suggest that flammulated owls may form loose colonial groups or congregations for the purposes of breeding.

Population Trends

In Idaho, the flammulated owl has a state rank of S4 (apparently secure). There are no population trend data for Idaho. The owl is difficult to detect: it's nocturnal, has secretive behavior, and low population densities. In 2005 the Forest Service conducted an extensive survey effort for flammulated owls across Montana and Idaho (Cilimburg, 2006). This effort yielded a total of 243 widely distributed owl detections. Sixty-nine owls were detected/heard on the Nez Perce National Forest. None of these records were in the analysis area, but the US Fish and Wildlife database shows one owl detected in the project area in 2000, and FS Region 1 records show one owl detected about 1 mile outside the project area in 2010. No scientific evidence exists that the flammulated owl is decreasing in numbers in the Northern Region of the Forest Service (Samson 2006).

Samson (2006a) states that few estimates of territory size are available for the flammulated owl. Some researchers suggest that the owl's habitat will decline due to fire suppression (Groves et al. 1997, Wright et al. 1997, Linkhart and Reynolds 2007), as suppression allows Douglas-fir trees to outcompete shade intolerant trees that are important for the owl. Another set of researchers (Nelson et al. 2009) suggest that flammulated owl habitat has declined over a period of 50 years. Their basis included the Jeffrey pine (which is not found on the Nez Perce Forest), and 10 western states that are outside of Idaho. The latter is not a feasible study to lend conclusions as to potential owl habitat conditions on the Nez Perce National Forest.

A study conducted by Samson (2006a) found no scientific evidence that the flammulated owl is decreasing in numbers in the Northern Region of the Forest Service. Samson (2006b) elaborates on a 6-step decision tree to conclude that no data suggest the flammulated owl would be susceptible to change in its habitat as affected by forest management following a consistent and quantitative approach. Bush and Lundberg (2008) used FIA date to estimate that the Nez Perce Forest has about 39,579 acres. A more detailed description of regional modelling is found under the Species Viability section. The district biologist used a forest model for the owl, then queried for tree ages greater than 100 years in order to establish mature habitat the bird prefers. Modelled potential habitat for the owl based on the criteria in Table 3-56 estimated 901 acres in the project area.

Affected Environment

The burn severity model was analyzed for potential flammulated owl habitat in GIS. Approximately 901 acres of potential flammulated owl habitat was detected in the project area prior to the fires. The Johnson Bar and Wash fires burned about 632 acres of habitat, leaving 269 acres unaffected. The latter acres are considered the existing potential habitat for owls in the project area.

3.14.8.4.1 Direct and Indirect Effects

Alternative 1

No activities are proposed in this alternative. Areas unaffected by the fire would continue to offer habitat for the owl. Areas that burned at low intensity would most likely retain all large tree species that the owl uses for foraging and nesting. However, low severity burns may have destroyed or set back vegetation such as shrubs and small trees. Those understories may have temporarily (1-5 years) lost the ability to produce flowers or nectar sources important to lepidopterans or other plant structures that provide forage for other insects that the flammulated owl feeds on. Not all foraging areas were burned. Pockets of untouched shrubs or herbs would still be present and providing food and cover for insects. As beetles and other insects move in to feed on the burnt or decaying matter, this may provide a pulse of food opportunities for the owl.

More severely burned areas would have lost some of the larger ponderosa pine or Douglas-fir species that the owl depends on for nesting or perching. About 5 years post-fire, the understory in all burned areas (except those of high intensity burns) would provide some foraging habitat for the owl. In the areas that suffered high intensity burns, the recovery of shrubs and understory would take longer than 5 years post-fire to offer some forage. The return of nesting habitat may take up to 100 years for trees to develop the structure preferred for owl nesting potential.

Alternatives 2, 3, and 4

All action alternatives would harvest in portions of potential flammulated owl habitat that was burned by the fire. Alternative 2 would harvest 172 acres, Alternative 3 (131 acres) and Alternative 4 (172 acres). These harvested areas would not affect potential owl habitat as the habitat acres have already been lost as a result of the fire.

All three action alternatives would harvest 15 to 45 acres in unburnt to low intensity areas. All live trees would be retained as well as all trees ≥25 inches dbh, according to unit prescriptions (Vegetation Section). On average, each unit would retain 14-28 trees per acre; of which 6 would be snags ≥20 inches dbh, with 3 snags ≥30 inches dbh. This would provide some structure for owl foraging habitat.

Areas that burned at a low severity would begin to recover vegetation in 1-5 years post-fire/harvest. As mentioned under Alternative 1, areas burned by moderate or high severities would take greater than 5 years for the forage to recover to offer potential food sources for the flammulated owl. As the vegetation continues to recover, potential prey would increase for the owl. Wright et al. (1997) found that flammulated owls were present in approximately half of the selectively logged stands in her study area south of Missoula, Montana. The authors mention that those harvest stands with owl presence contained large residual trees and snags. The unit prescriptions for the Johnson Bar Fire Salvage Project would retain similar structure components.

Noise and project activities may cause an owl to relocate to an area outside the affected units that it perceives as safe. All project activities would occur during daylight hours, so the nightly foraging by the owl may take it back into or along the edges of harvest units.

Tree-planting is planned to occur in all units after they have been harvested. Some ponderosa pine would be included in units that are along ridges or aspects that receive a moderate amount of sunshine. In about 80 years, these trees would be the future nesting platforms for flammulated owls.

3.14.8.4.2 Cumulative Effects

The cumulative effects area for flammulated owl is the 26,800-acre project area. The time frame for cumulative effects is 100 years which is the time it takes to develop large snags and trees used for nesting. The silvicultural prescriptions would retain large live or dead trees that would persist for a few years. These trees would provide perching and possible nesting habitat as shrubs recover in 3-10 years post treatments. Shrubs, natural tree growth and planted trees would provide habitat for lepidopterans and other flying insects that the flammulated owl would forage on.

Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions may disturb an individual owl, but would not affect its habitat. Recently completed timber projects include a State salvage sale on 144 acres and two private harvests affecting approximately 200 acres. These projects may have disturbed individual owls in or near the affects areas, but as the salvage sales occurred in moderate to high severity burn areas the activities did not reduce the amount of potential habitat. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. Both projects occur in unburned areas. The Lowell project would not affect the flammulated owl due to its grand fir/cedar habitat type (not a desired habitat for the owl). The CCIR Project may affect owls and/or their habitat as 210 acres of owl habitat (779 acres) would be temporarily reduced as a result of the project. Old growth is above Forest Plan standard and Ponderosa Pine is a species favored for planting in many of the harvested units. Prescribed fires in the timber projects and 2,000 acres of planned fires of the North Selway and Fenn Face may disturb a flammulated owl by human presence and smoke. These burns would reduce ladder fuels and create openings for shrub recovery. In about 5-10 years, the shrubs and young trees would offer potential foraging habitat for the owl.

Wood cutting for firewood would continue along roads open to public motorized access, which would reduce snags in these locations.

Alternative 1

No activities are planned in this alternative, so no direct, indirect or cumulative effects would occur. Over time vegetation would recover in burned areas, providing food for insects that flammulated owls prey on. Unburned or surviving, older ponderosa pines would provide potential nesting habitat. Pines regenerating from the fire would become potential nesting habitat in about 80 to 100 years. Wood cutting would continue to occur, though many firewood collectors would avoid the burned wood. This alternative would have ***no impact*** on the flammulated owl.

Alternatives 2, 3, and 4

The action alternatives would affect between 5-17% of potential flammulated owl habitat. Upon completion of the salvage harvest, forage habitat would occur in 3-10 years and produce forage for another 10 to 15 years. Forest openings caused by insect and disease damage or future fires would augment forage opportunities for the owl.

Project activities are likely to disturb owls from noise and other human activities. Owls may be displaced to other areas outside of the affected units during the period of harvest activities. Silvicultural prescriptions would retain legacy trees and other large trees, whether they are alive, dying or dead. This would provide some structure for owls that may return to the open areas for foraging on the insects the dead wood or new vegetation that is occurring in post-fire conditions.

This project meets Forest Plan standards for snags and old growth: all important habitat features for the flammulated owl. The following forest plan standards applicable to the owl are met, 1, 7, on pages II-18 and 19 of the forest plan.

Alternatives 2, 3 and 4 ***may impact individuals or habitat,*** but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the flammulated owl.

3.14.8.5 Bats: Fringed Myotis, Long-eared Myotis, and Long-legged Myotis

Three bat species associated with forest habitats in the analysis area are listed as sensitive species. In wildland settings, these three bats typically roost in snags, rock crevices, and caves. The long-legged myotis is more closely associated with coniferous forest habitat than either the long-eared myotis (second in association) or the fringed myotis. All three species are known to be multiple habitat bats in regard to roosts, hibernacula, and foraging habitats. Long-legged and long-eared myotis are known to forage together. Long-legged myotis and long-eared myotis are associated with old growth forest conditions in the Northern Region (Warren 1990).

All three bat species are known to utilize caves, mines, buildings, cliff faces, bridges, exfoliating tree bark, snags, and crevices in rocks as roost and hibernacula sites. There are no caves, mines, or old buildings in the analysis area that would be suitable hibernacula sites. Large trees with protective bark and large snags are the primary roosting habitat components available in the analysis area.

Habitat information suggests that the fringed myotis is more closely associated with forest conditions found on drier breaklands than mesic uplands. This bat is often found in dry habitats where open areas are interspersed with mature forest, creating a complex mosaic with ample edges and abundant snags (Keinath et al 2004). Fire exclusion has reduced bat roosting habitats, replacing ponderosa pine, white pine and western larch, with species less fire tolerant, smaller size, and younger age classes that are more susceptible to insects and disease before reaching maturity (Wisdom et al. 2000). These conditions have limited suitable habitat for fringed myotis in the project area prior to the fire event.

Long-eared myotis are habitat generalists in their selection of roost structures among various landscape conditions (Arnett and Hayes 2009). Long-eared myotis roost under exfoliating tree

bark, and in hollow trees, caves, mines, cliff crevices, sinkholes, and rocky outcrops on the ground. They also sometimes roost in buildings and under bridges (Western Bat Working Group 2005). Landscape snag densities influence the use of different types of roosts. The species has been found roosting in the snags and stumps of Douglas-fir, western hemlock (Barclay and Kurta 2007), western red cedar (Arnett and Hayes 2009), and pine (Vonhof and Barclay 1997). Arnett and Hayes (2009) found the frequency of snag use by long-eared myotis increased with density of snags and was nearly twice as high in landscapes with high snag densities (>2.2 snags/acre) as in those with low snag densities (<1 snag/acre).

Long-legged myotis are medium-sized bats, prefer large snags for roosting, but will also roost in live trees. The species occurs in sagebrush steppe, grasslands, and forested montane regions (Romin and Bosworth 2010). Habitat is often relatively continuous tracts of late-successional forest. They forage throughout most of the night (Keinath 2004) in and above the forest canopy (Warner and Czaplewski 1984).

Arnett and Hayes (2009) found long-legged myotis infrequently roosted in snags or trees in stands <40 years old, and 58% of the snag roosts and 33% of the live tree roosts were located within riparian management buffers retained during harvest near small- and medium-sized perennial streams. Long-legged myotis also use snags to roost in mid-seral (41-80 years) and old growth stands. In managed forests, the long-legged myotis avoided harvest units unless large snags and old trees were left in relatively high densities, such as in shelter woods and aggregate retention patches (Taylor 1999). These bats have been found in north central Idaho foraging in managed forests with trees that range from 5 to 15 inches in diameter (Johnson et al. 2007).

Arnett and Hayes (2009) indicated that the odds of snags and trees being used as roosts by female bats increased with increasing diameter. Large trees in the study tended to be in more open areas or extend above the canopy, thereby increasing detection and access for bats, as well as increasing exposure to solar radiation which contributes to cavity warming and more desirable roost microclimate. Also, the thermal and insulated qualities of wood and bark increase with diameter, resulting in more stable roost temperatures. Increased warmth of roosts reduces energetic demands and facilitates development and growth of fetuses and juveniles. Bats also may use large snags and trees because they are of sufficient age and size to have developed numerous cavities and more exfoliating bark area suitable for roosting.

All three bats have been detected on the Nez Perce portion of the forest and the north zone of the Clearwater forest. Records show 2 detections of long-eared myotis: one about 1 mile, another about 2 miles from the project boundary. Both detections were west of the project area.

Population Trends

Long-legged and Long-eared myotis have a global rank of G5 (secure) and an Idaho State rank of S3 (vulnerable). The fringed myotis has a global rank of G4/G5 (apparently secure/widespread, abundant, and secure) and an Idaho State rank of S2 (imperiled). The Western Bat Working Group (1998) ranked long-eared myotis and long-legged myotis as moderate conservation concerns. The present population status of fringed myotis is unknown. The Western Bat Working Group (1998) concluded that this bat may be uncommon or rare through the bulk of

its western range, not merely at the periphery. The bat was one of the least common detected species during surveys in north Idaho (Romin and Bosworth 2010). This information is consistent with the pattern of limited and patchy distribution that was the basis for including the fringed myotis on Idaho's list of species of greatest conservation need (IDFG 2005).

Affected Environment

No hibernacula sites are known in the project area. All three species forage where winged invertebrates are available: riparian areas, tree canopies and clearings. All of these areas would encompass the majority, if not all of the project area. Therefore, the estimates for bat species potential occurrence are based on habitat elements each species prefers for roosting. Bat presence on the forest has been detected during the late spring and summer seasons. When bats forage for periods longer than a couple of days, they would require a place to roost. Therefore, the computer analysis for potential bat habitat is based on literature pertinent to roosting habitat needs of each species.

Modeled habitat was analyzed from GIS layers. Areas burned at high severity were considered lost habitat as the bark would be minimal to none, and many snags would no longer be standing. Post-fire results show approximately 678 acres of suitable habitat available to fringed myotis, and 2,883 acres of potential habitat for the long-eared and long-legged myotis. No records of these bat species in the project area have been confirmed, although 2 records exist of long-eared bats west of the project area.

3.14.8.5.1 Direct and Indirect Effects

Alternative 1

No actions would be planned or occur with this alternative. Bat habitat would likely remain stable in areas unaffected by the fire or areas of low burn severity. Snags located near roads would likely be affected by wood cutting for firewood. However, snags further from roads or in dense forest would continue to function as habitat for bats.

The fire produced a large pulse of snags in the project area. Therefore, it appears that an abundance of potential roost and resting habitat is available for bats. The prey base for bats would increase during the post-fire season, as many winged invertebrates would arrive to feed on the dead and dying wood. As vegetation recovers, shrubs and other plants would offer nectar sources for lepidopterans and other insects that bats feed on. The natural fire event should be beneficial to the bat species.

Wind events would decrease the number of standing snags and may cause injury or death to a bat that accompanies a snag falling to the ground. Fire suppression is likely to occur in the future. This response would reduce snags in or near burned areas, but may also save or retain patches of large trees. Smaller openings created by fire of wind could be beneficial, as these patches would provide forage for insects during early succession.

Alternatives 2, 3, and 4

Action alternative effects to potential habitat for the fringed myotis would harvest 71 acres under Alternatives 2, Alternative 3 (52 acres) and under Alternative 4 (54 acres). For the long-

eared and long-legged myotis, Alternative 2 would harvest 190 acres, Alternative 3 (134 acres) and Alternative 4 (137 acres). Stand prescriptions would retain all live trees and some large dead or dying trees. Units proposed for helicopter logging would retain fewer snags than other units, due to safety concerns of rotor wash knocking down snags. In the proposed units using ground based logging systems, most of the larger dead or dying trees would be retained in patches. Arnett and Hayes (2009) state, "Maintenance and recruitment of snags represents the cornerstone for conservation and management of bats in forests [retain] large (>50.8 cm DBH [20 inches DBH]) snags that either protrude above the canopy, reside near a gap or stand edge, Large, solitary snags can provide roosts for species, but retaining patches of snags will likely increase the probability of use of snags and trees as roosts. Retain snags in upslope habitats and across a range of slope exposures to provide roosts with varied microclimates offering choices to optimize thermal benefits depending on ambient conditions". The stand prescriptions would provide 14-28 live or dead trees/acre, with 6 snags greater than 20 inches dbh. These prescriptions are above the high snag densities that Arnett and Hayes (2009) recommended.

According to Vonhof and Barclay (1997), forest management creates openings and edges for foraging. Forest practices that may provide suitable foraging habitat and enhance roosts include vegetation management with reserve trees and snag retention, and prescribed fire to enhance herbaceous growth for insect production and to create roost sites. Waldien et al. (2000) stated that management of roosts for forest-dwelling bats should focus on maintaining large conifer snags across the landscape through space and time. The action alternatives would meet the latter suggestion.

Construction of temporary roads (<2 miles in bat habitat) in all action alternatives would affect less than 2 acres. All trees would be removed for the placement of the roads. Upon conclusion of the project activities, these temporary roads would be decommissioned and planted with trees or other vegetation.

Noise and project activities would create disturbance. Disturbance to roosting bats may cause them to arouse and expend high amounts of energy, which can lead to roost abandonment or death in the winter (Adams 2004). For the latter season, no records are present of bats hibernating on the forest. Harvesting would reduce the quality and quantity of available roost sites, but retaining large trees and snags would provide habitat once favorable conditions develop in treated areas (Chapter 2, Design Criteria, Wildlife). Clumps of green trees and snags may provide suitable habitat in treated areas, especially those near the edge of units.

3.14.8.5.2 Cumulative Effects

The cumulative effects area for bat species is the 26,800-acre project area. The time frame for cumulative effects is 100-120 years which is the time it takes to develop large snags and trees used for roosting.

Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions would have no effect on bats or their habitat. Recently completed timber projects include a State salvage sale on 144 acres and two private harvests affecting approximately 200 acres.

These projects may have disturbd bats in or near the affected areas, but as the salvage sales were in moderate to high severity burn areas, the potential habitat may have been reduced. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. Both projects occur in unburned areas. The Lowell project would not affect the bats as timber prescriptions would retain all large trees. The CCIR Project may affect bats and/or their habitat. This project has snag retention guidelines that would leave more snags or recruitment snags than the Johnson Bar Salvage Project. In the CCIR project, old growth is above Forest Plan standard and Ponderosa Pine is a species favored for planting in many of the harvested units. Prescribed fires in the timber projects and 2,000 acres of planned fires of the North Selway and Fenn Face may disturb a bat by human presence and smoke. These burns would reduce ladder fuels and create openings for shrub recovery. In about 5-10 years, the shrubs and young trees would offer potential foraging habitat for bats. Snags created from the fires would provide potential habitat for the bat species.

Alternative 1

No activities are proposed with this alternative; therefore no cumulative effects would occur. Natural events (wind, fire, insect and disease) would create snags or drop them. Wood cutting would remove snags along roads with public motorized access. Fire suppression may reduce potential habitat and some large snags would be lost. This alternative would have ***no impact*** on the analyzed bat species.

Alternatives 2, 3, and 4

Alternative 2 would affect about 10% of the modelled habitat for the fringed myotis. Alternative 3 would affect about 8% and Alternative 4 would affect about 8%.

Alternative 2 would affect about 7% of the modelled habitat for the long-eared and long-legged myotis. Alternatives 3 and 4 would affect about 5%. The silvicultural prescriptions would retain large live or dead trees that would persist for a few years. Regeneration of shrubs, natural tree growth and planted trees would provide habitat for lepidopterans and other flying insects that the bat species would forage on. Design measures for the harvested stands would retain all live trees and large snags that would offer potential roosting or foraging opportunities for the myotis species. Old growth and all riparian areas would not be affected by timber activities. Disturbance effects may create direct (displacement, harm or fatality) or indirect affects (movement from roost to avoid noise) to bats in the affected areas. Cumulative effects would extend to 100-120 years, as this is the period it would take to develop a new generation of large trees or snags with the bark component favorable for bats. Similar effects to snags and fire suppression are discussed under Alternative 1.

This project meets Forest Plan standards for snags and old growth: all important habitat features for the bat species. The following forest plan standards applicable to the bats are met 1, 7, on pages II-18 and 19 of the Forest Plan.

The action alternatives ***may impact individuals or habitat***, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the analyzed myotis bats.

3.14.8.6 Gray Wolf

Gray wolf populations were extirpated from the western U.S. around the 1930s. Over time, individual wolves from Canada occasionally dispersed into Idaho. The gray wolf was listed as an endangered species in 1978. In the mid-1990s, gray wolves were introduced into central Idaho. By 2011 the USFWS finalized the delisting of the wolf in Idaho (IDFG and Nez Perce Tribe 2014).

The gray wolf is a Nez Perce National Forest sensitive species. Wolf habitat spans a broad range of elevations and habitat types. Key habitat components include: 1) a sufficient year-round prey base of ungulates and alternate prey; 2) suitable somewhat secluded denning and rendezvous sites; and 3) sufficient space with minimal exposure to humans (USDI 1987).

Denning/rendezvous sites, elk habitat effectiveness, and elk security areas (see Elk section) are used to assess existing conditions for wolves. Maintaining elk habitat effectiveness above minimum Forest Plan standards, providing elk security areas above minimum recommendations, and managing winter range to enhance forage productivity and quality will provide a sufficient prey base to sustain wolf populations at State objectives for the Selway Wolf Management Zone (WMZ).

Population Trends

The Idaho wolf population has increased from reintroductions in the 1990s through 2009 (the first year of the state's wolf hunting season). Since then, the numbers of individuals and packs have declined. The IDFG and Nez Perce tribe monitor wolves through a cooperative agreement signed in 2005. By the end of 2013, biologists documented 107 packs and 659 estimated wolves (IDFG and Nez Perce Tribe 2014). The gray wolf recovery plan (USDI Fish and Wildlife Service 1987) established a recovery goal of 10 breeding pairs for three consecutive years in central Idaho Twenty of the packs qualified as breeding pairs, producing a minimum of 166 pups (IDFG and Nez Perce Tribe 2014). Recovery objectives have been met and exceeded. Hunting and trapping of wolves for control purposes has been approved by court decisions, allowing natural resource agencies and the public opportunities to take wolves.

Affected Environment

A large portion of the Johnson Bar Fire Salvage Project is located in the Selway WMZ. Documented pack locations in the analysis area include the Selway Pack, which had 6 wolves detected in 2013 or 2014. The pack consists of a breeding pair and at least 2 pups (IDFG and Nez Perce Tribe 2014). Other agency records indicate a wolf was detected in the project area during 1982 and 1984. It was not determined as to what pack this individual belonged to.

All 26,788 acres of the project area are considered wolf habitat.

3.14.8.6.1 Direct and Indirect Effects

Alternative 1

No timber management activities would occur under this alternative; thereby, no direct or indirect effects to denning or rendezvous sites would occur. Elk habitat effectiveness (a measure for summer elk habitat) in two of the affected elk analysis areas (EAA) continue to meet Forest Plan Standards. One EAA has an existing EHE of 72%, which is below the updated

(1997) Forest Plan standard of 75% EHE. Habitat security would range from 28 to 69% in the affected EAAs. Road densities would remain low and as forage increases during the Project Area's recovery from fire effects, habitat security would increase. Though elk and other prey are present in the analysis area, wolves may prefer to hunt in other areas until the new or surviving forage increases in quantity and quality to attract elk and other big game back to the burned areas. One wolf pack was recognized in the area, but an increase in elk and big-game response to the increase in forage (about 10 years after the fire and harvest) may attract other adjacent wolf packs to the burned area. Future fires or outbreaks of insects and disease would help maintain prey in the area for the wolf. The latter disturbances reduce hiding cover for wolves and their prey, but would increase forage over a period of 20 years. Wolf management would continue until the state is meeting desired numbers of elk.

Alternatives 2, 3, and 4

All salvage harvest would occur in areas burned by the Johnson Bar Fire. No harvest would occur in old growth or riparian areas. All live trees would be retained, along with large dead and/or dying trees that would not pose a safety hazard to personnel involved in the proposed activities. Alternative 2 would harvest 3,096 acres, Alternative 3 would harvest 2,710 acres and Alternative 4 would harvest 2,207 acres in the project area. The alternatives would affect between 8-11% of the Project Area and between 17-22% of the burned areas.

Tree harvest and prescribed burning of slash piles would create openings that offer sunlight and nutrients to new vegetation. In 3-10 years after the salvage harvest, forage for elk would increase. The amount of forage from timber harvest would increase most under Alternative 2, and least under Alternative 4. Forage would improve as shrubs, grass and herbs grow and expand over bare soil. This would last for a period after prescribed burning to about 20 years.

In the short-term (up to 20 years), hiding cover in regeneration and improvement harvest areas would decrease in each alternative. The proposed harvest in all action alternatives would create more open forest stands, but some hiding cover would be retained. As vegetation recovers from planted trees and natural regeneration, cover would increase and become more distributed in the analysis area. Elk habitat effectiveness would remain unchanged for two EAAs and improve to 73% for the other EAA under all action alternatives (Elk section).

Similar to other species, the project would create noise and disturbance to wolves in or near affected areas. All of these activities would be conducted during daylight hours. No wolf dens or rendezvous sites have been identified.

Since depredation measures on wolves have been occurring for the past few years, the animal may be more wary of human contact, and would avoid areas of human presence. However, in the absence of humans, wolves may hunt harvest units during the hours of darkness, as potential prey (deer, elk and so on) may be present. Timber harvests have been recognized by industry and field personnel to sometimes attract elk or deer to harvest units for the purpose of foraging on the leaves, needles or lichens from the fallen trees.

Road construction and prescribed fire are other human activities that may disturb wolves. All temporary roads used for timber operations would remain closed to public motorized access. In

time the absence of human activity may attract wolves back to these areas to hunt or travel through.

3.14.8.6.2 Cumulative Effects

The cumulative effects area for the wolf is the 26,800-acre project area. Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions would have no effect on the wolf or its habitat. Recently completed timber projects include a State salvage sale on 144 acres and two private harvests affecting 200 acres. These projects may have disturbed wolves in or near the affected areas, but as the salvage sales occurred in moderate to high severity burn areas, these activites did not reduce the amount of potential habitat. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. The latter is a small project on area that would improve big-game winter range by the reduction of tree canopy levels. This would be beneficial to wolves if big-game use were to increase in this small area. The CCIR Project may affect wolves and/or their habitat. This project would maintain or improve EHE in all elk analysis areas: all of which are meeting Forest Plan standards of ≥ 50% EHE. Prescribed fires in the timber projects and 2,000 acres of planned fires of the North Selway and Fenn Face may disturb a wolf by human presence and smoke. However, when the projects are completed wolves would transit or hunt the areas.

Woodcutting and fire suppression may disturb wolves, but it would not affect their habitat.

Alternative 1

No activities are proposed with this alternative; therefore no cumulative effects would occur. As areas burned by the fire recover, foraging habitat for big game would continue to increase, thereby increasing prey availability for wolves. Additionally, road densities would remain low in the burned areas, would benefit big-game and wolves. Alternative 1 would have ***no impact*** on wolves.

Alternatives 2, 3, and 4

The action alternatives may disturb or cause wolves to avoid areas of human presence. All the action alternatives would create forage opportunities for elk and big-game in the span of the next 20 years after project activities are completed. An increase in prey quantity and availability would attract wolves into the analysis area.

The cumulative effects for changes in wolf prey would be about 5-30 years. In this timeframe forage for ungulates and other herbivores would be at peak availability, then decline as the tree overstory begins to shade out the understory. Increasing hiding cover would decrease a wolf's visual detection of elk and big game in the area. Decommissioned road prisms would produce vegetation that would offer forage or cover for big game. Elk security would return to the present existing conditions; then increase as forage becomes better represented in the project area. Wolves would continue to be managed until elk numbers reach desired conditions by the state.

Wildfires would continue to create disturbance and produce forage in the next 20 years after such events. Fire suppression would reduce the amount of forage created by wildfires. The

management for increasing elk numbers includes increased habitat and improvement of forage. The action alternatives would assist in the production of forage for elk and other big-game.

Ongoing or foreseeable projects may disturb wolf individuals, but will not remove habitat that would affect dens, wolf movement or forage opportunities. Forest Plan standards being met by the project for the wolf include Standards 1, 2, 5, 6, 10, 13, 16, and forest objectives on page II-6 in the Forest Plan.

Current numbers of wolves and packs are above the desired levels of management for the viability of the population. They are distributed throughout the combined forest. All of the action alternatives ***may impact individuals or habitat***, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the gray wolf.

3.14.9 Management Indicator Species (MIS)

The National Forest Management Act of 1976 directs the U.S. Forest Service to identify and actively monitor management indicator species (MIS) to assess effects of forest management activities on native biota within national forest lands (Code of Federal Regulations 1985). As defined by the National Forest Management Act, MIS may include species listed as (1) threatened, endangered, or rare, (2) having habitat requirements sensitive to management activities, (3) having social or economic value, and (4) serving as monitors for environmental factors, population trends of other species, or habitat condition.

The Nez Perce National Forest Plan (1987) uses the term wildlife indicator species, but the intent is the same as the national term. Five out of eleven MIS occur in the project area and are analyzed in the next few pages.

3.14.9.1 American Marten

The American marten was identified as a Nez Perce National Forest management indicator species for mid to high elevation, mature forest. The marten has a close association with late succession, mesic-dominated forests, especially those with uneven age structure and gaps in the canopy (Buskirk and Ruggiero1994). Marten need dense overstory (>30%) and sufficient understory cover for hiding and denning (Snyder and Bissonette 1987). However, it is possible that marten may be more associated with complex vertical and horizontal woody structure, as opposed to forests of a particular age, species, or overstory requirement (Chapin et al. 1997). American marten are found at higher elevations and on mid-slopes during winter; in summer, martens use riparian areas more intensively (Buskirk and Ruggiero1994). Marten use habitats similar to those used by fishers, but unlike fishers, they can hunt efficiently both in the subnivean layer (under snow) and on the surface of deep snowpacks (Aubry and Lewis 2003). Non-forest associations are used upon occasion during summer, and martens may hunt in open meadows bordering dense forests if hiding cover is present (Hargis et al. 1999, Buskirk and Powell 1994).

Marten in north-central Idaho were found to use a variety of forest types in winter, but activity was highest in Engelmann spruce/subalpine fir stands with mesic habitat types, >30% canopy cover, and overstory age >100 years (Koehler et al. 1975, Koehler and Hornocker 1977). Mature lodgepole pine is also suitable in moist habitat types, and in areas of high precipitation, dense

cedar-grand fir forests at lower elevations provide habitat for the marten as well (Koehler et al. 1975).

Resting and denning sites are important habitat components, as they provide marten protection from predators, inclement weather, and thermal stress (Bull and Heater 2000). In the central Rocky Mountains, large logs (>16 inches diameter), large snags (>16 inches dbh), and live spruce and fir trees >8 inches dbh were important characteristics for marten den sites, and rock crevices and red squirrel middens were used along with logs and snags (Ruggiero et al. 1998). Pine marten prey on voles, snowshoe hares, red squirrels, ground squirrels, berries, birds, and eggs (Ruggiero et al. 1998).

Population Trends

The American marten is considered as G5 (secure) global status, and S5 (secure) status in Idaho (NatureServe 2014). Total population size is unknown but probably is at least several hundred thousand (NatureServe 2014). Samson (2006) indicates 17,297 acres of suitable habitat is needed to maintain a viable population of marten in Region 1. Bush and Lundberg (2008) show over one million suitable habitat acres are on the forest. American marten are managed as furbearers that can be legally trapped in Idaho.

There is a difference in computer model analysis used in determining marten habitat. Samson (2006a, 2006b) and Bush and Lundberg (2008) used models that would enable them to analyze potential marten habitat in the larger area of Montana and northern Idaho. Therefore, they used more tree species than the analysis conducted for the project area. The V-MAP model used by the district biologist also has limitations: ranges of tree sizes and canopy cover that do not always capture a specific element, such as the 30% canopy cover or greater. Also, this model does not capture tree age, so a different model (TSMRS-based) was used to gather this information. This action allowed the biologist to analyze potential habitat, according to the habitat criteria in Table 3-56, with a minor over-estimation on canopy coverage.

Affected Environment

Use of computer modelled habitat showed 19,243 acres of potential marten habitat in the project area prior to the fire events of 2014 and 2015. The mixed severity fire reduced the canopy cover in most of the moderate and high burn severity areas. These areas are less likely to provide the species' desired canopy cover. Additionally, food sources were killed or displaced during the fire, which reduced the prey base after the fire.

A total of 6,266 acres were burned at moderate to high severity. The areas burned at this severity are no longer considered habitat as they do not provide the canopy cover and structure preferred by the marten. Adjusting for the loss of habitat as a result of the Johnson Bar and Wash fires, the amount of current available habitat amounts to 12,977 acres. Database records show one marten detection in 2011.

3.14.9.1.1 Direct and Indirect Effects

Alternative 1

No activities are proposed with this alternative. Unburnt and low intensity burned areas would likely have retained a large percentage of the canopy cover and prey base that was present prior to the fire. These areas, including riparian corridors of unaffected or low intensity burns, would continue to offer habitat for the American marten. More severely burned areas would take 40 or more years to recover the structure associated with marten use. Fire creates and maintains openings where abundant fruits, insects, ground squirrels, and voles provide food items for the marten during the summer (Koehler and Hornocker 1977).

The Johnson Fire burned 943 acres of old growth forest. Fire suppression of wildfires may save some areas of marten habitat. Post-fire recovery of vegetation would offer increasing habitat for small mammals and birds the marten preys on. Snags near roads open to public motorized access would likely be reduced by woodcutting.

Alternatives 2, 3, and 4

Salvage harvest in areas burned by moderate to high intensities would not affect marten, as the animal has already been displaced from the affected areas due to the wildfire and resulting loss of preferred habitat. Adjusted calculations of proposed actions in areas that may still provide some structure or foraging habitat for the marten finds Alternative 2 affecting about 1,251 acres, Alternative 3 (939 acres) and Alternative 4 (1,121 acres).

Marten tend to avoid large openings (Hargis et al. 1999, Moriarty et al. 2011, Potvin et al. 2000). On average 14-28 live trees and snags per acre would be retained by the silvicultural prescription. This includes 6 snags/acre greater than 20 inches dbh, with 3 of those greater than 30 inches dbh. Openings would occur mainly in areas that suffered moderate to high intensity burns. Marten are unlikely to be in these areas, since the fire consumed most of the tree canopy layers.

Marten are known to rest or den in snags, slash piles, downed logs (Bull and Heater 2000). Most of the downed wood in the moderate to high severity areas was consumed by the fire. All action alternatives would retain snags; which, over time, would contribute to a downed woody structure. In the areas of low severity burns or those unaffected, this downed wood component for marten exists, though it would be reduced by harvest activities. The desired future condition upon completion of the project proposes to leave 17-33 tons of downed woody material on the ground for wildlife habitat and as nutrients for soils (see the Vegetation Section of Chapter 3).

The Action Alternatives would reduce the likelihood of a large, intense fire. Fires have both positive and negative effects on marten (as discussed under the No Action alternative).

Portions of harvest units in lightly burned areas would retain all live trees, and large snags that would not be a safety concern for logging operations. Due to safety issues, fewer snags would be retained in helicopter-logged areas versus tractor-logged areas.

Direct effects from proposed logging and road building operations would be noise and disturbance activities that may displace marten from the affected areas. Indirect effects may be

displacement of the marten's prey base in the affected areas. The predator would shift its hunting locations to where the prey base can be discovered.

No harvest would occur in old growth. The silviculturist and wildlife biologist have designated 5,641 acres (11%) of old growth (verified and replacement old growth) to meet the Forest Plan standard of 10% (Appendix N of the 1987 Forest Plan). No harvest would occur in riparian areas under these alternatives.

3.14.9.1.2 Cumulative Effects

The cumulative effect area is the 26,800-acre Project area. The cumulative effects timeframe is 100 years, because it would take this long to develop large snags and trees used for nesting after a salvage harvest.

Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions would have no effect on the American marten or its habitat. Recently completed timber projects include a State salvage sale on 144 acres and two private harvests affecting approximately 200 acres. These projects may have disturbd individual marten(s) in or near the affected areas, but as the salvage sales occurred in moderate to high burn severity areas, these activities did not reduce the amount of potential habitat. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. The latter is a small project in grand fir/cedar habitat and would reduce the canopy coverage to a point the marten would find undesirable. The 160-acre fuels treatment would create a defensible space for private lands around Lowell. The CCIR project may affect the marten, but timber prescriptions would leave more snags than this project. Therefore, more habitat would become available to the mammal in the CCIR Project than the present condition in this project. Prescribed fires in the timber projects and 2,000 acres of planned fires of the North Selway and Fenn Face may disturb a marten by human presence and smoke. However, patches of trees would be left and snags would be created by these fuels activities, which would provide some structure for marten habitat.

Alternative 1

No activities are proposed under this alternative, so no direct, indirect or cumulative effects are expected. Firewood cutting along roads open to public motorized access would continue to remove snags along or near the road prisms. Fire suppression would continue in response to wildfires. Such operations may save portions of marten habitat. Activities may disturb or temporarily cause the marten to re-locate to other areas where prey is available, or where the animal perceives it is safe from disturbance. In 130 or more years, tree stands in the burned area would have developed into mature age class that would provide structure and snags preferred by the marten.

Alternatives 2, 3, and 4

The action alternatives would affect modelled marten habitat by 10% under Alternative 2, 7% under Alternative 3, and 9% under Alternative 4. Project activities would create noise and

activities that may disturb an individual marten. Direct and indirect effects may displace a marten from its nest or foraging areas within or adjacent to a harvest unit.

All harvested units would be replanted with trees. Vegetation recovery in units would begin providing habitat for small mammals in 3-5 years. In approximately 40 years the tree structure would be favorable for martens. As the replanted stands mature, tree diameter sizes and canopy cover would trend towards desired conditions for the marten.

The cumulative risk to marten habitat is considered low due to the retention of old growth and snags at levels higher than Forest Plan standards. Additional features of marten habitat to be maintained include other mature trees, riparian areas, and live trees and snags left in harvested areas. Downed woody debris would continue to accumulate as trees age and die.

Firewood cutting along roads open to public motorized access would continue to remove snags along or near the road prisms. Similar to Alternative 1, cumulative effects of fire suppression and time period of tree maturation to preferred marten habitat would occur.

The action alternatives are meeting Forest Plan Standards 1, 3, and 7. Under Alternatives 2, 3, and 4 *some effects may occur to individuals or their habitat, but is not expected to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing of the American marten*.

3.14.9.2 Northern Goshawk

The northern goshawk was identified as a National Forest management indicator species for old growth forest. Current condition of nesting habitat is analyzed, as it is the most limiting factor for goshawks. Nesting habitat is represented by a much narrower range of vegetation structure and composition than the post-fledgling areas and forage area.

Goshawks use large landscapes, integrating a diversity of vegetation types over several spatial scales to meet their life-cycle needs (Squires and Kennedy 2006). In “The Northern Goshawk Status Review,” the USFWS found that the goshawk typically uses mature forest or larger trees for nesting habitat; however, it is considered a forest habitat generalist at larger spatial scales (USFWS 1998). The FWS found no evidence that the goshawk is dependent on large, unbroken tracts of “old growth” or mature forest (63 FR 35183 June 29, 1998).

Nest areas are usually mature forest with large trees, relatively closed canopies (60-90%) and open understories (Squires and Kennedy 2006).In central Idaho, goshawks nest in a variety of forest stands that are comprised of mature trees with relatively high canopy cover and open understories (Moser 2007). Nest trees typically range between 12 and 21 inches dbh and are located on relatively gentle terrain with 70% of nests occurring on shaded aspects. Favored habitats typically are located in forest stands having only 1 or 2 canopy levels with an open or mixed-density understory (Moser 2007). Goshawks have been found to use the same nesting area for decades, and goshawk territories typically contain a number of alternate nests (Moser 2007). Goshawks appear to range over large areas and use a variety of habitats outside of the nesting area. Home ranges vary from 1,200 to 9,800 acres in size (Kennedy 2003).

Goshawks require habitats for prey that contain snags, downed logs, woody debris, large trees, herbaceous and shrubby understories, and a mixture of stand structural stages (Wisdom et al.

2000). Goshawks prey on a variety of medium-sized forest birds and small mammals (e.g. snowshoe hare, squirrels, grouse, and other forest birds) in early seral to mature forests and forest openings. Foraging habitat may be as closely tied to prey availability as to particular habitat composition or structure (Beier and Drennan 1997). The raptor may also hunt along forest edges and in small openings. Large diameter snags and stumps are often used as plucking posts where goshawks consume their prey.

Population Trends

The goshawk is rated secure across its range (global rank G5) and is not listed as a state species of greatest concern. Other studies show no evidence that the northern goshawk is declining in number in the western United States (Kennedy 1997, FR(63) 124 1998, Kennedy 2003, Andersen et al 2005, Squires and Kennedy 2006). Samson (2006a) concluded no scientific evidence exists that the northern goshawk is decreasing in number in the Forest Service Northern Region. Samson (2006b) concluded that to maintain a minimum viable population of the northern goshawk across Region One, there would need to be a minimum of 30,147 acres of post-fledging habitat. Bush and Lundgren (2008) show over 275,000 acres of post-fledgling habitat on the Nez Perce Forest, many times the area needed to maintain viable populations region-wide.

Affected Environment

The forest GIS model shows 18,900 acres of potential goshawk nesting habitat prior to the wildfires. Areas burned at moderate to high severity resulted in a loss of habitat as a result of reduced canopy cover and displacement of the prey bases in these areas. Therefore, the existing amount of potential nesting habitat is approximately 12,640 acres. Numerous detections of goshawks have been recorded across the Nez Perce National Forest. Available databases show 4 records of detected goshawk within the project area during the 1990s. The most recent observation occurred in summer of 2013 by a field crew.

The mixed severity fire would have displaced individual goshawks that may have been in the area during the event. Hatchlings of the year were most likely developed to the fledgling stage, and able to escape the flames from the event that began in August. Nesting habitat that was burned by moderate or severe intensities would have been consumed by fire. Canopy cover would be reduced below the level preferred for nesting habitat. Though some large trees or small patches may have survived the fire intensities, many would have lost limbs and tree needles from the fire effects. Potential prey in these areas would have been burned or fled from the fire. Most animals preferred in the goshawk diet would not be returning to the areas for a few years. So in the post-fire period of 1-3 years, goshawks would probably avoid these areas of compromised nesting habitat and minimal to no presence of an available prey base.

Areas of low intensity burns or that were unaffected by the fire may still provide nesting and foraging opportunities. Areas of ≥60% canopy cover and shrub understories would continue to function as goshawk habitat.

3.14.9.2.1 Direct and Indirect Effects

Alternative 1

None of the proposed activities would occur under this alternative. The mixed severity fire burned over the areas where goshawks were detected during the 1990s. However unburned areas exist in the project area, and may be used by the raptor for nesting or foraging.

Future fire suppression in the area would limit the amount and size of burned areas created by wildfires. This would benefit nesting habitat, and create more forage habitat.

Alternatives 2, 3, and 4

Harvest units are located in burned areas of mixed intensities. Forested areas consumed by moderate to high intensities are not considered as current habitat supporting goshawks. Potential remaining or functioning nest habitat that is proposed to be harvested is about 1,207 acres for Alternative 2, Alternative 3 (1,169 acres) and Alternative 4 (833 acres). If an active goshawk nest is detected, project design criteria (Chapter 2) would be implemented.

All of the action alternatives would retain all live trees and large snags that would not pose a safety issue. As mentioned in other sections of this report, helicopter salvaged units would retain fewer snags than those of ground-based harvest systems. These remaining trees (average per acre: 14-28 trees/acre, 6 snags $\geq$20 inches dbh) would offer potential perch sites for the raptor, and some foraging habitat for forest birds.

No harvest would occur in verified old growth or areas of mature trees unaffected by the fire. All riparian areas in the analysis area would be unaffected by timber activities. All salvaged units would be re-planted with tree species native to the forest. Upon completion of project activities, natural forest succession would create forage habitat for the raptor in about 10 years, and nesting habitat in 100-150 years.

During project implementation, human activity, equipment noise and burning would be disturbances that goshawks avoid. Completion of the project and human absence may encourage the raptor to hunt the new openings for prey.

3.14.9.2.2 Cumulative Effects

The cumulative effect area is the 26,800-acre Project area. The cumulative effects timeframe is 100-150 years, because it would take this long to develop large snags and trees used for nesting after a salvage harvest.

Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions may disturb the goshawk, but would not affect its habitat. Recently completed timber projects include a State salvage sale on 144 acres and two private harvests affecting approximately 200 acres. These projects may have disturbed goshawks in or near the affected areas, but as the salvage sales occurred in moderate to high severity burn areas, these activities did not reduce the amount of potential habitat. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. The latter is a small fuels project in grand fir/cedar habitat that would reduce the raptor’s habitat. An active nest was located in the

project area during 2014. A 40-acre buffer was designated around the nest, where no activities affecting vegetation would occur. Additionally, if the nest is occupied, a timing restriction would apply, as well as the amount of timber would be reduced to offer a buffer around the nest buffer. The CCIR project may affect the goshawk. Any nests found occupied would be protected by the design criteria similar to the Lowell WUI project. No harvest would occur in old growth or riparian areas of the CCIR project. Prescribed fires in the timber projects and 2,000 acres of planned fires of the North Selway and Fenn Face may disturb a goshawk by human presence and smoke. These burns would not occur in mature forest or old growth.

Alternative 1

Natural disturbances of wildfire, insect and disease or even wind or avalanche events may transition nesting habitat to an earlier successional stage that may or may not be foraging habitat for some years. This alternative has no direct, indirect or cumulative effects on the northern goshawk.

Firewood cutting along roads open to public motorized access would continue to remove snags along or near the road prisms. Fire suppression would continue in response to wildfires.

Future availability of habitat is difficult to predict. The recent fire event reduced habitat quality and quantity such that goshawks may not use the affected area. This effect would last until burned areas regenerate and grow to favorable conditions for foraging habitat (10 years and longer), and about 100 to 150 years for nesting habitat. In the absence of large, stand replacing fire or large outbreaks of insects/disease, nesting habitat would increase as the quantity of mature and old growth habitat increases. Connectivity would continue to be provided by riparian habitat conservation areas.

Alternatives 2, 3, and 4

Nesting habitat would be reduced by the action alternatives in a range of 6 to 10% in the project area. Harvest activities would improve growing conditions for grasses, forbs, and shrubs. Re-planting native tree species would provide future nesting habitat conditions for the goshawk in roughly 150 years.

Natural events may occur in the future as mentioned under Alternative 1. No measurable effects to goshawk populations at the local or regional scale, or alteration of current population trend, are expected from the cumulative effects of any of the action alternatives, or in combination with future activities, based on the availability of unaffected suitable habitats in the analysis area and across the Forest and region. Forest Plan standards being met by the project for the goshawk include Standards 1, 3, and 7. Under Alternatives 2, 3, and 4, *some effects may occur to individuals or their habitat, but is not expected to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing of the northern goshawk*.

3.14.9.3 Pileated Woodpecker

The pileated woodpecker is a Forest management indicator species for old growth forest and large snag habitat. Pileated woodpeckers are large, cavity-nesting birds associated with late successional stage forests, but also may use younger forests that have scattered, large, dead trees (Bull and Jackson 1995). The woodpecker appears to seek out microhabitats with a higher

diversity of tree species and densities of decadent trees and snags than are available across a landscape (Savignac et al. 2000, Aubry and Raley 2002b). Through their selection of large dead and damaged trees, the bird may serve as a good indicator of ecological function rather than just the age of a stand or forest (Bonar 2001).

Similar to the northern goshawk, the current condition of nesting habitat is considered the most limiting factor for pileated woodpeckers. The woodpecker's nesting habitat is a more specialized range of vegetation structure and composition than the stand age and structure for foraging habitat. The nest tree is the most important variable to estimate breeding habitat use by the pileated woodpecker (Kirk and Naylor 1996, Giese and Cuthbert 2003).

Nest trees are typically dead, and nest cavities possess a good insulative value. Most nest trees in northeast Oregon were in ponderosa pine, but larch and grand fir were also used (Bull and Jackson 1995). The mean dbh of nest trees was 33 inches, trees averaged about 90 feet high, and the mean height of the nest cavity was about 50 feet. In Montana, pileateds nested in a variety of tree species, including larch, ponderosa pine, grand fir, and Douglas-fir (McClelland and McClelland 1999). Nest trees averaged 28 inches dbh and 95 feet high, and stands typically had >50% canopy closure (Aney and McClelland 1985).

Pileated woodpeckers roost in hollow trees or vacated nest cavities at night and during inclement weather. Roost trees are similar to nest trees but typically have more entrances. In northeast Oregon, pileateds roosted in unlogged stands of old growth grand fir with canopies >60%. Roost cavities were in live or dead grand fir, larch, or ponderosa pine trees, and 95% had a hollow interior created by decay rather than excavation (Bull and Jackson 1995). Bull and Jackson (1995) suggest that by excavating only the entrance hole to gain access to the hollow interior of a tree, pileateds conserve energy by not having to excavate the entire cavity. In Montana, pileateds roost in western larch, black cottonwood, and ponderosa pine (McClelland and McClelland 1999).

Feeding habitat for pileateds is highly dependent on the availability of carpenter ants which make up the majority of their food supply (Aney and McClelland 1985). Cover types selected by the woodpecker include mixed conifer, ponderosa pine/Douglas-fir, western larch, grand fir, and decadent lodgepole pine stands. Preferred feeding habitats have high densities of snags and logs, dense canopies, and tall ground cover, with more than 10% of the ground area covered by logs. Pileateds seem to forage on large, decayed trees, and preferentially forage at low heights on tree boles; down material may need to be in excess of eight inches diameter and stumps between four to six feet high before pileateds will use these structures for foraging (Aney and McClelland 1985, Flemming et al. 1999).

Territories of nesting pairs cover 500-1000 acres in Montana, 1000-1300 acres in western Oregon, and 320-600 acres in northeastern Oregon (Aney and McClelland 1985). Not every stand within a bird's home range is used as feeding habitat. The range of a nesting pair is partly determined by the amount of suitable feeding habitat in proximity to the nest site.

Pileated woodpecker cavities are an important resource for a variety of cavity-using wildlife, especially those animals or birds that are too large to utilize cavities created by smaller woodpeckers (McClelland and McClelland 1999, Bonar 2001). In addition, pileateds provide

foraging opportunities for other species and accelerate decay processes and nutrient cycling (Aubry and Raley 2002b).

Bull and Meslow (1977) concluded that to maintain a pileated woodpecker population in northeast Oregon, 0.14 snags per acre 20 inches dbh or greater were needed. Bull and Holthausen (1993) later recommend maintaining a minimum of 0.65 snags per acre greater than 20 inches dbh. Retention of large, seral tree species is an important component for maintaining habitat for this species in managed forests.

Population Trends

The pileated woodpecker is rated secure across its range (global rank G5) and apparently secure (state rank S4) in the state of Idaho (ICWCS 2015). Samson (2006b) concluded that no scientific evidence exists that the pileated woodpecker is decreasing in numbers in the Northern Region. He indicates 90,441 acres are required to maintain a viable pileated woodpecker population in the Forest Service Northern Region. Bush and Lundberg (2008) show 299,667 acres of nesting habitat and 444,789 acres of foraging habitat on Nez Perce National Forest. Based on Bush and Lundberg's (2008) estimate, the Nez Perce Forest contains about three times more nesting habitat than is needed to provide viability at the Regional level. Please see the section under Species Viability for more information on how authors developed their models for species viability.

Affected Environment

After the wildfires of 2014 and 2015, the amount of potential habitat for pileated woodpeckers amounts to approximately 1,662 acres for nesting and 14,993 acres for foraging. The woodpecker is a common species on the Nez Perce-Clearwater National Forests.

Similar to the discussion on the northern goshawk, the mixed severity fire has reduced pileated habitats in some nesting areas. Areas of moderate to high severity burns would suffer a high tree mortality rate. Even large tree species would be harmed or killed by severe fire effects. However, mosaics of live trees may survive in these affected areas.

Approximately 1,000 acres (2%) of old growth was burned at moderate to high severity. Large or mature trees ≥20-inch dbh in unaffected or areas of low intensity burns would likely continue to function as potential nesting habitat for the woodpeckers. The remaining old growth would offer potential nesting and foraging habitat for the pileated woodpecker.

The fire event has produced a large quantity of snags of various bole diameters. Those that are larger than 10-inch dbh would provide potential foraging habitat for the pileated woodpecker. Other species of woodpeckers would move in the season after the fire (2015) to begin feeding on the beetles and other insects that are attacking the dead and dying trees. These birds include the black-backed woodpecker, three-toed woodpecker, northern flicker and downy and hairy woodpecker. The pileated woodpecker would forage on beetles (Bull and Jackson 1995). However, the bird's preference food is the carpenter ant. These and other ants would become more common in the break-down of decaying wood, from 3 to 10 years after the post-fire event. Snag densities and the availability of food sources would likely be very favorable for the pileated woodpecker during the next 15 years in the Project Area.

3.14.9.3.1 Direct and Indirect Effects

Alternative 1

The effects of natural disturbances on pileated woodpeckers include events such as insect activity, disease, wind, and fire (Bull et al. 2007). These disturbances are the mechanisms by which a continuum of snags, downed dead wood, and live trees with decay over time are provided, which the woodpecker depends upon for nesting, roosting, and foraging.

This alternative would not create any direct or indirect affects, as no activities are proposed. The mixed severity fire has produced a supply of snags and insects that pileated woodpeckers would forage on for 10-15 years after the fire event. Snags of large diameter (≥20 inches dbh) would offer potential nesting habitat. Fire suppression would continue. Fuels in the Analysis Area would continue increasing, making the area susceptible to a stand-replacing fire event in 10 to 20 years. Such an event would burn some snags to the ground. However, wildfires would also create snag habitat for pileated woodpeckers. Overall, suitable habitat would remain available across the area as forest succession continues.

Firewood cutting would reduce snags along roads open to public motorized access. However, the majority of the analysis area is beyond such access, and snags would continue to be a represented across the area.

Alternatives 2, 3, and 4

All action alternatives would propose harvest units in mixed severity areas. Nesting habitat has been reduced by the fire event through loss of large snags in moderate to high intensity areas. Areas of low burn severity to be salvaged include 121 acres under Alternative 2, 100 acres under Alternative 3, and 34 acres under Alternative 4. Silvicultural prescriptions would retain on average 14-28 trees/acre of live and/or dead trees, including 6 of those as snags ≥20 inches dbh. No trees over 25 inches or greater would be harvested.

Foraging habitat would be reduced by 2,771 acres under Alternative 2, Alternative 3 (2,409 acres) and Alternative 4 (2,119 acres). The same prescriptions would apply as those mentioned in the previous paragraph. New temporary road systems would remove up to another 35 acres of trees to construct the prisms.

Most of the retained snags or dying trees would be saved in patches. Solitary trees or snags would be retained in areas where patches are not feasible. Units proposed for tractor or skyline logging would retain more tree structure than helicopter units. The silvicultural prescription would be met or exceeded for all units, though helicopter units are prone to safety regulations that reduce snags. The latter units would retain larger patches of snags along the unit boundaries or in areas of topographical relief, such as swales or draws. Canopy cover will be less than the (>60%) habitat preferred by pileated woodpeckers for nesting. Foraging habitat would be available in snags and woody debris left after the harvest.

Prescribed burning would occur in units, which would target small sized fuels and large piles of slash. Vegetation treatments in all action alternatives would reduce habitat quality by decreasing canopy cover, and reducing standing snags in treated areas according to the safety practices associated with the logging system designated for each unit.

No harvest would occur in old growth, live mature trees or riparian areas. All salvaged units would be re-planted with tree species native to the forest. Upon completion of project activities, natural forest succession would create nesting habitat for the woodpecker in about 100-150 years.

Action alternatives would cause short-term displacement of individual pileated woodpeckers in treated areas. During project implementation, human activity, equipment noise and prescribed burning may discourage woodpecker activities in and near treated areas. Completion of the project and human absence would encourage the woodpecker to return to burned areas for food and nesting opportunities. Disturbance of individuals during project implementation is unlikely to cause measurable injury or decrease productivity (normal breeding, feeding, or nesting behavior on a forest-wide basis) of the species.

3.14.9.3.2 Cumulative Effects

The cumulative effect area is the 26,800-acre Project area. The cumulative effects timeframe is 100-150 years, because it would take this long to develop large snags and trees used for nesting after a salvage harvest.

Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions may disturb the woodpecker, but would not affect its habitat. Recently completed timber projects include a State salvage sale on 144 acres and two private harvests affecting approximately 200 acres. These projects may have disturbed individual birds in or near the affected areas, and would reduce snag habitat, which has also been reduced as a result of the wildfires. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. The latter is a small fuels project in grand fir/cedar habitat that would reduce the woodpecker's habitat by 160 acres. The CCIR project may affect the pileated woodpecker. The project treats about 7% of the area, leaving over 90% of the area unaffected: which includes 36% of the project area in old growth and/or riparian areas. Current designation of old growth in the Johnson Bar Salvage is at 11%, above the 10% Forest Plan standard. Prescribed fires in the timber projects and 2,000 acres of planned fires of the North Selway and Fenn Face may disturb a woodpecker by human presence and smoke. These burns would not occur in mature forest or old growth, and would create snags that offer potential foraging habitat for the pileated woodpecker.

Alternative 1

Alternative 1 would not generate any cumulative effects, as no activities are proposed. Woodcutting would continue to occur along roads accessible to public motorized access. Fire suppression would continue, which would result in both positive and negative effects. Snags would be created by fires, but suppression efforts would reduce the amount generated by the fires. Old growth and riparian areas may be affected by a wildfire, while suppression may save some of these areas. Alternative 1 would not affect the pileated woodpecker.

Alternatives 2, 3, and 4

Alternative 2 would affect 7% of pileated woodpecker nesting habitat and 18% of foraging habitat. Alternative 3 would affect 6% of the nesting habitat and 16% of the foraging habitat, whereas Alternative 4 would affect 2% of the nesting habitat and 14% of the foraging habitat. Timber harvest activities may contribute to short-term habitat fragmentation until harvested stands reach later stages of succession. Problems associated with forest fragmentation would include weather-related effects and loss of forest interior habitat, loss of habitat connectivity, and increased vulnerability to predators (Finch 1991). The action alternatives would not disrupt habitat connectivity for pileated woodpeckers. Riparian areas would not be affected and old growth would be maintained. Both areas would provide nesting and foraging habitat.

Some disturbance to woodpeckers would occur during the implementation of any of the action alternatives. Woodcutting would continue along roads open to public motorized access. Some snags would be lost to this activity, though many firewood collectors would avoid burned trees. The effects of fire suppression are mentioned in the cumulative effects section under Alternative 1.

Forest Plan standards being met by the project for the pileated woodpecker include Standards 1, 3, and 7 from page II-18 and 19 in the Forest Plan. Under Alternatives 2, 3, and 4, some effects may occur to individuals or their habitat, but is not expected to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing of the species.

3.14.9.4 Rocky Mountain Elk

Elk is a MIS for commonly hunted big game species on the Nez Perce National Forest, and an indicator for general forest seral species easily affected by management activities. Elk are habitat generalists and use a diversity of forest types and structures that provide forage and hiding cover. They use meadows and early seral communities for foraging in spring through early summer. From late summer through fall, elk forage more frequently under the forest canopy. During winter, they rely upon low elevation, warm aspect, and snow free or snow limited areas for foraging. Adult bulls often winter at much higher elevations than cows and immature elk. Elk also require forest cover for security and thermal regulation (Thomas et al. 1979). Calving areas can be traditional and preferred sites are generally large meadows, shrub fields and early seral forest openings in close proximity to water. A mosaic of diverse forest, shrub field, and meadow conditions with available water, productive winter range, and adequate security characterizes good elk habitat.

Population Trends

Elk populations in the analysis area were relatively insignificant until major fire events occurred in the early 1900s that increased forage availability and population levels. Populations in the north and central areas of Idaho probably peaked in the 1960s (IDFG 2014). Since the 1990s, elk populations in north and central Idaho have declined in forested areas due to weather events, predation by bears and lions, and more recently from wolf expansion. Active predator management is currently pursued by IDFG, and the statewide population as of 2013 is estimated at approximately 107,000 animals.

Affected Environment

The analysis area falls in the Idaho Department of Fish and Game's Big Game Management Unit (MU) 16 of the Elk City Management Zone (EMZ). The most recent (2008) elk population survey in MU 16 showed that the total elk numbers are up from a previous survey in 2006. Cow elk numbers were higher in 2008 and met the State's population objective (see Table 3-57).

Table 3-57: Elk winter population status and objectives for MU10A based on the most recent survey (IDFG 2011)

Management Unit	Survey Year	Status				Population Objectives	
		Cows	Bulls	Calves	Total	Cows	Bulls
16	2008	4,264	863	875	6,002	3,150-4,650	675-1,000
16	2006	3,334	686	904	4,924		

State ratios of bull and calf to cows were analyzed (IDFG 2014). Bull to Cow ratios were 21/100 in 2006; while 2008's ratio was 20/100. The recruitment average of 27 calves/100 cows occurred during 2006. For 2008, the average declined to 21 calves per 100 cows. The calf/cow ratio is an important indicator of population recruitment and long-term herd viability. A ratio of at least 25 calves to 100 cows is needed to offset natural mortality. Reasons for the decline in ratios are unclear but may be related to reductions in forage quality (poor condition of cows and low calf weights), high predation rates, less security area, and greater human disturbance and/or hunting pressure.

Elk Winter Range

Winter range is primarily below 4,500 feet in elevation on southerly aspects and includes grasslands, brushfields, and timbered lands. Generally, winter range receives less snow and is located at lower elevations than summer range. During winter, cow elk seem to prefer shrub habitats, while bull elk favor more open timber types (Unsworth *et al*. 1998). Older bulls also tend to use higher elevation benches or ridges with heavier snowfall compared to habitat used by younger bulls and cows (Unsworth *et al*. 1998).

Quality forage is an important component of elk winter range. Elk forage on grasses, forbs, and the tips of twigs from some woody vegetation. Shrub fields and conifer forests provide a higher proportion of winter forage than grassland sites. Species such as redstem ceanothus, serviceberry, mountain maple, choke and bitter cherry, and syringa provide much of the winter forage available to elk.

The Nez Perce National Forest Plan (1987) designates Management Area (MA) 16 as big game winter range. MA 16 provides about 9,937 acres for elk winter range in the project area. The goal for MA 16 is "manage to increase usable forage for elk and deer on potential winter range." Other MAs (timber, recreation, and wild and scenic) would offer general elk habitat.

The elk winter and general range is spread out among 3 Elk Analysis Areas (EAAs) in the Project Area. The North Hamby EAA has no active cattle pastures, no proposed temporary roads, and only 25 acres are proposed for harvesting under the action alternatives. The EAA is meeting Forest Plan Standards for habitat effectiveness, and the small amount of proposed harvest

would not affect the EAA. Therefore, this EAA was eliminated for further analysis. The other two EAAs are affected by cattle allotments, salvage harvesting activities, and road use changes. These two EAAs will be analyzed for project affects to elk. Both elk units are about 11 square miles in area. Roads open year-round either intersect or are adjacent to all blocks of winter range.

3.14.9.4.1 Direct and Indirect Effects

Alternative 1

There would be no direct effects to elk winter range under this alternative, as no project activities would occur. The approximate winter range acreage represents about 37% of the PA. About two thirds of the MA 16 winter range was burned by the Johnson Bar Fire. Areas of moderate to high burn severity would not begin providing browse until about 5-10 years post-fire. Areas of lower burn intensities would generate browse in 1-3 years post-fire. Canopy cover was generally reduced from the fire effects. Again, the more severely burned areas have lost a great deal of forest structure, and now consist of snags and open areas.

Elk would be expected to begin using the lesser affected areas in the fire perimeter within 2 years post-fire. For the next twenty years, forage habitat would improve in quantity and quality for elk. As the tree canopy recovers, the same forage would decline as it is shaded out. Insects and disease would continue to create canopy gaps and provide for a small supply of shrubs, forbs, and grasses.

Fire suppression would continue to be implemented against wildfires. This may reduce the potential forage habitat a wildfire could create, yet suppression would retain more hiding cover and thermal cover for elk.

Current roads open to the public would remain. During winter these roads are not maintained and snow accumulations would close or restrict access to certain sections of the road network to most wheeled vehicles.

Snowmobile access has been available on 9 miles of road that occurs in elk winter range within the project boundary since the 1970s. This use was recognized and permitted to occur in the 1987 Forest Plan. The noise and movement of snowmobiles have been shown to elevate stress levels in elk (Creel et al. 2002). Elk attempt to avoid disturbance from machines by moving away from the sight and sound of them, as they would a predator. During periods of low food availability, this added movement could be fatal for an elk that is starving and low on fat or other reserves.

The road accessed by snowmobiles is not groomed, and there are no developed or maintained parking places for vehicles or trailers; therefore, the trail is lightly used. Burned areas adjacent or near the route have lost some, or large percentages, of the horizontal layers of vegetation that elk would use to visually buffer and/or muffle the sound from the snow machines. Elk would likely move down closer to the rivers during winter, so as to avoid the depper snow at higher elevations, better foraging opportunities, and more cover from vegetation that was not burned by past fire events.

Winter recreational opportunities in the Johnson Bar Fire Salvage Project area are not expected to change in the near future. There are no new snowmobile routes proposed for this area. No snow grooming or upgrades are planned for this area. No snow grooming or upgrades are planned for increasing public usage of the existing routes. Other areas on the Forest are more likely to be preferred by the public, ski resorts, Lolo Pass, and locations with groomed trails for skiers and/or snowmobilers.

Alternatives 2, 3, and 4

Of 9,930 acres of MA 16 winter range, Alternative 2 would harvest 1,615 acres, Alternative 3 (1,134 acres) and Alternative 4 (1,022 acres). All of the proposed acres to be harvested are also in areas burned by the fire. The alternatives would also harvest in other MAs that could function as general elk forage habitats: Alternative 2 would salvage harvest 1,358 acres, Alternative 3 (1,446 acres) and Alternative 4 (1,276 acres).

As mentioned throughout this section, salvage harvest prescriptions would retain all live trees, all trees ≥25 inches dbh, and in units 14-28 trees/acre, which include 6 snags/acre ≥20 inches dbh. Large dead or dying snags in patches or solitary status would be retained in areas where there would not be safety concerns to timber activities in the affected units. The result would be rather open areas, with patches of trees that would offer some hiding cover. No harvest activities would occur in old growth or riparian areas.

The action alternatives would create disturbances (noise and human activities) to individual elk. Elk may return to salvage units during hours of darkness to forage on lichens or foliage from downed trees. Harvest operations may occur during the winter season, if soil and snow conditions are favorable. However, over 7,860 acres (79%) of winter range that was unaffected by the fire would remain available for elk in the project area.

Prescribed fires would reduce slash and prepare the units for tree planting. The burns would occur in jackpots of slash. Implementation of any of the action alternatives would increase forage production on winter range by stimulating shrub production. The proposed treatments would remove dead or dying trees and allow sunlight, water and nutrients to become more available to shrubs, forbs, grasses and newly planted trees. Forage quantity would increase in harvested areas for 20-30 years or until tree canopy cover closes and forage plants begin declining.

Temporary roads would be closed to public motorized access. Upon completion of each sale, these roads would be decommissioned.

Elk Summer Range

Summer range may overlap with wintering areas, as animals tend to move to higher elevations as the snow melts and additional forage becomes available. Important habitat components on spring, summer, and fall range include foraging sites, hiding cover, calving areas, rutting and security areas. In the unburned areas within the project boundary, the availability and abundance of understory forage in most of the mature or old growth stands are declining. Some shrub species have attained small tree status and are mostly unavailable for forage. Tree

canopy cover is increasing, causing a decrease in available forb, grass, and shrub forage. Hiding cover is available in forest stands mid-seral or older.

Newly burned areas and those proposed for salvage harvest would begin to provide forage in 2-5 years, depending on the burn severity. As stands grow from seedling to sapling stage, patches of hiding cover would develop. All MAs that are able to support tree stands would provide big-game summer range within a few years post-fire.

"Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho" (Leege et al. 1984) considers road density, livestock grazing, security areas, cover, and forage. These guidelines were adopted as the Forest Plan Standard for evaluating summer elk range. The disturbance to elk from roads is based upon the amount of traffic, the season and type of traffic, and the amount of buffer available to separate the disturbance from elk (Leege 1984). The presence of cattle may compete with elk for forage availability. Elk security areas are places where wildlife can retreat to for safety when affected by disturbances. In general, security areas are over 250 acres in size and >0.5 mile from an open road or trail. Cover is vegetation screening that provides hiding cover to an elk from human detection at 200 feet or less, while thermal cover provides tree canopies that intercept snow and reduce wind effects during the winter season. Forage is found in openings that produce grass, herbs, and/or shrubs for elk consumption.

An updated reference on elk summer habitat management (Servheen et al. 1997) has generated interest from some of the public as to replace the Leege (1984) guidelines. Servheen et al. (1997) suggest analyzing for motorized trails, which were not considered at the time the Forest adopted the 1984 guidelines. However, the calculations for primitive roads (found in the Leege 1984 worksheets) use the same co-efficients as for the temporary roads and system trails (found in Servheen et al. 1997 worksheets). Therefore, a motorized trail is now analyzed under the primitive road section of the worksheet, which results in the same value of standard road miles under either guideline. Overall the Servheen et al. (1997) model uses the same mileage co-efficients for road and motorized trail conditions (open, closed, or seasonal closures) as Leege et al. 1984. Road and trail densities are the same between both models. Livestock presence in an elk analysis area is similarly calculated, as well as security areas, cover, and forage. Examples of the calculation sheets for both models are located in the Wildlife Appendix E.

The Elk Vulnerability model is unique to the Servheen et al. analysis. The model attempts to analyze elk depredation from hunting, natural mortality factors, and road effects (access for hunters), and then extrapolates this information to determine trends in elk mortality per Game Management Unit (GMU).

Liabilities of the model for use with Forest Service projects include the scale of analysis and mortality factors. The desired scale for analysis is at the GMU. These units range in size from 262 to 1,555 mi^2; while the Johnson Bar Project area is 42 mi^2. For effects to elk in the project area, the biologist analyzed smaller polygons called Elk Analysis Areas (EAAs). These units are calculated from the input proposed under guidelines from Leege et al. (1984), which is also used in Servheen et al. (1997). Each EAA in the project area ranges from 7 to 14 mi^2.

Extrapolating road densities from Forest Service managed lands, such as the Johnson Bar Project, to a GMU would be conjecture, and not a dependable source for determining elk vulnerability at the larger scale. Road densities and hunter activities vary on private and corporate lands, in comparison to Forest Service managed lands. The larger size of the GMUs in Central Idaho include wilderness, roadless areas, and other terrain inaccessible to motorized vehicles, as well as the areas previously stated.

Mortality factors in the Vulnerability Model depend on consistencies. Changes in hunting seasons or alteration of gender numbers allowed for hunting would skew trends the Servheen document discusses. The elk vulnerability model only gathers data on legal hunting. Illegal take is not factored into the analysis. Treaty rights for the Nez Perce Tribe allows take of big game throughout the year, of either sex, with any weapon. The model does not address this supplemental mortality either. Additionally, the IDFG has recently increased trapping and other controls on the wolf population; which was not a consideration under the Servheen et al. 1997 guidelines. The latter document discusses a 10% natural mortality for elk, but the State's increased predator control must be the result of a known or perceived natural threat that is creating a larger mortality of elk than originally thought.

The IDFG has not contacted the Forest about the need or implementation of this model. The public arguing for the change of elk modeling guidelines are requesting that the Agency replace a 30-year old model with one that is almost 20 years old. Both need to be replaced with an analysis that uses the best available science, and more up to date knowledge. As the Forest progresses in its Forest Plan revision, the best available science will be selected and used for elk analysis. The Forest Service manages habitat for wildlife, while the IDFG manages the state populations for animals that are legally hunted or trapped. It would be more beneficial for the IDFG to generate and interpret this model, as they gather annual hunter harvest information to determine the management (tags, timing of season, etc.) for elk in each Big Game Unit.

Summer range habitat effectiveness objectives were established in the Nez Perce National Forest Plan for EAAs. The two EAAs are analyzed in Table 3-58. The Forest Plan objective for summer range elk habitat effectiveness (EHE) was increased in 1997 for both of the EAAs analyzed in Table 3-58. The wildlife biologist re-analyzed the EAAs, as the Johnson Bar Salvage DEIS was based upon outdated objectives.

Table 3-58. Elk summer range habitat effectiveness by alternative in the LID analysis area

Elk Analysis Area (EAA)	EAA Acres	Forest Plan Objective (%)	Summer Habitat Effectiveness (%)			
			Alt 1 Existing	Alt 2	Alt 3	Alt 4
Goodard	7102	75	72	73	73	73
Lodge Point	6890	50	56	56	56	56

3.14.9.4.2 Direct and Indirect Effects

Alternative 1

Lodge point EAA is in compliance with forest plan objective, while the Goodard EAA is slightly below the 75% measure. The Goodard EAA was at 70% in 1997 and is now at 72%. This

improvement could be due to a number of factors: road closures, increase in cover, forage, security or decrease in cow numbers or time in the EAA. Livestock grazing is occurring in the EAAs. The Tahoe-Clear Creek pasture and like-named range allotment have about 4,900 acres in the project area, and spans the two EAAs that are analyzed. Both EAAs have a low density of roads, which are reflected in EHE values above 50%. Minimal livestock grazing would continue, as the cattle stick to a few main roads (see Range Report in the project file). Cattle grazing would encourage invasive weed establishment adjacent or near the areas affected. This would potentially decrease elk forage quality in the affected areas.

The mixed severity fire reduced the amount of canopy cover and created many openings that are lacking forage. This temporary situation would discourage elk from using the area until vegetation recovers. In 3-10 years, vegetation would provide forage opportunities for elk in the previously burned areas. Many roads in the project area are closed to public motorized access. Security from motorized disturbances is present in the area, but for elk to use these areas forage would need to be present. This alternative would not create any new roads or change the present access.

There would be no direct effects to summer elk habitat effectiveness under Alternative 1 because no activities are proposed or would occur. Indirectly, habitats in the area would be susceptible to future wildfires due to the accumulation of fuels resulting from dead or dying snags that would fall and add to the ground fuels over time.

Fire suppression would continue, and would limit the amount of forage created by wildfire. In contrast, suppression would limit the amount of forest burned by fire, thereby retaining more hiding cover than would result from an uncontrolled wildfire.

Alternatives 2, 3, and 4

Timber harvesting and prescribed fires would reduce cover in proposed units. Again, disturbance would occur to individual elk in or near the affected areas. Both activities would increase forage across the analysis area for elk and other big game in 2-10 years post-harvest operations, depending upon the burn intensity of the areas.

Livestock number and periods of presence in both EAAs was considered immeasurable as to effects to elk (see Range Report in project file).

Direct effects to elk habitat effectiveness would be from shifts in the distribution of cover and forage, roadwork and increased traffic. During implementation of the action alternatives all EHE percentages would drop below the existing condition for both EAAs. Upon completion of the project activities, the Lodge Point EAA would return to 56% EHE, meeting its Forest Plan objective. Post project, the Goodard EAA would increase the EHE to 73% (see Table 3-58). The improvement would be due to the creation of more openings for forage. Though the EAA is below the Forest Plan objective, it is trending towards the established objective level.

Hiding and thermal cover have been reduced by the wildfire event. Hiding cover is defined as the vegetation capable of hiding 90% of a standing adult elk from a viewing distance of 200 feet or less (Thomas et al. 1979). Thermal cover is habitat that elk may seek out as means of thermo-regulation: using vegetation to reduce wind effects, or a vegetative cover to keep in

heat and/or act as an intercept for snow or rain. Thermal cover is a stand of conifers at least 40 feet tall, and the average canopy closure greater than 70% (Thomas et al. 1979). Proposed salvage harvest would create larger openings, and further reduce some hiding cover. Any harvest in areas that once offered thermal cover would have no effect, as the thermal cover would have already been lost to the effects of the fire.

Timber harvest reduces tree canopy coverage, but allows sunlight, water and nutrients to be more available to shrubs, forbs and grasses. Forage quantity would increase in harvested and burned areas for about 20-25 years. Forage representation would decline after this as the tree canopy cover increases. Burning releases nutrients that plants can use for a short-term benefit (1-2 years). Higher quality forage better prepares elk condition for winter. An increase in the quantity and quality of forage should help improve calf survival, as well.

During implementation of the action alternatives security areas would be temporarily reduced due to the use of roads and timber harvest activities. Some temporary roads would be built, and some closed roads would be re-constructed to access proposed units. Elk would move to other security areas inside or outside of these EAAs during periods of disturbance.

The calculations for the guidelines (Leege 1984) analyze all activities as occurring simultaneously in an EAA: roads used for harvest, openings created from units and livestock presence. This snapshot overestimates the impacts of project activities to elk. In reality, the harvest contractor would work a cluster of units within close proximity of one another. This reduces transportation costs and focuses the work to complete each unit before moving to the next. During treatment activities, roads used for access to units would remain closed to public motorized access. Upon completion of treatments in the units, all temporary roads would be decommissioned and Forest Service system roads would revert to their present travel management restrictions (in most cases, closed to public motorized access by a barrier). Upon completion of the timber sales, roads would be decommissioned and closed to public motorized access. Security Areas usually decrease (Table 3-50) from the openings created by the timber harvest. About 15 years after salvage treatments, these openings would produce trees or shrubs that would provide hiding cover for elk, and increase the percentage of security areas in the EAAs.

3.14.9.4.3 Cumulative Effects

Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions may disturb an elk, but would not affect its habitat. Recently completed timber projects include a State salvage sale on 144 acres and two private harvests affecting approximately 200 acres. These projects may have disturbed elk in or near the affected areas, but as the salvage sales occurred in moderate to high severity burn areas, these activities did not reduce the amount of potential habitat. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. Both projects occur in unburned areas. The Lowell project may disturb elk, but would provide forage for elk on winter range. The CCIR Project may disturb elk during project implementation, but it would increase forage opportunities by 3-20% in the affected EAAs. Prescribed fires in the timber projects and 2,000 acres of planned fires of the

North Selway and Fenn Face may disturb elk by human presence and smoke. These burns would reduce ladder fuels and create openings for shrub recovery. In about 5-10 years, the shrubs and young trees would offer potential foraging habitat for elk.

Snowmobile access would continue in the area. Vegetation that could provide visual screening from motorized traffic would grow back in 10-15 years. Units adjacent to roads would decrease dead or dying trees, which would open the visual distance of motorized activities to elk. Elk would move away from these clearings into areas of vegetation where visual and/or sounds from motorized traffic is screened or muffled. In 20 to 25 years, the tree plantations adjacent to snowmobile routes would muffle some of the noise from nearby traffic. The ongoing DRAMVU project would eliminate cross-country motor vehicle use on the Forest.

Alternative 1

This alternative would not create direct, indirect or cumulative effects, as no activities are proposed. Big game forage would remain low throughout the analysis area until vegetation begins to recover. Livestock grazing would continue. Future wildfires would create forage over time. Fire suppression would continue, which would limit the amount of forage the wildfires would create if unattended. The state would continue trapping wolves and managing other predators of elk.

Alternatives 2, 3, and 4

Temporary roads would be built in these alternatives and would remain closed to public access. The project activities would disturb elk during the period of implementation. Elk would move away from these areas, but may return during hours of darkness to forage on the lichens or younger leaves on the felled trees. Upon completion of the timber sales, all temporary roads would be decommissioned. Security areas would increase in response to the road closures in the EAAs. Indirect effects may be increased pressure on elk from wolves and other predators, due to the reduction of canopy and hiding cover from fire and salvage harvest.

The action alternatives would disturb elk in or near proposed units as they undergo management activities (harvest, slash burning, tree planting, etc.). Some habitat would become temporarily unavailable until vegetation grows back as forage and hiding cover. All action alternatives would improve forage potential in about 10-16% of existing winter range. About 7-8% of other MAs in the project area would provide potential elk forage from salvage harvest treatments. All treated units would improve at a faster rate than areas unaffected by timber activities, as all units would be planted with tree species found on the forest. In 5-10 years tree stands would be evident in the treated areas, whereas, the untreated areas may just be producing an understory of grass, herbs and shrubs. The planted areas would provide hiding cover in about 15 years post-harvest. About this time a mosaic of openings and developing forest conditions would provide an increase in EHE levels and the acreage available as security areas. The effects of livestock grazing, wildfires, fire suppression and predator management would be similar to Alternative 1.

The salvage project would meet Forest Plan Goal for MA-16 by improving the quality of winter range habitat for elk through management practices. Forest Plan Objectives for elk habitat effectiveness (EHE) are being met for one EAA. The other EAA is below the objective level, but

treatments will improve EHE by 1%. The project is meeting Forest Plan Standards 1, 3, 6, and 10, found on pages II-18 and 19 in the 1987 Forest Plan.

3.14.9.5 Shiras Moose

Moose are a Forest MIS representing hunted big game species and old-growth/Pacific yew habitats. In Idaho, moose occur mainly in mountainous conifer forests. Moose select vegetation types where forage is abundant in all seasons. Winter range is characterized by double-canopied, coniferous forests which intercept significant amounts of snow and also provide palatable evergreen forage. Forest vegetation types used by moose include grand fir and subalpine fir, especially those areas that have a subcanopy of Pacific yew (Pierce and Peek 1984).

Moose in north-central Idaho select dense Pacific yew stands in old-growth grand fir communities during winter (Pierce and Peek 1984). Fire suppression likely increased frequency and extent of Pacific yew, but timber harvests within the same areas has reduced the extent of yew communities. Pacific yew was typically slashed and burned during the course of regeneration timber harvest practices prior to 1987 (Crawford 1983 and Stickney 1980). From 1987 to 1991, timber harvest and burning were constrained in areas allocated to moose winter range. Forest fragmentation from harvest has reduced patch size and interior conditions, and isolated Pacific yew stands. After development of some conservation guidelines for the Pacific yew in 1992, timber harvest and burning in Pacific yew stands have been reduced considerably.

Moose disperse to higher elevations during summer, where open-canopied habitats provide abundant forage. Favored summer foraging areas include lakes, creeks, meadows, 5-40 year old timber harvest units, and burned forests (Innes 2010). Even-aged pole timber stands are also used (Pierce and Peek 1984). Both riparian and upland shrub species are consumed, and favored browse species used year-round include: willow, menziesia, mountain maple, serviceberry, and Pacific yew.

Pierce (1983) conducted a moose habitat use and selection study on the Red River Ranger District from 1979-1982. Mature stands were used throughout the year, old growth was used more than expected during all seasons except summer, and stands containing Douglas-fir and lodgepole pine were avoided. Moose used all timber cover types in proportion to their availability from June to August.

The Nez Perce Forest Plan designated MA21 as grand fir/Pacific yew communities to be managed for moose winter range. The goal in MA21 is to manage the grand fir-Pacific yew plant communities to provide for a continuing presence of Pacific yew "suitable" for moose winter habitat. Management standards and practices for timber harvest and fire management in MA21 to help maintain suitable winter habitat are found in the Nez Perce National Forest Plan (1987; III-59).

Population Trends

Moose are considered a big game animal in the State of Idaho, with annual drawings rewarding a limited number of hunters.

Affected Environment

The Project Area encompasses about 810 acres of MA 21 winter range for moose. This area of winter range consists of 10 patches ranging in size from 8 to 387 acres. Half of the MA 21 patches are greater than 50 acres in size, while the other half is less than 40 acres in size. A total of 24 acres of MA 21 moose winter range was burned in the fire. No detections of moose in the project area were in the wildlife observation databases.

The fire event would have pushed individual moose out of burning areas and relocated these animals to unaffected areas.

3.14.9.5.1 Direct and Indirect Effects

Alternative 1

No activities are planned under this alternative. Moose would continue to use the habitat that is available. Old growth stands hosted 50% of moose presence during fall, winter, and spring, while mature stands were used throughout the year (Pierce and Peek 1984). Any areas of Pacific yew would be greatly favored by the mammal. As vegetation recovers in the burned areas, shrubs, such as mountain maple, serviceberry and scouler willow would provide seasonally available forage for the moose.

Alternatives 2, 3, and 4

All three alternatives propose harvest in 11 acres of MA 21 moose winter range. These acres have been burned over by the Johnson Bar Fire. Noise and project activities would create possible disturbance to individual moose that may be in the affected areas. This may cause moose to avoid the area until the activities are completed. However, moose may return to harvest units during hours of darkness to feed on the foliage from trees that have been dropped to the ground by logging operations.

Old growth was designated at 11% for the project area. No harvest activities would occur in old growth or riparian areas.

Approximately 5 years after the burn or harvest operations, shrubs would be recovering in the harvested areas and other areas of the low intensity burns. About 10 years post-fire, shrubs and other vegetation would be available with improved quantity and quality for moose and other ungulates.

3.14.9.5.2 Cumulative Effects

Ongoing or foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions may disturb moose, but would not affect its habitat. Recently completed timber projects include a State salvage sale on 144 acres and two private harvests affecting approximately 200 acres. These projects may have disturbed individual moose in or near the affected areas, but as the salvage sales occurred in moderate to high burn severity areas, these activities did not reduce the amount of potential habitat. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. The Lowell project may disturb moose and reduce tree canopy. In 5-10 years, shrubs would mature to a stage that

would be potential forage habitat for moose. The CCIR Project may impact moose and/or its habitat. Old growth is above Forest Plan standard and harvested units would provide forage for the mammal in 5-10 years. Prescribed fires in the timber projects and 2,000 acres of planned fires of the North Selway and Fenn Face may disturb moose by human presence and smoke. These burns would reduce ladder fuels and create openings for shrub recovery. In about 5-10 years, the shrubs and young trees would offer potential foraging habitat for moose.

Alternative 1

There would be no direct or indirect effects from this alternative; therefore, there are no cumulative effects. Areas of MA 21 that were affected by the fire would recover to mature or old growth potential in 130 to 150 years, if no further disturbances occurred. The burned areas outside of MA 21 would provide shrub forage in about 5-10 years post-fire, depending on the burn severity of the affected areas. This forage would be summer forage. As the trees grow and multi-layered canopies develop, the shrub and understory component would decline.

Disturbance factors, such as fire, insect and disease, wind events, and so on, would create openings where the cycle of forest succession would begin anew. These openings would generate forage for moose as they occur. Fire suppression would continue in response to wildfires.

Alternatives 2, 3, and 4

All of the action alternatives would affect about 1% of moose winter range (MA 21). The direct effects of disturbance have been discussed. Indirect effects may be increase pressure on moose from wolves and other predators, due to the reduction of canopy and hiding cover from fire and salvage harvest.

None of these alternatives would harvest old growth or in riparian areas. All harvested units would be re-planted with native species to the forest. Besides the planted trees, natural vegetation response to the areas affected by harvest and fire would be similar to what was described under Alternative 1. The same applies to the disturbance factors mentioned under Alternative 1.

Forest Plan Standards being met by the project for the moose include Standards 1, 3, and 7 on pages II-18 and 19. Under Alternatives 2, 3, and 4, some effects may occur to individuals or their habitat, but is not expected to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing of the Shiras moose.

3.14.9.6 Neotropical Migratory Birds

In accordance with Neotropical Migratory Bird Laws under the National Forest Management Act (NFMA), the Forest Service is directed to “provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives” [P.L. 94-588, Sec 6 (g) (3) (B)]. The January 2000 USDA Forest Service (FS) Landbird Conservation Strategic Plan, followed by the US Shorebird Conservation Plan and Executive Order 13186 in 2001, and the January 2004 PIF North American Landbird Conservation Plan all reference goals and objectives for integrating bird conservation into forest management and planning.

In late 2008, a Memorandum of Understanding between the USDA Forest Service and the US Fish and Wildlife Service to Promote the Conservation of Migratory Birds was signed. The intent of the MOU is to strengthen migratory bird conservation through enhanced collaboration and cooperation between the Forest Service and the Fish and Wildlife Service as well as other federal, state, tribal and local governments. Within the National Forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities.

Neotropical migratory birds are species that breed and rear their young in the United States and Canada, then migrate south to winter in Mexico, the Caribbean Islands, and Central and South America. The status of neotropical birds is of special concern to state and federal agencies and conservation groups. Many of these birds are experiencing serious declines in population. Some migratory birds are covered by the endangered species act, while others are managed by state hunting regulations. Most of the migratory birds on the forest are protected as non-game status by the Idaho Department of Fish and Game.

Design criteria for project activities cover potential disturbances to birds, and allow for mitigations of the project if necessary. Silvicultural prescriptions (for retention of live trees and snags) would maintain tree and snag structure in salvage units for neotropical migrants dependent on burned forest environments.

Affected Environment

The Project Area contains portions of 6 OGAAs, with an approximate total of 1,934 acres of remaining old growth (after the fire event), and over 4,600 acres of riparian areas. Approximately one half of the Project Area was burned by the Johnson Bar Fire in 2014, including riparian areas, and 943 acres of old growth.

Fire intensities ranged from low to high with the respective tree mortality rates from 10-100%. Tree canopies were reduced, existing snags probably burned to the ground, and large portion of the existing downed woody debris was consumed.

The post-fire landscape would possess a large number of snags or dying trees that may still have pine needles on the branches. Areas that were affected by moderate to high fire severity would lack an understory, while the overstory would consist of larger diameter trees: many dead or dying, with some surviving the event. Low severity areas may retain most of the tree structure and patches of understory.

Generally, the canopy cover has been reduced throughout the burned areas. Hutto (1995) found 87 avian species in burned areas from 33 fires in Montana. Point counts were conducted in these areas during first or second year after the fire events. 77% were considered as migrants that winter to the south (Hutto 1995). The author does not elaborate if these birds are neotropical migrants, and most of these species have been seen in unburned forests as well. The species found in fire-affected areas represent most bird families with the exception of waterfowl and shorebirds. In general the mixed severity fire created a recovering forest with reduced canopy, large numbers of dead trees and more numerous open areas.

3.14.9.6.1 Direct and Indirect Effects

Alternative 1

There would be no direct or indirect effects to neotropical migrants since no proposed activities would occur. Birds that prefer high percentages of canopy cover would have relocated from burnt areas that no longer offer such habitat, to areas outside the fire perimeter. Conversely, many bird species would be attracted to the burned areas due to the increase of insects feeding on the dead and dying wood.

Alternatives 2, 3, and 4

All action alternatives would harvest dead or dying trees in burned areas. The alternatives would impact from 8-11% pf the project area. No harvest would occur in old growth or riparian areas. Noise and movement of machinery and other human activity may disturb migrant birds. The operating season, year-round for up to 3 years, may disrupt some nesting birds in or near areas of project activities. However, operations would be suspended when soil conditions become unfavorable or other weather conditions occur (fog in helicopter flight paths and so on).

All live trees, and live or dead trees over 25 inches dbh would not be affected by salvage operations. Unit prescriptions include an average of 14-28 trees/acre, including 6 snags/acre greater than 20 inches dbh. This retains some forest structure in units, as well as food sources for insects and birds. Individual bird pairs may lose their nests in areas proposed for salvage harvest. However, approximately 89% of the project area would not be affected by timber operations, and would continue to provide forage and nesting habitat for birds in the area.

3.14.9.6.2 Cumulative Effects

Ongoing and reasonably foreseeable projects include 7 culvert replacements and road reconstruction on 20 miles of road in the Middle Fork and Selway areas adjacent to the project area. These actions may disturb those bird migrants who nest or forage along roads or culvert locations, but the activities are unlikely to affect such habitat. Recently completed timber projects include a State salvage sale on 144 acres and two private harvests affecting approximately 200 acres. These projects may have disturbed birds attracted to burned trees or wood in or near the affected areas. The habitat loss for bird species across the Forest as a result of the fires, has now become a gain in the amount of habitat for avian species preferring more open habitat. Forest timber projects include the Clear Creek Integrated Restoration (CCIR) and Lowell Wildland Urban Interface. The Lowell project would reduce tree densities in the grand fir/cedar habitat type, but retain large trees and some snags. In 5-10 years an understory of vegetation (shrubs, grass, herbs, seedlings) would provide forage for insects, which would become forage for neotropical migrants that favor forest/opening edges. The CCIR Project may impact neotropical migrants and/or their habitat. Old growth in the project is above Forest Plan standard and would not be harvested: providing long-term habitat for species preferring mature forests. Openings from harvested units would provide forage for birds in 3-10 years post harvest. These areas would be potential habitat for species preferring open or forest edge habitat. 2,000 acres of planned fires of the North Selway and Fenn Face would disturb migrants in the area by human presence and smoke. These burns would reduce ladder fuels and create

openings for shrub recovery. In about 5-10 years, the shrubs and young trees would offer potential foraging habitat for species that prefer shrub, open or edge habitat.

Alternative 1

There would be no direct or indirect effects to neotropical migrants from this alternative; therefore, there are no cumulative effects. Current population trends would be unaffected. Wildfires may create openings for up to 30 years, depending on how hot the fire burned. These openings would produce shrubs, grass and forbs for about 15 to 20 years. This stage of vegetation growth would offer birds some vertical structure for nests and foraging.

Snags near or adjacent to roads that allow public motorized access would be cut for firewood. Any nests in such trees would be lost. Snags occurring in further distances from roads or in remote areas are likely to unaffected by firewood gathering. Fire suppression would continue. It may disturb some birds, yet save some save some habitats for neotropical migrants.

Alternatives 2, 3, and 4

Harvested units would recover from native seed sources in the soil and planted trees. During the first 15 years after timber sale completions, growing shrubs and trees would offer favorable opportunities for nesting songbirds. A greater quantity and diversity of invertebrates would be available during this period, which would benefit bird insectivores.

All temporary roads would be decommissioned. In time, vegetation would fill in the bare ground. Shrubs and trees would provide a vertical structure for nests and foraging.

The short-term effects have been listed above in the direct and indirect effects, and cumulative effects under Alternative 1. Long-term effects up to 150 years would be the recovery period for fire and timber affected areas to produce old growth or mature forested stands. Tree growth (if unaffected by disturbance) would increase the vegetative horizontal and vertical representation in the area, offering increased canopy cover and more diverse structure to the forest. This would benefit all forest-preferring migratory birds. The effects for snags would be the same as those mentioned under Alternative 1. The reduction in road densities would also discourage predation or parasitism of neotropical migrants from species that prefer edge effect habitats, such as cowbirds, starlings, ravens, and others. The determination for the action alternatives - *some effects may occur to individuals or their habitat, but is not expected to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing*.

3.15 Wilderness/Unroaded Areas

3.15.1 Analysis Area

The analysis area consists of the Middle Fork drainage area, in which the former 10,710-acre Middle Fork Face Roadless Area #1842 lies, as designated under the 1974 RARE II analysis and identified in the 1987 Nez Perce Forest Plan. The Middle Fork Face Roadless Area was considered but not included under the 2008 Idaho Roadless Rule.

3.15.2 Regulatory Framework

Nez Perce Forest Plan

Management area designations across the greater Middle Fork area are generally allocated to big game and elk, timber and timber/visual management themes, as well as a small component of old growth (MA 15, 16,17, 12, and 20 respectively). There are no specific Management Area designations for the Middle Fork Roadless Area, nor are there any Forest Plan goals or objectives specific to the management of roadless areas. Forest-wide management direction states that the Middle Fork Roadless Area would be open to development for multiple-use management.

2008 Idaho Roadless Rule

The 2008 Idaho Roadless Rule designated a system of lands titled Idaho Roadless Areas and established State specific direction for the conservation and management of 250 Inventoried Roadless Areas within the State of Idaho. After evaluation, the Middle Fork Face Roadless Area was removed from the final 2008 Idaho Roadless Rule due to the roadless character of the area being reduced as a result of development.

1997 Middle Fork FEIS and ROD

In 1997, the Middle Fork FEIS ROD was signed selecting Alternative 5 (USDA Forest Service 1997). Notable among the activities authorized by the decision were 2,645 acres of timber harvest, over 80% of which would occur within the Middle Fork Face Roadless Area (2,170 acres).

3.15.3 Analysis Methodology

The Wilderness Act states that a wilderness area have at least 5,000 acres of land or is of sufficient size to make its preservation and use in an unimpaired condition practicable. FSH 1920.12, Chapter 71.2 provides direction on the inventory process for potential Wilderness, including size criteria. 2013 Google Earth imagery, past timber sale administration maps, field validation, and professional judgement and knowledge were used to delineate core blocks of unroaded/undeveloped areas and areas unharvested by the most recent timber harvest activities (approximately 10-15 years ago). For timber harvest activities, only areas of regeneration harvest were excluded as salvage and intermediate harvest are not considered substantially noticeable as they do not change the age class or canopy structure of the area. The majority of past helicopter harvest units are noticeable from Forest roads 5503 (Swan Creek), 101 (Smith Creek), 5515 and 426 (Bridge Creek/Bill Hill), 470/470A junction (Swiftwater), and 653 (Lodge Point).

Boundaries of the unroaded and undeveloped areas were generally located using readily identifiable topographic or man-made features that would facilitate improve manageability. It was suggested that the effects of the Johnson Bar Fire might have erased evidence of past logging activities; however, field observations indicated this was not the case. Therefore, the fire areas were not mapped as part of the unroaded/undeveloped area.

The largest core block of unroaded/undeveloped area occurs generally between Decker and Lodge creeks. Acreage of the remaining unroaded/undeveloped area was calculated using GIS; harvest history layers were also overlain from FACTS databases.

The mapped areas equaled approximately 2,670 acres, short of the minimum 5,000 acres required under the Wilderness Act. There are no other unroaded, Idaho Roadless Areas, Wilderness, or recommended Wilderness areas contiguous to the Middle Fork area. Existing conditions do not support a practical unimpaired area for consideration as future Wilderness.

- Natural Integrity of the area is moderate;
- Past human activities are visible from numerous vantage points across the valley and from the road system above; thereby, reduced undeveloped characteristics;
- The area offers moderate opportunities for solitude or primitive recreation;
- There are some areas containing large benches of old growth cedar stands resulting in special features and values;
- Creating an area large enough for Wilderness consideration would have very low manageability.

3.15.4 Affected Environment

The Johnson Bar Fire Salvage Project is proposing to helicopter salvage approximately 250 acres within the Middle Fork unroaded area.

3.15.5 Direct and Indirect Effects

Alternative 1

Under the No Action Alternative, no timber harvest activities would occur. The Middle Fork area would remain in its current condition. Burned areas would continue to regenerate naturally.

Alternatives 2 and 3

Alternatives 2 and 3 would harvest approximately 320 acres within the remaining unroaded/undeveloped areas of the Middle Fork.

Natural Integrity – Would remain moderate. Disturbance would be sustained although the mechanism of disturbance would be human influenced. Reforestation with early seral species could improve natural integrity over the long-term.

Undeveloped Characteristics – Salvage harvest in proposed under alternatives 2 and 3 would decrease the undeveloped nature of the area by approximately 320 acres because stumps and evidence of timber harvest would be apparent. Units would generally be dispersed across the ridge systems between Decker and Lodge Creeks. Effects of harvest would be expected to be visible for 25-30 years, until stumps decay and the area regenerate.

Outstanding Opportunities - The 320 acres of proposed salvage harvest would further reduce opportunities for solitude and primitive recreation, particularly from access off Forest Road #653 (Lodge Point). The old growth cedar benches along the Middle Fork of the Clearwater River would be unaffected. River access opportunities would not be affected.

Special Features and Values - The old growth cedar benches along the Middle Fork of the Clearwater would be unaffected by alternatives 2 or 3.

Manageability – Implementation of alternatives 2 or 3 would not change the manageability of the area.

Alternative 4

Effects under Alternative 4 would be similar to those under alternatives 2 and 3. Under Alternative 4, approximately 135 acres would be salvage logged.

Natural Integrity – Effects would be similar to alternatives 2 and 3 except fewer acres would be logged and reforested.

Undeveloped Characteristics - Salvage harvest proposed under Alternative 4 would decrease the undeveloped nature of the area by approximately 135 acres because stumps and other evidence of harvest would be apparent. Units would generally be dispersed along Forest Road #653 and not extend downslope very far. Less of the core block of the remaining unroaded/undeveloped land would be affected.

Outstanding Opportunities – Effects from Alternative 4 would be similar to those from alternatives 2 and 3 except less acreage would be salvaged. The salvage would generally be concentrated along Forest Road #653 with little helicopter harvest further down the ridges. River access would remain unaffected.

Special Features and Values - The old growth cedar benches along the Middle Fork of the Clearwater would be unaffected.

Manageability – Implementation of Alternative 4 would not change the manageability of the area.

3.15.6 Cumulative Effects

Spatial Boundary

The cumulative effects boundary consists of the Middle Fork drainage.

Temporal Boundary

The time frame for cumulative effects is 25-30 years, which is the length of time tree stumps and other evidence of management actions would be expected to be substantially noticeable in these habitat types. This is based upon field observations of salvage units from the Rackliff Fire, located directly across the river, which were salvaged following a wildfire in the mid-1990s.

Past, Present, and Reasonably Foreseeable Future Activities

Past and present actions that are generally still affecting this landscape are the Middle Fork timber sale circa the early 2000s; the Lodge Point timber sale, which is still ongoing; and the

Johnson Bar Fire of 2014. There has been some road decommissioning in the headwaters of Lodge Creek. Fire suppression is expected to continue to be the primary response, given the areas proximity to Syringa and Lowell, as well as managed plantations. Given the scale of disturbance in the area from the fire and ongoing timber harvest, the Johnson Bar Fire Salvage Project would not be expected to cumulatively increase effects beyond what already exist to diminish the likelihood of future wilderness designations. Implementation of salvage harvest from this project would be expected to be completed within 1 year due to the time sensitivity and deteriorating timber value. Thus the effects would be condensed and the area would be allowed to continue regeneration and recovery.

Irreversible or Irretrievable Effects

The Johnson Bar project has no irreversible or irretrievable effects in regard to changing roadless or wilderness attributes. As previously referred to, both the 1997 Middle Fork FEIS and the 2008 Idaho Roadless Rule considered both roadless and wilderness attributes for this area and found that they were not robust enough to move the area forward as a managed roadless area to be considered for future wilderness recommendation. The attribute analysis for both roadless and wilderness conducted as part of this project, again affirms that this area does not have the needed attributes. Thus there is no need for additional alternative development and analysis to address a no salvage harvest option in the Middle Fork unroaded area.

Chapter 4

Consultation and Coordination

The Forest Service consulted and coordinated with the following individuals, Federal, State, and local agencies, Tribes, and non-Forest Service persons during the development of this Final Environmental Impact Statement.

Interdisciplinary Team Members

Heather Berg – Recreation/Wild and Scenic Rivers

David Callery – Hydrology

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Cara Farr – Soils

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Doug Graves – Fire/Fuels/Air Quality

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Sheila Lehman – NEPA Planner/Team Lead

Dave Ruppert – Soils

Cindy Schacher – Cultural/Heritage

Michael Ward – CFLRA Coordinator/Wilderness Attributes

John Warofka – Botany/Weeds

Tam White – Logging Systems/Economics/Layout

Federal, State, and Local Agencies

Board of Idaho County Commissioners

Department of Interior

Environmental Protection Agency

Idaho Department of Environmental Quality

Idaho Department of Fish and Game

Idaho Department of Lands

Idaho Department of Parks and Recreation

Idaho State Historic Preservation Office

National Marine Fisheries Service

National Oceanic and Atmospheric Administration

U.S. Fish and Wildlife Service

Tribes

Nez Perce Tribe

Others

Idaho Conservation League

Idaho Rivers United

The Clearwater Basin Collaborative

The Friends of the Clearwater

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Glossary and Acronyms

A

Activity	A measure, course of action, or treatment that is undertaken to directly or indirectly produce, enhance, or maintain forest and rangeland outputs or achieve administrative or environmental quality objectives.
Affected Environment	The biological and physical environment that will or may be changed by actions proposed and the relationship of people to the environment.
AIRFA	American Indian Religious Freedom Act of 1978
Alternative	One of several policies, plans, or projects proposed for decision making.
Anadromous Fish	Fish that spend much of their adult life in the ocean, returning to inland waters to spawn; e.g. salmon, steelhead.
Aquatic Ecosystem	A stream channel, lake, or estuary bed, the water itself, and the biotic communities that occur therein.
ATV	All-terrain vehicle. A type of off-highway vehicle that travels on three or more low-pressure tires; has handle-bar steering; is less than or equal to 50 inches in width; and has a seat designed to be straddled by the operator.

B

Basal Area	The cross-sectional area of all stems in a stand measured at breast height and expressed in terms of square feet (feet^2).
Best Management Practices, BMPs	The set of standards in the Forest Plan which, when applied during implementation of a project, ensures that water related beneficial uses are protected and that State water quality standards are met. BMPs can take several forms. Some are defined by State regulation or memoranda of understanding between the Forest Service and the State. Others are defined by the Forest interdisciplinary planning team for application Forest-wide. Both of these types of BMPsare included in the Forest Plan as forest-wide standards. A third type is identified by the interdisciplinary team for application to specific management areas. A fourth type, project level BMPs, is based on site specific evaluation, and represents the most effective and practicable means of accomplishing the water quality and other goals of the specific evaluation, and represents the most effective and practicable means of accomplishing the water quality and other goals of the specific area involved in the project. These project

	level BMPs can either supplement or replace the Forest Plan standards for specific projects.
Big Game	Those species of large mammals normally managed as a sport hunting resource.
Big Game Summer Range	Land used by big game during the summer months.
Big Game Winter Range	The area available to and used by big game through the winter season.
Biological Assessment	An assessment required by the Endangered Species Act of 1973 to identify any threatened, endangered, or sensitive species, which are likely to be affected by a proposed management action, and to evaluate the potential effects of the proposed actions on those species and their habitats.
Biological Opinion	Adocument issued by the US Fish and Wildlife Service or the National Oceanic and Atmospheric Administration fisheries after formal Section 7 consultation has occurred in accordance with the Endangered Species Act, which states the opinion of the US Fish and Wildlife Service or the National Oceanic and Atmospheric Administration fisheries as to whether a Federal action is likely to jeopardize the continued existence of a Threatened or Endangered species or result in the destruction or adverse modification of the species' critical habitat.
Biological Potential	The maximum possible output of a given resource, limited only by its inherent physical and biological characteristics.
BLM	Bureau of Land Management
BO/BiOp	Biological Opinion
Browse	Twigs, leaves, and young shoots of trees and shrubs on which animals feed; in particular, those shrubs which are utilized by big game animals for food.

C

Capability	The potential of an area of land and/or water to produce resources, supply goods and services, and allow resource uses under a specified set of management practices and at a given level of management intensity.
Cavity	A hollow in a tree, which is used by birds or mammals for roosting and reproduction.
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations

Channel Morphology	The study of the channel patterna and geometry at several points along a river channel, including the network of tributaries within the drainage basin; also known as fluviomorphology or stream morphology.
Channel Type	A system developed by hydrologist Dave Rogen to classify and characterize similar stream channels. Water surface gradient and substrate particle size are the primary stream features used. Other features include bankfull width, width to depth ratio, entrenchment ratio, and floodprone width.
Clearcut with Leave Trees	Even-aged regeneration or harvest method that removes most of the trees in a stand, producing an exposed microclimate for the development of a new age class in one entry. A minor (less than 10% of full stocking) live component may be retained for reasons other than regeneration.
Closed Roads	Roads developed and operated for limited use. Public vehicular traffic is restricted except when they are operating under a permit or contract, or in an emergency situation.
Closure	The administrative order that does not allow specified uses in designated areas or on Forest development roads or trails.
Commodities	Resources with commercial value; all resource products which are articles of commerce, such as timber, range, forage, and minerals.
Council onEnvironmental Quality	An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.
Cover	Vegetation used by wildlife for protections from predators, or to protect themselves from weather conditions, or in which to reproduce.
Critical Habitat	Specific areas within the geographic area occupied by a speices on which are found those physical and biological features (1) essential to the conservation of the species, and (2) which may require special management considerations or protection. Critical habitat does not include the entire geographic area which may be occupied by a Threatened or Endangered species.
Cultural Resources	The physical remains of human activities, such as artifacts, ruins, burial mounds, petroglyphs, etc., and the conceptual content or context, such as a setting for legendary, historic, or prehistoric events as a sacred area of native peoples, etc., of an area.
Cumulative Effects	The effects on the environment, which result from the incremental effect of a management action when added to other

	actions, whether they be on Federal, State, or private lands. Cumulative effects can be individually minor be collectively significant that take place over a period of time.
CWA	Clean Water Act

D

DEIS	Draft Environmental Impact Statement
DEQ	Department of Environmental Quality
Desired Future Condition	A desired condition of the land or a resource to be achieved sometime in the future.
Detrimental Soil Disturbance	Compaction, displacement erosion, loss of organic matter, and decreased soil productivity
Developed Recreation	Recreation that occurs where improvements enchance recreational opportunities and accommodate intensive recreational activities in a defined area.
Direct Effects	Effects on the environment or a resource which occur at the same time and place as the initial cause or action.
Dispersed Recreation	The portion of outdoor recreation use which occurs outside of developed sites in the unroaded and roaded Forest environment; i.e., hunting backpacking, berry picking, etc.
Disturbance	Any management activity that has the potential to accelerate erosion or mass movement; also any other activitity that may tend to disrupt the normal movement or habits of a particular species. At the landscape scale, a disturbance would be a force, such as wildfires, disease, or large scale vegetation management, which can significantly alter existing ecosystem conditions.
Diversity	The distribution and abundance of different plant and animal communities and species within an area.
Draft Environmental Affect Statement	A detailed written statement as required by Section 102(2)(C) of National Environmental Policy Act.
DSD	Detrimental Soil Disturbance

E

EA	Environmental Assessment
EAU	Elk Analysis Unit
Economic Efficiency	The usefulness of inputs (costs) to produce outputs (benefits) and effects when all costs and benefits that can be identified and valued are included in the computations. Economic efficiency is

	usually measured using present net value, though use of benefit cost ratios and rates of return may sometimes be appropriate.
Ecosystem	A complete, interacting system of organisms considered together with their environment; for example a marsh, watershed, or lake.
Effects	Physical biological, social, or economic results (expected or experienced) resulting from natural events or management actions. Effects (effects/consequences) can be direct, indirect, and/or cumulative.
EHE	Elk Habitat Effectiveness
EIS	Environmental Impact Statement
Endemic	Term applied to populations of potentially injurious plants, animals, or viruses that are at their normal, balanced level in an ecosystem in contrast to epidemic levels. Plant and animal diseases which are prevelant in or peculiar to a certain locality.
Elk Hiding Cover	Vegetation, primarily trees, capable of hiding 90% of an elk seen from a distance of 200 feet or less
Elk Security Area	An area elk retreat to for safety when there is a disturbance in their normal range is being intensified, such as by logging actitivities or during the hunting season. To qualify as a security area, there must be at least 250 contiguous acres that are more than ½ mile from open roads.
Endangered Species	Any species which is in danger of extinction throughout all or a significant portion of its range, and listed as such by the Secretary of the Interior in accordance with the Endangered Species Act of 1973.
Endangered Species Act	The Act was enacted in 1973 to protect animal and plant species from extinction by preserving the ecosystems in which they survive and by providing programs for their conservation. The Endangered Species Act is administred by two agencies: The National Marine Fisheries Services, which designates marine fish and certain marine mammals, and the US Fish and Wildlife Service, which has jurisdiction over all other wildlife.
Environment	The aggregate of physical, biological, economic, and social factors affecting organisms in an area
Environmental Analysis	An analysis of alternative actions and their predicatable short- and long-term environmental effects, which include physical, biological, economic, social, and environmental design factors and their interactions.

Environmental Assessment	A concise public document for which a Federal Agency is responsible that serves to: (1) briefly provide sufficient evidence and analysis for determining whether to prepare an Environmental Affect Steement of a Finding of No Significant Affect; (2) aid an agency's compliance with the National Environmental Policy Act when no Environmental Impact Statement is necessary; and (3) facilitate preparation of an Environmental Impact Statement when one is necessary.
Environmental Affect Statement	A public document for which a Federal Agency is responsible that serves to: (1) provide sufficient evidence and analysis for determining the effects of an action on resources; (2) aid an agency's compliance with the National Policy Act; and (3) promote informed decision making by the Federal Agency.
EO	Executive Order
Ephemeral	A depression in the topography that carries surface water for brief periods of time either during or after peak rainfall events, but are normally dry throughout the majority of the year.
Epidemic	Plant and animal diseases which rapidly build up to highly abnormal and generally injurious levels
Erosion	The wearing away of the land's surface by water, wind, snow, ice, or other physical processes; it includes detachment, transport, and deposition of soil or rock fragments.
ESA	Endangered Species Act
Essential Habitat	Areas with essentially the same characteristics as critical habitat but not declared as such. These habitats are necessary to meet recovery objectives for Endangered, Threatened, and Candidate species.

F

FEIS	Final Environmental Impact Statement
Final Environmental Affect Statement	The final version of the public document required by the National Environmental Policy Act (see Draft Environmental Impact Statement).
Floodplain	Lowland and relatively flat areas adjoining streams, rivers, and lakes, which are periodically inundated by overbank flows of water.
Forage	All browse and non-woody plants available to livestock or wildlife for feed.

Forest Plan	Nez Perce National Forest Land and Resource Management Plan, September 1987
Forest and Rangeland Renewable Resources Planning Act of 1974	An Act of Congress which requires the assessment of the nation's renewable resources and the periodic development of a national renewable resources program. It also requires the development, maintenance, and, as appropriate, revision of land and resource management plans for the National Forests.
Forest Type	A classification of forest land based upon the live tree species present.
FP	Forest Plan
FR	Federal Register
FS	Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
Fuels	Includes both living plants and dead woody vegetation that are capable of burning in the event of fire
Fuels Management	Manipulation or reduction of fuels to meet Forest protection and management objectives while preserving and enhancing environmental quality
USFWS	U.S. Fish and Wildlife Service

G

Geographic Information System	A computer program for manipulating landscape configuration data
Geomorphic Threshold	The percent increase of sediment over normal or natural conditions, which may result in unstable channel conditions in a stream system.
GIS	Geographic Information System

H

Habitat	A place where a plant or animal naturally or normally resides and grows
Habitat Effectiveness	The measure of how open roads affect utilization of habitat by elk
Habitat Type	An aggregation of all land areas potentially capable of producing similar plant communitities at climax
Hiding Cover	Trees of sufficient size and density to conceal animals from view at 200 feet

HUC	Hydrologic Unit Code
Hydrologic Recovery	The process of revegetation of a disturbed area which returns the site to predisturbance levels of water runoff and timing of flow
Hydrologic Unit Code	A sequence of numbers or letters used to identify a particular hydrological feature, such as a river, reach, lake, or watershed

I

IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDL	Idaho Department of Lands
IDPR	Idaho Department of Parks and Recreation
IDT	Interdisciplinary Team; ID Team
Indicator Species	Species identified in a planning process that are used to monitor the effects of planned management activities on viable populations of wildlife and fish, including those that are socially or economically important.
Indigenous	Having originated in and being produced, growing, living, or occurring naturally in a particular region or environment.
Indirect Effects	Effects caused by an action that occur later in time or further removed spatially, but are still reasonably foreseeable.
INFISH	Inland Native Fish Strategy, 28 July 1998
INFRA	Infrastructure Database used to record Forest Service roads and trails
Interdisciplinary Team	A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the issues. Through interaction, team members bring different points of view to bear on any given issue.
Intermittent	A depression in the topography that has flowing water during the wet season (winter-spring) but is normally dry during the hot summer months; the area does not have a continuous year-round flow.
Invasive Species	Any non-native plant, such as spotted knapweed or yellow star thistle, which when established may become destructive and difficult to control by ordinary means of cultivation or other control practices.

Inventory Data	Recorded measurements, facts, evidence, or observations of forest resourches, such as soil, water, timber, wildlife, range, geology, minerals, and recreation, which is used to determine the capability and opportunity for the Forest to be managed for those resources.
IPM	Integrated Pest Management
Irretrievable	Foregone or lost production, harvest or use of renewable natural resources; for example when a fire destroys a tree plantation, the effect is irretrievable but the loss of site productivity as measured by the presence of trees is not irreversible.
Irreversible	The removal of resources such that they cannot be produced again;this applies most commonly to nonrenewable resources, such as minerals or cultural resources, or to resources such as soil productivity that are renewable only over long periods of time. Loss of renewable resources can also be irreversible as in the replacement of a forest with a permanent road.
Issue	A subject or question of widespread public discussion or interest regarding management of National Forest System administered lands.

K

Key Habitat Components	Areas or features of the forest which are of particular importance for maintaining overall wildlife habitat; these areas and features include moist areas, wallows, meadows, parks, critical hiding cover, thermal cover, migration routes, and staging areas.

L

Land Allocation	The assignment of a management emphasis to particular land areas to achieve the goals of the issues, concerns, and opportunities identified during the planning process.
Landtype	An area of land classified on the basis of geomorphic attributes. An understanding of geological processes, as reflected in land surface form and features, individual kinds of soils, and the fators which determine the behavior of ecosystems (i.e., climate, vegetation, relief, parent material, and time) is used as the basis for this classification system.
LAU	Lynx Analysis Unit
LIDAR	A remote sensing technology that works on a principal similar to that of radar but instead uses infrared light from a laser to illuminate a target and analyze the refected light.

M

MA	Management Area
MA 1	Provide the minimum management necessary to provide for resource protection and to ensure public safety. Additional road construction will be allowed to manage adjacent areas.
MA 2	Provide and maintain sites for facilities necessary for the administration of Nez Perce National Forest lands.
MA 3	Manage to ensure that prehistorical, historical, archaeological, and/or paleonotological sites are studied, preserved, or protected.
MA 4	Encourage valid exploration and development of mineral resources while minimizing surface effects from mineral activities.
MA 6	Manage areas for non-manipulative research, observation, and study of undisturbed ecosystems.
MA 7	Manage for developed recreational opportunities, providing interpretation and enhancement of cultural and natural resources. Maintain or enchance existing developed recreation sites.
MA 8.1, 8.2, and 8.3	Manage for outstaingly remarkable values and free-flowing river conditions as specified in the Wild and Scenic Rivers Act of 1968, as amended.
MA 9.1, 9.2, and 9.3	Manage the wilderness values as specified by the Wilderness Preservation Act of 1964.
MA 10	Manage to protect or enhance riparian-dependent resources.
MA 11	Manage for high fishery/water quality objectives, wildlife security, and high quality dispersed recreation with no additional roads.
MA 12	Manage for timber production and other multiple uses on a sustained yield basis.
MA 13	Manage for timber production and other multiple uses on a sustained yield basis while meeting visual quality objectives of retention or partial retention in those areas of medium to high visual sensitivity. This management area consists of intermingled acreages of lands similar to those found in MA 12 and 17. The heterogeneous spatial mix of these lands is the primary reason for identifying them as unique management areas.
MA 14	Manage for timber production and other multiple uses on a sustained yield basis while meeting visual quality objectives of retention or partial retention and improving the quality of winter

	range habitat for deer and elk. This management area consists of intermingled acreages of lands similar to those found in MA 12, 16, and 17. The heterogeneous spatial mix of these lands is the primary reason for identifying them as unique management areas.
MA 15	Manage for timber production and other multiple uses on a sustained yiled basis while improving the quality of deer and elk winter range. This management area consists of intermingled acreages of lands similar to those found in MA 12 and 16. The heterogenous spatial mix of these lands is the primary reason for identifying them as unique management areas.
MA 16	Manage to increase usable forage for elk and deer on potential winter range.
MA 17	Manage for timber production and other multiple uses on a sustained yield basis while meeting visual quality objectives of retention or partial retention.
MA 18	Manage to improve the quality of winter range habitat for deer and elk through timber harvesting or prescribed fires while meeting visual quality objectives of retention or partial retention in appropriate areas. This management area consists of intermingles acreages of lands similar to those found in MA 16 and 17. The heterogeneous spatial mix of these lands is the primary reason for identifying them as unique management areas.
MA 19	Manage for livestock forage production and other multiple uses on a sustained yield basis.
MA 20	Manage for old-growth habitat for dependent species.
MA 21	Manage grand fir-Pacific yew communities for moose winter range and other multiple uses.
MA 22 and 23	Manage to ensure that the Idaho water quality standards for community public supply water uses are met.
Management Area	An aggregation of capability areas, which have common management direction and may be non-contiguous in the Forest; consists of a grouping of capability areas selected through evaluation procedures and used to locate decisions and resolve issues and concerns.
Management Direction	A statement of multiple use and other goals and objectives, the associated management prescriptions, and the associated standards and guidelines for attaining them
Management Indicator	A plant or animal which, by its presence in a certain location or

Species	situation, is believed to indicate the habitat conditions for many other species
Management Practice	A technique or procedure commonly applied to Forest resources, resulting in measurable outputs or activities.
Management Prescription	Management practices and intensities selected and scheduled for application on a specific area to attain multiple use and other goals and objectives.
MIS	Management Indicator Species
Mitigation	Avoiding or minimizing effects by limiting the degree or magnitude of the action and its implementation; rectifying the effects by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the effect by preservation and maintenance operations during the life of the action.
Model	A theoretical projection in detail of a possible system of natural resource relationships. A simulation based upon an empirical calculation to set potential or outputs of a proposed action or actions.
Monitoring	An examination, on a sample basis of Forest Plan management practices, to determine how well objectives have been met and a determination of the effects of those management practices on the land and environment.

N

NAGPRA	Native American Graves Protection and Repatriation Act of 1990
National Environmental Policy Act; NEPA Process	An Act to declare a national policy that will encourage productive and enjoyable harmony between man and his environment, to promote efforts that will prevent or eliminate damage to the environment and biosphere, to stimulate the health and welfare of man, to enrich the understanding of the ecological systems and natural resources important to the Nation, and to establish the Council on Environmental Quality. An interdisciplinary process, mandated by the National Environmental Policy Act, which concentrates decision making around issues, concerns, alternatives, and the affects of alternatives on the environment.
National Forest Management Act	A law passed in 1976 as amendment to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of Regional and Forest Plans and the preparation of regulations to guide that development.
National Forest System	All National Forest lands reserved or withdrawn from the public domains of the United States; all National Forest lands acquired

	through purchase, exchange, donations, or other means; the National Grasslands and land utilization projects administered under Title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 U.S.C. 1010-1012); and other lands, waters, or interests therin which are administered by the Forest Service or are designated for administration through the Forest Service as part of the system.
National Recreation Trails	Trails designated by the Secretary of the Interior or the Secretary of Agriculture as part of the national system of trails authorized by the National Trails System Act. National recreation trails provide a variety of outdoor recreational uses in or reasonably accessible by urban areas.
National Register of Historic Places	A listing maintained by the National Park Service of areas which have been designated as being of historical value. The Register includes places of local and State significance, as well as thos of value to the Nation as a whole.
Natural Sediment Production	The amount of sediment produced in a watershed prior to any management activities, such as roads or harvest; natural, or baseline, sediment is a function of parent material, soil type, degree of weathering, glacial influences, etc.
NEPA	National Environmental Policy Act
NEZSED	A computer model that analyzes and predicts effects of activities on water quality and quantity.
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest system
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
No Action Alternative	An alternative where no management activities would occur beyond those currently underway. The development of a No Action Alternative is in accordance with regulations implementing the National Environmental Policy Act (40 CFR 1502.14). The No Action Alternative provides a baseline for estimating the effects of other alternatives.
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
NPT	Nez Perce Tribe
NRLMD	Northern Rockies Lynx Management Direction

O

Objective	A specified statement of measurable results to be achieved within a stated time period; objectives reflect alternative mixes of all output of achievements which can be attained at a given budget level. Objectives may be expressed as a range of outputs.
OHV	Off-highway vehicle
Off-Highway Vehicle	Vehicles, such as four- and three-wheelers, motorcycles, and bicycles, which are designated to operate on primitive roads and trails, or to navigate cross-country where there are no constructed travelways.
ORV	Off-road vehicle

P

PACFISH	The Decision Notice/Decision Record, Finding of No Significant Affect, and Environment Assessment for the interim strategies for managing anadromous fish producing watersheds in eastern Oregon and Washington, Idaho, and portions of California. It was published by the USDA Forest Service and USDI Bureau of Land Management in 1995.
Perennial Stream	A stream which normally flows throughout the year
PILT	Payment in Lieu of Taxes
PL	Public Law
Preferred Alternative	The Agency's preferred alternative, one or more, that is identified in the environmental document (EA or EIS).
Prescription	Management practices selected and scheduled for application on a designated area to attain specific goals and objectives.
Proposed Action	In terms of the National Environmental Policy Act, the project, activity, or action that a Federal Agency is proposing to implement or undertake and which is the subject of an environmental analysis.
Public Access	Usually refers to a road or trail route over which a public agency claims a right-of-way available for public use.
Public Involvement	A Forest Service process designed to broaden the information based upon which Agency decisions are made by (1) informing the public about Forest Service activities, plans, and decisions, and (2) encouraging public understading about and participation in the planning processes, which lead to final decision making.

Public Issue	A subject or question of widespread public interest relating to management of the National Forest System.

R

Range Allotment	A designated area of land available for livestock grazing upon which a specified number and type of livestock may be grazed under a Range Allotment Management Plan. It is the basic land unit used to facilitate management of the range resource on National Forest System and associated lands administered by the Forest Service.
Ranger District	Administrative subdivision of the Forest supervised by a District Ranger
Record of Decision	A document separate from, but associated with, and Environment Affect Statement that publicly and officially discloses the responsible official's decision about an alternative assessed in the Environmental Impact Statement chosen for implementation.
Recreation Opportunity Spectrum	The framework for stratifying and defining classes of outdoor recreation environments, activities, and experiences, which are arranged along a continuum or spectrum that is divided into seven classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded modified, roaded natural, rural, and urban.
Recruitment Old Growth	Timber stands that would meet old growth criteria within 100 years. Therefore, replacement old growth stands may consist of stands 50 years old or older. Used interchangeably with replacement old growth.
Replacement Old Growth	Timber stands that would meet old growth criteria within 100 years. Therefore, replacement old growth stands may consist of stands 50 years old or older.
Re-vegetation	The re-establishment and development of plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through the direct action of humans; for example reforestation and range seeding.
Right-of-Way	Land authorized to be used or occupied for the construction operation, maintenance, and termination of a project facility passing over, upon, under, or through such lands.
Riparian Areas	Areas with distinctive resource values and characteristics that are comprised of aquatic and riparian ecosystems, 100-year floodplains, and wetlands; they also include all upland areas

	within a horizontal distance of approximately 100 feet from the edge of perennial streams or other perennial water bodies.
RMO	Resource Management Objective
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
Road Management	The combination of both traffic and maintenance management operations; traffic management is the continuous process of analyzing, controlling, and regulating uses to accomplish National Forest objectives. Maintenance management is the perpetuation of the transportation facility to serve intended management objectives.
Road Decommissioning	Activities that result in the stabilization and restoration of unneeded roads to a more natural state.
Roadless Area	An area of the Nation Forest which: 91) is larger than 5,000 acres or, if smaller, is contiguous to a designated wilderness area or primitive area; (2) contains no roads, and (3) has been inventoried by the Forest Service for possible inclusion in the wilderness preservation system.
Rotation	The planned number of years between the formation of a generation of trees and their harvest at a specified stage of maturity.

S

Scoping	The procedures by which the Forest Service determines the extent of analysis necessary for a proposed action; i.e. the range of actions, alternatives, and effects to be addressed, identification of significant issues related to a proposed action, and establishing the depth of environmental analysis, data, and task assignments needed.
Security Area	Any area which, because of its geography, topography, and/or vegetation, that will hold elk during periods of stress.
Sediment	Any material carried in suspension by water, which will ultimately settle to the bottom of streams.
Sediment Delivery Efficiency	A term describing how efficiently sediment is transported within a given portion of a stream
Sediment Yield	The amount of material eroded from the land surface by runoff and delivered to a stream system.
Semi-Primitive Non-Motorized	There is a high quality of experiencing solitude, closeness to nature, tranquility, self-reliance, challenge, and risk.

Semi-Primitive Motorized	There is a moderate opportunity for solitude, tranquility, and closeness to nature.
Sensitive Species	Species (plants or animals) with special habitat needs that may be influenced by management programs
SHPO	State Historic Preservation Office
Site Productivity	The production capability of special areas of land
Skid Trails	A travelway through the woods formed by loggers dragging (skidding) logs from the stump to a log landing without dropping a blade and without purposefully changing the geometric configuration of the gound over which they travel
Slash	The residue left on the ground after felling and other silviculatural operations and/or accumulating there as a result of storms, fires, girdling, or poisoning.
Snag	A standing dead tree used by birds for nesting, roosting, perching, courting, or foraging for food and by some mammals for escape cover, denning, and reproduction.
Snowmobile	Any self-propelled vehicle under 1,000 pounds unladened gross weight, designed primarily for travel on snow or ice or over natural terrain, which may be steered by tracks, skis, or runners.
Soil Productivity	The capacity of soild to produce a specific crop, such as fiber and forage, under defined levels of management. It is generally dependent upon available soild moisture, nutrients, and length of the growing season.
Stand	A plant community of trees which possess uniformity in vegetation type, age class, vigor, size class, and stocking class and one which is distinguishable from adjacent forest communities.
Standard	An objective requiring a specific level of attainment; a rule to measure against; a guiding principle
Stream Order	A measure of the position of a perennial stream in the hierarchy of tributaries. First order streams are unbranched streams with no tributaries. Second norder streams are formed by the confluence of two or more first order streams. Third order streams are formed by the confluence of two or more second order streams; they are considered third order until they join another third order or larger stream.
Subnivean	A zone that is in or under the snow layer; it can form when latent heat from the ground melts a thin layer of snow above it, leaving a layer of air between the ground and the snow. Subnivean animals include small mammals, such as mice, voles, shrews, and

	lemmings that must rely on winter snow cover for survival. These mammals move under the snow for protection from heat loss and predators.
Successional Stage	A phase in the gradual supplanting of one community of plants by another.
Suitable Forest Land	Forest land (as defined in CFR 219.13) for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions; for which there is reasonable assurance that such lands can be adequately restocked (as provided for in CFR 219.14), and for which there is management direction that indicates that timber production is an appropriate use of the area.
Supply Limited Stream	A supply (sediment) limited stream has more energy available during a typical year than there is sediment in the stream channel available to be moved. Thes excess energy leads to a resilience that enables the system to recover and cleanse itself if extreme sediment loads are not delivered in a short period of time.
System Road	A road that is part of the Forest development transportation system, which includes all existing and planned roads, as well as other special and terminal facilities designated as Forest development transportation facilities.

T

Temporary Roads	Roads which are necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road and that is not included in a forest transporation atlas. Roads which are constructed for a one time or short-term use, which are not expected to be utilized in the future; these roads will be decommissioned after the need has passed.
Terrestrial	Living or growing on land
Thermal Cover	Cover used by animals to ameliorate effects of weather; for elk, a stand of coniferous trees 40 feet or taller with an average crown closure of 70% or more.
Threatened Species	Any species that is likely to become an endangered species within the foreseeable future throught all or a significant portion of its range and one that has been designated as threatened in the *Federal Register* by the Secretary of the Interior.
Timber	A general term for the major woody growth of vegetation in a forested area.

TMDL	Total Maximum Daily Load
Topography	The configuration of land surface including its relief, elevation, and the position of its natural and man-made figures.
Trailhead	The parking, signing, and other facilities available at the terminus point of a trail.
Turbidity	Sediment or foreign particles stirred up or suspended in water.
Two-aged Stand	Two-aged regeneration or harvest method that removes sufficient trees to produce an exposed microclimate for the development of a new age class. Sufficient residual trees, representing at least 10% of full stocking, are trained to attain goals other than regeneration and create a two-aged stand.

U

Understory	Vegetation (trees or shrubs) growing under the canopy formed by taller trees.
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

V

Verified Old Growth	Stands that have been verified by field data, which is referred to as stand exam data. Verified old growth stnds have met the minimum requirements of Green et al. 1992, errata 2011 old growth, and have been field verified by a silviculturist.
Viewshed	A total landscape as seen from a particular viewpoint.
Visual Quality Objectives	The degree of acceptable alteration of the characteristic landscape
Visual Resource	The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.
VQOs	Visual Quality Objectives

W

Wallow	A depression, pool of water, or wet area produced or utilized by elk or moose during the breeding season.

Watershed	The total area of land where all that is under it or drains off of it goes into the same place; the total area above a given point on a stream that contributes water to the flow at that point
Wilderness Character	Wilderness character attributes are: Natural Integrity, Apparent Naturalness, Outstanding Opportunities for Solitude, and Opportunities for Primitive, Unconfined Recreation. These features were evaluated using capability analyses as conducted in 1978 using the Wilderness Attribute Rating (WAR) System and in 2005 using the Area of Capability Assessment (ACA) Process. These analyses techniques rate wilderness charater attributes as identified by the Wilderness Act of 1964.
Windthrow	Trees that are blown down by wind.
Windfirm	Trees able to withstand strong winds and resist windthrow (blow down), wind-rocking, and major breakage.
WSRA	Wild and Scenic River Act

APPENDIX A

Fish Summary Data

Fish Summary Data

Tables 1A through 4A: USFS O'Hara Creek Fish Density surveys by year (#/100 m^2)

Table 1A: 1988 Fish Densities

Length Class (in)	*Undiff Trout*	*Steelhead*		*Chinook*		*Rainbow*		*Cutthroat*	*Bull*	*Whitefish*
		W	*A*	*W*	*A*	*W*	*H*			
<2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	**28.61**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	**5.01**	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	**22.71**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

W= ***Wild and Natural*** A= **Adipose Clipped** H=Hatchery

Table 2A: 1989 Fish Densities

Length Class (in)	*Undiff Trout*	*Steelhead*		*Chinook*		*Rainbow*		*Cutthroat*	*Bull*	*Whitefish*
		W	*A*	*W*	*A*	*W*	*H*			
<2	**3.57**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	**2.62**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	**0.24**	0.00	0.00	0.00	0.00	0.00	**0.24**	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 3A: 1990 Fish Densities

Length Class (in)	*Undiff Trout*	*Steelhead*		*Chinook*		*Rainbow*		*Cutthroat*	*Bull*	*Whitefish*
		W	*A*	*W*	*A*	*W*	*H*			
<2	**4.87**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	**0.85**	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	**4.76**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	**2.33**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	**0.63**	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 4A: 1991 Fish Densities

Length Class (in)	*Undiff Trout*	*Steelhead*		*Chinook*		*Rainbow*		*Cutthroat*	*Bull*	*Whitefish*
		W	*A*	*W*	*A*	*W*	*H*			
<2	**2.22**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	18.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	**11.11**	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	**6.22**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	**5.78**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 5A: Nez Perce Tribe Fall Chinook Spawning Ground Surveys

Length Class (in)	*Undiff Trout*	*Steelhead*		*Chinook*		*Rainbow*		*Cutthroat*	*Bull*	*Whitefish*
		W	*A*	*W*	*A*	*W*	*H*			
<2	0.00	**1.27**	0.00	**0.49**	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	**1.76**	0.00	**2.26**	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	**1.98**	0.00	**2.82**	0.00	0.00	0.00	**0.07**	0.00	0.00
4	0.00	**2.26**	0.00	**4.02**	0.00	0.00	0.00	**0.07**	0.00	0.00
5	0.00	**1.41**	0.00	**0.07**	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	**0.21**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	**0.07**	0.00	0.00	0.00	0.00	0.00	**0.07**	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.07**	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 6A: 2014 Fish Densities

Length Class (in)	*Undiff Trout*	*Steelhead*		*Chinook*		*Rainbow*		*Cutthroat*	*Bull*	*Whitefish*
		W	*A*	*W*	*A*	*W*	*H*			
<2	0.00	**0.00**	0.00	**0.47**	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	**0.00**	0.00	**0.21**	0.00	0.00	0.00	0.42	0.00	0.00
3	0.00	**0.00**	0.00	**0.00**	0.00	0.00	0.00	**0.21**	0.00	0.00
4	0.00	**0.00**	0.00	**0.00**	0.00	0.00	0.00	**0.16**	0.00	0.00
5	0.00	**0.00**	0.00	**0.00**	0.00	0.00	0.00	0.26	0.00	0.00
6	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.05**	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

A 1995 fish survey that found salmonid densities ranging from 4.8 to 10.4 (#/100m^2), 4 transects were surveyed, data can be located in the project record.

Table 7A: Summary of Nez Perce Tribe Fall Chinook Aerial Redd Counts

Observation Year	Middle Fork Clearwater (RK 120.4-157)	Selway (RK 0-30)
2008	0	5
2009	0	1
2010	0	1
2011	3	8
2012	3	20
2013	28	10
2014	82	31

The Tool: The NetMap Tool, a GIS spatial modeling system, was used to determine the relative sediment delivery to streams from roads using a GRAIP-lite application and the identification of the intrinsic habitat potential for steelhead trout. These models use local Forest information for roads and streams and combine them with a digital landscape. The landscape uses digital elevation models to create hillslopes, topographic features, and road and stream slopes. Information on general soil and vegetation types and local climate data are selected by the user to help give a better modeled representation of the area.

Intrinsic Habitat Potential for Steelhead

NetMap models the relative ranking of fish habitat quality for anadromous fish using preference curves and a geometric mean approach based on Burnett et al. (2007) ("Distribution of salmon habitat potential relative to landscape characteristics and implications for conservation." Ecological Applications 17(1): 66-80). Map 1B displays the NetMap results for intrinsic habitat potential for the Lower Selway River, refer to Figure A1 for actual steelhead distribution, e-fishing surveys were conducted in 2013-2014 and past surveys.

Figure A1: Intrinsic steelhead habitat potential for the Lower Selway River, 0= very low potential to 1= Very high steelhead intrinsic potential. With the exception of lower Goddard and O'Hara creeks, there is low steelhead intrinsic potential throughout much of the lower Selway.

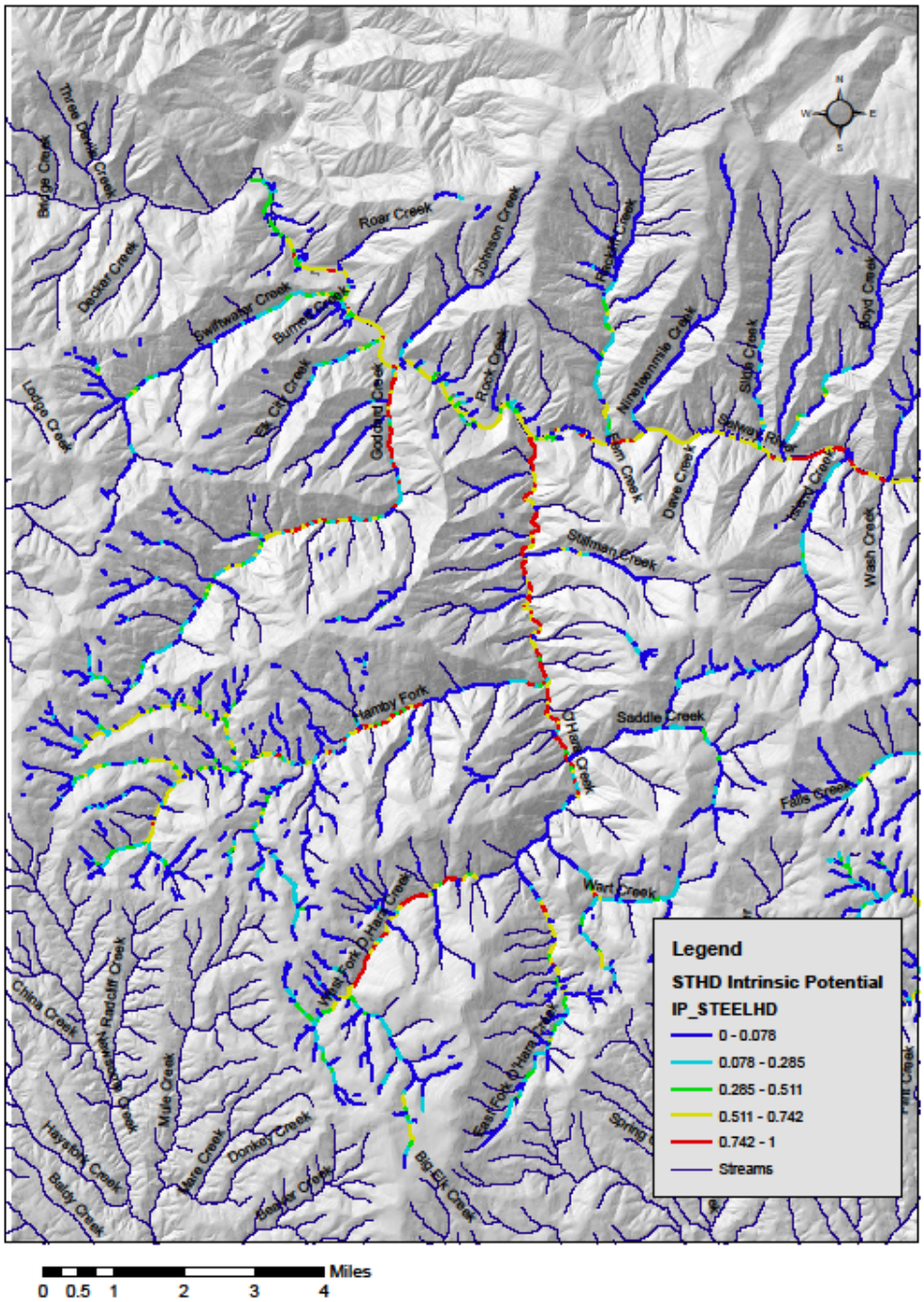
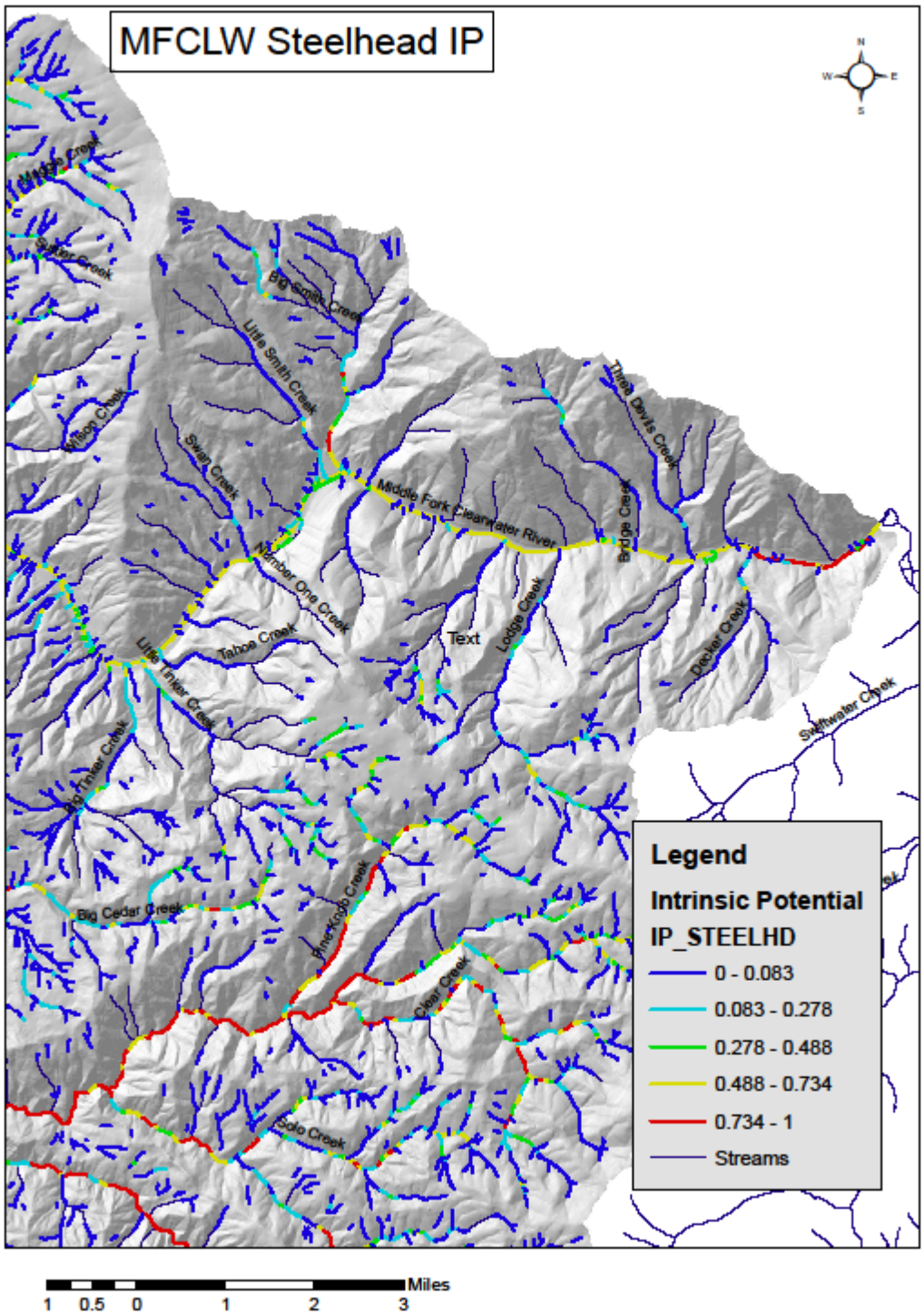


Figure A2: Intrinsic steelhead habitat potential for the Middle Fork Clearwater, 0= very low potential to 1= Very high steelhead intrinsic potential. There is low steelhead intrinsic potential throughout the Middle Fork Clearwater face drainages.



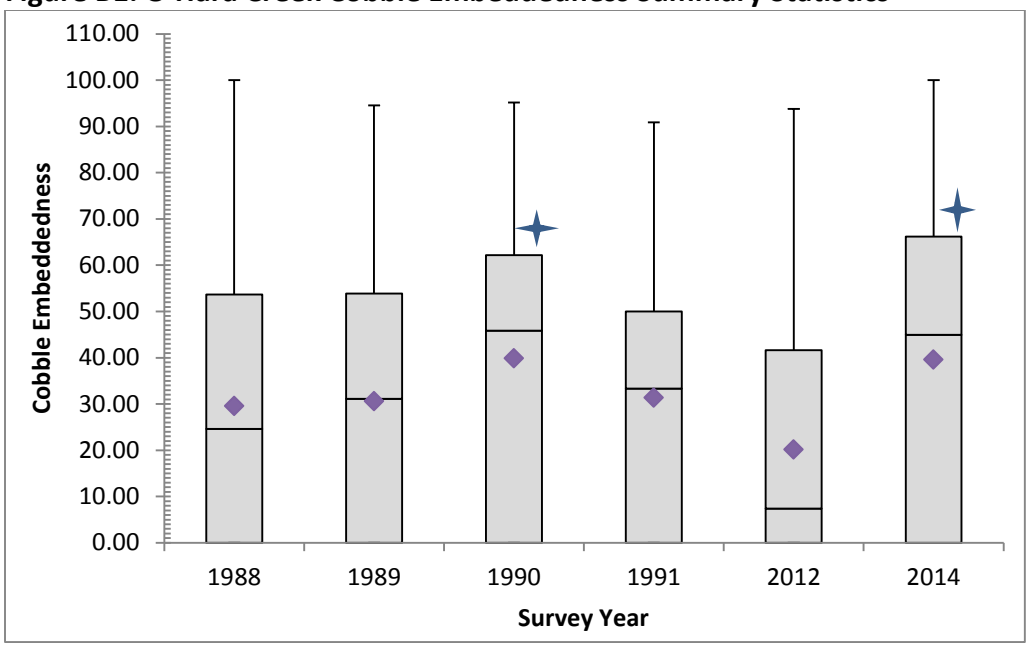
Appendix B

Temperature and Substrate Data

Table B1: Stream Temperature Monitored in the Analysis Area

Stream Site	Stream Temperature by Year (Seven day maximum average °C)																					
	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Selway at Mouth										23	25		25	26					23	26		23
Selway above FS boundary	19	24						22	22													
Selway above O'Hara Creek	23	25	20		19		21	24		22		23		25							13	21
Selway above Race Creek										21	22			24		20					17	20
Swiftwater Creek above FS. Boundary			13				17															
O'Hara Creek																			19	20		
EF O'Hara Creek					15					16												

Figure B1: O'Hara Creek Cobble Embeddedness Summary Statistics



This box and whisker plot is a display of summary statistics [mean (purple diamond), median, max, min, Q1 and Q3 with SD]. The asterisks mark years that were significantly different than the others. Below are the results of the Analysis of Variance (ANOVA), which detects any significant differences between mean weighted cobble embeddedness. Unfortunately, ANOVA through Excel, does not show where these differences lie so, a separate paired t-test with a Bonferonni adjustment was needed to detect these differences. The ANOVA did detect differences (p=5.64E-12). The paired t-test showed significant differences between the years (88 vs 90, 89 vs 90, 89 vs 2014, 90 vs 91, 90 vs 2012, and 2012 vs 2014), indicating the 1990 survey and 2014 were significantly different than other years. No trend was detected, the mean CE ranges between 10-47%.

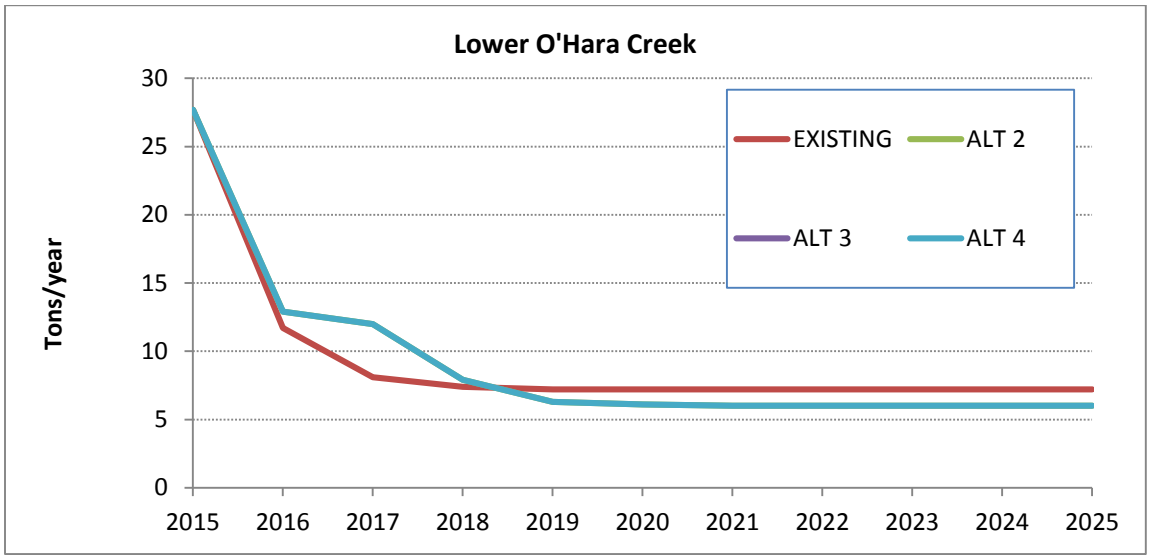
Appendix C

NEZSED and FISHSED Results

NEZSED and FISHSED Results

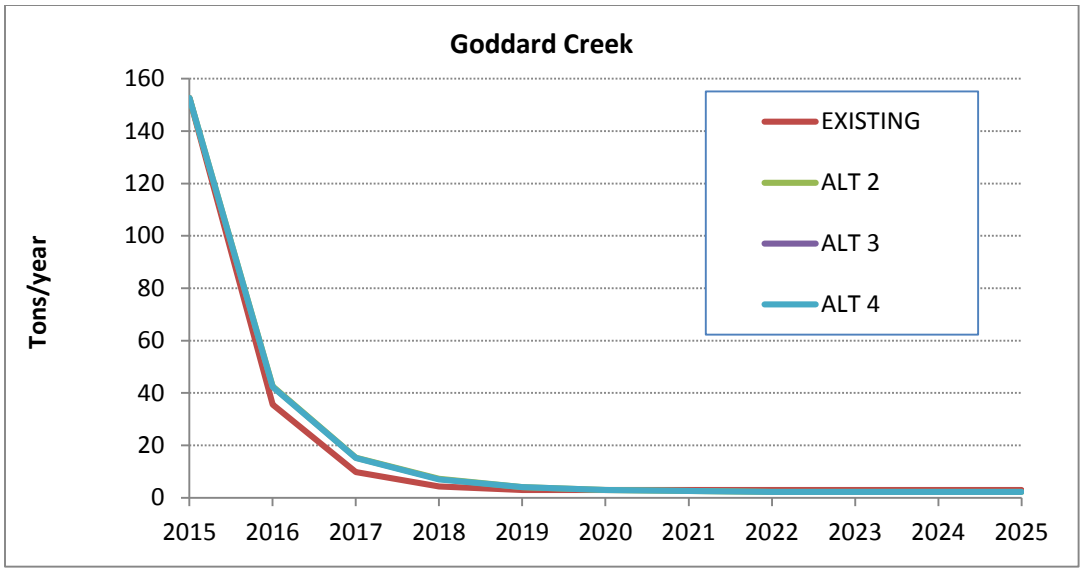
Figures C1 to C8: NEZSED sediment tons/year by alternative (10 years) and prescription watershed. Alternatives 2 and 4 have greater sediment yields due to ground based harvest, road improvements and decommissioning efforts reduce sediment yields below existing condition in some watersheds.

Figure C1: Lower O'Hara Creek



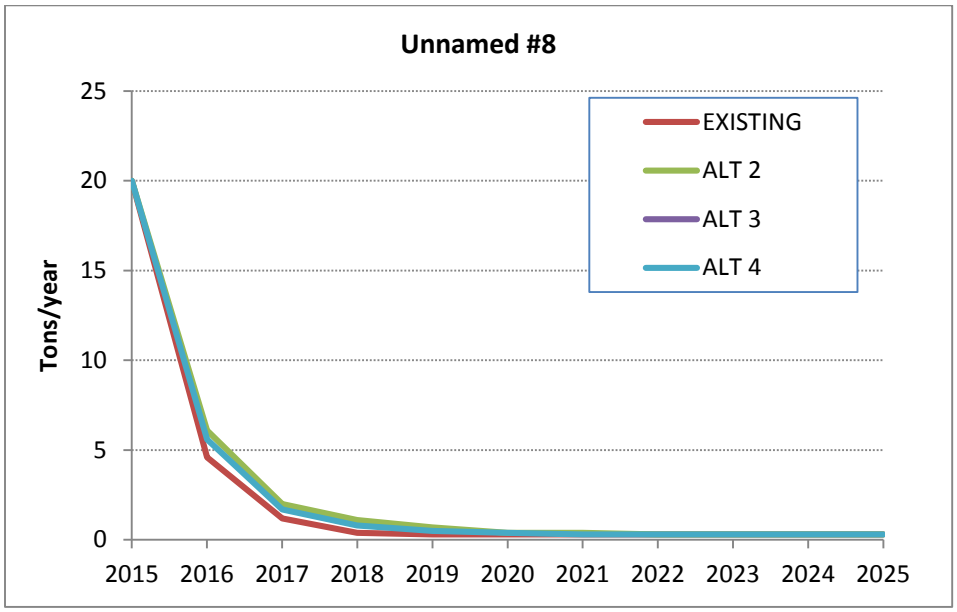
There are sediment increases for all Alternatives given proposed harvest activities and connected actions with an overall decrease in sediment below baseline with proposed road decommissioning activities and road improvements.

Figure C2: Goddard Creek



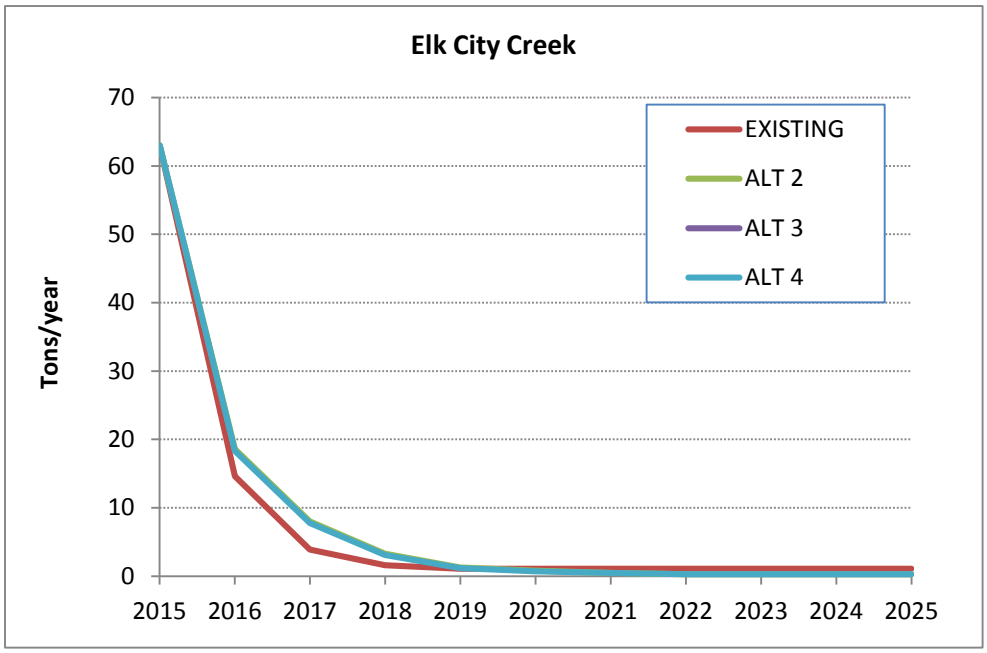
There is a slight sedimentation increase given proposed harvest activities under all action Alternatives then quickly reduces to baseline conditions.

Figure C3: Unnamed No. 8



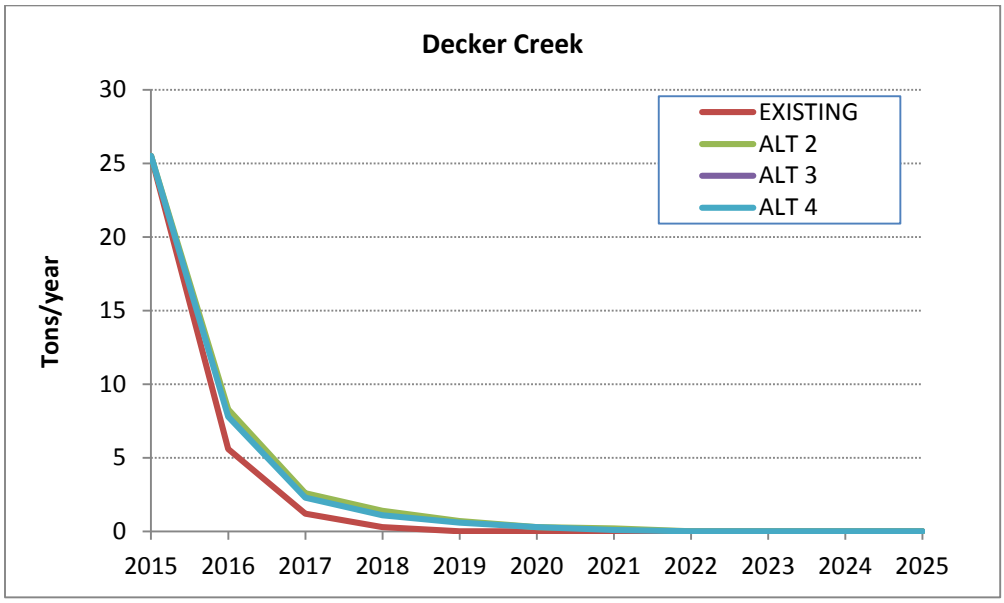
There is a slight sedimentation increase given proposed harvest activities under all action Alternatives then quickly reduces to baseline conditions.

Figure C4: Elk City Creek



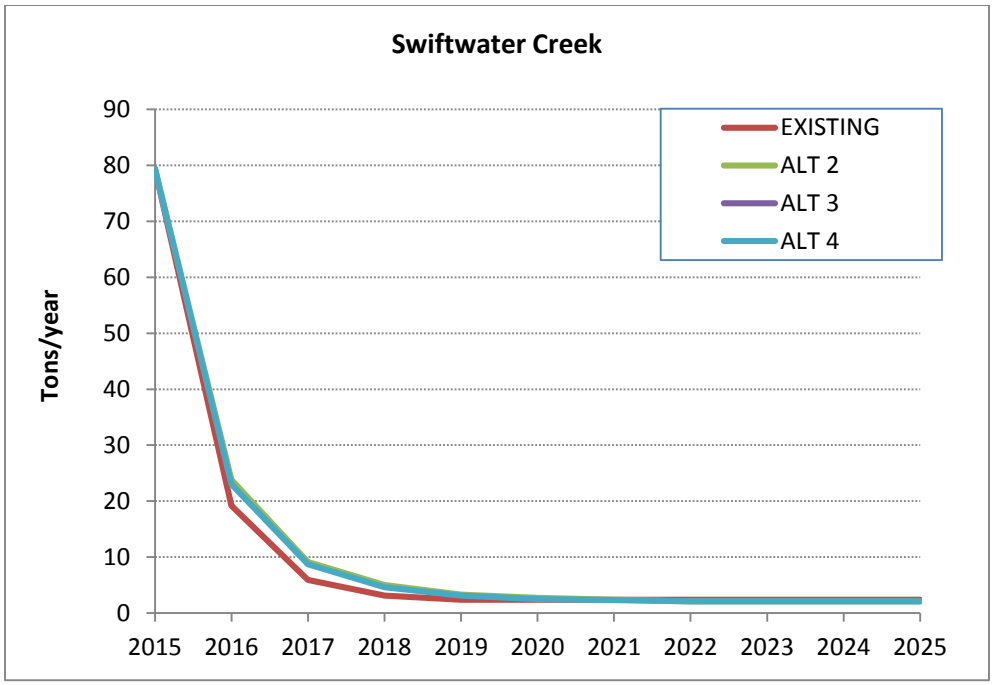
The spike in sedimentation is due to proposed harvest activities and road decommissioning efforts under all action Alternatives. Sedimentation decreases to baseline conditions after road decommissioning.

Figure C5: Decker Creek



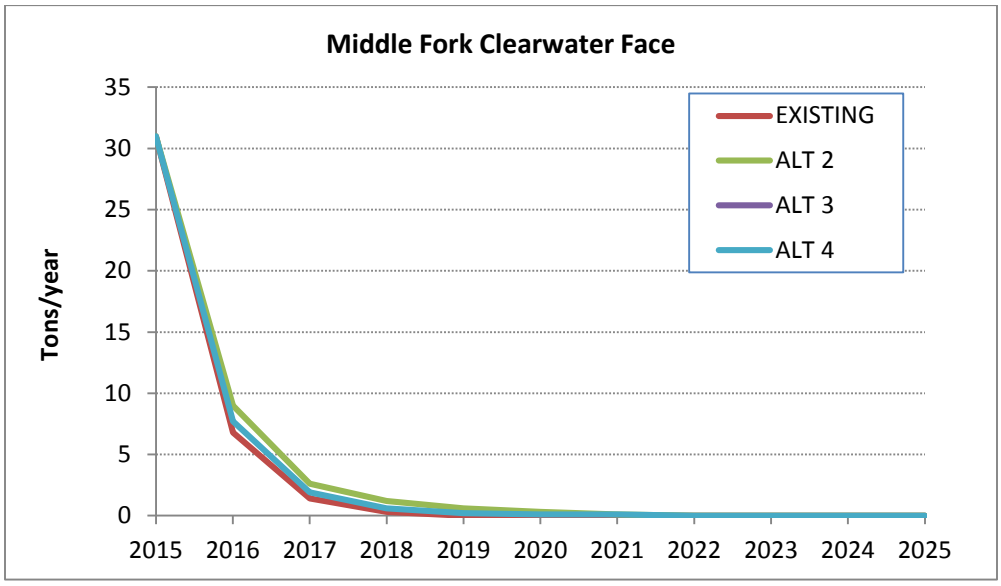
There is a slight sedimentation increase given proposed harvest activities under all action Alternatives then quickly reduces to baseline conditions.

Figure C6: Swiftwater Creek



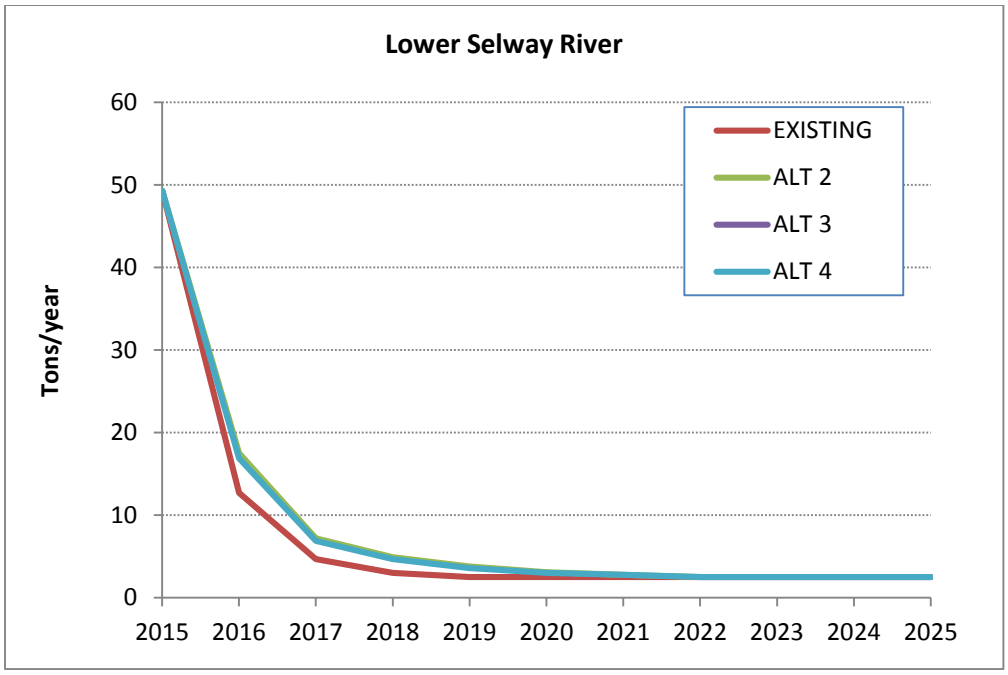
There is a slight sedimentation increase given proposed harvest activities under all action Alternatives then quickly reduces to baseline conditions.

Figure C7: Middle Fork Clearwater Face



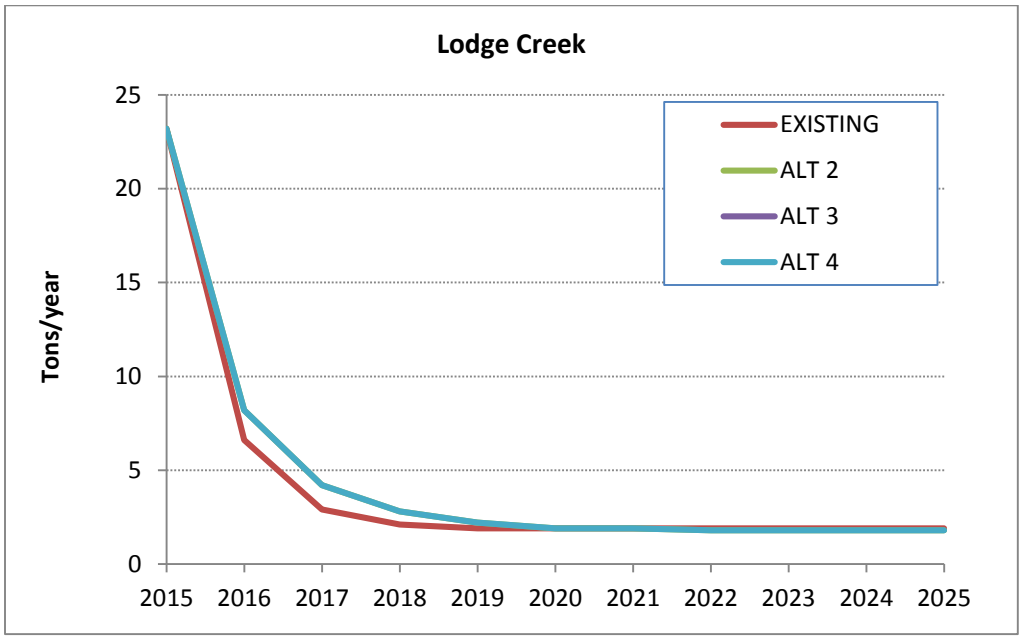
There is a slight sedimentation increase given proposed harvest activities under all action Alternatives then quickly reduces to baseline conditions.

Figure C8: Lower Selway River



There is a slight sedimentation increase given proposed harvest activities under all action Alternatives then quickly reduces to baseline conditions.

Figure C9: Lodge Creek



The spike in sedimentation is due to proposed harvest activities and road decommissioning efforts under all action Alternatives. Sedimentation decreases to baseline conditions after road decommissioning.

FISHSED results are in Tables C1 to C3. FISHSED does not generate trend over year but, only compares between treatments by Alternative.

Table C1: Summary of Summer Rearing Capacity by Alternative

Prescription Watershed	Pre-Fire Existing Condtion	Alt. 1 Existing Condition (Effect of Fire)	Alt. 2 (Effects of Fire and Alt.2)	Alt 3 (Effects of Fire and Alt. 3)	Alt. 4 (Effects of Fire and Alt. 4)
Lower O'Hara	91	91	91	91	91
Goddard Creek	83	82	82	82	82
Elk City Creek	80	79	78	78	78
Swiftwater Creek	88	88	88	88	88
Lower Selway River	86	86	86	86	86
Lodge Creek	91	91	91	91	91
Unnamed Number 8	86	86	86	86	86
Decker Creek	91	91	91	91	91
Middle Fork Clearwater Face	86	86	86	86	86

*These values do not represent percent of available habitat but are calcualtions based upon existing cobble embeddedness and response curve constants based upon channel type (Rosgen B) and species (steelhead).

Table C2: Summary of Winter Rearing Capacity by Alternative

Prescription Watershed	Pre-Fire Existing Condtion	Alt. 1 Existing Condition (Effect of Fire)	Alt. 2 (Effects of Fire and Alt.2)	Alt 3 (Effects of Fire and Alt. 3)	Alt. 4 (Effects of Fire and Alt. 4)
Lower O'Hara	28	28	28	28	28
Goddard Creek	18	17	17	17	17
Elk City Creek*	15	12	15	15	15
Swiftwater Creek	24	23	23	23	23
Lower Selway River	21	21	21	21	21
Lodge Creek	28	28	28	28	28
Unnamed Number 8	21	21	21	21	21
Decker Creek	28	28	28	28	28
Middle Fork Clearwater Face	21	21	21	21	21

*These values do not represent percent of available habitat but are calcualtions based upon existing cobble embeddedness and response curve constatns based upon channel type (Rosgen B) and species (steelhead).

Table C3: Predicted Increases in Cobble Embeddedness by Alternative and Percent Over Baseline

Prescription Watershed	Pre-Fire Condition		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	% Over Base	% CE	% Over Base	% CE	% Over Base	% CE	% Over Base	% CE	% Over Base	% CE
Lower O'Hara	1	37	1	37	1	37	1	37	1	37
Goddard	1	51	5	52	7	52	7	52	7	52
Elk City	1	55	15	56	20	57	19	57	19	57
Swiftwater	1	42	9	43	11	43	10	43	11	43
Lower Selway	0	46	1	46	2	46	2	46	2	46
Lodge Creek	1	37	1	37	2	37	2	37	2	37
Unnamed Number 8	0	46	1	46	3	46	3	46	2	46
Decker	0	37	3	37	6	38	6	38	6	38
Middle Fork Clearwater Face	0	46	0	46	0	46	0	46	0	46

Table C4: Percent reduction in winter and summer rearing habitat by Alternative. Reduction in rearing habitat capacity calculation: (rearing capacity by alternative – prefire rearing capacity)/prefire rearing capacity X 100.

Prescription Watershed	Pre-Fire Condition		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	% summer	% winter	% summer	% winter	% summer	% winter	% summer	% winter	% summer	% winter
Lower O'Hara	0	0	0	0	0	0	0	0	0	0
Goddard	-1	-6	-1	-6	-1	-6	-1	-6	-1	-6
Elk City	-1	0	-3	0	-3	0	-3	0	-3	0
Swiftwater	0	-4	0	-4	0	-4	0	-4	0	-4
Lower Selway	0	0	0	0	0	0	0	0	0	0
Lodge Creek	0	0	0	0	0	0	0	0	0	0
Unnamed Number 8	0	0	0	0	0	0	0	0	0	0
Decker	0	0	0	0	0	0	0	0	0	0
Middle Fork Clearwater Face	0	0	0	0	0	0	0	0	0	0

Appendix D

Upward Trend Analysis

Upward Trend Analysis for Prescription watersheds that are not currently meeting Fishery Water Quality Objectives and Habitat Potential (Nez Perce LRMP Appendix A).

Upward trend analysis is required in the Johnson Bar Salvage Project because timber harvest is proposed following a wildfire (Conroy and Thompson 2011, Appendix A Nez Perce LRMP). Watershed restoration projects including road improvements and road decommissioning efforts are proposed through Johnson Bar project activities within prescription watersheds. Aproximately 3.6 miles of the 21 miles to be decommissioned are within RHCAs. Although sediment delivery from these road segments was not quantified, restoring these segments and crossings to natural contours and vegetation will eliminate these existing or potential chronic sediment sources from the landscape. Additional restoration activities include BAER road improvements, culvert removals across the project area and several culvert replacements, along O'Hara creek on USFS 651 Road. The BAER funding and proposed activities will be implemented prior to the timber sale. Proposed project design criteria would help to minimize any additional adverse effects to fisheries and their aquatic habitat. The Johnson Bar Fire Salvage project includes the use of PACFISH riparian buffers, minimum road construction and reconstruction with no stream crossings, placement of roads on ridge tops, and the avoidance of landslide prone areas. The NPCNF will implement best management practices (BMPs) from the Idaho Forest Practices Act and Soil and Water Conservation Handbook and the 2012 National Best Management Practices to prevent non-channelized sediment delivery from harvest units and road building and maintenance to streams.

As described in the baseline habitat conditions Table 3-19 in the Fisheries report, existing cobble embeddedness (% WCE) is above cobble embeddedness objectives in 5 prescription watersheds, that are not currently meeting water quality and fisheries objectives. The other streams do not have past or current substrate data available or are meeting the Forest Plan water quality and fisheries objectives. As noted, many of the sample sites have only been sampled once or twice and this small samples size is not sufficient to determine trend. There is a Forest monitoring station on O'Hara Creek within the project area with long-term cobble embeddedness data (1988-2014). Figure B2 in Appendix B, does not display an obvious trend with significant increases in 1990 and 2014 samples, average WCE is 37% near or just above the 35% CE objective. To supplement Forest substrate data, there are 7 PIBO sites located within the Selway Basin, only a couple are located within the project area. The 2013 PIBO summary report found managed sites (Middle Fork Clearwater, Selway) in poorer condition than reference sites. The Selway sites indicated significant increases in percent fines, with other habitat perimeters remaining relatively constant, refer to PIBO 2013 summary report for more details within the project file. PIBO results can be somewhat skewed given the small sample size of both managed and reference reaches, so six additional PIBO sites will be added to the Selway Basin in 2015. Due to the inconclusive data, additional PIBO survey sites have been added along with intensive monitoring protocol. Below highlights some of the additional monitoring:

- Annual cobble embeddedness (CE) monitoring on Swiftwater, Elk City, and Goddard and O'Hara creeks. Baseline cobble embeddedness surveys were conducted in 2014 and additional baseline surveys will be conducted summer of 2015 on each of these streams. There will be two designated sites on Swiftwater Creek, one below and above the Idaho

Department of Lands. The site below IDL will be sampled before logging operations commence and later that season. Given the timing of salvage operation 2015-2017 there will likely be harvest operations conducted in several drainages at once so separating fire effects from harvest operations could be difficult but, where possible, CE would be monitored simultaneously in a drainage with harvest and one that is currently not undergoing harvest operations. Monitoring will continue at each site 3 years past the last harvest.

- Habitat surveys will continue to be conducted on Swiftwater and Goddard creeks. These are full stream surveys collecting, bank stability, stream geomorphology (pool riffle sequences and percent pool habitat), percent shade, Wolman pebble counts.
- PACFISH/INFISH Biological Opinion (PIBO) effectiveness monitoring will be ongoing (3-5 year rotation) within the Selway and Middle Fork Clearwater subbasin. Currently, there is PIBO EM site located within the specific Project Area (Goddard Creek). Six more monitoring sites will be added to the Selway subbasin.

A Forest Plan Monitoring Site has been established on O'Hara Creek. PACFISH riparian management objectives (RMOs) along with fish density are measured every three years. Given proposed actions this site will be revisited on an annual base.

Many of these streams are high gradient with natural barriers limiting fish distribution to lower stream reaches including Lodge and Decker Creek, unnamed tributaries to the Middle Fork Clearwater and Lower Selway Rivers. Recent stream surveys indicate anadromous fish distribution limited to lower portions of Swiftwater and Elk City creeks. Goddard and O'Hara are more productive fisheries with quality/quality habitat refer to Affected Environment section 3.5.5. Given the proposed actions, percent post-fire increase of fines above natural baseline under all Alternatives range from 1-5%, refer to Table C-3 in Appendix C and Figures C1 to C7. There is minimal increase in percent cobble embeddedness (Table C-3) with reduction in winter and summer rearing habitat of 1-6% (Table C4). These are assumed short-term effects with minimal long-term sediment effects (10 year NEZSED estimates Figures C1 to C7).

An Upward Trend assessment was conducted for each of the Forest Plan Prescription watersheds functioning below water quality/fisheries objectives. Alternative 1 (existing condition) was compared to Alternatives 2 (maximum alternative) for the short-term (0-5 years) and long-term (>5 years). Activities were given a rating based on the indicators shown in Table D1. Number ranges for each of the ratings were based on the relative affect at the Prescription watershed scale. The Upward Trend determination was calculated by assigning a value to the Low, Moderate, and High ranking (L=1, M=2, H=3) and then summarized. Vegetation treatment ranking system is slightly different, "High" ranking speaks to a greater ECA area or burned acres (L= -1, M= -2, H= -3).

Table D1: Rating Indicators

Proposed Activities	High	Moderate	Low
Vegetation Treatments Total harvest and burn Regen harvest	 >40% of watershed acres >25% of watershed acres	 15-40% of watershed acres 10-25% of watershed acres	<15% of watershed acres <10% of watershed acres >25% of watershed acres
Temporary Road Construction	>5% of watershed acres	2-5% of watershed acres	<2% of watershed acres
Road Improvement Road reconstruction Road recondition	 >75% of total roads >25% of total roads	 50-75% of total roads 15-25% of total roads	 <50% of total roads <15% of total roads
Road Decommissioning	>50% reduction	25-50% reduction	<25% reduction
RHCA Road Decommissioning	>50% reduction	25-50% reduction	<25% reduction
Non-System Road Decommissioning Riparian shade	 >40 miles >10 miles RHCA	 20-40 miles 5-10 miles RHCA	 <20 miles <5 miles RHCA
Stream Crossing Improvements Fish passage culverts	 >20 >3	 10-20 2-3	 <10 <2

Table D2: Upward Trend Analysis Lodge Creek

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
Vegetation Treatments	Surface erosion	Pulse and Chronic Sediment	-M	-L		Moderate to low burn severity ~20% of the watershed. Alt 2 proposes to salvage 96 acres, 3% total watershed disturbance (Table 3-8), Table 3-10 model estimates 63% reduction in sediment (tons/year) on an average annual basis with post treatment within units. Estimated increase in sediment yield under Alternative 2 over post-fire condition is 1%, Table 3-13.
	Mass failure risk	Pulse sediment	-L	-L		No vegetation treatment or skid trail construction would occur on landslide prone or high mass wasting areas
	Infiltration, runoff, peaks	Hydrologic process	-L	-L	-L	Only short-term increases in post-fire runoff, compacted soils minimized by skyline and helicopter harvest methods. Peak flows mitigated by post-harvest treatments and road decommissioning efforts.
	Solar heating	Riparian shade	-L			<3% of RHCAs burned at low fire severity. No vegetation treatment would occur in RHCAs.
Temporary Road Construction	Surface erosion	Pulse and Chronic Sediment		-L		Less than 0.5 acres of temp road construction, no temp road construction within RHCAs, or stream crossings. Channelized deposition in system road ditches – reduced by design criteria and cross drain culverts diverting material prior to stream crossings.
	Mass failure risk	Pulse sediment		-L		No temp road construction would occur on landslide prone or high mass wasting areas
	Infiltration, runoff, peaks	Hydrologic process		-L		Compacted soils could limit infiltration and concentrate flow in the short-term. Roads would be decompacted, recontoured, and revegetated.
	Riparian shade	Riparian condition				No temp road construction in RHCAs
Road Improvement	Surface erosion	Pulse and Chronic Sediment	-L	-L	+L	General Road maintenance is ongoing, ditch cleaning, minor road improvements/reconditioning (USFS 653 Rd, Refer to Table 6 and 7 in the BA), and logging truck haul could increase sediment delivery in the short-term. Gravel placement and additional cross drain culverts would reduce sediment delivery in the long-term.
	Infiltration, runoff, peaks	Hydrologic process	-L	+L	+L	Gravel placement and addition of cross drain culverts would slow overland flow and reduce runoff. Most of the roads reconditioned are on ridge-top with water connectivity.

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	Minimal road maintenance on closed roads has the potential for sediment delivery, especially at stream crossings. Potential for increased sediment delivery during road decomm activities and until road is revegetated.
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	Compacted soils allow for increased overland flow. Once roads are decompacted and recontoured infiltration would increase and concentrated overland flow would diminish. Culverts would be removed.
RHCA Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	See above under Road Decommissioning
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	See above under Road Decommissioning
	Riparian Shade	Riparian condition			+L	Vegetative recovery would be minimal given very small perand tree growth in long-term
Non-System Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	See above under Road Decommissioning
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	See above under Road Decommissioning
	Riparian Shade	Riparian condition			+L	Vegetative recovery and tree growth in long-term
Stream Crossing Improvement	Surface erosion	Pulse and Chronic Sediment		-L	+L	Undersized/failing culverts have the potential for chronic sediment delivery or plug/collapse causing road fill failure. Short-term, localized sediment could be delivered during implementation and until road fill slopes are stabilized and revegetated. Long-term culverts would allow for 100 year flows.
	Mass failure risk	Pulse sediment		+L	+L	
	Infiltration, runoff, peaks	Hydrologic process				
	Fish Passage	Habitat availability				Replacing culverts to allow for Aquatic Organism Passage increase available habitat
		Total	-6	-6	+11	Post-fire sedimentation effects from surface erosion and possible mass wasting events would be detectable (negative effects) in the short-term. Proposed harvest activities under Alternative 2 would be minimal given harvest methods, project design criteria and proposed road improvements and decommissioning efforts would be long-term beneficial watershed improvements.

Table D3: Goddard Creek Upward Trend Analysis

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
Vegetation Treatments	Surface erosion	Pulse and Chronic Sediment	-M	-L		Low to high burn severity (~40%) throughout much of the watershed. Alt 2 proposes to salvage 664 acres, 7% total watershed disturbance (Table 3-8), Table 3-10 model estimates 49% reduction in sediment (tons/year) on an average annual basis with post treatment within units. Estimated increase in sediment yield under Alternative 2 over post-fire condition is 1%, Table 3-13.
	Mass failure risk	Pulse sediment	-L	-L		No vegetation treatment or skid trail construction would occur on landslide prone or high mass wasting areas
	Infiltration, runoff, peaks	Hydrologic process	-L	-L	-L	Only short-term increases in post-fire runoff, compacted soils minimized by skyline and helicopter harvest methods. Peak flows mitigated by post-harvest treatments and road decommissioning efforts.
	Solar heating	Riparian shade	-L			<10% of RHCAs burned at low fire severity. No vegetation treatment would occur in RHCAs.
Temporary Road Construction	Surface erosion	Pulse and Chronic Sediment		-L		Less than 1.5 acres of temp road construction, no temp road construction within RHCAs, or stream crossings. Channelized deposition in system road ditches – reduced by design criteria and cross drain culverts diverting material prior to stream crossings.
	Mass failure risk	Pulse sediment		-L		No temp road construction would occur on landslide prone or high mass wasting areas
	Infiltration, runoff, peaks	Hydrologic process		-L		Compacted soils could limit infiltration and concentrate flow in the short-term. Roads would be decompacted, recontoured, and revegetated.
	Riparian shade	Riparian condition				No temp road construction in RHCAs
Road Improvement	Surface erosion	Pulse and Chronic Sediment	-L	-M	+M	General Road maintenance is ongoing, ditch cleaning, minor road improvements/reconditioning (Refer to Table 6 and 7 in the BA), and logging truck haul could increase sediment delivery in the short-term. Gravel placement and additional cross drain culverts would reduce sediment delivery in the long-term.

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
	Infiltration, runoff, peaks	Hydrologic process	-L	+L	+L	Gravel placement and addition of cross drain culverts would slow overland flow and reduce runoff
Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	Minimal road maintenance on closed roads has the potential for sediment delivery, especially at stream crossings. Potential for increased sediment delivery during road decomm activities and until road is revegetated.
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	Compacted soils allow for increased overland flow. Once roads are decompacted and recontoured infiltration would increase and concentrated overland flow would diminish. Culverts would be removed.
RHCA Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	See above under Road Decommissioning
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	See above under Road Decommissioning
	Riparian Shade	Riparian condition			+L	Vegetative recovery would be minimal given small percentage of road decommissioning within RHCAs.
Non-system Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	See above under Road Decommissioning
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	See above under Road Decommissioning
	Riparian Shade	Riparian condition			+L	Vegetative recovery and tree growth in long-term
Stream Crossing Improvement	Surface erosion	Pulse and Chronic Sediment		-L	+L	Undersized/failing culverts have the potential for chronic sediment delivery or plug/collapse causing road fill failure. Short-term, localized sediment could be delivered during implementation and until road fill slopes are stabilized and vegetated. Long-term culverts would allow for 100 year flows.
	Mass failure risk	Pulse sediment		+L	+L	
	Infiltration, runoff, peaks	Hydrologic process				
	Fish Passage	Habitat availability				Replacing culverts to allow for Aquatic Organism Passage increase available habitat

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
		Total	-7	-7	+12	Post-fire sedimentation effects from surface erosion and possible mass wasting events would be detectable (negative effects) in the short-term. Proposed harvest activities under Alternative 2 would be minimal given harvest methods, project design criteria and proposed road improvements and decommissioning efforts would be long-term beneficial watershed improvements.

Table D4: Swiftwater Creek Upward Trend Analysis

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
Vegetation Treatments	Surface erosion	Pulse and Chronic Sediment	-H	-M		Moderate to high burn severity (>50%) throughout much of the watershed. Alt 2 proposes to salvage 482 acres, 18% total watershed disturbance (Table 3-8). Total watershed disturbance from harvest includes proposed IDL salvage (170 acres) and private lands salvage that was harvested in Fall of 2014 (80 acres); all harvest is regeneration. Table 3-10 model estimates 43% reduction in sediment (tons/year) on an average annual basis with post treatment within units. Estimated increase in sediment yield under Alternative compared to post-fire condition is 3%, Table 3-13.
	Mass failure risk	Pulse sediment	-M	-L		No vegetation treatment or skid trail construction would occur on landslide prone or high mass wasting areas. Surface erosion throughout much of Swiftwater creek is naturally low too moderate throughout much of the project area, with some high risk erosion in upper Swiftwater Creek. There is a risk of mass failure in the short-term in areas of high burn severity shortly after post-fire condition. Harvest on both private and state salvage is on landtype that is moderate to chronic instability, according to IDL SHALSTAB model. IDL salvage harvest proposes helicopter logging only. A certain percentage of this can be mitigated with slash spreading, refer to Fisheries BA Figure 12 and 13.
	Infiltration, runoff, peaks	Hydrologic process	-M	-L	-L	Only short-term increases in post-fire runoff is expected given the percentage of moderate to high burn severity throughout much of the drainage. Compacted soils minimized by skyline and helicopter harvest methods. IDL salvage proposes helicopter logging only.

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
	Solar heating	Riparian shade	-L	-L	-L	Approximately 25% of RHCAs burned, but at low to moderate burn severity. This mosaic type burn and is not expected to increase stream temperatures in the short or long-term to a detectable level. No vegetation treatment would occur in RHCAs. There is a 75-foot no harvest buffer proposed through IDL salvage and approximately 50-foot buffer was maintained through private salvage operations. Buffers are assumed to be adequate to maintain riparian shade but, may affect large wood recruitment in the future.
Temporary Road Construction	Surface erosion	Pulse and Chronic Sediment		-L		Approximately 2.0 acres of temp road construction, no temp road construction within RHCAs, or stream crossings. Channelized deposition in system road ditches – reduced by design criteria and cross drain culverts diverting material prior to stream crossings. Roads would be obliterated after harvest.
	Mass failure risk	Pulse sediment		-L		No temp road construction would occur on landslide prone or high mass wasting areas.
	Infiltration, runoff, peaks	Hydrologic process		-L		Compacted soils could limit infiltration and concentrate flow in the short-term. Roads would be decompacted, recontoured, and revegetated.
	Riparian shade	Riparian condition				No temp road construction in RHCAs
Road Improvement	Surface erosion	Pulse and Chronic Sediment	-L	+M	+M	General Road maintenance is ongoing, ditch cleaning, minor road improvements/reconditioning (Refer to Table 6 and 7 in the BA), and logging truck haul could increase sediment delivery in the short-term. Gravel placement and additional cross drain culverts would reduce sediment delivery in the long-term. Reduction in sediment yield within the greater Goddard Creek-Selway subwatershed is 3.8 ton/year.
	Infiltration, runoff, peaks	Hydrologic process	-L	+L	+L	Gravel placement and addition of cross drain culverts would slow overland flow and reduce runoff
Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	Minimal road maintenance on closed roads has the potential for sediment delivery, especially at stream crossings. Potential for increased sediment delivery during road decomm activities and until road is revegetated.

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	Compacted soils allow for increased overland flow. Once roads are decompacted and recontoured infiltration would increase and concentrated overland flow would diminish. Culverts would be removed.
RHCA Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	See above under Road Decommissioning
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	See above under Road Decommissioning
	Riparian Shade	Riparian condition				Vegetative recovery would be minimal given very small percentage of riparian road decommissioning.
Non-system Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	See above under Road Decommissioning. 3.5 miles of roads are proposed for road decommissioning decreasing road density to 2.4 mi/mi^2.
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	See above under Road Decommissioning
	Riparian Shade	Riparian condition			+L	Vegetative recovery and tree growth in long-term
Stream Crossing Improvement	Surface erosion	Pulse and Chronic Sediment		-L	+L	Undersized/failing culverts have the potential for chronic sediment delivery or plug/collapse causing road fill failure. Short-term, localized sediment could be delivered during implementation and until road fill slopes are stabilized and revegetated. Long-term culverts would allow for 100 year flows.
	Mass failure risk	Pulse sediment		+L	+L	
	Infiltration, runoff, peaks	Hydrologic process				
	Fish Passage	Habitat availability				Replacing culverts to allow for Aquatic Organism Passage increase available habitat

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
		Total	-10	-5	+10	Post-fire sedimentation effects from surface erosion and possible mass wasting events would be detectable (negative effects) in the short-term. Proposed harvest activities under Alternative 2 would not add to increased measurable sedimentation and proposed road improvements and decommissioning efforts would be long-term beneficial watershed improvements. Some of this would be mitigated through some project design criteria; refer to cumulative effects section in the BA. IDL is in compliance with the Idaho Forest Practices Act. There could be both short-term, long-term effects from proposed IDL and private harvest, however, upward trend is partially achieved through proposed road decommissioning efforts and road improvements under Alternative 2 and natural watershed recovery post fire. These restoration activities would be long-term benefits to Swiftwater Creek watershed as a whole.

Table D5: Elk City Creek Upward Trend Analysis

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
Vegetation Treatments	Surface erosion	Pulse and Chronic Sediment	-H	-M		Low to high burn severity (>50%) throughout much of the watershed. Alt 2 proposes to salvage 500 acres, 25% total watershed disturbance (Table 3-8), Table 3-10 model estimates 44% reduction in sediment (tons/year) on an average annual basis with post treatment within units. Estimated increase in sediment yield under Alternative 2 over post-fire condition is 5%, Table 3-13. There are an additional 140 acres proposed for private salvage, which would include both ground and cable yarding.
	Mass failure risk	Pulse sediment	-L	-L		No vegetation treatment or skid trail construction would occur on landslide prone or high mass wasting areas under all alternatives. Private salvage has proposed activities in landslide prone areas.
	Infiltration, runoff, peaks	Hydrologic process	-L	-L	-L	Only short-term increases in post-fire runoff, compacted soils minimized by skyline and helicopter harvest methods. Peak flows mitigated by post-harvest treatments and road decommissioning efforts.
	Solar heating	Riparian shade	-L			Approximately 15% of RHCAs burned at low fire severity. No vegetation treatment would occur in RHCAs.
Temporary Road Construction	Surface erosion	Pulse and Chronic Sediment		-L		Less than 1.5 acres of temp road construction, no temporary road construction within RHCAs, or stream crossings. Channelized deposition in system road ditches – reduced by design criteria and cross drain culverts diverting material prior to stream crossings.
	Mass failure risk	Pulse sediment		-L		No temporary road construction would occur on landslide prone or high mass wasting areas under the action alternatives. Temporary road construction and reconstruction of existing road template has been proposed under private salvage operations, but will be decommissioned after use.
	Infiltration, runoff, peaks	Hydrologic process		-L		Compacted soils could limit infiltration and concentrate flow in the short-term. Roads would be decompacted, recontoured, and revegetated.
	Riparian shade	Riparian condition				No temporary road construction in RHCAs

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
Road Improvement	Surface erosion	Pulse and Chronic Sediment	-L	-L	+L	General Road maintenance is ongoing, ditch cleaning, minor road improvements/reconditioning (Refer to Table 6 and 7 in the BA), and logging truck haul could increase sediment delivery in the short-term. Gravel placement and additional cross drain culverts would reduce sediment delivery in the long-term. General road maintenance has been proposed under private harvest operations.
	Infiltration, runoff, peaks	Hydrologic process	-L	+L	+L	Gravel placement and addition of cross drain culverts would slow overland flow and reduce runoff
Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	Minimal road maintenance on closed roads has the potential for sediment delivery, especially at stream crossings. Potential for increased sediment delivery during road decomm activities and until road is revegetated.
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	Compacted soils allow for increased overland flow. Once roads are decompacted and recontoured infiltration would increase and concentrated overland flow would diminish. Culverts would be removed. Landings used in the private salvage activities would be obliterated and recontoured after use; haul roads and skid trails would be seeded with suitable drainage features installed per Idaho Forest Plan standards to stabilize haul roads and skid trails.
RHCA Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-M	+M	See above under Road Decommissioning. Road decommissioning of JB-128 to 131.
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	See above under Road Decommissioning
	Riparian Shade	Riparian condition			+L	Vegetative recovery would be minimal given very small percentage and tree growth in long-term
Non-system Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	See above under Road Decommissioning. Road decommissioning of JB-128 to 131.
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	See above under Road Decommissioning
	Riparian Shade	Riparian condition			+L	Vegetative recovery and tree growth over long-term
Stream Crossing Improvement	Surface erosion	Pulse and Chronic Sediment		-L	+L	Undersized/failing culverts have the potential for chronic sediment delivery or plug/collapse causing road fill failure.

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
	Mass failure risk	Pulse sediment		+L	+L	Short-term, localized sediment could be delivered during implementation and until road fill slopes are stabilized and revegetated. Long-term culverts would allow for 100 year flows.
	Infiltration, runoff, peaks	Hydrologic process		-L	+L	
	Fish Passage	Habitat availability		-L	+L	1 culvert replacement on Lower Elk City Creek through proposed BAER projects. Culvert is undersized and a partial barrier to anadromous fish at high spring flows. Replacing culverts to allow for Aquatic Organism Passage increase available habitat. Elk City Creek does not provide ideal winter rearing habitat but, there is approximately 0.5-1.0 miles of potential spawning and summer rearing habitat.
		Total	-8	-10	+14	Post-fire sedimentation effects from surface erosion and possible mass wasting events would be detectable (negative effects) in the short-term. Proposed harvest activities under Alternative 2 would be minimal given harvest methods, project design criteria and proposed road improvements and decommissioning efforts would be long-term beneficial watershed improvements. There could be both short- and long-term effects from proposed private harvest activities; however, upward trend would be achieved through proposed road decommissioning and improvement efforts under the action alternatives, and natural watershed recovery post-fire. These restoration activities would be long-term benefits to Elk City Creek watershed as a whole.

Table D6: Lower O'Hara Creek Upward Trend Analysis

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
Vegetation Treatments	Surface erosion	Pulse and Chronic Sediment	-M	-L		Low to moderate burn severity (~10%) throughout much of the watershed. Alt 2 proposes to salvage 122 acres, 1% total watershed disturbance (Table 3-8), Table 3-10 model estimates 52% reduction in sediment (tons/year) on an average annual basis with post treatment within units. Estimated increase in sediment yield under Alternative 2 over post-fire condition is 0% Table 3-13.
	Mass failure risk	Pulse sediment	-L	-L		No vegetation treatment or skid trail construction would occur on landslide prone or high mass wasting areas
	Infiltration, runoff, peaks	Hydrologic process	-L	-L	-L	Only short-term increases in post-fire runoff, compacted soils minimized by skyline and helicopter harvest methods. Peak flows mitigated by post-harvest treatments and road decommissioning efforts.
	Solar heating	Riparian shade	-L			<10% of RHCAs burned at low fire severity. No vegetation treatment would occur in RHCAs.
Temporary Road Construction	Surface erosion	Pulse and Chronic Sediment		-L		Less than 1.0 acres of temp road construction, no temp road construction within RHCAs, or stream crossings. Channelized deposition in system road ditches – reduced by design criteria and cross drain culverts diverting material prior to stream crossings.
	Mass failure risk	Pulse sediment		-L		No temp road construction would occur on landslide prone or high mass wasting areas
	Infiltration, runoff, peaks	Hydrologic process		-L		Compacted soils could limit infiltration and concentrate flow in the short-term. Roads would be decompacted, recontoured, and revegetated.
	Riparian shade	Riparian condition				No temp road construction in RHCAs
Road Improvement	Surface erosion	Pulse and Chronic Sediment	-L	-M	+M	General Road maintenance is ongoing, ditch cleaning, minor road improvements/reconditioning (Refer to Table 6 and 7 in the BA), and logging truck haul could increase sediment delivery in the short-term. Gravel placement and additional cross drain culverts would reduce sediment delivery in the long-term. 7 culvert replacements and reconditioning on USFS 651 Rd.
	Infiltration, runoff, peaks	Hydrologic process	-L	+L	+L	Gravel placement and addition of cross drain culverts would slow overland flow and reduce runoff

Action	Process Affected	Characteristic Indicator	Alt 1 (Existing Condition/Post Fire)	Alt 2 Short-term	Alt 2 Long-term	Explanations
Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	Minimal road maintenance on closed roads has the potential for sediment delivery, especially at stream crossings. Potential for increased sediment delivery during road decomm activities and until road is revegetated, USFS 653 and spur roads.
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	Compacted soils allow for increased overland flow. Once roads are decompacted and recontoured infiltration would increase and concentrated overland flow would diminish. Culverts would be removed.
RHCA Road Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	See above under Road Decommissioning.
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	See above under Road Decommissioning
	Riparian Shade	Riparian condition			+L	Vegetative recovery would be minimal given very small percentage and tree growth in long-term
Non-system Decommissioning	Surface erosion	Pulse and Chronic Sediment		-L	+L	See above under Road Decommissioning. Road decommissioning on JB-131 to 148
	Infiltration, runoff, peaks	Hydrologic process		+L	+L	See above under Road Decommissioning
	Riparian Shade	Riparian condition			+L	Vegetative recovery and tree growth over long-term
Stream Crossing Improvement	Surface erosion	Pulse and Chronic Sediment		-M	+M	Undersized/failing culverts have the potential for chronic sediment delivery or plug/collapse causing road fill failure. Short-term, localized sediment could be delivered during implementation and until road fill slopes are stabilized and revegetated. Long-term culverts would allow for 100 year flows.
	Mass failure risk	Pulse sediment		+M	+M	
	Infiltration, runoff, peaks	Hydrologic process		-M	+M	
	Fish Passage	Habitat availability				Replacing culverts to allow for Aquatic Organism Passage increase available habitat.
		Total	-7	-9	+15	Post-fire sedimentation effects from surface erosion and possible mass wasting events would be detectable (negative effects) in the short-term. Proposed harvest activities under Alternative 2 would be minimal given harvest methods, project design criteria and proposed road improvements and decommissioning efforts would be long-term beneficial watershed improvements.

Table D7: Prescription Watersheds Summary of Upward Trend Analysis

Prescription Watershed	Maximum increase in allowable Sediment Yield	Entry Frequency- # of years in 1 decade sediment yield guidelines can be approached or equaled.	% change in rearing habitat (Action Alternatives		Meeting Upward Trend	Rationale
			Summer	Winter		
Lodge Creek	45	2 Refer to past harvest activities Fisheries section 3.5.6.4. and past regeneration and commercial thinning harvest in Table 16 of the BA.	0	0	Y	Natural disturbance of wildfire can have short-term negative effects but, with possible long-term watershed benefits refer to existing condition section Fisheries section 3.5.7.1. Sediment yield under proposed action alternatives is below allowable sediment yield and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10% reduction in rearing habitat. Proposed 2.0 miles of road decommissioning reduces overall road density, refer to Hydrology, Table 3-12 for estimated reduction in road density. Proposed harvest activities would be designed to minimize any adverse effects to fisheries. Proposed road improvements on haul routes in Lodge Creek would reduce sediment delivery by 1.0 (tons/year), Table 3-11. The 653C, 653Am abd 653A1 are proposed for decommissioning. Ongoing and cumulative effects were analyzed in Table 3-24. Upward trend activities associated with Lodge Point Project and Middle Fork Vegetation Project include 3 miles of road decommissioning the 77826, 9724, and parts of the 653A1 roads. The Lodge Point sale also made road improvements and culvert upgrades to the 653 and 77766A roads. Culverts were removed and the 77766A1 Road was put into storage. In addition, the Clear Creek Project is proposing to decommission the 77770 and 77742A roads. Refer to Table 3-24, that analyses suppression efforts, ongoing road maintenance and permitted grazing.
Goddard Creek	45	2 Refer to past harvest activities Fisheries section 3.5.6.4. and past regeneration and commercial thinning harvest in Table 16 of the BA.	1-3% reduction in summer rearing habitat	6% reduction in winter rearing habitat	Y	Sediment yield under proposed action alternatives is below allowable and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10% in summer or winter rearing habitat. Proposed 4.4 miles of road decommissioning would reduce overall road density (Table 3-12) and store several miles of roads. Proposed harvest activities and road construction would be designed to minimize any adverse effects to fisheries. Ongoing and cumulative effects were analyzed in Table 3-24. Cumulative effects to consider in Upward Trend analysis are past road decommissioning, for example approximately 3.2 miles of past road decommissioning in Goddard Creek, which includes 9701D, 9723Am 1119E, 1129F1, 1129F, 119F, and 77791 roads. Refer to Table 25 in the BA for details on decommissioning effects from the JB-

Prescription Watershed	Maximum increase in allowable Sediment Yield	Entry Frequency- # of years in 1 decade sediment yield guidelines can be approached or equaled.	% change in rearing habitat (Action Alternatives		Meeting Upward Trend	Rationale
			Summer	Winter		
						163 and 168, 77763 and 77788. Refer to Table 3-24, that analyses suppression efforts, ongoing road maintenance and permitted grazing.
Swiftwater Creek	45	2 Refer to past harvest activities Fisheries section 3.5.6.4. and past regeneration and commercial thinning harvest in Table 16 of the BA.	0	4% reduction in winter rearing habitat.	Y	Natural disturbance of wildfire can have short-term negative effects but, with possible long-term watershed benefits refer to existing condition section Fisheries section 3.5.7.1. Sediment yield under proposed action alternatives is below allowable sediment yield and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10% reduction in rearing habitat. Proposed 3.5 miles of road decommissioning reduces overall road density, refer to Hydrology, Table 3-12 for estimated reduction in road density. Proposed harvest activities would be designed to minimize any adverse effects to fisheries. Proposed road improvements on Haul routes in Swiftwater-Goddard Creek would reduce sediment delivery by 3.8 (tons/year), Table 3-11. Ongoing and cumulative effects were analyzed in Table 3-24. Cumulative effects to consider in Upward Trend analysis are past road decommissioning, for example approximately 4.6 miles of past road decom in Upper Swiftwater Creek. Refer to Table 25 in the BA for details on decommissioning effects of JB 100-125 rods and 77835. Refer to Table 3-24, that analyses suppression efforts, ongoing road maintenance and permitted grazing. Additional cumulative effects considered in this upward trend analysis include the IDL state salvage activities and private land salvage. A portion of permanent road construction is located in lower Swiftwater prescription watershed. Some mitigated efforts on USFS lands include proposed road decommissioning (3.5 miles).
Elk City Creek	70	3 Refer to past harvest activities Fisheries section 3.5.6.4. and past regeneration and commercial thinning harvest in Table 16 of the BA.	1-3% reduction in summer rearing habitat	0-20% reduction in winter rearing habitat.	Y	Natural disturbance of wildfire can have short-term negative effects but, with possible long-term watershed benefits refer to existing condition section Fisheries section 3.5.7.1. Sediment yield under proposed action alternatives is below allowable sediment yield and meets entry frequency guidelines. Post-fire percent change in winter rearing capacity does exceed 10% reduction in rearing habitat under Alternatives 2-4. Proposed 4.4 miles of road decommissioning reduces overall road density, refer to Hydrology, Table 3-12 for estimated reduction in road density. Proposed harvest activities would be designed to minimize any adverse effects to fisheries. There are a few

Prescription Watershed	Maximum increase in allowable Sediment Yield	Entry Frequency- # of years in 1 decade sediment yield guidelines can be approached or equaled.	% change in rearing habitat (Action Alternatives		Meeting Upward Trend	Rationale
			Summer	Winter		
						roads within Elk city Creek, thus few USFS road improvements/reconstruction and no past road decommissioning efforts or permitted grazing. Johnson Bar suppression efforts and effects are summarized in Table 3-24. Additional cumulative effects considered in this upward trend analysis include the IDL state salvage activities. A portion of permanent road construction is located in the lower Elk City prescription watershed. Some mitigated efforts on USFS lands include proposed road decommissioning (4.4 miles).
Lower O'Hara	30	1 Refer to past harvest activities Fisheries section 3.5.6.4. and past regeneration and commercial thinning harvest in Table 16 of the BA.	0% reduction in summer rearing habitat	0% reduction in winter rearing habitat	Y	Natural disturbance of wildfire can have short-term negative effects but, with possible long-term watershed benefits refer to existing condition section Fisheries section 3.5.7.1. Sediment yield under proposed action alternatives is below allowable sediment yield and meets entry frequency guidelines. Percent change in rearing capacity does not exceed 10% reduction in summer and winter rearing habitat. Proposed 5.7 miles of road decommissioning reduces overall road density, refer to Hydrology, Table 3-12 for estimated reduction in road density. Proposed harvest activities would be designed to minimize any adverse effects to fisheries. There would not be a significant reduction in sediment delivery given proposed road improvements, Table 3-11. Ongoing and cumulative effects were analyzed in Table 3-24. Cumulative effects to consider in Upward Trend analysis are past instream watershed restoration efforts (1990s), previous instream efforts will continue to increase habitat complexity. Culvert upgrades (7) on the 651 Road (Letter to the file 2014, implementation 2015 and 2017). Culvert upgrades would reduce long-term sediment inputs and restore hydrologic processes to lower O'Hara creek. Past instream efforts will continue increase instream habitat complexity. There is no permitted grazing within Lower O'Hara Creek.

The upward trend for the Johnson Bar prescription watersheds are primarily a result of riparian areas that are mostly intact with minimal effects from the fire or land management activities. Also, the majority of roads are graveled and positioned to have minimal effects to streams. The Forest Plan Appendix A Implementation Guide (Conroy and Thompson 2011) states "It was assumed in the Forest Plan that implementation of instream restoration and other watershed restoration activities would result in an upward trend in carrying capacity. Where these activities have been implemented, it could be stated that an upward trend in habitat conditions has been accomplished." Watershed restoration activities in the form of road improvement, culvert replacement, and road decommissioning have been, and continue to be, implemented in the project area. These have contributed to the upward trend in fish habitat carrying capacity based on the Appendix A guidance document.

Although short-term effects to modeled sediment yield are expected with the implementation of the Johnson Bar Fire Salvage Project, they are less than those that could occur under Alternative 1 (No Action). The No Action alternative does not address road-related sediment issues beyond what projects have already been completed. Short-term (<5 years) negative effects with long-term beneficial effects to sediment yield would be expected as a result of the road improvement and decommissioning activities. Modeled sediment yield using NEZSED shows an increase in 6 of the 9 prescription watersheds, but all remain well below Forest Plan water quality objectives (FEIS Table 3-13). Modeling in FISHSED shows increases in cobble embeddedness of 0-1% over post-fire conditions (FEIS Table C3). This is below the 10% threshold where changes might occur based on the model documentation (Stowell, 1983). The results showed no differences between post-fire and post-project conditions for fish rearing habitat capacity (FEIS Table C4). Upward trend of aquatic and watershed conditions, particularly related to sediment, would therefore be realized over the long-term (>5 years), primarily as a result of road related projects. In addition, BMPs and project specific design criteria would be implemented in order to minimize sediment additions to streams.

The long-term benefits in reduced sediment input to streams would be a result of project activities, which include placing 5 miles of roads into storage, decommissioning 21 miles of system and non-system roads, reconstructing 17 miles to improve drainage, and conduct 58 miles of road maintenance in association with the timber sale. These long-term benefits are based on a detailed WEPP analysis of treatment units and roads, which predicted a reduced probability and magnituge of erosion and sediment delivery from roads and treated hillslopes as compared to the No Action alternative. The restriction of hauling to dry or frozen conditions on hydraulically connected haul routes would also minimize risk of sediment delivery from roads a a result of hauling operations. Upcoming culvert replacements in O'Hara Creek would also reduce the risk of culvert failure at these crossings. Road improvements through the BAER process, as well as general road maintenance activities, would also reduce erosion and sedimentation from the road system and burned areas within the project area.

In summary, the Johnson Bar Fire Salvage Project would have minimal short-term negative effects associated with modeled sediment increases but would have a long-term positive effect associated with road improvements and decommissioning. The combined road-related projects are expected to maintain an upward trend through reduced sediment delivery and runoff from

roads to stream and aquatic habitats throughout the watershed. Reduced chronic sediment delivery would be expected to allow for a continued upward trend for reduced cobble embeddedness levels and improved fish habitat carrying capacity over time.

APPENDIX E

Wildlife Eliminated from Detailed Analysis

Table E1 lists Nez Perce National Forest TES, sensitive species and management indicator species that may occur in the project area boundary. Additional columns display if suitable habitat is present and/or would be affected in the project area for the associated species. Another column displays if the animal is known to be in the project area, and the determination column shows if the proposed project actions are likely to affect the species or habitat.

Species highlighted in gray are analyzed in detail in the wildlife section of Chapter 3 in the EIS. Species non-highlighted were dropped from detailed study if: 1) habitat (and therefore the species) is not present; 2) habitat is protected by regulations, policies, laws, or project design criteria; or 3) no activities are proposed in suitable habitats such that there would be no effect; effects would be improbable; or the effects would be immeasurable.

Table E1: Threatened (T), sensitive (S), and management indicator species (MIS) that the Nez Perce portion of the National Forest must evaluate for each project. A yes (Y) or no (N) indicates how this project would affect each species.

Species Name	Status	Habitat Present	Habitat Affected	Known Occurance	Determination
Canada Lynx (*Lynx canadensis*)	T	N	N	*N	NE
American Peregrine Falcon (*Falco peregrinus anatum*)	S, MIS	N	N	N	NI
Bald Eagle (*Haliaeetus leucocephalus*)	S, MIS	Y	N	Y	MIIH
Black-backed woodpecker (*Picoides arcticus*)	S	Y	Y	Y	MIIH
Black Swift (*Cypseloides niger*)	S	N	N	N	NI
Common Loon (*Gavia immer*)	S	N	N	N	NI
Coeur d'Alene salamander (*Plethodon idahoensis*)	S	Y	N	Y	NI
Flammulated Owl (*Otus flammeolus*)	S	Y	Y	Y	MIIH
Fisher (*Martes pennant*)	S, MIS	Y	Y	Y	MIIH

Species Name	Status	Habitat Present	Habitat Affected	Known Occurance	Determination
Fringed Myotis (*Myotis thysanodes*)	S	Y	Y	N	MIIH
Gray Wolf (*Canis lupus*)	S, MIS	Y	Y	Y	MIIH
Harlequin Duck (*Histrionicus histrionicus*)	S	N	N	N	NI
Long-billed curlew (*Numenius americanus*)	S	N	N	N	NI
Long-eared myotis (*Myotis evotis*)	S	Y	Y	Y	MIIH
Long-legged myotis (*Myotis volans*)	S	Y	Y	Y	MIIH
Mountain Quail (*Oreortyx pictus*)	S	N	N	N	NI
North American Wolverine (*Gulo gulo luscus*)	S	Y	N	N	NI
Pygmy Nuthatch (*Sitta pygmaea*)	S	Y	N	N	NI
Ringneck snake (*Diadophis punctatus*)	S	Y	N	N	NI
Townsend's big-eared bat (*Corynorhinus townsendii*)	S	N	N	N	NI
Western Toad (*Bufo boreas*)	S	Y	N	N	NI
White-headed woodpecker (*Picoides albolarvatus*)	S	N	N	N	NI
American Marten (*Martes Americana*)	MIS	Y	Y	N	
Bighorn Sheep (*Ovis canandensis*)	S, MIS	N	N	N	NI

Species Name	Status	Habitat Present	Habitat Affected	Known Occurance	Determination
Grizzly Bear (*Ursus arctos horribillis)*	MIS	Y	N	Unknown	currently unoccupied status
Northern Goshawk (*Accipiter gentilis*)	MIS	Y	Y	Y	
Pileated Woodpecker (*Dryocopus pileatus*)	MIS	Y	Y	Y	
Rocky Mountain Elk (*Cervas elaphus*)	MIS	Y	N	Y	
Shiras Moose (*Alces Alces*)	MIS	Y	Y	N	

*- Not seen since 1999. Determinations: NE= no effects; NI= no effects; MIIH= may affect individuals or their habitats, but not likely to result in a trend to federal listing or a reduced viability for the population or species.

Species Dropped from Detailed Analysis

Not all management indicator species (MIS) and Forest sensitive species or their habitats occur in the analysis area. Species unlikely to be present due to insufficient habitat and/or species unaffected by proposed activities include: Canada lynx, American peregrine falcon, bighorn sheep, black swift, common loon, Coeur d' Alene salamander, grizzly bear, harlequin duck, long-billed curlew, mountain quail, north American wolverine, ring-neck snake, Townsend's big-eared bat and yellow-billed cuckoo. These species will not be considered in detail in this assessment.

Canada Lynx

The project area is not in a lynx analysis area (LAU). No lynx observations or signs have been detected in the project area. The proposed activities for this project would have ***no impact*** on the Canada lynx or its habitat. The lynx was dropped from detailed analysis.

American Peregrine Falcon

This species is a Nez Perce National Forest sensitive species and an Idaho species of greatest conservation need (IDFG 2005). Peregrine falcons nests on ledges on steep cliff faces. No cliff habitat has been identified in the PA. No peregrine falcons have been detected in the project area. The proposed activities would have ***no impact*** on this species and it was dropped from detailed study.

Bighorn Sheep

This species is a Nez Perce National Forest sensitive species and management indicator species and an Idaho species of greatest conservation need (IDFG 2005). There is no suitable habitat or detections of the sheep in the analysis area, therefore the proposed activities would have ***no impact*** on this species and it was dropped from detailed study.

Black Swift

This species is a Nez Perce National Forest sensitive species and an Idaho species of greatest conservation need (IDFG 2005). The black swift is a neotropical migratory bird that nests in moist cliff environments, preferring high elevation mountains. Nests are built on cliff ledges, near or behind waterfalls or in shallow caves. Riparian habitats would be protected by implementing Forest Plan Amendment 20 (PACFISH) and no suitable habitat is known to occur in the project area. Researchers found that most of Idaho's Black Swift observations occurred in the northern panhandle, north of the Lochsa River. They concluded that "South of the Lochsa River the more highly metamorphosed Precambrian Belt rocks lose some of their layering as they change into schist, probably reducing the availability of nesting ledges like those at Shadow and Fern falls. Our observations of nest-site habitat at Shadow and Fern falls and the prevalence of summer sight records in [northern Idaho] suggest that any northern Idaho waterfall on sedimentary rock may meet the requirements of nesting Black Swifts and should be investigated. Additional field work should enhance our knowledge of the distribution of Black Swifts in Idaho." *(*Levad 2007). The author used quotes from Dumroese, R. K., M. R. Mousseaux, S. H. Sturts, D. A. Stephens, and P. A. Hollick. 2001. Idaho Black Swifts nesting habitat and spacial analysis of records. *Western Birds* 32:218-227.

The proposed activities would have ***no impact*** on this species and it was dropped from detailed study.

Coeur d' Alene salamander

The salamander has been observed (1998, 2002) in tributaries to the Selway River. Potential habitat features are present in the analysis area, however, no activities are proposed in the streams or adjacent riparian habitats. The action alternatives would affect 15-16 acres of the upper portions of RHCAs. The proposed road decommissioning activities would reduce potential future sedimentation into the affected tributaries that empty into the Selway River. The project would have ***no impact*** on this species and it was dropped from detailed analysis.

Common Loon

This species is a Nez Perce National Forest sensitive species. It is found in rivers, pond and lake environments. No ponds or lakes are present in the project area. No harvest activities would occur adjacent to the Selway or Middle Fork of the Clearwater rivers. The proposed activities would have ***no impact*** on this species and it was dropped from detailed study.

Grizzly bear

Despite numerous studies and many reported bear observations, there have been no verifiable sightings of grizzly bears in the last 60 years until an adult male grizzly bear was mistakenly

killed by a black bear hunter in September 2007 in the northern mountains of the Bitterroot Ecosystem.

In November 2000, the U.S. Fish and Wildlife Service (FWS) published a Record of Decision (ROD) for a Final Environmental Impact Statement to reintroduce bears in the Bitterroot Ecosystem. The preferred alternative selected in the ROD called for establishment of a nonessential experimental population of grizzlies in the Bitterroot ecosystem under section 10(j) of the Endangered Species Act. The decision was to reintroduce grizzly bears only into the Selway-Bitterroot Wilderness Area unless it was later determined that reintroduction in the Frank Church-River of No Return Wilderness also was appropriate. The State of Idaho sued to block the plan.

The Service is now reevaluating this Record of Decision and is proposing a "No Action" alternative. The U.S. Fish and Wildlife Service proposes to concentrate recovery efforts and resources on existing grizzly bear populations in the lower 48 states and to withdraw its plan to reintroduce grizzly bears into the Bitterroot ecosystem of Idaho and Montana. Public comment on this proposal was received but there has not been a final decision. If the No Action alternative is selected, grizzly bears would not be reintroduced into the Bitterroot ecosystem.

The analysis area falls within the Bitterroot Grizzly Bear Experimental Population Area but outside the Recovery Area. The Bitterroot Grizzly Bear Recovery Area consists of the Selway-Bitterroot Wilderness and the Frank Church-River of No Return Wilderness. The Recovery Area is located within the Experimental Population Area, and is the area where grizzly bear recovery would be emphasized.

Because the FWS is re-considering grizzly reintroduction into the Bitterroot ecosystem, pending State of Idaho litigation if implementation of a reintroduction program is proposed, and since there has been only one verifiable grizzly sighting in the Clearwater basin in the last 60 years, the grizzly will not be further considered in detail in this analysis.

Harlequin duck

Harlequin summer habitat is not expected to be affected by the salvage project. Records of the bird in the river portions along the project area (1 detection in 1995) indicate potential presence. Potential breeding habitat is further upstream on the Selway and Lochsa Rivers. Project activities would not occur in the duck's habitat, and foraging opportunities would remain available. The project would have ***no impact*** on this species and no further analysis is required.

Long-billed Curlew

Long-billed curlews nest in open short-grass or mixed-prairie habitat with level or slightly rolling topography and in general avoid areas of trees, high-density shrubs, and tall, dense grasses. The non-forested areas in the analysis are limited and do not provide suitable habitat for this species. This project would have ***no impact*** on this species; therefore it was dropped from detailed study.

Mountain Quail

Recent surveys in Idaho indicated mountain quail are commonly found only in the lower Salmon River drainage, particularly the Little Salmon River Canyon of Idaho County (Brennan 1989; Robertson 1989, 1990; Heekin et al. 1995). There is no favorable habitat in the PA for the mountain quail. Therefore, ***no impact*** to the mountain quail or its habitat.

North American Wolverine

Year-round habitat is at high elevation, in or above tree line, basins and rock chutes that have sources of food for the wolverine. Deep and persistent snow habitats with reliable snow cover lasting through mid-April to May is the best predictor of wolverine occurrence (USFWS 2013, 2014). The PA lacks such habitat. No modelled habitat was shown by GIS models and no occurrence of the wolverine has been recorded in the project area. This project would have ***no impact*** on the wolverine.

Pygmy Nuthatch

Approximately 21 acres of potential ponderosa pine habitat was shown to be in the project area. This is a very small amount of potential habita that would not be connected to other habitat needed to support a small population of birds. Project activities would not affect the potential habitat, the bird has not been seen in the area; thefore, there would be ***no impact*** to the pygmy nuthatch.

Ring-neck Snake

In west–central Idaho, ring-necked snakes are typically found adjacent to perennial rivers or streams in grassland or forested habitats (IDFG 2005). It is known to use forested and brushy areas or open hillsides with rocks or other debris to hide in, and may even use moist microhabitats (Storm and Leonard 1995). The snake is nocturnal and hides underground or under surface cover during the day.

Modelled habitat (VRU3) showed about 192 acres on the west side of the Selway River, near the confluence with the Lochsa River. No detections of the snake have occurred in this area. None of the action alternatives in the proposed project would affect any habitat for the snake. This salvage project would cause ***no impact*** to the ring-neck snake.

Townsend's Big-eared Bat

Townsend observations have been confirmed on both the Clearwater and Moose Creek Ranger Districts. Romin and Bosworth (2010) found this bat just northeast of the analysis area on the Moose Creek Ranger District along the Selway River in the vicinity of Goddard Creek.

Perkins (1992) surveyed some of the most suitable hibernacula and maternity/nursery roost sites on the Nez Perce Forest during summer and winter without finding any recent evidence or presence of Townsend's big-eared bat on the Forest. He suggested that their occurrence on the forest is peripheral and does not involve reproductive activities. The probable occurrence of this bat outside the Salmon and Snake River riparian areas is extremely low and initial population indicators suggest less than 10 on the Forest (Perkins).

Because the PA does not have cave habitat, it is unlikely that Townsend's big-eared bats use snags as day or night roosting habitat or forage in the area. For this reason, they were dropped from detailed analysis and the project would have ***no impact*** on this bat.

Western Toad

The toad is found in a variety of habitats but lives in or near water. Western toads eat a variety of insects and have been found in burned over areas (Guscio et al. 2007). GIS modelling calculated about 4,620 acres of potential toad habitat- all in riparian areas. No harvest units from any of the action alternatives would affect modelled toad habitat. Wildlife occurrence databases revealed no records of western toads in the Project area.

The effects of the Johnson Bar fire would likely create a pulse of insect activity in the post-burned locations that would be favorable for toads to forage on. For this reason, the western toad was dropped from detailed analysis and the project would have ***no impact*** on this amphibian.

White-headed Woodpecker

In Idaho all observations of the woodpeckers were in mature and old stands of mixed ponderosa pine and Douglas-fir with open canopies and relatively low density of trees (Frederick and Moore 1991). Bull et al. (1986) noted that only ponderosa pine and ponderosa pine forest types were used as foraging areas by white-headed woodpeckers. White-headed woodpeckers forage on insects such as ants, wood boring beetles, spiders, and fly larvae gleaned from tree bark, branches, and foliage from May to September (Blair and Servheen 1995). Potential white-headed woodpecker habitat was analyzed from GIS models. Only 15 acres were detected, and of this, proposed salvage harvest units would affect ½ acre in all action alternatives. With minimal acres present and the potential modification of 0.5 acres, the project would have an immeasurable affect to the woodpecker. No observations of the woodpecker haveoccurred in the PA. The proposed project activities would have ***no impact*** to the white-headed woodpecker.

Using Leege et. al. 1984:
Guidelines for Nez Perce 1987 Forest Plan

FORM 1

Calculated by: Glen Gill

AREA: 302017141

Date: 7-23-2015

ALTERNATIVE: Existing

ESTIMATING QUALITY OF ELK SUMMER HABITAT IN NORTHERN IDAHO

1. Total size of evaluation area in usable acres* 7102 **(A)**; and square miles **(A ÷ 640)** 11.1 **(B)**

2. Potential elk use as affected by roads.**

		Vegetation Adjacent to Roads					
		Hiding Cover			Open		
Road Type	**Road Status**	**Miles (C)**	**Coeff. (D)**	**Std. Miles (C x D) (E)**	**Miles (C)**	**Coeff. (D)**	**Std. Miles (C x D) (E)**
Main	Open	2.5	.80	2		1.20	
	Closed—hunting season		.71			1.06	
	Closed (w/gates)	5.5	.24	1.32		.36	
	Closed (w/barrier)		.08			.12	
	Closed completely		.00			.00	
Secondary	Open		.50			.90	
	Closed—hunting season		.44			.80	
	Closed (w/gates)		.15			.27	
	Closed (w/barrier)		.05			.09	
	Closed completely	4.3	.00	0		.00	
Primitive	Open		.03			.07	
	Closed—hunting season		.03			.06	
	Closed (w/gates)		.01			.02	
	Closed (w/barrier)	12.9	.01	0.129		.01	
	Closed completely		.00			.00	

Subtotal Std. Miles 3.4 **(F)** 0 **(F)**

Total Std. Miles **(F + F)** 3.4 **(G)**

Miles of standard road per square mile **(G ÷ B)** .31 **(H)**

Percent of potential elk use after road effects [use **(H)** and **Fig. 2**] 84% % **(I)**

*All acres usable *except* talus, water surface, and other areas elk would not use because of *natural* features—may also include winter range.

**Refer to Table 2 for coefficient information and definitions of road and vegetation types.

Using 1997 Guidelines (Servheen et al.)

FORM 1

Calculated by: G. Gill
Date: 7-23-2015

AREA: 3020 17141
ALTERNATIVE: Existing

ESTIMATING QUALITY OF ELK SUMMER HABITAT IN NORTHERN IDAHO

1. Total size of evaluation area in usable acres[1] 7102 (A); and square miles (A÷640) 11.1 (B)
2. Potential elk use as affected by roads.[2]

		Vegetation Adjacent to Roads					
		Hiding Cover			Open		
Road Type	Road Status	Miles (C)	Coeff. (D)	Std. Miles (C x D) (E)	Miles (C)	Coef. (D)	Std. Miles (CxD) (E)
Arterial/Collector	Open	2.5	.80	2		1.20	
	Closed w/ gates	5.5	.24	1.32		.36	
	Closed w/ barrier		.08			.12	
	Closed completely		.00			.00	
Local	Open		.50			.90	
	Closed w/ gates		.15			.27	
	Closed w/ barrier		.05			.09	
	Closed completely	4.3	.00	0		.00	
Temporary Road & System Trail	Open		.03			.07	
	Closed w/ gates		.01			.02	
	Closed w/ barrier	12.9	.01	0.129		.01	
	Closed completely		.00			.00	

Subtotal Std. Miles 3.4 (F) 0 (F)

Total Std. Miles (F+F) 3.4 (G)

Miles of standard road per square mile (G+B) 0.31 (H)

Percent of potential elk use after road effects [use (H) and Fig. 2] 84% (I)

[1]All acres usable *except* talus, water surface, and other areas elk would not use because of *natural* features--may also include winter range.

[2]Refer to Table 2 for coefficient information and definitions of road and vegetation types.

Using 1997 Guidelines (Servheen et. al.)

FORM 2

Calculated by: Glen Gill

Date: 7-22-2015

AREA: 302017141

ALTERNATIVE: Existing

ESTIMATING QUALITY OF ELK SUMMER HABITAT IN NORTHERN IDAHO
(continued)

	Pre-Sale	Post Sale	Post-Sale Alternatives	
3. Potential elk use as related to livestock density				
Square Miles within evaluation area used by Livestock	(J) 11.1			
Total cattle equivalents using area	(K) 70			
Cattle equivalents per sq. mi. (K÷J)	(L) 6.3			
Percent of potential elk use [use (L) and Fig.3]	(M) 100%	%	%	%
Percent of elk use period used by livestock	(N) 29 %	%	%	%
Weighted percent of potential elk use on livestock portion (MxN) + 100 (100-N) / 100	(P) 100 %	%	%	%
Percent of potential use on entire evaluation area (PxJ) + 100 (B-J) / B	(Q) 100 %	%	%	%
4. Potential elk use as related to other factors. (Refer to Table 3)				
Size and distribution of hiding and thermal cover	0 %	%	%	%
Size and distribution of forage areas	9 %	%	%	%
Adequacy of security areas	0 %	%	%	%
Total decrease from these factors	9 %	%	%	%
Potential elk use remaining (100-R)	91 %	%	%	%

	Pre-Sale	Post Sale Alternatives		
5. EXISTING AND LOG-TERM POTENTIAL ELK USE				
Potential elk use of home range	100 %	%	%	%
Potential use as related to roads	(I) 84 %	%	%	%
Potential use as related to livestock	(Q) 100 %	%	%	%
Potential use as related to other factors	(S) 91 %	%	%	%
REMAINING POTENTIAL ELK USE	(T) 73 %	%	%	%

(100%)x (I)/100x(Q)/100x(S)/100 =

Using Lange et al. 1984:
Guidelines for Nez Perce 1987 Forest Plan

FORM 2

Calculated by: Glen Gill

Date: 7-23-2015

AREA: 302017141

ESTIMATING QUALITY OF ELK SUMMER HABITAT IN NORTHERN IDAHO
(continued)

cattle on for June 1 – Sept 15
Days = 30+31+31+15=107

3. Potential elk use as related to livestock density.

		Pre-Sale	Post-Sale Alternatives		
Square miles within evaluation area used by livestock	(J)	11.1			
Total cattle equivalents using area	(K)	70			
Cattle equivalents per sq. mi. (**K** ÷ **J**)	(L)	6.3			
Percent of potential elk use [use (**L**) and **Fig. 3**]	(M)	100 %	%	%	%
Percent of elk use period used by livestock	(N)	29 %	%	%	%
Weighted percent of potential elk use on livestock portion $\frac{(M \times N) + 100\,(100 - N)}{100}$	(P)	100 %	%	%	%
Percent of potential elk use on entire evaluation area $\frac{(P \times J) + 100\,(B - J)}{B}$	(Q)	100 %	%	%	%

107 ÷ 365 = 0.29

4. Potential elk use as related to other factors. (Refer to Table 3)

Size and distribution of hiding and thermal cover		-0 %	-%	-%	-%
Size and distribution of forage areas		-9 %	-%	-%	-%
Adequacy of security areas		-0 %	-%	-%	-%
Total decrease from these factors	(R)	-9 %	-%	-%	-%
Potential elk use remaining (100 - **R**)	(S)	91 %	%	%	%

5. EXISTING AND LONG-TERM POTENTIAL ELK USE

		Pre-Sale	Post-Sale Alternatives		
Potential elk use of home range		100%	100%	100%	100%
Potential use as related to roads	(I)	84 %	%	%	%
Potential use as related to livestock	(Q)	100 %	%	%	%
Potential use as related to other factors	(S)	91 %	%	%	%
REMAINING POTENTIAL ELK USE $(100\%) \times \frac{(I)}{100} \times \frac{(Q)}{100} \times \frac{(S)}{100} =$ EHE	(T)	73 %	%	%	%
LONG TERM POTENTIAL ELK USE (see instructions p. 13)	(U)	%	%	%	%
PERCENT CHANGE FROM PRE-SALE CONDITION 100 (Pre-Sale **T**-**U**) ÷ Pre-Sale **T**	(V)	%	%	%	%

APPENDIX F

Roads Analysis

Roads

Roads Analysis

According to the Forest Service Road Management Policy published 12 January 2001, all NEPA decisions signed after 12 January 2002, which involve certain changes in the transporation system, must be informed by a Roads Analysis. In accordance with FSM 7712.1, the analysis was conducted at the project level scale and limited to the salvage project. The roads analysis was an interdisciplinary process that would provide the Responsible Official information on the needs, opportunities, and priorities for the road system in order to inform the decision making process. The analysis concluded that the remaining transportation system is sufficient for Forest needs, while at the same time, road decommissioning would move the area towards desired future conditions and reduce effects to fisheries and watersheds.

Road Decommissioning

Roads identified in this document for decommissioning are not needed for future land management activities. Roads are categorized as system or non-system roads. System roads are part of the inventoried Forest Service road system and are currently maintained for management activities. Non-system roads are not part of the inventoried Forest Service road system and are not maintained to any standard. These roads were identified through imagery (LiDAR) and ground surveys. Non-system roads are not open to public access and are typically grown over with trees and inaccessible. Non-system roads in this document are identified by JB-#.

Road decommissioning practices vary depending on the road location and the risk of road failure and are specific for each road. Practices vary from full recontour of the road back to natural slope to road abandonment which requires no ground disturbing activities.

Roads that have moderate to high risk of failure, that are near fish bearing streams or are being used by unauthorized vehicles would require full decompaction and natural slope recontour. All roads with stream crossings, heavy compaction from traffic or other watershed concerns would be recontoured including stream grade channel restoration. Roads identified in this project not meeting the above criteria may be abandoned. Abandoned roads typically require no stream crossing restoration, are well vegetated, are resistant to surface erosion and are not prone to mass failure. During implementation system and non-system roads are held to the same standards for decommissioning.

Road Storage

Roads identified in this document for road storage are needed for future land management activities but would not be used for access for an extended amount of time. Roads placed in storage do not require regular maintenance reducing funding required in order to maintain the Forest Service road system. Road storage practices vary depending on the risk of road failure and future access requirements. Practices vary from removal of culverts and addition of water bars to accommodate hydraulic flows to road closure devises to close the road to vehicle traffic. Each road placed into storage shall have a specific prescription designed to protect the watershed for the duration of road storage.

Road Maintenance

Each road used for timber haul in accordance with this project would be maintained or brought to standard for the road use. Roads will be either reconditioned or reconstructed before the start of the project based on the existing condition of the roadway. Road would also be maintained to standard throughout the project for safe traffic movement and protection of the watershed.

Reconditioning roads consists of standard maintenance, such as road blading, brushing, removal of small cut slope failures, small shoulder repair, applying rock in wet areas and removal of obstructions such as rocks and trees. Reconditioning also includes maintenance of existing culverts and installation of drainage dips.

Reconstruction of a roadway improves the roadway to bring it to required standards for haul. This includes replacing and installing new culverts for cross drains and live water culverts, placement of rock surfacing, placement of roadway fill, road realignment due to failures and installation of new signs or gates. Other activities may include installation of drainage dips, road blading, brushing and removal of obstructions.

The definitions above do not include all activities that can be completed under each classification; these definitions are for informational purposes only.

Below is a list of roads requiring road maintenance based on proposed use and the current condition of the roadway. As the project continues, road failures or different access may require the type of work and roads requiring work to change. This is an approximation of road work for the Johnson Bar Fire Salvage Project.

Table F1: Road Reconstruction Effects

Road Number	Road Name	Proposed Work	Effects
470	Swiftwater	Reconstruction, includes culvert replacements and new installation and shoulder repair	Culvert replacement on perennial non-fish bearing tributaries to Swiftwater Creek. Increased sediment for short duration, unlikely to have measurable indirect effects to fisheries, no direct effects. Culvert replacement is approximately 1.5 miles above occupied steelhead habitat.

Road Number	Road Name	Proposed Work	Effects
470B	Swiftwater Spur B	Reconstruction, includes removal of road closure and culvert installation	Culvert replacement on perennial non-fish bearing tributaries to Swiftwater Creek. Increased sediment for short duration, unlikely to have measurable indirect effects to fisheries, no direct effects. Culvert replacement is approximately 0.5 mile above occupied steelhead habitat.
653A	Lodge Point	Reconstruction, includes culvert installation	Culvert replacement in wetland/seep areas. No active stream channels, no downstream effects to fisheries in Lodge Creek.
653A1	Burning Lodge	Reconstruction, includes removal of road closure and culvert installation	Culvert replacement in wetland/seep areas. No active stream channels, no downstream effects to fisheries in Lodge Creek.
653C	Dirty Socks	Reconstruction, includes culvert installation; may include removal of road closure	Culvert replacement in wetland/seep areas. No active stream channels, no downstream effects to fisheries in Lodge Creek.
9723B	Elk Ridge	Reconstruction, includes culvert installation	Replacement of a relief culvert, which is not in an active stream channel so there would be no downstream effects to fisheries in Elk City Creek.

F2: Road Decommissioning Effects

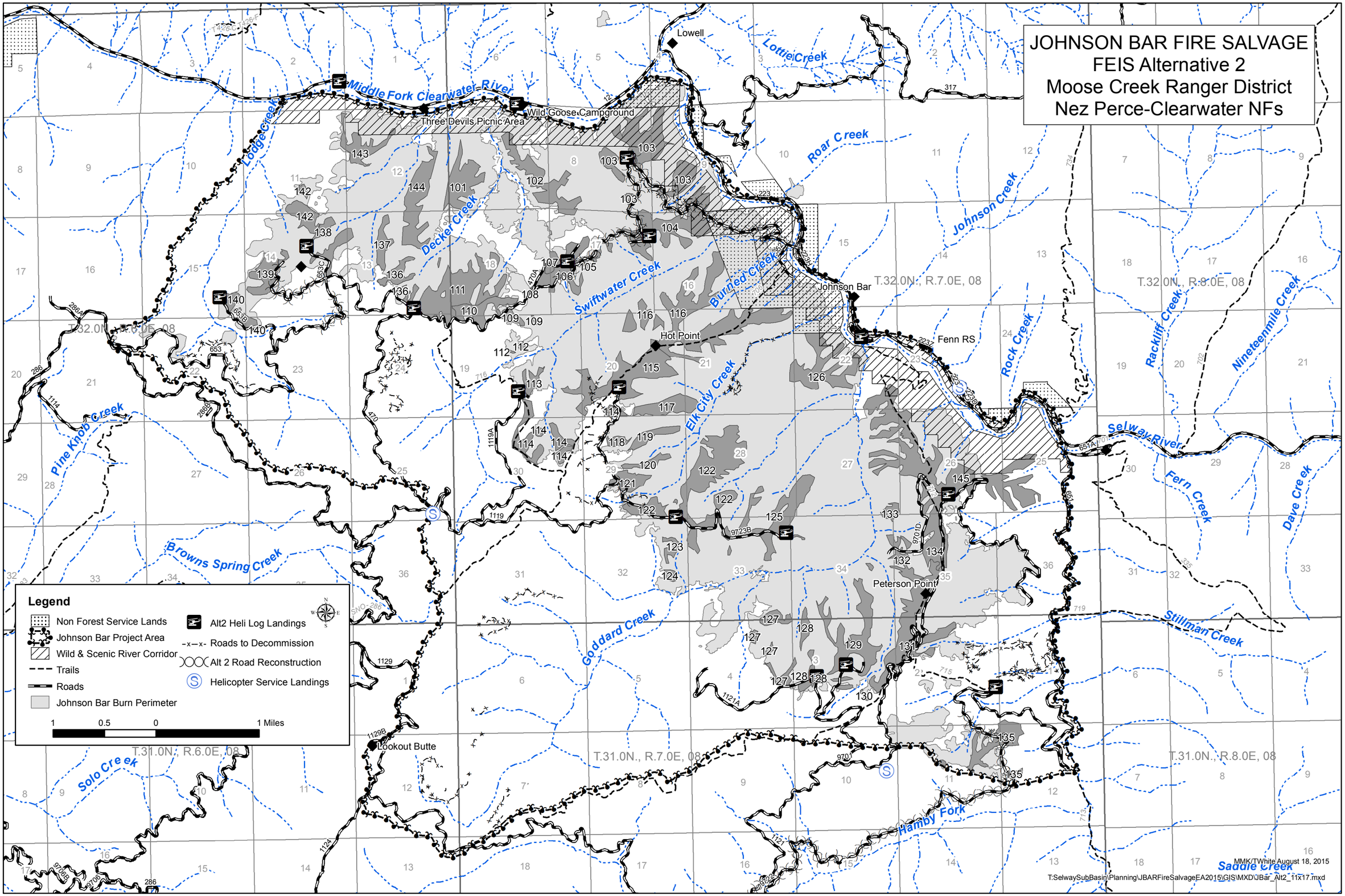
Road Number	Proposed Work	Effects
1129F, 1129F1	Decommission and remove culvert	Potential short-term downstream sediment effects to fisheries would be minimal given distance (>4.0 miles) above designated critical steelhead habitat.
JB-163, JB-168	Non-system road decommissioning; culvert removal associated with JB-163	Potential short-term downstream sediment effects to fisheries would be minimal given distance (>4.0 miles) above designated critical steelhead habitat. Long-term benefits would include reduced risk of sedimentation if routes were reopened in the future and restored channel/hillslope stability at crossings.
JB-128, JB-129, JB-130, JB-131	Non-system road decommissioning and remove culvert	Potential short-term sedimentation increase to fisheries in Elk City Creek due to proximity of decommissioning activities and designated steelhead critical habitat (JB-128, JB-130 and JB-131 are adjacent to occupied steelhead habitat). Culvert removal on JB-139 is approximately 0.5 mile above occupied habitat, downstream sediment effects would be minimal. Turbidity monitoring would be conducted with removal of JB-129 culvert. Long-term benefits would include reduced risk of sedimentation if routes were reopened in the future and restored channel/hillslope stability at crossings. Approximately 1.68 miles of road decommissioning in landslide prone areas, long-term benefits would include restoration of hillslope stability, restored subsurface flow paths, and reduced risk of hillslope failure and sediment delivery to streams.

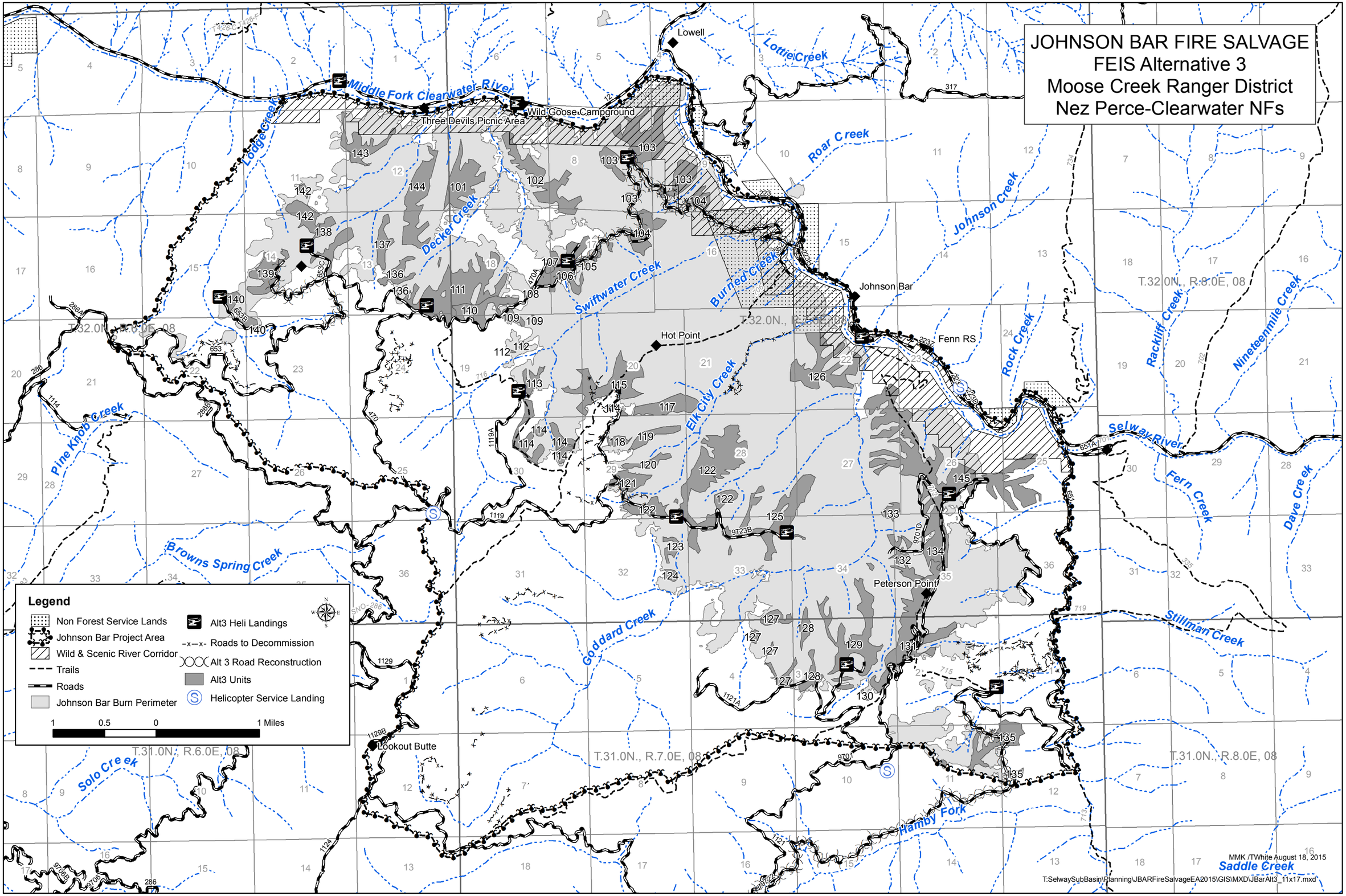
Road Number	Proposed Work	Effects
JB-132 to JB-153	Non-system road decommissioning; culvert removal and crossing stabilization	Potential short-term sedimentation increases downstream in O'Hara Creek due to culvert removal on JB-133 (approximately 0.2 mile above occupied critical habitat in O'Hara Creek). Turbidity monitoring would be conducted with JB-133 culvert removal. Road decommissioning and culvert removal on JB-152 would be 0.6 mile above occupied habitat in O'Hara Creek. Long-term benefits would include reduced risk of sedimentation if routes were reopened in the future and restored channel/hillslope stability at crossings. Approximately 5.5 miles of road decommissioning in landslide prone areas, long-term benefits would include restoration of hillslope stability, restored subsurface flow paths, and reduced risk of hillslope failure and sediment delivery to streams.
JB-177, JB-178	Non-system road decommissioning; culvert removal and crossing stabilization	No detectable short-term sedimentation increases are expected in the Selway River due to distance of activities (>0.5 mile above occupied habitat) and low base flows in these tributaries during the timing of proposed activities. Long-term benefits would include reduced risk of sedimentation if routes were reopened in the future and restored channel/hillslope stability at crossings. Approximately 0.4 mile of road decommissioning in landslide prone areas, long-term benefits would include restoration of hillslope stability, restored subsurface flow paths, and reduced risk of hillslope failure and sediment delivery to streams.

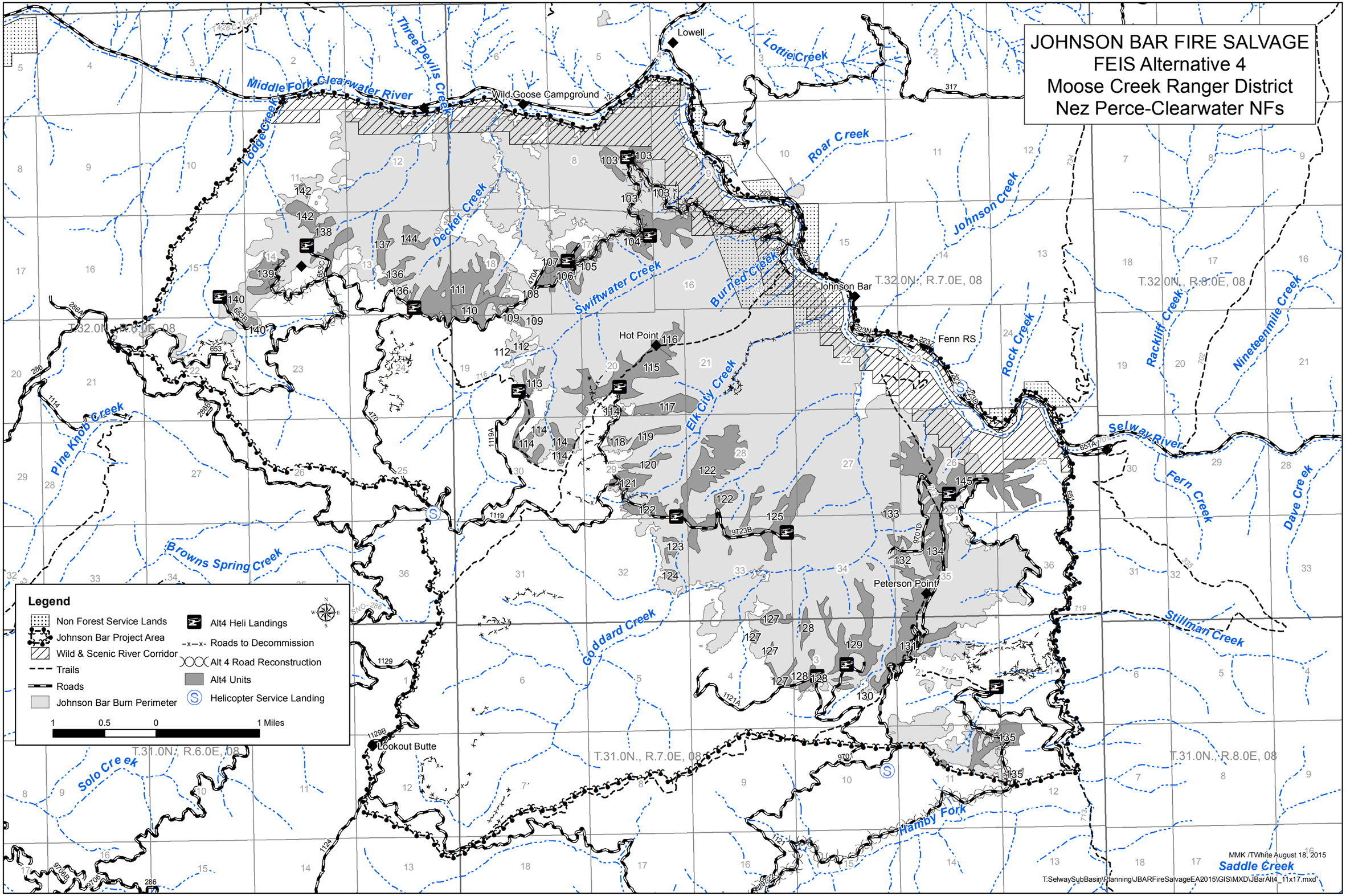
Road Number	Proposed Work	Effects
77763, 77788, 77835, JB-108 to JB-113	System and non-system road decommissioning	No detectable short-term sedimentation increases are expected due to distance of activities from occupied habitat, lack of connectivity with perennial stream network, and timing of activities. Approximately 3.5 miles of road decommissioning in landslide prone areas, long-term benefits would include restoration of hillslope stability, restored subsurface flow paths, and reduced risk of hillslope failure and sediment delivery to streams.

APPENDIX G

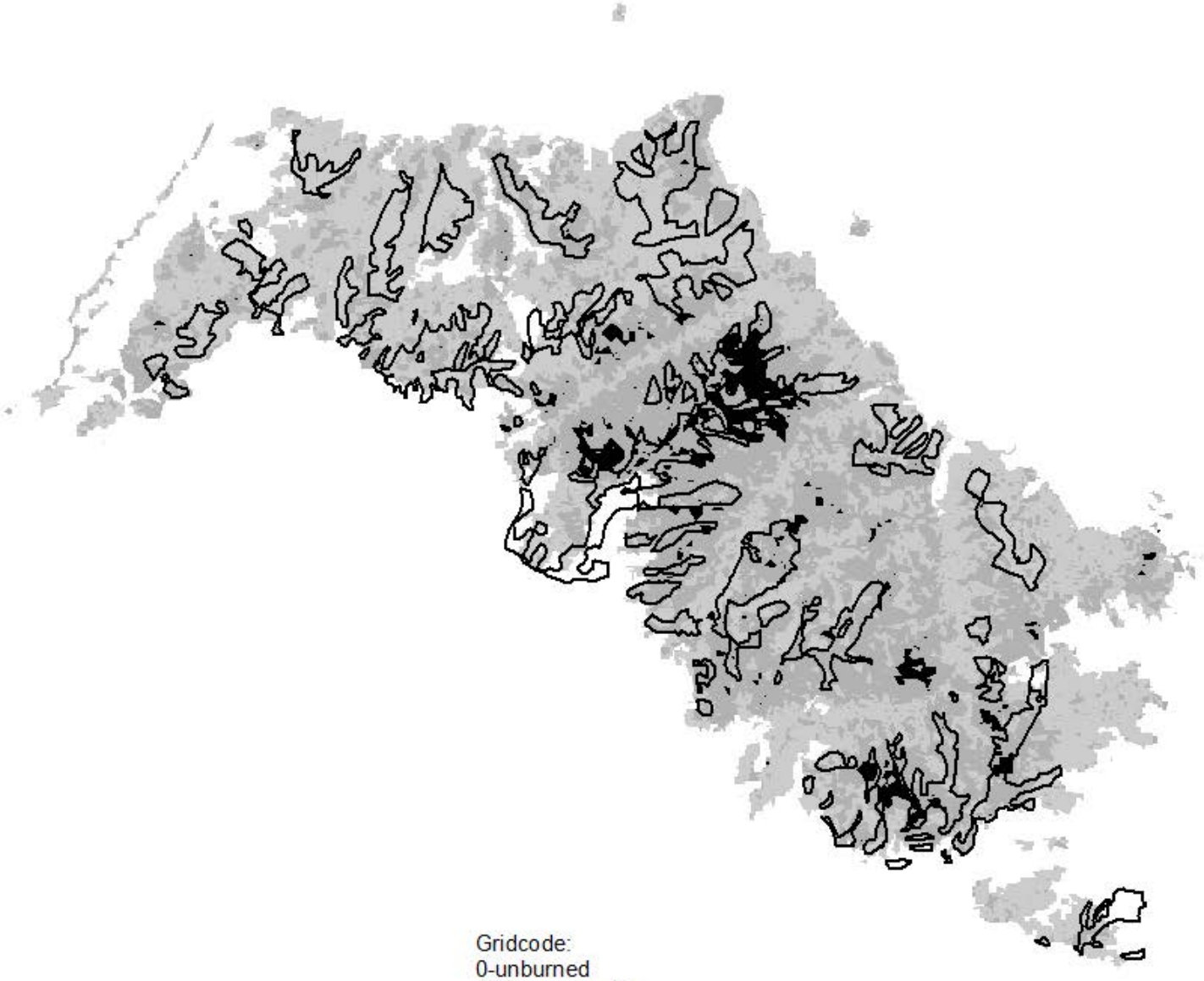
Maps


JOHNSON BAR FIRE SALVAGE
FEIS Alternative 2
Moose Creek Ranger District
Nez Perce-Clearwater NFs
Middle Fork Clearwater River
Lowell
Lotte Creek
Wild Goose Campground
Three Devils Picnic Area
Lodge Creek
Roar Creek
Johnson Creek
Decker Creek
Swiftwater Creek
Burned Creek
Johnson Bar
Hot Point
Fenn RS
Rock Creek
Elk City Creek
Racklift Creek
Nineteenmile Creek
Selway River
Pine Knob Creek
Fern Creek
Dave Creek
Browns Spring Creek
Peterson Point
Stillman Creek
Goddard Creek
Lookout Butte
Solo Creek
Hamby Fork
Saddle Creek
T.32.0N., R.7.0E, 08
T.32.0N., R.8.0E, 08
T.31.0N., R.6.0E, 08
T.31.0N., R.7.0E, 08
T.31.0N., R.8.0E, 08
Legend
Non Forest Service Lands
Johnson Bar Project Area
Wild & Scenic River Corridor
Trails
Roads
Johnson Bar Burn Perimeter
Alt2 Heli Log Landings
Roads to Decommission
Alt 2 Road Reconstruction
Helicopter Service Landings
1 0.5 0 1 Miles
MMK/TWhite August 18, 2015
T:SelwaySubBasin\Planning\JBARFireSalvageEA2015\GIS\MXD\JBar_Alt2_11x17.mxd


JOHNSON BAR FIRE SALVAGE
FEIS Alternative 3
Moose Creek Ranger District
Nez Perce-Clearwater NFs
Legend
Non Forest Service Lands
Johnson Bar Project Area
Wild & Scenic River Corridor
Trails
Roads
Johnson Bar Burn Perimeter
Alt3 Heli Landings
Roads to Decommission
Alt 3 Road Reconstruction
Alt3 Units
Helicopter Service Landing
1 0.5 0 1 Miles
Middle Fork Clearwater River
Lowell
Lotte Creek
Wild Goose Campground
Three Devils Picnic Area
Lodge Creek
Roar Creek
Johnson Creek
Decker Creek
Swiftwater Creek
Burned Creek
Johnson Bar
Fenn RS
Rock Creek
Rackliff Creek
Nineteenmile Creek
Hot Point
Elk City Creek
Pine Knob Creek
Selway River
Fern Creek
Dave Creek
Browns Spring Creek
Peterson Point
Goddard Creek
Stillman Creek
Lookout Butte
Solo Creek
Hamby Fork
Saddle Creek
T.32.0N., R.8.0E, 08
T.31.0N., R.6.0E, 08
T.31.0N., R.7.0E, 08
T.31.0N., R.8.0E, 08
MMK /TWhite August 18, 2015
T:SelwaySubBasin\Planning\JBARFireSalvageEA2015\GIS\MXD\JBarAlt3_11x17.mxd


JOHNSON BAR FIRE SALVAGE
FEIS Alternative 4
Moose Creek Ranger District
Nez Perce-Clearwater NFs
Middle Fork Clearwater River
Three Devils Creek
Lodge Creek
Decker Creek
Swiftwater Creek
Burned Creek
Roar Creek
Johnson Creek
Lottie Creek
Rock Creek
Rackliff Creek
Nineteenmile Creek
Selway River
Fern Creek
Dave Creek
Stillman Creek
Hampy Fork
Saddle Creek
Goddard Creek
Elk City Creek
Pine Knob Creek
Browns Spring Creek
Solo Creek
Lowell
Wild Goose Campground
Johnson Bar
Fenn RS
Hot Point
Peterson Point
Lookout Butte
T.32.0N., R.7.0E, 08
T.32.0N., R.8.0E, 08
T.32.0N., R.6.0E, 08
T.31.0N., R.6.0E, 08
T.31.0N., R.7.0E, 08
T.31.0N., R.8.0E, 08
Legend
Non Forest Service Lands
Johnson Bar Project Area
Wild & Scenic River Corridor
Trails
Roads
Johnson Bar Burn Perimeter
Alt4 Heli Landings
Roads to Decommission
Alt 4 Road Reconstruction
Alt4 Units
Helicopter Service Landing
1 0.5 0 1 Miles
MMK /TWhite August 18, 2015
T:SelwaySubBasin\Planning\JBARFireSalvageEA2015\GIS\MXD\JBarAlt4_11x17.mxd

Alternative 2 Units



Gridcode:
0-unburned
1-2 Low severity
3- Moderate Severity
4- High Severity

Fire Severity Unit Comparison

Alt2_Units

jbar_finalseverity

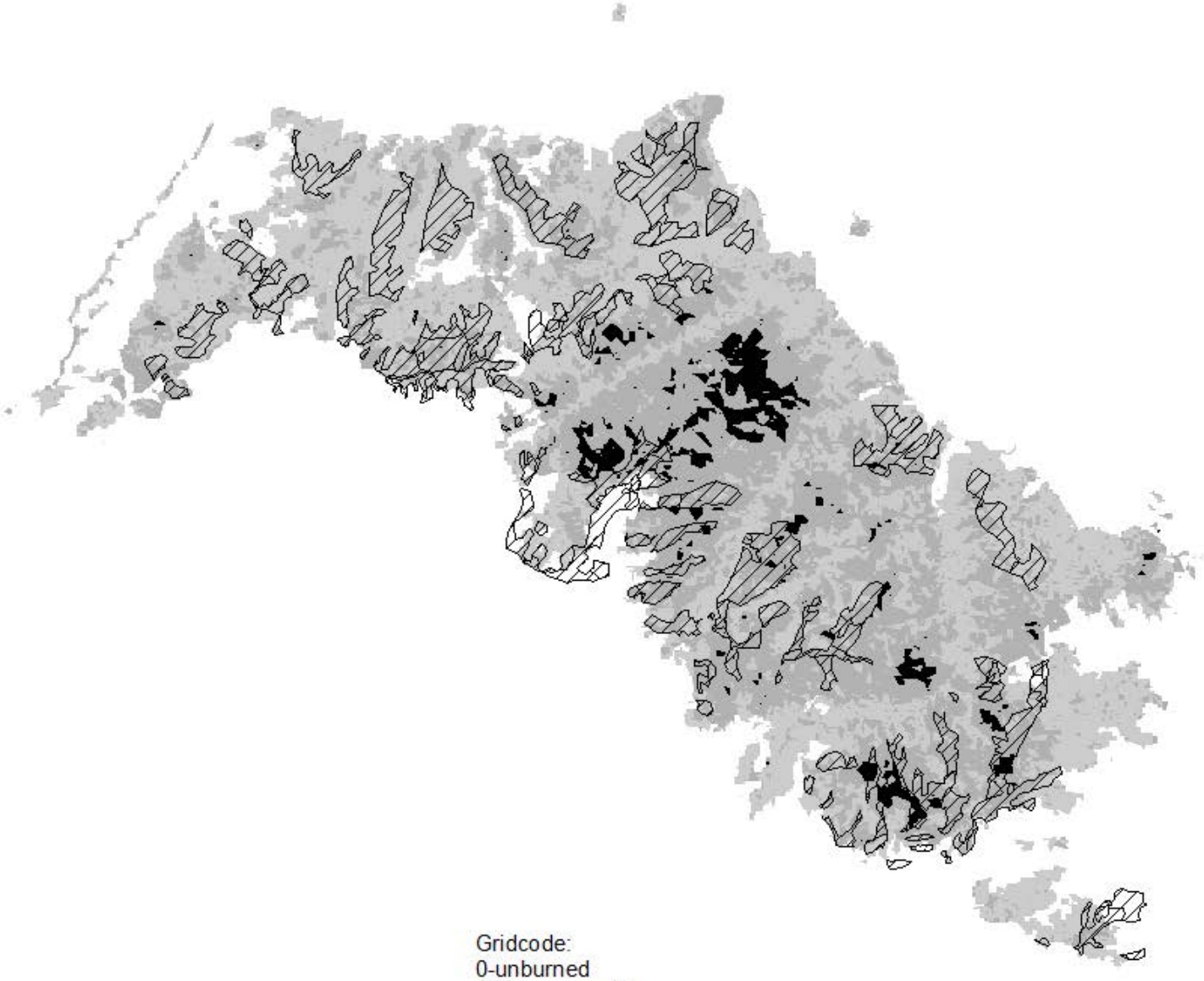
<all other values>

GRIDCODE

0
1
2
3
4

A Burned Area Reflectance Classification (BARC) is a satellite-derived data layer of post-fire vegetation condition. The BARC has four classes: high, moderate, low, and unburned. By analyzing the variation between pre and post fire infrared light bands, severity is determined. High severity has a higher accuracy because of the large difference between the bands whereas accuracy decreases in the lower severity classes. Some burned areas may show as unburned due to this.

Alternative 3 Units



Gridcode:
0-unburned
1-2 Low severity
3- Moderate Severity
4- High Severity

Fire Severity Unit Comparison

Alt3_Units

jbar_finalseverity

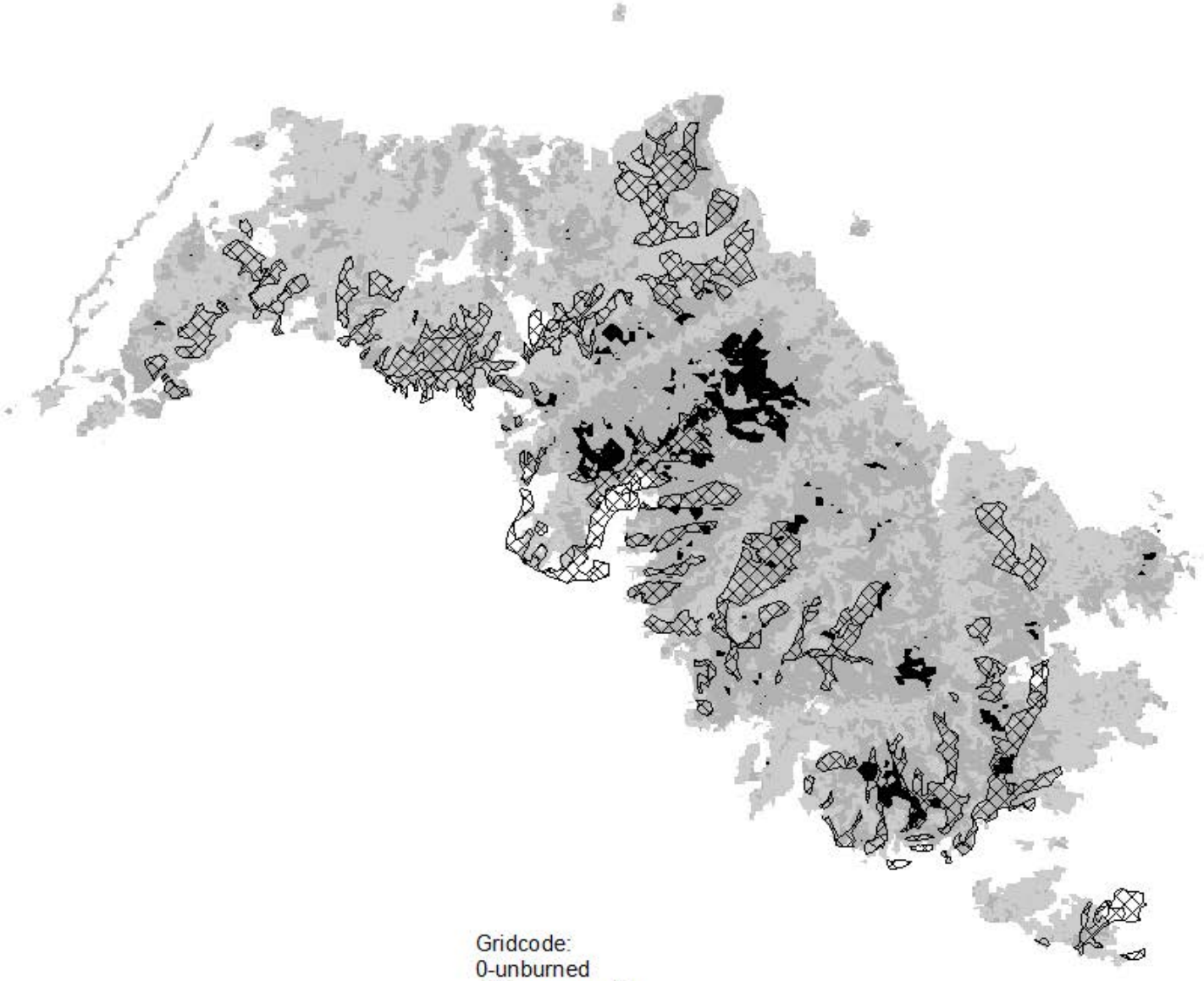
<all other values>

GRIDCODE

0
1
2
3
4

A Burned Area Reflectance Classification (BARC) is a satellite-derived data layer of post-fire vegetation condition. The BARC has four classes: high, moderate, low, and unburned. By analyzing the variation between pre and post fire infrared light bands, severity is determined. High severity has a higher accuracy because of the large difference between the bands whereas accuracy decreases in the lower severity classes. Some burned areas may show as unburned due to this.

Alternative 4 Units



Gridcode:
0-unburned
1-2 Low severity
3- Moderate Severity
4- High Severity

Fire Severity Unit Comparison

Alt4_Units

jbar_finalseverity

<all other values>

GRIDCODE

0
1
2
3
4

A Burned Area Reflectance Classification (BARC) is a satellite-derived data layer of post-fire vegetation condition. The BARC has four classes: high, moderate, low, and unburned. By analyzing the variation between pre and post fire infrared light bands, severity is determined. High severity has a higher accuracy because of the large difference between the bands whereas accuracy decreases in the lower severity classes. Some burned areas may show as unburned due to this.

Appendix H

Vegetation Cumulative Effects Charts

Table H1: Trends Towards or Away From Historical Range of Variation

Idaho Batholith Scale[2]		Johnson Bar Fire Salvage Project Scale			
Historical Range			Movement Towards Historical Range of Variation		
Cover Type	1937 Inventory (Percent)	Current (Percent)	Alt 2 (Percent)	Alt 3 (Percent)	Alt 4 (Percent)
Ponderosa Pine	14.5	-14.5	0%	0%	0%
Douglas-fir	41.8	-27%	-3%	-2%	-2%
Western Larch-Douglas-fir[1]	38.2	-36	+12%	+11%	+10%
Lodgepole Pine	52.4	-52	0%	0%	0%
Western White Pine[3]	30.4	-30	+10%	+9%	+8%
Engelmann Spruce-Sub Alpine Fir	26	Unknown	0%	0%	0%
Subalpine	60	Unknown	0%	0%	0%

[1]587 acres of pre-commercial thinning units of previously harvested units is WP, WL, PP, DF which reduced WL-DF variance by an additional 2%
[2]We are comparing Idaho Batholith scale to the project scale which is an unbalanced comparison.
[3]WL, WP, and PP are combined together so WP is double counted and PP improvement is not counted.
[4]White pine blister rust has altered the ecosystem so historical range of variation is only a reference point in time. Future forest may be similar but would not be the same.

Table H2: Comparison of Historic Size Classes- Idaho Batholith

Idaho Batholith 332A 1937 Inventory Size Class % Assessment				
	Source	**Natural Range of Variation (Percent)**	**Natural Range of Variation (Percent)**	**Natural Range of Variation (Percent)**
Size Class (Inches)	**Leiberg**	**Full Breaklands (Percent)**	**Full Uplands (Percent)**	**Full Sub-Alpine (Percent)**
Non-forest		8-9	0-0	7-7
Grass/shrub		3-11	7-20	6-21
0-4.9 (seeds/saps)		15-26	12-26	19-33
5-14.9 (poles)		23-33	32-49	17-32
15.0-19.9 (mature)		23-35	17-27	16-33
20+ (over-mature)		5-10	3-6	2-7

Table H3: Johnson Bar Fire Salvage Size Classes (pre-fire)

Size Class (Inches)	**Acres**	**Percent**
Herb	125	0%
Shrub	393	1%
0-4.9	1,501	6%
5-9.9	3,377	13%
10-14.9	1,480	6%
15-19.9	15,649	58%
20+	3,518	13%
Unknown	745	3%

Appendix I

Salvage Operations and Tree Mortality Criteria

For all units within the project area, salvage operations would retain 14-28 live or dead trees per acre using a combination of selected single (large dbh) trees and clumps (9+ trees per clump) distributed across the unit. Of the 14-28 leave trees, 6 snags would be greater than 20 inches dbh, and of these 6 snags, 3 should be larger than 30 inches dbh.

Scott et al. 2002 does not have any western red cedar ratings; therefore, the Forest Service would use Region 1 criteria for red cedar.

Trees meeting the following criteria would be left on site:

- All tree species 25 inches or larger dbh;
- All dead western larch and ponderosa pine;
- All non-high risk white pine;
- Non-merchantable snags as long as there is no hazard according to OSHA regulations; and
- All live trees.

Trees with active bark beets would be considered dead.

To meet Scott et al. 2002 guidelines, at least two criteria would need to be met under each species criteria, except for cedar. The following criteria would be used to determine fire damage tree survivability and leave tree selection:

Table I1: Criteria Used to Determine Tree Mortality

Species	Dead Tree Selection Criteria
Two criteria must be met in order to be considered dead.	
Douglas-fir	1. 50% or more circumference of bole cambium at ground line is burned. 2. 25% or more crown scorch. 3. 50% or more of the area under tree crown has had duff removed by fire.
Lodgepole and all other species, except cedar	4. 25% or more circumference of bole cambium at ground line is burned. 5. 25% or more crown scorch 6. 50% or more of the area under tree crown has had duff removed by fire.
One criteria must be met in order to be considered dead.	
Cedar	1. 33% or more circumference of bole cambium at ground line is burned. 2. 25% or more crown scorch. 3. 50% or more of the area under tree crown has had duff removed by fire.

Appendix J

Unit Acres by Alternative

UNIT	Alternative 2			Alternative 3			Alternative 4		
	Acres[1]	Temp Road (miles)[2]	Logging System[3]	Acres[1]	Temp Road (miles)[2]	Logging System[3]	Acres[1]	Temp Road (miles)[2]	Logging System[3]
101	74		H	74		H	drop		
102	91		H	91		H	Drop		
103	169	0.05 Exist 0.23 new	T, S, H	169	0.05 exist	S, H	55	0.05 Exist 0.28 new	T, S, H
104	139	0.36 exist	T, S, H	71		S	91	0.32 exist	T, S, H
105	28		T, S	28		S	28		T, S
106	56		T, S	56		S	56		T, S
107	11		T, S	11		T, S	11		T, S
108	1		T, S	1		S	1		T, S
109	13		S	13		S	13		S
110	45		T, S	45		S,H	45		T, S
111	169	0.11 exist 0.85 new	T, S, H	169	0.12 new	T, S, H	169	1.07 new	T, S, H
112	3		S	3		S	3		S
113	16		S, H	16		S, H	16		S, H
114	73		T, S, H	70	0.22 exist	S, H	73		T, S, H
115	153	0.21 new	S, H	101		S, H	153	0.21 new	S, H
116	263		H	drop			25		H
117	52		S, H	52		S, H	52		S, H
118	10		S	10		S	10		S
119	24		H	24		H	24		H
120	17		S, H	17		S, H	17		S, H
121	32		T, S	32		S	32		T, S
122	219	0.12 new	T, S, H	219		S, H	219	0.12 new	T, S, H
123	12		H	12		H	12		H
124	6		H	6		H	6		H
125	117	0.03 exist 0.13 new	T, S, H	117		S, H	117	0.03 exist 0.13 new	T, S, H
126	102		H	102		H	Drop		
127	42		S, H	42		S, H	42		S, H
128	34		T, S, H	34		S, H	34		T, S, H
129	124	0.15 new	T, S, H	124		S, H	124	0.15 new	T, S, H
130	2		H	2		H	2		H
131	144	0.08 exist 0.49 new	T, S	144	0.08 exist	S,H	144	0.08 exist 0.49 new	T, S
132	32		S	32		S,H	32		S
133	13		H	13			13		H
134	91	0.05 new	T, S	91		S,H	91	0.05 new	T, S
135	67		S, H	67		S, H	67		S, H
136	28	0.21 new	S	28		S	28	0.24 new	S

UNIT	Alternative 2			Alternative 3			Alternative 4		
	Acres[1]	Temp Road (miles)[2]	Logging System[3]	Acres[1]	Temp Road (miles)[2]	Logging System[3]	Acres[1]	Temp Road (miles)[2]	Logging System[3]
137	27		H	27		H	27		H
138	44		S, H	44		S, H	44		S, H
139	49	0.12 exist	S	49	0.12 exist	S	49	0.12 exist	S
140	24		H	24		H	24		
142	39		H	39		H	39		H
143	45		H	45		H	Drop		
144	93		H	93		H	21		H
145	303		S, H	303		S, H	198		S, H
	3,096	0.75 exist 2.44 new	T = 3% S = 48% H = 49%	2,710	0.28 exist 0.0 new	T = 1% S = 34% H = 65%	2,207	0.75 exist 2.74 new	T = 3% S = 61% H = 36%

[1]Temporary Roads: Exist = existing road template; New = new construction
[2]Logging system designators: T = Tractor, S = Skyline, H = Helicopter
[3]Some individual unit acres may vary from specialist's report acres due to internal calculation rounding during analysis.

Appendix K

Responses to Opposing Science

Much of the literature cited by commenters of the Johnson Bar Fire Salvage Project addresses a variety of resources, topics, or issues. The Johnson Bar Fire Salvage Interdisciplinary Team (IDT) considered the general principles and recommendation made in the various literature cited. Some articles and reports were not applicable to the Johnson Bar Fire Salvage proposed activities. Other articles and reports provided general or background information and were consistent with the project analysis. Other articles provided opposing views to the proposed project and are discussed below. A review of all literature cited by commenters is contained in the project record.

Beschta et al. 1995 Post-fire Principles and Recommendations

In March, 1995, Dr. Robert Beschta, Oregon State University, and other research scientists produced a commentary entitled: "Wildfire and Salvage Logging, Recommendations for Ecologically Sound Post-Fire Salvage Logging and Other Post-Fire Treatments on Federal Lands in the West." This document was prefaced with a discussion of the interrelationships between the natural disturbance cycle and the impacts of past land management, and the need to examine and "focus on the pattern and consequences of current and proposed human manipulation and disturbances of all types at the landscape level." The Beschta et al. 1995 report was neither peer-reviewed nor published in a credible source.

Interest groups have successfully used this commentary to oppose post-fire projects. Excerpts from a statement by Dale Bosworth, Chief, USDA Forest Service to the Subcommittee on Forests and Forest Health, Committee on Resources, U.S. House of Representatives, Washington, D.C., June 12, 2002, on NEPA process gridlock shows the controversy associated with this report.

> *I can't think of a better example to illustrate this (gridlock) than the so-called "Beschta Report," a commentary authored in 1995 by eight university and government scientists. Many members of the Subcommittee may not be familiar with this report.*
>
> *The authors prepared the paper at the request of the Pacific Rivers Council. It offers 21 "principles and recommendations" regarding a wide range of topics. The topics include: erosion, soil impacts, noxious weeds, sensitive areas, effects of road building, reseeding, and fire management policies. The paper generally recommends against any active management of post-fire areas other than removal of existing roads. The paper has never been published in any scientific or professional journal, nor has it been subject to any formal peer review.*
>
> *None-the-less, interest groups have filed numerous lawsuits challenging post-fire recovery projects in part on the grounds that the associated NEPA documents fail to adequately document the agency's consideration of the "Beschta Report." I have been told that information on how to use the report to write comments on proposed projects and appeals of project decision documents is available on more than 100 Web sites. To date, there have been judicial opinions on the "Beschta Report" in six cases.*
>
> *In four of these cases, the Courts have concluded that project decisions violated NEPA because the associated NEPA documents did not adequately document the agency's consideration of Beschta. In two other recent cases, Federal District Courts have ruled in favor of the Forest Service. In one case, Native Ecosystem Council v. U.S. Forest Service (D. Mont.) (Maudlow-Toston, Helena NF), the Court found that the EIS complied with NEPA even though the plaintiffs strenuously argued that failure to adequately consider the "Beschta Report" violated NEPA. In the other case, Center for Biological Diversity v. Andre (D. N.M.) (Corner Mountain Fire Salvage, Gila NF), the Court found that EA adequately considered the issues in the "Beschta Report,"*

even though the EA did not reference the "Beschta Report."

Hitting .333 is very good in baseball. It's not much of an average in natural resource case law. As a result of these 4 decisions, land managers wishing to reduce the risk that their decision will be reversed in Federal Court should feel compelled to thoroughly document their consideration of the "Beschta Report" even though the underlying land management issues are already addressed. This includes documenting why some elements of the "Beschta Report" are not relevant to the specific proposed project.

The judicial opinions against the agency have inspired some interest groups to demand that the agency consider numerous other papers and articles that they assert are relevant to the some proposed actions. Sometimes the list of references exceeds 100 articles and papers. To minimize the risk of adverse judicial opinions, land managers are advised to fully document within the body of the NEPA document their detailed consideration of each and every paper or article.

So, when critics assert that the Forest Service is its own worst enemy by spending so much time preparing large NEPA documents, I ask that you remember the "Beschta Report" - an unpublished document of questionable science proposed for an advocacy group that has never been peer-reviewed – but whose consideration now must be documented in several if not all judicial districts in order to build a defensible NEPA document.

It's a powerful example of the incentive for land managers to fill, or overstuff, NEPA documents with excessive amounts of information – even if the information is of questionable relevance and does not illuminate the reasons for the decision – all in an effort to protect their decisions from charges they failed to adequately consider some piece of information. As a result of these efforts to increase the legal defensibility of decisions, project analysis and documentation processes are very time consuming and costly, but the additional documentation contributes little to the quality of public involvement or land management.

In 1995, US Forest Service research scientists reviewed the original Beschta report and concluded that it was biased toward a custodial, or hands-off, approach (Everett 1995). It is generally accepted in the science community that limiting post-fire management to just a single approach is inappropriate as forest encompass a wide range of variability resulting in the need for site-specific plan to address salvage activities on a case-by-case basis (Everett 1995; McIver and Starr 2001).

A similar report, Beschta et al. 2004, was subsequently published in *Conservation Biology*, which is a peer-reviewed journal. Although the second report cited more literature to support the authors' viewpoint and was published in a peer-reviewed scientific journal, it is still considered to be an opinion or editorial piece.

The IDT reviewed the Beschta et al. reports and believe that the Johnson Bar Fire Salvage Project includes an alternative, Alternative 1 – No Action, that would satisfy most of the recommendations made by Beschta et al. Under this alternative, salvage activities and road decommissioning would not occur, which would result in the Purpose and Need not being achieved.

Design criteria (Section 2.9), including PACFISH buffers, and BMPs would be incorporated into the proposed project, regardless of the action alternative in order to protect resources and limit adverse effects. Regardless of the action alternative that may be selected, no harvesting would occur within RHCAs. Also, any new temporary roads would be hydrologically disconnected from streams and would be placed on ridgetops.

Contrary to Beschta et al., unauthorized roads would not be decreased or eliminated as a result of the No Action alternative. Also, as a result of the Johnson Bar Fire some areas may not recover quickly, which would reduce the effectiveness of natural regeneration throughout the entire project area. The EIS included an analysis of effects to resources, including soils, hydrology, and fisheries. Harvest methods, design criteria, BMPs, and erosion controls were selected based on soil sensitivity as a result of the fire and in order to minimize effects. Landslide prone areas were eliminated from harvest and 14-28 trees/acre would remain as leave trees. PACFISH buffers would be incorporated as well.

Donato et al. 2006

Donato et al. 2006 published a report in *Sciencexpress* and in the journal *Science* regarding post-fire logging hindering regeneration and increasing fire risk in the Biscuit Fire project area. Baird 2006 completed an analysis of the Donato et al. methodology and determined that there may be serious flaws in regards to the study and its design, including statistical analysis of the data presented. The IDT reviewed the report and determined the report provided background information in regards to salvage harvesting activities; however, the report is not applicable in many ways. The proposed project includes both artificial and natural regeneration. Also, the Biscuit salvage activities occurred several years after the actual fire; whereas, the Johnson Bar Fire Salvage salvage activities are expected to occur following a shorter time separation. The proposed project salvage activities are expected to help manage fuels over the short- and long-term; thereby, reducing the potential for reburn and fire intensity.

Johnson et al. 2007

One objector stated that the analysis did not consider Johnson, et al. 2007 in regards to the "reburn theory". The objector states that the study does not support the reburn theory. The study, *Effects of Salvage Logging and Pile and Burn on Fuel Loading, Fire Behavior, and Emissions* was compiled from data gathered from a windthrow event in central Oregon. The authors hypothesized that fuels would increase after logging and decrease after treatment. From site-specific data the authors concluded the treatment "…clearly reduced fuel loadings, fuel-bed depth, and simulated smoke emissions…" but "…did not produce unequivocal evidence…" of a significant reduction in fire behavior (p. 767).

The study does note that the fuel levels were low to begin with and "…it is possible…" that greater effects would occur with a higher fuel loading (p. 767).

From this, the authors compare their results with other researcher's work based on post-wildfire salvage and surmise that the fuel loadings would be greater. But the study also notes that "…fire managers have less concern about coarse woody fuel because these fuels do not influence fire rate-of-spread and flame length" (P.764).

Furthermore, the study states that there is usually an immediate reduction in fuels following a wildfire, but over time fuel loadings may increase above pre-fire loadings as fire-killed snags fall (P. 758). This increase in fuel loadings may increase soil heating (P. 764).

Using site specific data from the Johnson Bar Fire and one of the same models used by the authors, the analysis reaches the same conclusion, namely that coarse woody fuels will increase

over time and other resource areas may be affected in untreated areas, while treated areas will have reduced fuel loadings and smoke emissions. There is no reason to believe that the risk of ignition (predominantly lightning) will decrease, and may actually increase.

Also, this study was conducted on tractor logging units on slopes less than 18 degrees, which is approximately 34% slope. At around 35% slope or greater the rate of spread increases dramatically (Butler, 2007). The majority of the Johnson Bar Fire Salvage project area is greater than 35% slope, so greater fire behavior should be expected in untreated areas as the authors mentioned (see above), with a corresponding decrease in treated areas.

As the study does not actually draw a conclusion from data based on wildfires, and instead supports the analysis, Johnson et al. 2007 was not considered.

Karr et al. 2004

Karr et al. 2004 published a peer-reviewed report in the journal *BioScience* regarding the effects of salvage logging aquatic ecosystems and presented recommendations very similar to the ones proposed by Beschta et al. 1995 and 2004. The IDT reviewed the report and determined that the completed analysis utilized the most recent literature available and sources within the range of cited scientific literature. Effects to aquatic species were analyzed in the EIS and design criteria and BMPs would be incorporated into the proposed project in order to minimize adverse effects.

Lindenmayer et al. 2004

Lindenmayer et al. 2004 published an opinion or editorial piece in the journal *Science* regarding salvage harvesting. The IDT reviewed the report and determined that the project included an alternative that incorporated the reports findings, namely Alternative 1 – No Action. The proposed project action alternatives also incorporate design criteria and BMPs in order to minimize adverse effects to resources.

Noss et al. 2006

Noss et al. published an opinion or editorial piece in *Society for Conservation Biology* that reviewed ecological science pertaining to fire management fires on forests in the western United States. The article did not incorporate literature citations, making it difficult to determine if the analysis is based upon scientific fact or to determine the veracity of the findings. The IDT reviewed the report and determined that the proposed project addresses the report's findings through the various alternatives, including the No Action alternative, or components of the various alternatives, including incorporating natural regeneration when applicable.

Open Letter to Members of Congress from 250 Scientists Concerned about Post-fire Logging

Some objectors referenced an opinion letter to members of Congress from 250 scientists, who were concerned about post-disturbance legislation addressed in HR 1526 and the over-riding of environmental laws proposed in HR 3188. While the Johnson Bar Fire Salvage Project is a post-fire fire salvage project, it does not propose any changes to existing legislation. The letter also discusses the ecological importance of post-fire landscapes and the amount of studies documenting cumulative effects of post-fire logging. Both the draft and final Environmental

Impact Statements for the Johnson Bar Fire Salvage Project analyzed direct, indirect, and cumulative effects as a result of the four alternatives.

Appendix L

Response to Comments

Johnson Bar Fire Salvage Project Summarized Public Comments			
Resource	**Comment/Issue (some may be paraphrased)**	**Response**	**Commenter**
Alternatives	Projected impacts to a treaty-reserved resource are of serious concern to the Tribe. The Tribe reiterates its recommendation that the Forest Service amend the project by dropping some road-adjacent units from the treatment so as to promote a static upward trend in appropriate metrics for elk.	Thank you for your comment. All alternatives will be considered prior to the making of a decision by the Forest Supervisor. The final decision may incorporate all or portions of any of the alternatives, including the No Action alternative. As a multiple-use agency, the Forest Service is required to manage for a variety of resources and uses in accordance with applicable rules, laws, and regulations. All of the alternatives are in compliance with Forest Plan objectives regarding wildlife, including elk. Please see the wildlife section for affects to elk as a result of the No Action and action alternatives.	Nez Perce Tribe
	The Tribe strongly encourages the Forest Service to incorporate a more ecosystem-focused approach to wildlife and plant related alternative development and impact assessments.	Thank you for your comment. The Forest Service has been incorporating a more ecosystem-focused approach in its management activities by analyzing landscape level projects. This allows for a more ecosystem based approach when analyzing and managing resources, including wildlife and plants.	Nez Perce Tribe

Johnson Bar Fire Salvage Project Summarized Public Comments			
Resource	**Comment/Issue (some may be paraphrased)**	**Response**	**Commenter**
	Reopening an already decommissioned road would result in restarting the recovery process that has already had some time to recover. The Tribe recommends not opening any roads that have been previously decommissioned.	Thank you for your comment. All alternatives will be considered prior to the making of a decision by the Forest Supervisor. The final decision may incorporate all or portions of any of the alternatives, including the No Action alternative. Any proposed roads would be properly decommissioned following the completion of salvage harvesting operations.	Nez Perce Tribe
	The Tribe recommends that no matter which alternative is selected, that all new construction of temporary roads be eliminated from the project.	Thank you for your comment. All alternatives will be considered prior to the making of a decision by the Forest Supervisor. The final decision may incorporate all or portions of any of the alternatives, including the No Action alternative. The Forest Service did consider harvesting without any new temporary roads; however, this would result in any harvesting activities being uneconomical. Therefore, it was eliminated from detailed analysis (FEIS Section 2.8).	Nez Perce Tribe
	The Tribe recommends that no matter which alternative is selected, that no new helicopter landings be constructed.	Thank you for your comment. All alternatives will be considered prior to the making of a decision by the Forest Supervisor. The final decision	Nez Perce Tribe

Johnson Bar Fire Salvage Project Summarized Public Comments			
Resource	**Comment/Issue (some may be paraphrased)**	**Response**	**Commenter**
		may incorporate all or portions of any of the alternatives, including the No Action alternative. The Forest Service did consider harvesting without any new helicopter landings; however, this would result in any harvesting activities being uneconomical. Therefore, it was eliminated from detailed analysis (FEIS Section 2.8).	
	The Tribe recommends that the Forest follow the direction set out in, and comply with, the 1997 BA and 1998 LRMP BiOp and revise the proposed action accordingly.	The 1998 LRMP Biological Opinion established a threshold that timber harvest activities cannot have an adverse effect to Selway River Steelhead. All of the Johnson Bar alternatives were designed to comply with this requirement. Alternative 3 was developed to address the Tribe's scoping comments in regards to implementation of the Biological Opinion.	Nez Perce Tribe
	All three landings within the wild and scenic river corridor need to be rehabilitated and their use should be abandoned for this project.	Thank you for your comment. Alternative 4 does not include landings within the Wild and Scenic River Corridor. Wild Goose and Johnson Bar landing sites are within developed campgrounds and do not require rehabilitation to their	Harry Jageman

Johnson Bar Fire Salvage Project Summarized Public Comments			
Resource	**Comment/Issue (some may be paraphrased)**	**Response**	**Commenter**
		existing condition. Two Shadows is a large turnout adjacent to the highway. This site is also used for temporary storage of highway debris (wood, rocks, and soil). This site is also an active dispersed campsite. Rehabilitation, including scarification and seeding, could potentially occur here but is not a component of this project.	
	A smaller alternative that poses less risk to water quality, aquatic resources, and wildlife could have been proposed.	All action alternatives include design criteria in order to reduce or eliminate effects to resources, including water quality, aquatic resources, and wildlife; thereby, reducing risk to resources.	Harry Jageman
	Some elements of Alternatives 3 and 4 could be combined into a less intrusive alternative.	Thank you for your comment. All alternatives will be considered prior to the making of a decision by the Forest Supervisor. The final decision may incorporate all or portions of any of the alternatives, including the No Action alternative.	Harry Jageman
	The DEIS does not include an alternative that stays out of the wild and scenic river corridor; that does not log in the Middle Fork Face roadless areas; that would build no new roads; or that only follows the forest plan DFCs.	Alternative 4 has been modified between the Draft and Final to eliminate all harvesting activities within the Wild and Scenic River Corridor.	Friends of the Clearwater

Johnson Bar Fire Salvage Project Summarized Public Comments			
Resource	**Comment/Issue (some may be paraphrased)**	**Response**	**Commenter**
	All action alternatives have identical restoration proposals. Yet there is no restoration-only alternative. Considerable scientific evidence was provided that shows post-fire logging creates enormous impacts. Such an alternative should have been considered since the fire created the diversity the agency alleges it seeks in national forests.	Thank you for your comment. This is outside of the scope of the purpose and need of this project.	Friends of the Clearwater
	Alternative 1 (No Action) is the only supportable alternative.	Thank you for your comment. All alternatives will be considered during the NEPA process.	Idaho Rivers United
	IRU disputes the need for a project the size of the proposed action. A significant reduction of salvage logging is not going to increase future fire damage. The stage has been set to conduct periodic, low-intensity burning that reduces ladder fuels, promotes wildlife habitat, and reduces the chances of future high-intensity fires.	Thank you for your comment. The purpose of the project is to recover economic value of the burned trees, not to reduce future fire hazard, although that may be a benefit as a result of implementing the proposed project.	Idaho Rivers United
	The proposed project should have been more narrowly focused on areas of intense burn while allowing natural regeneration to take its course.	Thank you for your comment. As a result of meeting various resource objectives, including old growth, riparian management, fisheries, and visuals, the project would harvest less than 20% of the fire area. The remaining 80% of the area would be planted where possible for species regeneration, with natural regeneration expected to occur	Idaho Rivers United

Johnson Bar Fire Salvage Project Summarized Public Comments			
Resource	**Comment/Issue (some may be paraphrased)**	**Response**	**Commenter**
		over the majority of the burned area. Supplemental planting with long-lived early seral species following the salvage harvest would promote increased species diversity and resiliency.	
	Road decommissioning can easily be a stand-alone project.	Thank you for your comment. Decommissioning of new temporary roads is included in this project in order to maintain or enhance watersheds that are part of the project area. Also, a stand-alone road decommissioning project would not meet the purpose and need of the project.	Idaho Rivers United
	We feel strongly that there may be alternatives that were not addressed in the DEIS and are open to working with the Forest Service to identify, develop, and refine new approaches to advance the project.	Opportunities to present alternatives were provided during the scoping process. If there specific alternatives you wished to have considered in the EIS the Forest Service would have greatly appreciated them being brought forward for consideration during the scoping period as there were ample opportunities to do so.	Idaho Conservation League
	Consider additional alternatives that 1) reduce the extent and severity of salvage logging; 2) increase levels of retention across logged areas; 3) avoid areas with steep,	Please review Section 2 of the EIS for alternatives considered and carried forward and alternatives considered but eliminated from	Idaho Conservation League

Johnson Bar Fire Salvage Project Summarized Public Comments			
Resource	**Comment/Issue (some may be paraphrased)**	**Response**	**Commenter**
	sensitive, or landslide-prone soils; 4) avoid temporary road construction; 5) incorporate restoration and mitigation work into the proposed action to help meet Forest Plan objectives; and 6) retain large diameter trees >16 inches DBH. Also avoid roads, logging, skidding, or other activities in Riparian Conservation Areas or other sensitive habitat areas.	detailed analysis. There is no harvesting being proposed in landslide prone areas or RCAs.	
	Please analyze an alternative in detail that does not construct any new roads (temporary or system).	Thank you for your comment. The Forest Service did consider harvesting without any new temporary roads; however, this would result in any harvesting activities being uneconomical. Therefore, it was eliminated from detailed analysis (FEIS Section 2.8).	Dick Artley
	Select the “No Action” alternative for the proposed Johnson Bar post-fire salvage sale.	Thank you for your comment. All alternatives will be considered prior to the making of a decision by the Forest Supervisor. The final decision may incorporate all or portions of any of the alternatives, including the No Action alternative.	Dick Artley
Best Available Science	Please disclose a comprehensive list of what the Forest Service considers to be “best available scientific information” for the purposes of planning this project. The agency must allow for the public to have meaningful	All references are cited in the EIS.	Jeff Juel

Johnson Bar Fire Salvage Project Summarized Public Comments			
Resource	**Comment/Issue (some may be paraphrased)**	**Response**	**Commenter**
	input on what is considered best available science for the purposes of planning this project, and as new science emerges.		
	We urge the Forest Service to utilize Sullivan et al., 2006 as part of its "best available science" on the subject of "best available science". Also, Nie and Schembra, 2014, recommend that the agency solicit independent feedback on its use of science.	Sullivan et al., 2006, discusses conducting scientific research and evaluating data implementation. The project analysis follows the report's recommendations to provide "greater transparency" and adhere to "well established scientific process". The focus of Nie and Schembra, 2014, is an evaluation of the use of standards for forest planning. Forest planning is outside the scope of this project.	Jeff Juel
	Some of the DEIS citations were not peer reviewed and at least one is policy opinion rather than based upon scientific research (for example, Western Governors' Association Forest Health Advisory Committee, 2008). There is other research that suggests these findings are indeed wrong and that beetles and diseases are important factors in forest ecology.	The project analysis uses the best available information. Sullivan et al., 2006, support this by stating, "The results of a sound scientific process need not be infallible to be the best available" and that "The soundness of any science is enhanced if associated values, assumptions, and uncertainties are clearly explained", which has been accomplished through the project analysis.	Friends of the Clearwater
	Are the documents cited on page 2 currently the best available science? We provided	The cited documents are related specifically to forest management	Friends of the Clearwater

Johnson Bar Fire Salvage Project Summarized Public Comments			
Resource	**Comment/Issue (some may be paraphrased)**	**Response**	**Commenter**
	citations in our scoping document of peer-reviewed science, of a later date, that would seem to challenge what the Forest Service apparently imputes from those studies, namely these forests are somehow out of whack and that logging is the cure. The concern is one of public process. Desired conditions are based upon the Forest Plan, which goes through both NEPA and NFMA for compliance. Only the Nez Perce National Forest Plan has gone through NEPA and a decision document. Neither the Scientific Assessments for Ecosystem Management nor the subbasin assessment did.	on the Nez Perce-Clearwater National Forests and provide a wealth of information that has been compiled for the areas. The documents support the Forest Plan desired future conditions.	
	Include (and cite) some source documents from the Opposing Views Attachments in the References section of the FEIS.	Consideration was provided to the literature submitted by the public. The project file contains a listing of all scientific literature used and referenced in this document.	Dick Artely
	Cite specific quotes presented for the source literature chosen by this member of the public in the text of the EIS.	Consideration was provided to the literature submitted by the public. The project file contains a listing of all scientific literature used and referenced in this document.	Dick Artley
	Include clickable links to each Opposing Views Attachments you choose to include in the reference section and explain why this is best science and trumps the information presented in the EIS.	The analysis processes for this project are based on the consideration of the best available science. The manner in which best available science is addressed can	Dick Artley

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		be found throughout the disclosure of rationale found within this EIS, ROD, and the project file. The project record references all scientific information considered: papers, reports, literature reviews, review citations, academic peer reviews, science consistency reviews, and results of ground-based observations to validate best available science. The literature used to develop and support the desired future condition for this project is disclosed in the NEPA document under the "Reference" section.	
	Best science clearly indicates post-fire logging causes significant, long-term harm to natural resources in the Forest.	The analysis processes for this project are based on the consideration of the best available science. The manner in which best available science is addressed can be found throughout the disclosure of rationale found within this EIS, ROD, and the project file. The project record references all scientific information considered: papers, reports, literature reviews, review citations, academic peer reviews, science consistency	Dick Artley

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		reviews, and results of ground-based observations to validate best available science.	
Climate Change	The DEIS fails to provide an analysis whatsoever for climate change. It fails to disclose how its management affects climate change or the carbon balance in the ecosystem. It also fails to disclose the implications, under likely climate change scenarios, for meeting vegetative desired conditions.	Thank you for your comment. Climate change was addressed under various resource sections throughout the EIS rather than in a separate section by itself.	Jeff Juel
Collaboration	The DEIS is not explicit if the sale is under the CFLRA and the "collaboration" groups. Was this sale a topic of discussion and agreement in the CBC group? Does it comply with the requirements of the CFLRA?	The Johnson Bar project is located within the Selway-Middle Fork CFLRP landscape and therefor a CLFR project by virtue of its location. The project was discussed with the CBC; however agreement was not sought nor was it implied as a condition of moving the project forward. "Requirements" specified by the CFLRA legislation are specific to the development and submission of the proposals that were selected for funding by the Secretary of Agriculture. The Selway-Middle Fork project, selected in 2010, is not a decision document, but instead identifies areas of broad agreement	Friends of the Clearwater

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		and outlines the desired social, ecological and economic conditions identified by the CBC and FS. The proposal also discusses a landscape strategy and a number of goals and objectives to work towards those conditions. Subsequent individual, site-specific projects are generally consistent with one or more of the goals and objectives and work towards the overall intent identified in the proposal. A description of how this project fits into the CFLR program is located in the Project History section of Chapter 1 of the DEIS.	
Cultural	How can it be that the five cultural resource sites located within the sale area boundary will not be affected by logging because they are not eligible for the NRHP?	Section 106 of the NHPA requires that historic properties be identified, the effects analyzed, and if applicable, consultation occur with SHPO in order to determine ways to avoid, reduce, or mitigate any adverse effects. Historic properties are defined as any district, archaeological site, building, structure, or object either listed or eligible for listing in the NRHP. As such, any cultural resources present within the project APE but not listed	Dick Artley

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		or eligible for listing under NRHP would not be considered an historic property and therefore not affected as a result of the proposed salvage harvesting.	
	The cultural resources effects disclosure does not mention what the USFS will do if they discover buried historic and prehistoric objects.	Thank you for your comment. Please see Heritage Resources design criteria (Chapter 2, Section 2.9.4).	Dick Artley
Design Criteria (all resources)	Request clarification and revision as appropriate to ensure that the intent of the design criteria measures are clearly actionable and measurable. 1) What are disturbance risks associated with cable corridors and landings (#13). Recommend that measurable limits that will not be exceeded be included. 2) How is “least soil damage” measured and/or controlled (Soils #13b)? Recommend that measurable thresholds be included. 3) Identify what “suitable measures” will be incorporated to “minimize soil disturbance…” (Soils #13c)What measures other than “intermediate supports” would be considered or applied? 4) Clarify the specific thresholds “when soil moisture levels are high” and “when soils are	1) Disturbances associated with cable corridors and landing are discussed in the Soils and Hydrology Analysis Sections. Design measures were planned in order to minimize the increased erosion risk of these sites in accordance with the analysis. 2) Locating corridors in locations with the fewest slope breaks and/or areas where the yarded material drags is the intent of least soil damage. This is determined on site during operations. 3) Suitable measures include intermediate supports, slashing of the corridor, and other methods to be determined on site.	Idaho Conservation League

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	wet" and what activities would be halted (Soils #13d and 14d). 5) Strengthen design criteria to preclude "locating landings on steep slopes or highly erodible soils" (Aquatics #10). Include specific measurable thresholds for what constitutes "steep slopes" and "highly erodible soils." 6) Require decommissioning of existing landings after use (Aquatics #10c). 7) Include specific measurable and actionable criteria to mitigate sedimentation associated with "sediment delivery points" (Aquatics #12). 8) It is unclear whether winter logging will be considered as a required design feature or if it is an option (Aquatics #12f). Clarify and strengthen direction regarding winter logging, reword to "Leave a minimum of 2 inches of snow on road surfaces" and to "Leave drainage points (breaches) in snow berms [AT REGULAR INTERVALS] to avoid concentrated snow melt runoff onto road surfaces." 9) Reword to "Tree retention [WILL ADHERE TO] Region 1 tree survival guidelines…" (Vegetation #1). 10) Clarify whether PACFISH/INFISH Biological Opinion (PIBO) effectiveness monitoring will be guaranteed throughout	4) High soil moisture and/or wet soils is generally defined as 25% of field capacity. This is determined on site during operations and may not be the only determination of soil moisture. In unit operations are suspended during these times. 5) Steep slopes are generally defines as slopes greater than 35%. Highly erodible soils are those shown as highly erodible in the landtype document (UDSA NRCS 2006). 6) Some existing landings are dispersed recreation sites, which would be undesirable to eliminate. 7) Road reconstruction under the Proposed Action was designed to address the identified delivery points. 8) Winter logging is an option. The wording will be modified to state "leave a minimum of 2 inches", which is consistent with the timber sale contract requirements. The "at regular interval" wording will also be added to the design criteria. 9) Tree mortality determination will be based upon the Scott Mortality	

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	the life of the project, even if a new Forest Plan is enacted that may no longer maintain PIBO monitoring program (Monitoring #3). 11) It is unclear how often, when, and how effectiveness monitoring of target stands and design criteria will be implemented (Monitoring #6). Clarify and strengthen actionable and measureable direction regarding post implementation effectiveness monitoring.	Guideline criteria (Scott D., C. Schmitt, and L. Spiegel. BMPMSC-03-01, November 25, 2002). 10) Riparian management monitoring will continue across the Forest for the foreseeable future and would be beyond the duration of the proposed project. 11) A review of the project will be conducted by the IDT prior to advertisement of the sale to ensure the design criteria have been properly incorporated. Post-harvest areas will be reviewed as the various logging system phases are completed. Helicopter and conventionally logged areas will most likely be completed at separate times. Reviews will take place as the activities are starting and as they progress towards completion.	
	Avoid logging on slopes that exceed 45%.	Ground based equipment is limited to appropriate slopes by design criteria.	Idaho Conservation League
	Clarify in Section 2.9 which design criteria would be included as components common to all action alternatives with regard to herbicide application.	Herbicide application is not being proposed as part of the Johnson Bar project. Any weed treatments would be in accordance with the	EPA

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		existing programmatic NEPA document. Weed control would be accomplished through equipment washing and site re-vegetation.	
Economics	The DEIS fails to disclose how the PNV for Alternative 4 can be so favorable as compared to the other action alternatives. The economics analysis has too few details to information anybody. Provide an itemization of costs and benefits of the project's various aspects.	The Alternative 4 PNV is so favorable, primarily because it requires the least amount of expensive helicopter logging as noted on DEIS page 46. Individual alternative costs can be found in the project file.	Jeff Juel
	The DEIS proposes "jobs" as a benefit of the project. How much work equates to one job?	One job is equivalent to one year of fulltime work. If two people work 6 months each, it is considered one job.	Jeff Juel
	In terms of economic feasibility, I am in support of implementing what the timber market can bear between Alternatives 2 and 4, where the use of carefully placed temporary roads maximize the utility of ground based and skyline systems, as well as shorten helicopter flight distances, for increased economic feasibility of salvage. Helicopter logging will likely result in a deficit value for species other than cedar for each ton harvested with that system. That cost must be carried by the positive stumpage value using conventional logging systems and high value timber species like cedar. Beyond	Thank you for your comment. All alternatives will be evaluated for resource effects including economics.	Idaho Forest Group

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	receipts to the US government for stumpage, the net economic benefit for each unit of timber volume salvaged measured in employment and direct and indirect economic activity is significant well beyond the net return to the agency in stumpage receipts.		
	The IRU disagrees that the proposed project is cost effective.	The economic analysis evaluated the various aspects of the alternatives to determine feasibility and economic benefits.	Idaho Rivers United
	The DEIS indicates that the project will result in long-term reductions of large fuels. At the same time Wildlife Design Criteria #5 indicates that large snags ≥ 15-inch DBH should be retained for all units if possible. It is difficult to comprehend how the project would implement this design feature and still result in an economically viable project.	Design criteria #5 only requires 5.6 snags to be left over 15-inch DBH. This can easily be met by leaving the higher defect large trees, while harvesting the low defect, higher volume trees.	Idaho Conservation League
	The proposed harvest of 2,973 acres of the 13,000 acres that were affected is the minimum acceptable number. Your consideration and analysis that harvest of additional acreage would provide little or no economic return makes sense. It is imperative to finalize this decision to retain as much economic viability as possible.	Thank you for your comment	Board of Idaho County Commissioners
	Offer the sale as an SBA sale to prevent a large timber corporation from logging it using	Small business set-aside sales are determined in conjunction with the	Dick Artley

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	their own labor and to prevent the logs from being hauled many miles to be processed at a mill far removed from small communities.	Small Business Administration (SBA). The sales are selected by the SBA based upon suitability to support small businesses.	
	Dr. Power's research shows that logging levels are inversely proportional to community stability. The DEIS fails to show why these research conclusions are not applicable to the communities near the Nez Perce National Forest.	The key to community stability is sustaining a continuous supply of timber. The Clearwater Basin has not reached the maximum mill capacity; therefore, the Forest has not reached the level of being inversely proportional to community stability.	Dick Artley
	Remove the "salvage timber before it loses its economic value, which would assist in the supporting the economic structure of local communities and to provide for regional and national needs" from the Purpose and Need statement, or offer the sale as an SBA sale, or include the cited references in their entirety in an Appendix to the NEPA document.	One of the goals in the Nez Perce National Forest Plan is to "Provide a sustained yield of resource outputs at a level that will help support the economic structure of local communities and provide for regional and national needs" (page II-1). All cited references are listed in the EIS under the Reference section.	Dick Artley
	The DEIS fails to provide an economic analysis to determine if the USFS will spend more money planning, preparing, and administering the sale than they would receive from the timber sale. The economic analysis should show the public if it is a below-cost sale.	Please see Chapter 3, Section 3.2 for the Economic analysis, which includes an analysis of the project sale feasibility.	Dick Artley

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Fire and Fuels	What evidence do you have that contradicts reams of science which show that climate, not fuel amounts or insects, are what drive stand-replacing fires and that stand-replacing fires are a normal part of most forest ecosystems?	Thank you for your comment. The Forest Service agrees that climate contributes to stand-replacing fires. Climate is an average of weather over time. Weather, fuels and topography are the 3 main drivers of fire behavior. As noted in Section 2.1.1, this area has (based on fire history) generally low fire growth, except when weather factors, such as high winds and high temperatures, corresponding to low relative humidity promote large fire growth. However, fuel loading also contributes to fire behavior. Byram's Fire Intensity Equation: Intensity = Heat of combustion*Weight of Fuel*Rate of spread shows in layman's terms that more fuel equates to more intense fires. Topography remains static. The Forest Service also agrees that stand-replacement fires are a part of forest ecosystems (see Section 3.3.5 and Appendix G).	Friends of the Clearwater
	Snags, logs, and other woody debris play a critical role in mitigating post-fire erosion rates and facilitating recovery of the	Design criteria set required amounts of CWD and fine debris that are to be left on site for soil and	Friends of the Clearwater

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	ecosystem. By removing them, natural rates of recovery will be slowed.	ecosystem function. For this proposal 17-33 tons/acre would be left to promote recovery. However, levels above this may actually impede recovery if burned again by sterilizing the remaining seed-bank and creating more erosion from hydrophobic soils.	
	The reburn theory seems to be an additional, unstated purpose and need for the project, yet is never adequately disclosed or addressed. Furthermore, no discussion is provided as to how salvage logging represents the only practical method of control.	The 'reburn theory' discussion was placed under 'history and risk' in order provide the reader a history of the area and explains what has led to the current situation. Since the 'reburn theory' is not part of the purpose and need, only the listed alternatives were analyzed.	Friends of the Clearwater
	We are concerned that the project fails to incorporate sufficient restoration elements that could offset some of the negative impacts associated with post-fire salvage logging. Research has indicated that salvage logging can increase subsequent fire severity, impede successful natural regeneration, and alter the rate and trajectory of forest recovery. A more robust discussion and plan is needed to demonstrate compliance with the upward trend requirements of the Forest Plan.	(1) There is conflicting science with regards to subsequent fire severity. Many papers are based on fires that occurred in Oregon and are not site-specific to this area. We don't disagree that in some places in the United States salvage logging may increase severity, but the argument is essentially whether man-made plantations burn with higher	Idaho Conservation League

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		surface fire severity than unmanaged stands. The majority of the plantations in the Johnson Bar fire did not burn and in fact served as barriers to fire spread. We assume that based on this site-specific fact that this should prove true in the future. (2) The sites will be replanted, making the possible impediment to natural regeneration mute. (3) Forest Management improves the forest condition. Ground-based logging can mitigate some detrimental impacts by leaving logging residue on site after a wildfire to provide additional protection from erosion ([Megahan and Molitor 1975] as cited in Page-Dumroese, Jurgensen, Abbott, Rice, Tirocke, Farley, and DeHart, 2006). Post-fire logging is an effective tool	

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		for reducing fuel loadings in forests regenerating after high severity wildfires. Post-fire logging can reduce woody fuels and help reduce threats to human health, property, and ecosystem services from unacceptable future wildfire behavior and effects. By applying best management practices post-fire logging could serve as an effective option for reducing fuels and restoring low and mixed severity fire regimes in dry coniferous forests (Peterson, Dodson and Harrod, 2015). Artificial reforestation practices are science-based and well tested. Performance of planted seedlings commonly exceeds that of natural seedlings. Given the competitiveness of shrubs as well as the historical variability in natural regeneration	

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		success, tree planting after salvage operations better ensures the desired density, species, and distribution of conifers (Newton et. al, 2006). Planted seedlings have 2-4 more years of competitive advantage and would shorten the time of recovery (Hobbs, Tesch, Owston, Stewart, Tappeniner, Wells, 1992). Impeding natural regeneration is desirable because most of the natural regeneration would likely be grand fir. Grand fir is prone to root rot and would develop a Forest that is not resistant to wildfire. If nothing was done the future forest would be in poor condition.	

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		Planting early seral species would promote forest health because these species are resistant to wildfire and root rot. By planting early seral species the forest would be more resilient to disturbance agents. Planting early seral species would also promote vegetation diversity which promotes wildlife diversity. Early seral tree species are more resilient to disturbance agents and would be more likely to develop into mature stands that provide diverse habitats. "Upward trend in habitat carrying capacity is assessed and described through many different measures. These measures/process are thoroughly outlined in The Implementation Guide to Appendix A of the Nez Perce National Forest Plan (Conroy and Thompson, 2011). In general, current trend is assessed	

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		using legacy stream survey data, watershed analyses, Forest Plan monitoring station cobble embeddedness compared to contemporary data (such as PIBO and current cobble embeddedness) and other substrate data. Disturbance history over the past 20 years including harvest, wildfire, etc., restoration activities that date to 1987 and ongoing activities are considered, along with trending fish populations. Step 2 is to assess the proposed project activities to trend, and the Step 3 is to describe the analysis with rationale. The existing upward trend analysis for Johnson Bar will be expanded in the FEIS."	
	The discussion of the Reburn Theory in section 2.2.1 is curious. It appears to set the stage for a non-existent purpose and need, which is actually used to justify some aspects of the project. At the same time, the reburn theory is not incorporated as a purpose of the project. Reburn theories have largely been dismissed as driving rationales for salvage logging. As a result we encourage you to strike this section and to instead rely upon established purpose and need statements to	The 'reburn theory' discussion was placed under 'history and risk' in order provide the reader a history of the area and explains what has led to the current situation. There is conflicting science with regards to subsequent fire severity. The purpose and need statements may be found under Section 1.2.3.	Idaho Conservation League

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	drive alternative development and rationale for project implementation.		
	Please include BARC maps or other maps that illustrate severity of the fire in areas proposed for salvage logging and to discuss how and whether the project will influence future fire risk, and how the project considers the results of Thompson et al., 2007.	(1) BARC maps are being included in the FEIS Soils Resource section. (2) Fire risk (probability) is represented by the ignition frequency map and discussion on pages 9-10. The hazard (high fuel loadings) is discussed in Section 3.3. There is conflicting science with regards to subsequent fire severity. Many papers (including Thompson, et al) are based on fires that occurred in Oregon and are not site-specific to this area. Other non-site specific papers, such as Peterson et al, 2015 show downward trends in fire severity. We don't disagree that in some places in the United States salvage logging may increase severity, but the argument is essentially whether man-made plantations burn with higher surface fire severity than unmanaged stands. The majority of the plantations in the Johnson Bar fire	Idaho Conservation League

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		did not burn and in fact served as barriers to fire spread. We assume that based on this site-specific fact that this should prove true in the future.	
	The DEIS justifies the project because it will assist with later fire suppression efforts; however, the agency failed to disclose the ecologically damaging impacts of fire suppression.	Please see Fisheries existing condition Section 3.5.7.1 and cumulative effects section Table 3-52.	Jeff Juel
Fisheries/Hydrology	The proposed action needs to be consistent with the PACFISH Biological Opinion. The terms of the Biological Opinion prohibit the construction of new roads, reopening of closed roads, construction of landings, and require low impact harvest through horse or helicopter yarding and skidding. Because much of the project occurs within the Selway River drainage, it appears the proposal is inconsistent with this direction. This inconsistency should be thoroughly vetted and discussed in the FEIS.	The BiOp established an overall objective that management activities must not have an adverse effect on steelhead. All of the alternatives comply with this through the development of mitigation measures, which is discussed in the BiOp at part V.B.4 where it states “Provide additional mitigation measures in steelhead strongholds in the Snake River basin ESU to reduce the potential of adverse combined effects:” The BiOp recommended harvest methods and practices in the BiOp Appendix 1 that at the time were felt to meet this objective. Modern harvest techniques and Best Management Practices based on	Idaho Rivers United

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		current best science allow a wider range of harvest equipment and road use to be implemented without having detrimental water quality impacts and subsequent potential adverse fish effects that had been associated with past harvests.	
	Given the steep gradients, the Tribe is concerned about the likelihood of sediment from post-fire events adversely affecting fish-bearing streams, which can be detrimental to the Nez Perce Tribe's fisheries restoration efforts. The BAER report rates the risk level as high for threats to fisheries communities due to post-fire erosion events. The Tribe is concerned with any activity associated with the proposed actions and alternatives that would exacerbate or increase sediment delivery to the Selway River, Middle Fork, Clearwater, and mainstem Clearwater River downstream. Increased sediment may cause problems with water quality and quantity pumped from the mainstem Selway River to the Cedar Flats Acclimation Facility. In addition, increased sediment input could negatively impact viable spawning habitat for steelhead, spring and fall Chinook, bull trout, Pacific lamprey, westslope cutthroat trout,	NEZSED modeling displays measurable sediment increases from post-fire effects (Appendix C). Sediment increases quickly dissipate 1-4 years post fire. Table 3-13 displays estimated sediment yield (percentage over baseline). These increases vary from 1-5% below the water quality objectives threshold outlined in the Nez Perce National Forest Plan, with a 1-6% reduction in winter and summer rearing capacity (FISHSED, below 10% objectives outlined in Nez Perce National Forest Plan Appendix C Tables C1-C3). There is a 0-1% detectable sediment increase in some prescription watersheds 10 years post-fire and after project implementation (Table 3-13). Table 3-11 displays sediment reduction	Nez Perce Tribe

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	rainbow trout, mountain whitefish, and other resident aquatic species.	with proposed treatments using the WEPP Roads module, and Table 3-10 compares post fire sediment yield (tons) given a 10% probability run-off event with a total of 48% post-treatment reduction in sediment yield. The Fisheries section (Section 3.5), pages 94-97, discusses the beneficial effects of fire to salmonid habitat. Table 3-24 discusses indirect effects (short- and long-term) by Alternative to fisheries habitat (RMOs), including cumulative effects in table 3-52. Determination of effects is outlined in Table 3-53 for ESA listed fisheries and essential fish habitat and Table 3-56 for Regional Sensitive Species. There should be limited effects to the Cedar Flats acclimation site given its location. The majority of moderate to high burn severity was in the Swiftwater, Elk City, and Burned creek drainages downstream of the Cedar Flats facility (refer to burn severity map). Approximately 970 acres burned at low to moderate burn severity in lower O'Hara Creek, 2% of the total	

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		subwatershed. Given this, it is unlikely that there would be measureable increases in sediment intake at the facility specifically from the Johnson Bar Fire itself or proposed Johnson Bar Salvage actions.	
	Given the increased sedimentation risks and on-going fisheries restoration actions, the Tribe recommends implementing BMPs, design criteria, and the watershed improvement projects before any harvest or haul begins.	Improvements to roads, reconstruction and road maintenance will be completed before harvest activities with applicable project design criteria in place.	Nez Perce Tribe
	The Tribe is implementing a Snake River fall Chinook salmon restoration program in the Clearwater River Basin, which involves operation of the Nez Perce Tribal Hatchery and several satellite facilities. The purpose is to expand natural production of fall spawning Chinook salmon into their historic range, which is an important component of increasing diversity of the stock and reducing the risk of extirpation. Sediment deposition will be detrimental to restoration of the fall Chinook.	Refer to Table 3-24 for indirect effects to fisheries habitat by Alternative. Refer to Table 3-52 for cumulative effects to Fisheries within the project area. Effects determination to SR Fall Chinook and critical habitat is NLAA (Table 3-53) primarily given the Fall Chinook distribution is limited to the mainstem Selway and Middle Fork Clearwater with a low number of adult returns at this point in time (Appendix A, Tables 7A and 8A).	Nez Perce Tribe
	The pre-fire watershed condition for the Goddard Creek-Selway River and O'Hara Creek subwatersheds is functioning properly.	Several Matrix of Pathways and Indicators of Watershed Condition (NMFS, USFWS 1996) were used	Nez Perce Tribe

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	The condition of the Big Smith-Middle Fork Clearwater River, however, is functioning at risk. Lodge and Decker Creek subwatersheds have poor indicators for road and trail conditions, and fair indicators for riparian/wetland vegetation condition, aquatic habitat, and soil condition. It is critical that all efforts are made in order for the Goddard Creek-Selway River and O'Hara Creek continue to be rated as properly functioning. It is also important that the Big Smith-Middle Fork Clearwater River be improved in order for it to not function at risk, and the indicators for Lodge and Decker creeks also need to improve so they can be rated as functioning properly.	along with applicable RMOs and cobble embeddedness measurements. Refer to Tables 3-16, 3-19 and 3-20. Given past survey data, all watersheds have low watershed conditions for pool quality/quantity, large woody debris and off-channel habitat. This is in part due that these are high gradient, small channel size streams (refer to Fisheries Methodology section 3.5.3). In addition, the Matrix of Pathways and Indicators considers Watershed Condition at the watershed (HUC 5) level or in this particular analysis, the subwatershed scale because proposed actions and cumulative effects would not necessarily be distinguishable at a larger scale. Habitat survey information for one stream (prescription subwatershed) is just a piece that speaks to watershed condition at the watershed scale.). Additional survey information such as PIBO habitat survey data attempts to compare reference as well as managed sites since PACFISH survey	

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		data does not do this and in many cases both reference reaches and managed reaches do not meet objectives (Keshner and Roper 2010). See Fisheries section 3.5.6.2 for further discussion. Temperature data collection and cobble embeddedness survey would be ongoing and continue to speak to existing condition and upward trend within these watersheds. Existing cobble embeddedness taken on 7 different stream reaches is above cobble embeddedness objectives refer to Table 3-19 and following narrative. Fish distribution is limited on Lodge and Decker Creek due to natural barriers (rock falls, Refer to Figure 7). The Johnson Bar Fire Salvage project was designed to have minimal effects on aquatic resources. The design criteria include the use of PACFISH riparian buffers, minimum road construction and reconstruction with no stream crossings, placement of roads on ridge tops, and the avoidance of landslide prone areas. All newly proposed roads and landings would	

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		be obliterated. Entry frequency guidelines would apply to future harvest within prescription watersheds (Appendix A, Table A-1 in Nez Perce LRMP) with the objective of achieving upward trend within prescription watersheds. Monitoring will include: • Temperature monitoring would continue in the lower Selway (Selway River and O'Hara Creek). • Habitat surveys will continue to be conducted on Swiftwater and Goddard creeks. These are full stream surveys collecting, bank stability, stream geomorphology (pool riffle sequences and percent pool habitat), percent shade, Wolman pebble counts. • PACFISH/INFISH Biological Opinion (PIBO) effectiveness monitoring will be ongoing (3-5 year rotation) within the Selway and Middle Fork Clearwater subbasin. Currently, there is PIBO EM	

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		site located within the specific Project Area, located on Goddard Creek. Six more monitoring sites will be added to the Selway subbasin • A Forest Plan Monitoring Site has been established on O'Hara Creek. PACFISH riparian management objectives (RMOs) along with fish density are measured every three years. Given proposed actions this site will be revisited on an annual base. Cobble embeddedness (CE) monitoring on Swiftwater, Elk City, and Goddard and O'Hara creeks is conducted on an annual basis. Baseline cobble embeddedness surveys were conducted in 2014 and additional baseline surveys will be conducted summer of 2015 on each of these streams. There will be two designated sites on Swiftwater Creek, one below and above the Idaho Department of Lands. The site below IDL will be sampled before	

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		logging operations commence and later that season. Given the timing of salvage operation 2015-2017 there will likely be harvest operations conducted in several drainages at once so separating fire effects from harvest operations could be difficult but, where possible, CE would be monitored simultaneously in a drainage with harvest and one that is currently not undergoing harvest operations. Monitoring will continue at each site 3 years past the last harvest.	
	The 1998 LRMP BiOp includes the Nez Perce National Forest for ESA listed Snake River steelhead. Within the 1997 BA and 1998 BiOp, steelhead stronghold subbasins were designated, including the Selway River subbasin because the Selway River includes a genetically and ecologically unique sub-population. A provision of the 1998 BiOp states that its recommendation should be extended indefinitely, until such time as a new, long-term, plan-level direction is adopted by the USFS and BLM for both salmon and steelhead. The 1998 BiOp and its provisions are still valid.	Several Matrix of Pathways and Indicators of Watershed Condition (NMFS, USFWS 1996) were used along with applicable RMOs and cobble embeddedness measurements. Refer to Tables 3-16, 3-19 and 3-20. Given past survey data, all watersheds have low watershed conditions for pool quality/quantity, large woody debris and off-channel habitat. This is in part due that these are high gradient, small channel size streams (refer to Fisheries Methodology section 3.5.3). In addition, the	Nez Perce Tribe

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		Matrix of Pathways and Indicators considers Watershed Condition at the watershed (HUC 5) level or in this particular analysis, the subwatershed scale because proposed actions and cumulative effects would not necessarily be distinguishable at a larger scale. Habitat survey information for one stream (prescription subwatershed) is just a piece that speaks to watershed condition at the watershed scale.). Additional survey information such as PIBO habitat survey data attempts to compare reference as well as managed sites since PACFISH survey data does not do this and in many cases both reference reaches and managed reaches do not meet objectives (Keshner and Roper 2010). See Fisheries section 3.5.6.2 for further discussion. Temperature data collection and cobble embeddedness survey would be ongoing and continue to speak to existing condition and upward trend within these watersheds. Existing cobble embeddedness taken on 7	

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		different stream reaches is above cobble embeddedness objectives refer to Table 3-19 and following narrative. Fish distribution is limited on Lodge and Decker Creek due to natural barriers (rock falls, Refer to Figure 7). The Johnson Bar Fire Salvage project was designed to have minimal effects on aquatic resources. The design criteria include the use of PACFISH riparian buffers, minimum road construction and reconstruction with no stream crossings, placement of roads on ridge tops, and the avoidance of landslide prone areas. All newly proposed roads and landings would be obliterated. Entry frequency guidelines would apply to future harvest within prescription watersheds (Appendix A, Table A-1 in Nez Perce LRMP) with the objective of achieving upward trend within prescription watersheds. Monitoring will include: • Temperature monitoring would continue in the lower Selway (Selway River and O'Hara Creek).	

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		• Habitat surveys will continue to be conducted on Swiftwater and Goddard creeks. These are full stream surveys collecting, bank stability, stream geomorphology (pool riffle sequences and percent pool habitat), percent shade, Wolman pebble counts. • PACFISH/INFISH Biological Opinion (PIBO) effectiveness monitoring will be ongoing (3-5 year rotation) within the Selway and Middle Fork Clearwater subbasin. Currently, there is PIBO EM site located within the specific Project Area, located on Goddard Creek. Six more monitoring sites will be added to the Selway subbasin • A Forest Plan Monitoring Site has been established on O'Hara Creek. PACFISH riparian management objectives (RMOs) along with fish density are	

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		measured every three years. Given proposed actions this site will be revisited on an annual base. Cobble embeddedness (CE) monitoring on Swiftwater, Elk City, and Goddard and O'Hara creeks is conducted on an annual basis. Baseline cobble embeddedness surveys were conducted in 2014 and additional baseline surveys will be conducted summer of 2015 on each of these streams. There will be two designated sites on Swiftwater Creek, one below and above the Idaho Department of Lands. The site below IDL will be sampled before logging operations commence and later that season. Given the timing of salvage operation 2015-2017 there will likely be harvest operations conducted in several drainages at once so separating fire effects from harvest operations could be difficult but, where possible, CE would be monitored simultaneously in a drainage with harvest and one that is currently not undergoing harvest operations.	

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		Monitoring will continue at each site 3 years past the last harvest.	
	Appendix 1, #4 of the 1998 LRMP BiOp list mitigation measures of federal actions. These actions (in the 1998 LRMP BiOp), as compared to the actions being proposed under the Johnson Bar Fire Salvage Draft EIS, have several inconsistencies.	The BiOp references the1997 BA recommendation 4 in section VIII.3.a on page 36 of the BiOp. To minimize or prevent adverse impacts to steelhead, the BiOp contains a number of *recommended considerations* or mitigation measures to incorporate in project planning and design (BiOp, V.B.4 and Appendix 1,4). Items 2 (restrict new roads), 3 (avoid landslide prone) and 6 (minimize timber harvest road construction and ground disturbance) are pertinent to timber harvest and harvest related activities. In reference to the Appendix 1 mitigation measures that were outlined to reflect the above items, the BiOp states, “It is acknowledged that there are limitations to the best available science and that these limitations play an important role in actual effects to steelhead from management actions. Mitigative measures are intended to provide risk avoidance until such time as	

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		better scientific information is available" (BiOp,Appendix1, 4). The Johnson Bar project was designed to be consistent with the intent of the BiOp. The BiOp directs use of the Level 1 consultation process stating,*"the ultimate goal of Level 1 review is to design actions that are not likely to adversely affect listed species, and thus avoid the likelihood of incidental take and the need for formal consultation"*(BiOp,XIV,A). Marine Fisheries Service (NMFS) personnel have been assigned to the project to advise and assist in designing the project to ensure consistency with the BiOp so that the Johnson Bar activities can be implemented to not likely to adversely affect listed or proposed species in regard to timber harvest related activities. Through this coordination and NEPA analysis, modern harvest techniques and Best Management Practices based on current best science were determined to reduce resource impacts previously associated with past harvests, which allowed a	

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		wider range of harvest equipment and road use to be utilized on the Johnson Bar Project without having detrimental water quality impacts and subsequent potential adverse fish effects. To meet the BiOp objectives the following design criteria are being utilized; 1. New Roads – Any proposed new road construction is restricted to short sections of temporary roads that would be recontoured following use and would be located on a ridge top area where there is no risk of sediment entering a water source. 2. Old Roads – Many old overgrown roads exist in the area; any overgrown road proposed for use would be decommissioned properly following use to contribute toward the area upward trend. 3. RHCA –There is no harvest occurring on landslide prone areas or in RHCAs.	

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		4. Timber Management –The project will only use timber harvest methods and Best Management Practices that result in low levels of ground disturbance and avoid adverse effects to steelhead. All alts use helicopter and skyline, with a minor amount of tractor. The tractor skidding is only proposed where it would not have any adverse effect on steelhead. Landings - No new landings are proposed for the skyline or tractor areas. New landings proposed for the helicopter areas are extensions of existing roads and range from ¼ to ½ acre in size. They are located in areas that are completely disconnected from any water delivery sources and these landings would be obliterated, decompacted and seeded following use.	
	The Selway River needs additional protection from combined adverse effects. The FEIS needs to clearly explain how the impacts from non-federal actions, and the impacts of this project, will not cumulatively impact	Refer to Table 3-52 for cumulative effects analysis in Fisheries section 3.18. There are possible long and short term indirect effects from both Private Land and IDL Salvage	Nez Perce Tribe

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	stream and river conditions and not adversely impact listed steelhead and fall Chinook habitat.	given harvest within the 300 foot RHCA buffer and permanent road construction under IDL proposed actions. Determination of effects by Alternative is located in Table 3-53. There are possible adverse effects to SR Steelhead given the proximity of private and IDL salvage operations to Swiftwater Creek and occupied steelhead habitat. In addition, proposed road decommissioning efforts could have associated short-term sediment increases but, with long-term watershed benefits. Further analysis is contained in the Biological Assessment within the Project file. This will also be further explained in the FEIS.	
	How will the PACFISH buffer monitoring be accomplished, and what methods will be used?	PACFISH buffer monitoring will not be incorporated into this project; the monitoring section will be updated in the FEIS.	Nez Perce Tribe
	The DEIS claims that an upward trend is apparent. How was this determined? Why were NEZSED and FISHSED used to make this determination when they have serious problems?	Upward trend in habitat carrying capacity is assessed and described through many different measures. These measures/processes are thoroughly outlined in *The Implementation Guide to Appendix*	Friends of the Clearwater

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		A of the Nez Perce National Forest Plan (Conroy and Thompson, 2011). In general, current trend is assessed using legacy stream survey data, watershed analyses, Forest Plan monitoring station cobble embeddedness compared to contemporary data (such as PIBO and current cobble embeddedness) and other substrate data. Disturbance history over the past 20 years including harvest, wildfire, etc., restoration activities that date to 1987 and ongoing activities are considered, along with trending fish populations. Step 2 is to assess the proposed project activities to trend, and the Step 3 is to describe the analysis with rationale. The existing upward trend analysis for Johnson Bar will be expanded for the FEIS.	
	The DEIS states that cobble embeddedness samples at the sites have been done only once or twice. How can trends be determined by one or two data points when the DEIS states that it can't? Every single creek in the chart on page 89 shows cobble embeddedness above forest plan objectives. There is no data for the Middle Fork,	Existing cobble embeddedness taken on 7 different stream reaches is above cobble embeddedness objectives refer to Table 3-19 and following narrative. Trend data for cobble embeddedness was only completed for O'Hara Creek because it is a Forest Plan	Friends of the Clearwater

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	Clearwater River. PIBO data show the managed sites are worse than reference streams. Doesn't this prove that the management strategy is not recovering watersheds? This is evidence that the prescription watersheds are not meeting their water quality objectives, and there are no upward trends.	monitoring station with many years of cobble embeddedness data (WCE). An analysis of variance (ANOVA) with Bonferonni adjustment was used to detect significant differences in cobble embeddedness through the years. 1990 and 2014 showed significant differences (increases) but, no trend was detectable over time. There will be ongoing cobble embeddedness monitoring within the project area: • Annual cobble embeddedness (CE) monitoring on Swiftwater, Elk City, and Goddard and O'Hara creeks. Baseline cobble embeddedness surveys were conducted in 2014 and additional baseline surveys will be conducted summer of 2015 on each of these streams. There will be two designated sites on Swiftwater Creek, one below and above the Idaho Department of Lands. The site below IDL will be sampled before logging	

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		operations commence and later that season. Given the timing of salvage operation 2015-2017 there will likely be harvest operations conducted in several drainages at once so separating fire effects from harvest operations could be difficult but, where possible, CE would be monitored simultaneously in a drainage with harvest and one that is currently not undergoing harvest operations. Monitoring will continue at each site 3 years past the last harvest. Past PIBO does indicate that managed sites are poorer condition than reference in some respects for example, pool depth, percent pools and percent fines in both the Selway and MF subbasins but, other habitat perimeters remained constant and overall, managed sites remained the same during the study time- frame. Results may be somewhat skewed given the small sample size of both	

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		managed and reference. Refer to the 2013 PIBO report within the project file, six new PIBO sites (a mix of managed and reference) will be added to the Selway Basin summer of 2015. PIBO data is on a 5 to 3 year sampling rotation beginning 2001 so, additional monitoring is necessary within in these subbasins and across the Columbia River Basin to establish long-term trends in managed areas.	
	Have water quality and fish habitat monitoring protocols remained the same over time? If not, why? How can data be compared with different monitoring protocols?	Most protocols change overtime to adapt new science and methodology. These are often not used in comparison given differing protocol. Refer to Fisheries report section 3.5.3 Analysis Methodology. This section will be expanded to include cobble embeddedness protocol and clarification on FISHSED methodology and assumptions.	Friends of the Clearwater
	The allegation that the proposed project meets the upward trend requirements of the Forest Plan is not based upon hard data. There is no factual basis and the models are faulty.	Upward trend in habitat carrying capacity is assessed and described through many different measures. These measures/process are thoroughly outlined in *The Implementation Guide to Appendix*	Friends of the Clearwater

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		A of the Nez Perce National Forest Plan (Conroy and Thompson, 2011). In general, current trend is assessed using legacy stream survey data, watershed analyses, Forest Plan monitoring station cobble embeddedness compared to contemporary data (such as PIBO and current cobble embeddedness) and other substrate data. Disturbance history over the past 20 years including harvest, wildfire, etc., restoration activities that date to 1987 and ongoing activities are considered, along with trending fish populations. Step 2 is to assess the proposed project activities to trend, and the Step 3 is to describe the analysis with rationale. The existing upward trend analysis for Johnson Bar will be expanded for the FEIS.	
	Why doesn't the DEIS discuss the weaknesses of FISHSED and NEZSED in terms of analysis, including critiques of the models. The DEIS notes WEPP was used but it provides little information to the reader to compare how the WEPP results correlate with those of FISHSED or NEZSED.	Some FISHSED methodology and assumptions are outlined in the Fisheries section 3.5.3 Analysis Methodology but, will be further defined in the FEIS. The Hydrology Report discusses the use of both models in the analysis. There is no correlation between	Friends of the Clearwater

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		WEPP and NEZSED. NEZSED is used to comply with existing Forest Plan standards and provide a coarse overview of potential project impacts. WEPP is used to inform questions on the relative impact of various alternatives (including no action) on hillslope and road erosion.	
	The ECA measure is complicated by the fact that only dead trees would be logged. There is the questions as to whether the ECA was correctly calculated for any alternative, including the No Action.	ECA calculations are explained under the Hydrology section of the EIS. Since the project does not propose the harvesting of live trees, there would not be much change in the ECA between alternatives. Any changes that do occur would be the result of potential removal of incidental live trees for temporary road construction and clearing of landings.	Friends of the Clearwater
	The DEIS seems to possibly suggest logging may actually decrease sediment (Tables 3-10 and 3-11) by treating logging roads or slash on units. There are two issues: 1) the BAER recovery efforts should have mitigated those sediment sources already; and 2) that removal of trees under action alternatives will increase the erosive effects of	The BAER treatments included for the fire were limited to road, trail, and invasive plant treatments. Johnson Bar Fire BAER treatments did not include hillslope treatments. While BAER hillslope treatments were determined to have a high likelihood of reducing post-fire hillslope erosion, the treatments	Friends of the Clearwater

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	precipitation versus the No Action alternative.	were determined not to be cost-effective. While dead and defoliated trees are less effective at interception than live trees, they would nonetheless be expected to intercept a percentage of incoming precipitation. However, the groundcover prescription for treatment units described in the EIS would be expected to be at least as effective at intercepting precipitation (absorbing the erosive energy of falling water). Moreover, additional groundcover would reduce erosion from overland flow.	
	What are the impacts to aquatic species, specifically steelhead, bull trout, and fall Chinook habitat? Westslope cutthroat, Pacific lamprey, and pear musselshell are also known to exist.	Direct and Indirect effects are outlined in the Fisheries report Section 3.5.7. Determination of Effects to Sensitive Species is shown in Table 3-21. Indirect effects to fisheries habitat under the post-fire no Action Alternative are displayed in Table 3-23. Indirect effects to fisheries/aquatic habitat under Alternatives 2-4 are displayed in Table 3-24.Cumulative effects to fisheries/aquatic habitat are	Friends of the Clearwater

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		displayed in Table 3-52. Determination of Effects to ESA fish are displayed in Table 3-53 and Regional Sensitive Species is located in Table 3-56.	
	With regard to fisheries and watersheds, the basic argument of "no impact" analysis is primarily based upon BMPs and the decommissioning of roads. BMPs are not "fail-safe" and do not recover watersheds. BMPs failed to recover watersheds on the Clearwater National Forest. The failure of prescription watersheds to meet Forest Plan objectives for water quality/fish habitat and the lack of an upward trend is verification of BMP ineffectiveness. The decommissioning of roads will generate and delivery sediment to streams. The contention that sediment delivery will be minor and temporary is seriously flawed. Depressed populations of steelhead and bull trout could suffer prolonged impacts to their recovery. The DEIS does not provide an analysis of those road conditions and whether decommissioning is needed (grown-over roads) or not. It also does not differentiate between complete decommissioning, closure via a gate, or anything in between.	Determination of Effects to ESA fish is displayed in Table 3-56 and Determination of Effects to Regional Sensitive Species is located in Table 3-56. Table 3-24 displays indirect effects to aquatic habitat from proposed actions. Specifics pertaining to road decommissioning will be identified further in the FEIS. Project design criteria is outlined in section 2.9 of the DEIS along with project Monitoring, section 2.10. This section will be expanded in the FEIS new additions include design measures below: • Implementation and post implementation effectiveness monitoring of target stands and design criteria would be performed as an interdisciplinary team at least two selected harvest units. Implementation monitoring with an	Friends of the Clearwater

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		interdisciplinary team also includes inspection of erosion control measures on roads, skid/swing trails and skyline corridors. These Best Management Practice reviews could be submitted to the regulatory agencies. BMP audit results are entered into the USFS National BMP database. • Soil scientist in coordination with the TSA would conduct field evaluations of selected tractor logging units during harvest operations. The general watershed benefits of road decommissioning are discussed in the hydrology specialist report, and include reduced erosion, reduced sediment delivery where connected to streams, restored near-surface groundwater flowpaths, soil decompaction, and reduced vulnerability to hillslope failure, especially in the event of burn-over. Potential benefits were not quantified in the analysis due to lack of data on these routes. While	

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		road obliteration can lead to a temporary increase in erosion or sediment delivery, in practice BMPs minimize or prevent this. Properly done, road decommissioning provides long-term stability to sites that currently have some level of watershed impact, and the potential to have greater impacts if disturbed (e.g. by fire or unauthorized travel). Methods for road decommissioning are described in the EIS.	
	The DEIS states that 1 mile of road is to be constructed on an existing template, another is not on an existing template, and one mile consists of tractor swing trails. Do the various models and the narrative treat these roads differently in terms of impacts? If so, why?	These roads were not evaluated using WEPP for sediment delivery to streams because these segments would not have a surface connection to any stream channel. Any eroded sediment carried off of these roads would be deposited on the forest floor. In NEZSED, all of these routes were treated as roads.	Friends of the Clearwater
	Has the Net Map model been calibrated on the project area streams? If not, its use is not valid.	NetMap was only used to identify steelhead intrinsic potential, refer to BA in the project file and results will also be included in the FEIS.	Friends of the Clearwater
	We question the analysis of cumulative impacts on watersheds and fisheries/aquatic species. There is almost no analysis of the difference in post-fire logging versus logging	IDL Selway Salvage Sale, fire suppression efforts, Middle Fork Vegetation Project and grazing were	Friends of the Clearwater

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	in areas which have not seen recent fire in spite of the fact our scoping comments provided a significant number of scientific citations about much greater impacts of post-fire logging. There are numerous activities, such as the State of Idaho timber sale, fire suppression, Middle Fork Vegetation Project, livestock grazing, etc. that need to be integrated into the assessments.	addressed in Table Cumulative Effects Table 3-52. Many of the scientific references that you provided on impacts of post-fire logging were included in the DEIS, refer to references. Additionally, a literature review of some of these references can be found within the project files.	
	Are PACFISH buffers intact?	There will be no harvest or road construction within RHCAs, refer to Project Design Criteria 2.9.3.	Friends of the Clearwater
	Cumulative effects analyses of the Selway and Middle Fork are lacking. The DEIS does not look at the entire drainage of the Selway and Lochsa, which affect the lower Selway and Middle Forks. All projects in those areas need to be assessed.	The fisheries analysis will use the subwatershed scale to analyze direct, indirect and cumulative effects. This scale of analysis was selected because effects from the proposed actions and cumulative effects would not necessarily be distinguishable at a larger scale.	Friends of the Clearwater
	NEZSED does not take into account mass wasting events. The land types in this area are at high risk of failure and that needs to be factored into the analyses of impacts to soils, watersheds, hydrology, and aquatic species.	Verified landslide prone lands or areas at risk to mass wasting have been avoided by the proposed harvest activities. Any areas identified during layout will be avoided in accordance with design criteria in Chapter 2.	Friends of the Clearwater
	Ensure consistency with the PACFISH Biological Opinion (1198). The FEIS should	The BiOp references the1997 BA recommendation 4 in section	Idaho Conservation League

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	disclose the provisions of the PACFISH BiOp and discuss how the alternatives comply with that direction. Specifically the BiOp prohibits the construction of new roads, reopening closed roads, construction of landings, and requires low impact harvest through horse or helicopter yarding and skidding. It appears the proposal is inconsistent with this direction.	VIII.3.a on page 36 of the BiOp. It also summarizes the key special management measures. Items 2 (restrict new roads), 3 (avoid landslide prone) and 6 (minimize timber harvest road construction and ground disturbance) are pertinent to timber harvest and harvest related activities. The BiOp does not "prohibit" new road construction or otherwise establish non-discretionary standards. Instead, to minimize or prevent adverse impacts to steelhead, the BiOp contains a number of *recommended considerations* or mitigation measures related to the above items to incorporate in project planning and design (BiOp, V.B.4 and Appendix 1,4). In reference to the Appendix 1 mitigation measures the BiOp states, "It is acknowledged that there are limitations to the best available science and that these limitations play an important role in actual effects to steelhead from management actions. Mitigative measures are intended to provide	

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		risk avoidance until such time as better scientific information is available" (BiOp,Appendix1, 4). The Johnson Bar project was designed to be consistent with the intent of the BiOp. The BiOp directs use of the Level 1 consultation process stating,*"the ultimate goal of Level 1 review is to design actions that are not likely to adversely affect listed species, and thus avoid the likelihood of incidental take and the need for formal consultation"*(BiOp,XIV,A). Marine Fisheries Service (NMFS) personnel have been assigned to the project to advise and assist in designing the project to ensure consistency with the BiOp so that the Johnson Bar activities can be implemented to not likely to adversely affect listed or proposed species in regard to timber harvest related activities. Through this coordination and NEPA analysis, modern harvest techniques and Best Management Practices based on current best science were determined to reduce resource impacts, which allowed a wider	

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		range of harvest equipment and road use to be utilized on the Johnson Bar Project without having detrimental water quality impacts and subsequent potential adverse fish effects that had been associated with past harvests. To meet the BiOp objectives the following design criteria are being utilized; 1.New Roads – Any proposed new road construction is restricted to short sections of temporary roads that would be recontoured following use and would be located on a ridge top area where there is no risk of sediment entering a water source. 2.Old Roads – Any overgrown road proposed for use would be decommissioned properly following use to contribute toward the area upward trend. 3.RHCA –There is no harvest occurring on landslide prone areas or in RHCAs. 4.Timber Management –The project will only use timber	

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		harvest methods and Best Management Practices that result in low levels of ground disturbance and avoid adverse effects to steelhead. All alts use helicopter and skyline, with a minor amount of tractor. The tractor skidding is only proposed where it would not have any adverse effect on steelhead. Landings - No new landings are proposed for the skyline or tractor areas. New landings proposed for the helicopter areas are extensions of existing roads and range from ¼ to ½ acre in size. They are located in areas that are completely disconnected from any water delivery sources and these landings would be obliterated, decompacted and seeded following use.	
	Because roads often serve as a vector for increased sedimentation, this should be closely evaluated. The analysis should consider how dead and dying trees and their juxtaposition along roadsides can reduce or mitigate the effects associated with sediment delivery to streams.	The matter of erosion from roads was discussed in the EIS and Hydrology Report. The probability of erosion in the post-fire environment is highest in the first year following the fire and drops continually after that. Tree roots provide some erosion control, and would do so	Idaho Conservation League

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		whether the tree above the roots is removed or in place. Fire-killed trees have already fallen, and will continue to fall in an uncontrolled manner. While contour-falling of logs as a post-fire treatment have fallen out of favor, fallen logs would likely provide at least a modest level of erosion control. However, systematic slashing of treatment units as proposed in the EIS were predicted to provide substantial erosion control.	
	It is unclear from the maps whether all RHCAs will be excluded, and whether landslide prone areas will similarly be excluded and buffered.	A map clarifying the RHCA buffers will be added to the FEIS. All verified landslide prone lands have been avoided in the project design of treatment areas and any additional areas found during sale layout will be avoided as described in the design criteria.	Idaho Conservation League
	Concerned with the related impacts associated with the removal of standing dead and downed trees from RHCAs by firewood cutters, especially if this project proposes measures that contribute to accessibility by firewood cutters. In particular skidding of trees that have already been felled along roadsides and its attendant impacts to	This will be further addressed in the Fisheries cumulative effects section, thank you for your comment. In part, this is addressed with the project design criteria below: “Temporary roads would be constructed on or near ridge tops	Idaho Conservation League

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	riparian soils, vegetation, removal of coarse wood, etc. should be considered as a related and/or cumulative impact as part of the analysis.	with no stream crossings. All temporary roads would be constructed and then obliterated within 2 operating seasons. Obliteration includes de-compaction, recontouring where needed and the application of woody material onto the de-compacted surface to provide for soil productivity and limit erosion potential. There would be no road construction in RHCAs and roads would be located to avoid adverse effects to soil, water quality and riparian resources."	
	With regard to upward trend and prescription watersheds, the DEIS fails to adequately demonstrate compliance and consistency with the Forest Plan.	Upward trend in habitat carrying capacity is assessed and described through many different measures. These measures/processes are thoroughly outlined in *The Implementation Guide to Appendix A of the Nez Perce National Forest Plan* (Conroy and Thompson, 2011). In general, current trend is assessed using legacy stream survey data, watershed analyses, Forest Plan monitoring station cobble embeddedness compared to contemporary data (such as PIBO	Idaho Conservation League

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		and current cobble embeddedness) and other substrate data. Disturbance history over the past 20 years including harvest, wildfire, etc., restoration activities that date to 1987 and ongoing activities are considered, along with trending fish populations. Step 2 is to assess the proposed project activities to trend, and the Step 3 is to describe the analysis with rationale. The existing upward trend analysis for Johnson Bar will be expanded for the FEIS.	
	The ECA fails to display effects at the prescription watershed scale. If displayed at the finer scale, it would likely illustrate that a number of prescription watersheds approach or exceed management thresholds. No discussion is included as to why these finer scale findings were not included, and/or were not determined to be relevant.	The ECA calculations are presented at the prescription watershed scale in the FEIS.	Idaho Conservation League
	The DEIS fails to accurately portray the extent of cumulative effects associated with private and state logging adjacent to the project area. The DEIS states there would be negligible cumulative effects, but then also states there could be measurable cumulative effects. No further delineation of what those effects may be, how they would be	Direct and indirect effects from the IDL Selway Salvage Sale and private land salvage were disclosed the cumulative effects Table 3-52. The fisheries analysis determined possible measureable short and longterm negative effects to aquatic habitat, which is further explained	Idaho Conservation League

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	addressed or mitigated, and/or whether they are discountable is provided. A more thorough discussion is warranted in the FEIS.	in Table 3-52. These cumulative effects were rationale for determinations of effects to Regional Sensitive Species and ESA listed fish refer, to Table 3-53 and 3-56.	
	With the exception of the O'Hara Creek subwatershed, the 6th level HUC designations are meaningless. There needs to be a true watershed analysis that includes all activities in upstream areas and current instream conditions within the lower reaches of the Middle Fork. The analysis needs to include ongoing projects in upstream areas.	Please refer to Fisheries Analysis area section 3.5.1.	Harry Jageman
	The water yield analysis needs to be modified to include Forest Plan prescription watersheds and/or true 6th code watersheds like the entire O'Hara Creek drainage. Water yield changes in Swiftwater Creek have no influence on water yield changes in Goddard Creek. Water yield calculations for lower face areas are meaningless for large drainages like the Middle Fork and Selway River.	The ECA calculations are presented at the prescription watershed scale in the FEIS.	Harry Jageman
	It is unclear how live trees that may or may not die have been incorporated into the ECA analysis. The FEIS needs to clearly describe how existing ECAs were calculated following the Johnson Bar fire and include all	This was described in the draft hydrology report, and is also in the final hydrology report.	Harry Jageman

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	assumptions regarding trees that are currently alive and may or may not die.		
	The WEPP model was used for a portion of the analysis; however, the outdated NEZSED model was still used for a portion of the analysis. A Forest Plan amendment would correct this problem. It is not clear why WEPP was not used to predict overall sedimentation rates for the existing condition and each of the proposed treatment alternatives.	The Hydrology report contains explanations for the use of the NEZSED and WEPP models.	Harry Jageman
	The DEIS predicts that BMPs will be effective in preventing new erosion and that logging will reduce sedimentation from existing levels due to the scattering of logging slash and road improvements. Shouldn't erosion have been stabilized with BAER activities following the fire and should Forest Service roads be maintained to a level that they are not actively producing sediment already? Why aren't the roads being closed if they are rutted, unsurfaced, and lack adequate drainage?	The BAER treatments included for the fire were limited to road, trail, and invasive plant treatments. No hillslope treatments were requested. Only treatments that were shown to address increases in sedimentation and flows from the post-fire environment were included in the BAER request. Project design criteria is outlined in section 2.9 of the DEIS along with project Monitoring, section 2.10. This section will be expanded in the FEIS new additions include design measures below: • Implementation and post implementation	Harry Jageman

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		effectiveness monitoring of target stands and design criteria would be performed as an interdisciplinary team at least two selected harvest units. Implementation monitoring with an interdisciplinary team also includes inspection of erosion control measures on roads, skid/swing trails and skyline corridors. These Best Management Practice reviews could be submitted to the regulatory agencies. BMP audit results are entered into the USFS National BMP database. • Soil scientist in coordination with the TSA would conduct field evaluations of selected tractor logging units during harvest operations. Johnson Bar Fire BAER treatments did not include hillslope treatments. While BAER hillslope treatments were determined to have a high likelihood of reducing post-fire hillslope erosion, the treatments	

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		were determined not to be cost-effective. Road maintenance is ongoing, activities are consistent with the Nez Perce LRMP and the Road Maintenance Programmatic.	
	The predictions in Tables 3-9, 3-1, and 3-11 cause concern as to how the WEPP model is being applied. It does not make sense that the removal of large amounts of timber and the short-term application of logging slash is going to reduce sedimentation over no logging. It would seem the residual canopy in unharvested stands would provide rain and snow interception that would not occur in harvested stands and thus reduce erosion impacts. Also, the gradual needle and litter fall associated with fire killed and scorched trees seems like it would be preferable to the short-term input of slash from logging.	While dead and defoliated trees are less effective at interception than live trees, they would nonetheless be expected to intercept a percentage of incoming precipitation. However, the groundcover prescription for treatment units described in the EIS would be expected to be at least as effective at intercepting precipitation (absorbing the erosive energy of falling water). Moreover, additional groundcover would reduce erosion from overland flow. Needles and other fine material have already begun to fall on the forest floor in the project area. This process will have progressed largely to completion by the time the project would be implemented. In a manner similar to logging slash, this fine litter will help to reduce erosion from the forest floor, although this	Harry Jageman

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		material would not be expected to last as long as the logging slash that would be distributed in treatment units.	
	The DEIS acknowledges that four project area streams are not currently meeting Forest Plan fisheries standards and that an upward trend in condition must be demonstrated before new logging can occur. No data is actually presented that supports the conclusion that these four streams are actually improving. In fact that data presented actually shows that monitoring of upward trend has not been completed for most project area streams or that monitoring has not shown an upward trend.	Appendix A (A-7) of the Nez Perce LRMP states (footnote 3/): "Sediment is the primary limiting factor in these streams. Timber management can occur in these watersheds, concurrent with improvement efforts, as long as habitat capacity shows a positive, upward trend." Existing cobble embeddedness taken on 7 different stream reaches is above cobble embeddedness objectives refer to Table 3-19 and following narrative. Trend data for cobble embeddedness was only completed for O'Hara Creek because it is a Forest Plan monitoring station with many years of cobble embeddedness data (WCE). An analysis of variance (ANOVA) with Bonferonni adjustment was used to detect significant differences in cobble embeddedness through the years.	Harry Jageman

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		1990 and 2014 showed significant differences (increases) but, no trend was detectable over time. There will be ongoing cobble embeddedness monitoring within the project area refer to 2.10 Monitoring. Past PIBO does indicate that managed sites are poorer condition than reference in some respects for example, pool depth, percent pools and percent fines in both the Selway and MF subbasins but, other habitat perimeters remained constant and overall, managed sites remained the same during the study time- frame. Results may be somewhat skewed given the small sample size of both managed and reference. Refer to the 2013 PIBO report within the project file, six new PIBO sites (a mix of managed and reference) will be added to the Selway Basin summer of 2015. PIBO data is on a 5 to 3 year sampling rotation beginning 2001 so, additional monitoring is necessary within in these subbasins and across the Columbia River Basin to establish long-term trends in managed areas.	

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		Due to the inconclusive sampling and additional survey and monitoring that will be ongoing, proposed upward trend projects are proposed concurrently with harvest activities in these sediment limited prescription watersheds. Upward trend in habitat carrying capacity is assessed and described through many different measures. These measures/processes are thoroughly outlined in *The Implementation Guide to Appendix A of the Nez Perce National Forest Plan* (Conroy and Thompson, 2011). In general, current trend is assessed using legacy stream survey data, watershed analyses, Forest Plan monitoring station cobble embeddedness compared to contemporary data (such as PIBO and current cobble embeddedness) and other substrate data. Disturbance history over the past 20 years including harvest, wildfire, etc., restoration activities that date to 1987 and ongoing activities are considered, along with trending fish populations. Step 2 is to assess the	

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		proposed project activities to trend, and the Step 3 is to describe the analysis with rationale. The existing upward trend analysis for Johnson Bar will be expanded for the FEIS.	
	Appendix D relies largely on predictions from NEZSED and FISHSED models. Modeled data should not be a substitute for field collected information. All data collected in the field indicates the streams are not meeting Forest Plan standards and there is no evidence that they are showing an upward trend based on field measurements. The analysis should have been completed using the WEPP model. Also, none of the sediment reduction activities are mandatory for the project and no sources of funding have been identified.	Refer to comment above. Road decommissioning, reconstruction and road improvements are part of the Johnson Bar Salvage proposed activities. The WEPP model was used to compare alternatives of hillslope treatment (including no treatment) and road improvements.	Harry Jageman
GIS	Provide an aerial photo map of the burn with the various units and roads marked on them. This would give a better visual representation of the type of burn that actually occurred.	Thank you for your comment. The most current aerial photos are from 2013, which was prior to the Johnson Bar fire. Maps depicting the various units and roads are located in the project file and the FEIS.	Friends of the Clearwater
NEPA	The rapidity at which the DEIS was produced has resulted in some major issues in terms of public involvement and document quality. No time extension was granted and the online and paper volumes have different pagination makes review and comment problematic as	The public was provided opportunities to comment both during the 45-day scoping period and the 30-day public comment period. Thank you for letting us know about the pagination	Friends of the Clearwater

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	does the separation of individual resources into two sections, all within Chapter 3.	differences between the online and paper copies; however, even with the differences in pagination the document content was the same. The Forest Service will make every attempt that the FEIS pagination be identical for both the online and paper versions. The resources are being combined into one section in the FEIS.	
	The DEIS does not mention under "Regulatory Requirements" the Travel Management Regulations at 36 CFR 212 Subpart A.	Thank you for your comment. The Nez Perce National Forest is currently in the process of completing a Forest-wide analysis, known as the Designated Routes and Areas for Motor Vehicle Use (DRAMVU), to implement the 2005 Travel Management Rule. A minimum transportation system analysis was completed at the project-scale and is included in the project record and Appendix F.	Jeff Juel
	The DEIS does not incorporate the science-based transportation analysis required under 36 CFR 212 Subpart A, and so there was no assessment that identified unneeded roads. The DEIS also fails to disclose the Access Management Plan required by the forest plan.	A transportation analysis was conducted by the IDT with the intent of developing a minimum transportation system. The analysis is part of the project record and included in Appendix F.	Jeff Juel

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	Is the public process the Forest Service uses for project design consistent with the Travel Management Regulations at 36 CFR 212 Subpart A?	Thank you for your comment; however, the Travel Management Regulations at 36 CFR 212 Subpart A does not address the public process.	Jeff Juel
	Why does the DEIS fail to include Forest Plan soil standards as part of its "Regulatory Framework."	The Forest Plan soil standards will be included as part of the "Regulatory Framework" in the FEIS.	Jeff Juel
	Does the project comply with the Collaborative Forest Landscape Restoration Act (CFLRA)? Include a full discussion in the FEIS.	The Johnson Bar project is generally consistent with the landscape strategy and desired social, economic, and ecological conditions identified in the Selway-Middle Fork CFLRP proposal, selected for funding by the Secretary of Agriculture in 2010. The CFLRA established a program to fund ecological restoration treatments and program "requirements" specified under Section 4003(b) (PL 111-11 Title IV) are specific to the elements of proposal submitted for evaluation and nomination by a Resource Advisory Committee. There is no requirement, that we are aware of, for individual site specific planning projects to comply with all of Section 4003(b)(c) since these deal with the overall landscape strategy, 10-year plan,	Idaho Conservation League

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		and proposal requirements; or contain subjective conditions that are unique to individual CFLRP landscapes and are dealt with at the site specific project level. Some elements, however, are understood to be conditions of all site-specific projects since they are non-discretionary [such as Section 4003 (c)(F)]. All projects planned within the CFLRP landscape need to be done in accordance with Section 4003 (a). The Johnson Bar fire resulted in conditions the Forests and CBC were seeking to prevent through planned restoration projects, as were envisioned in the Selway-Middle Fork proposal. We acknowledge that fires, even lethal fires, are an important component of a given landscape, the Johnson Bar fire occurred at a time and place that has led to undesirable effects. The proposed Johnson Bar Project would continue to advance a number of goals within the framework of the Selway-Middle Fork proposal.	

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	Include a list of the Interdisciplinary Team members in the FEIS.	A list will be included in the FEIS.	Idaho Conservation League and Dick Artley
	Assure that all issues identified by the public are listed in the body of the NEPA document posted online. The Responsible Official should discuss each issue and describe how the timber sale will be modified to eliminate any chance that resource harm will occur to the resource at issue.	Identified issues that relate to the development of alternatives are disclosed in the EIS, which is published online. All scoping comments are included in the project file.	Dick Artley
	The DEIS contains no list of IDT members and their specialties.	Thank you for your comment. A list of the IDT members has been included in the FEIS.	Dick Artley
	There is no reason to have commercial timber sales in the national forests. Over 500 Ph.D. scientists are quoted in Opposing Views Attachments 1, 2, and 4. They describe how and why a post-fire landscape must never be logged and roaded, showing a clear and substantiated acknowledgement of massive resource damage caused by timber sales.	Thank you for your comment. The Forest Service is required to be in compliance with its Forest Plan and numerous regulations, including NFMA, the Multiple-Use, Sustained Yield Act, the Forest and Rangeland Renewable Resources Planning Act, and NEPA. This includes the management, multiple-use, and sustained yield of renewable resources.	Dick Artley
	Post responses to public comments on the DEIS online, as well as maintaining a hardcopy in the Project File.	Responses to comments are included in the FEIS, which is posted online. The USFS also maintains a copy of all comments and responses as part of the project file.	Dick Artley

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	Please respond to the opposing views contained in the Opposing Views Attachments to these comments to the comments. Each opposing viewpoint is different and is related to a unique subject, therefore a single response attempting to deal with all opposing views simultaneously does not respond to opposing views as required by law.	Comments received as a result of the comment period have been responded to and are included as part of the FEIS.	Dick Artley
	The DEIS does not discuss the following items: a) Energy requirements and conservation potential of various alternatives and mitigation measures; b) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures; and c) Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.	The proposed project does not include any abnormal energy requirements, depletable resources, urban areas, or built environments; therefore, these issues are not addressed in the EIS. Any potentially affected resources have been disclosed and analyzed in the EIS.	Dick Artley
Non-substantive	Logging the burned timber will disrupt the natural slow regrowth that follows a fire. Helicopters will disturb wildlife and new roads scar the landscape. The area is in a wild region.	Thank you for your comment. All alternatives, including the No Action Alternative, will be considered in the NEPA process.	Lynne Haagensen
	I have great concerns about salvage logging in post-fire landscapes, as well as how logging could compromise fish habitat and water quality standards in the forest plan.	Thank you for your comment. All alternatives, including the No Action Alternative, will be considered in the NEPA process.	Mark Giese

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	I am opposed to the sale that would destroy the Middle Fork Roadless Area and negatively affect water quality standards in the old Forest Plan. The land needs time to heal and this won't happen if logging occurs.	Thank you for your comment. All alternatives, including the No Action Alternative, will be considered in the NEPA process. In accordance with the 2008 Idaho Roadless Rule, the Middle Fork area has not been deemed a roadless area. All roadless areas are listed in the 2008 Idaho Roadless Rule.	Fred Rabe
	Abandon the proposed Johnson Bar Fire Salvage Sale in the Selway and Middle Fork Clearwater Wild & Scenic River corridor. I have concerns about the Middle Fork Roadless Area being destroyed and the negative effects salvage logging has in a post-fire landscape. Allow the area to regenerate on its own.	Thank you for your comment. All alternatives, including the No Action Alternative, will be considered in the NEPA process. In accordance with the 2008 Idaho Roadless Rule, the Middle Fork area has not been deemed a roadless area. All roadless areas are listed in the 2008 Idaho Roadless Rule.	Dawn Serra
	There is no science demonstrating that forests benefit from logging after a fire. Dead trees are critical to forest health. The provide habitat for fish when they fall into streams. Snags are used by many species. Dead trees contain nutrients important to soil development and provide habitat for insects, small mammals, and so forth. Construction of roads has many negatives including the spread of weeds, disruption of wildlife, and provides access for hunters, poachers, ATVs,	Thank you for your comment. All alternatives, including the No Action Alternative, will be considered in the NEPA process. Design criteria, BMPs, and mitigation measures would be implemented as needed for resource concerns.	George Wuerthner

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	etc. Roads are also a major source of sediment in streams affecting aquatic ecosystems.		
	Don't log burnt trees. No sites should be cleared for helicopters. Cut the road building by 50% or more. Stop all prescribed burns which are air pollutions vehicles. Whatever grows naturally should be allowed to grow naturally. Suggest animal and wildlife protection groups be added to mailing list.	Thank you for your comment. All alternatives, including the No Action Alternative, will be considered in the NEPA process. Any group or individual wishing to be added to a mailing list can request to be added to the Forest mailing list. Any groups or individuals are able to provide written comments during open comment periods as part of the NEPA process.	Jean Public
Outside the scope of the project	The Forest plans to address the Clearwater CRMP problem in the current forest plan revision; however, this will take many years to complete. It is impossible for the Forest to analyze impacts of any new proposed activities within the corridor without a valid CRMP, it is imperative that the Forest begin working on a new CRMP immediately.	Thank you for your comment; however, the development of a new CRMP is outside the scope of this project proposal.	Idaho Rivers United
	A valid CRMP cannot be stitched together by cross-referencing multiple sections of the Forest Plan. The CRMP must be a single document that addresses all elements of the plan. The Forest has the authority to develop an updated CRMP that complies with the WSRA and ensures protection of Clearwater	Thank you for your comment; however, the development of a new CRMP is outside the scope of this project proposal.	Idaho Rivers United

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	ORVs. IRU respectfully requests that the Forest begin preparing an updated CRMP for the Clearwater River corridor immediately.		
Range	The DEIS notes that livestock grazing will continue to be permitted within the project area, including areas that were recently burned. The DEIS also asserts that many areas within the project area are mostly inaccessible or undesirable to livestock, yet 4,907 acres fall within the Tahoe-Clear Creek Allotment. The Tribe is concerned that livestock use of the project area will be greater than in past years. Ridgetop areas harvested and prepped for replanting are likely to be particularly attractive to livestock in the first few years after treatment. The Tribe recommends that the Forest Service take a harder look at the potential for expanded livestock use within the project area and close all of the project area to livestock grazing for at least three years following treatment.	Only three proposed units are within the allotment. Salvage units 139 and 140 have steep slopes and are not readily accessible to livestock. Unit 114 is accessible by livestock from Road 1119A (see Design Criteria, FEIS Chapter 2). Most of the burned area (98%) is already closed to grazing. The Johnson Bar project area includes about 4,907 acres of the grazing allotment; however, only 466 acres of the allotment is actually within the fire burned area. Of those 466 acres, 99 acres are unburned, 166 acres are a low severity burn, 199 acres are a moderate burn severity and 1 acre is classified as a high severity burn. The majority of the burned area is on ground not near roads and on steeper slopes typically not traveled by cattle. Also, of the acres burned within the allotment, 75 acres are within treatment areas with 15 acres unburned (small scattered	Nez Perce Tribe

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		inclusions), 29 acres low severity and 31 acres of moderate severity. Based on the limited burned areas readily available to cattle and the limited amount of harvested acres within the burned area within the grazing allotment, the Forest Service determined that there was little risk of grazing impacts to other resources in conjunction with the fire and salvage operations.	
	What about impacts from grazing on the watershed and fisheries? There is one allotment but the acreage figures for the allotment are inconsistently presented in the DEIS.	Approximately 365 acres of the allotment were burned as a result of the fire. These burned areas traditionally receive little grazing use; however, a design criterion has been added to the proposed project to reduce grazing in the fire areas should it become a resource issue.	Friends of the Clearwater
	The DEIS is premised on the fact of soil recovery from decommissioned roads (including those for the timber sale). However, livestock trailing will compact soils. Please explain this discrepancy.	Livestock trailing on restored sites is discussed in the cumulative effects section of the FEIS Soils Resource analysis.	Friends of the Clearwater
	What are the impacts of livestock grazing on reforestation? The DEIS talks about planting trees and increased forage opportunities for livestock. These are usually in conflict.	A design criterion has been added to the proposed project to reduce grazing in the fire areas should it adversely affect reforestation efforts.	Friends of the Clearwater

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Recreation	Concerned with project impacts to recreation trail opportunities. Several trails are located in the project area. The design features should be adequate for protecting these opportunities. There is a provision to accommodate snowmobiling. We would like the district to consider another similar design feature that could protect snowmobiling even better. Only allow logging operations up to December 15th. This would allow snowmobile recreation to occur on the groomed route for a least part of the season. Only allowing a limited window (up to December 15th) would allow both activities to occur.	The proposed design criteria were developed in cooperation with the local groomer and snowmobile club.	Idaho Department of Parks and Recreation
	The design features also indicated that the Wild Goose and Johnson Bar Campgrounds would be used as helicopter landing sites. Only using these sites from November 1st through April 15th will minimize impacts to campers, though some winter campers could be impacted.	Please see the Design Criteria section in the FEIS. Only Alternatives 2 and 3 would utilize these landings; however, Alternative 4 would not.	Idaho Department of Parks and Recreation
	The DEIS presented very limited recreation analysis in Chapter 3. This analysis should be further discussed by presenting the temporary impacts to trail visitors and campers while project activities are occurring. The FEIS should also disclose the harvest impacts to the Wild and Scenic River	Effects to Trails and Recreation can be found in the FEIS, Section 3.7. Effects to the Wild and Scenic River resources can be found in Section 3.12. Some of the project may be seen from the Lolo Motorway; however,	Idaho Department of Parks and Recreation

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	Corridor and along US Highway 12, as well as possibly to the Lolo Motorway, which offers views of the mountain tops in the area.	it would be in the background where modifications to the landscape are permissible.	
	Recreationists avoid areas that have been logged and recreation-related revenues to local communities with lumber mills are much more than the revenues generated by logging.	Thank you for your comment. Please see Section 3.7 for the Recreation and Trails analysis.	Dick Artley
Roadless	The agency must analyze the impacts to the Middle Fork Face Roadless Area, which the DEIS fails to do.	In 2005 under the President Bush administration, states were granted the authority to develop their own roadless rules. After numerous public meetings and requests for public comment, in 2008 the State of Idaho signed into law the Idaho Roadless Rule. In accordance with the 2008 Idaho Roadless Rule, the Middle Face area is not a designated roadless area and therefore is not analyzed as a roadless area. An analysis of wilderness was completed as required and did not find that wilderness attributes would be affected as part of the proposed project.	Friends of the Clearwater
	The Ninth Circuit determined that the Forest Service cannot completely ignore, but instead must consider the roadless nature of an area in the analysis of its timber sales. In addition,	In 2005 under the President Bush administration, states were granted the authority to develop their own roadless rules. After numerous	Friends of the Clearwater

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	the court determined that logging in roadless areas is irreversible and irretrievable. The agency did not do any analysis of the impacts on the area's roadless values or wilderness characteristics.	public meetings and requests for public comment, in 2008 the State of Idaho signed into law the Idaho Roadless Rule. In accordance with the 2008 Idaho Roadless Rule, the Middle Face area is not a designated roadless area and therefore is not analyzed as a roadless area. An analysis of wilderness was completed as required and did not find that wilderness attributes would be affected as part of the proposed project.	
	The Middle Face Roadless Area was not adequately analyzed in the DEIS.	In 2005 under the President Bush administration, states were granted the authority to develop their own roadless rules. After numerous public meetings and requests for public comment, in 2008 the State of Idaho signed into law the Idaho Roadless Rule. In accordance with the 2008 Idaho Roadless Rule, the Middle Face area is not a designated roadless area and therefore is not analyzed as a roadless area. An analysis of wilderness was completed as required and did not find that wilderness attributes	Harry Jageman

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		would be affected as part of the proposed project.	
	A large existing roadless area exists in the project area. The old Middle Fork Road (approximate date May 1998) states that the Middle Fork Face roadless area would still "meet the minimum criteria for wilderness consideration" and inspection of the project area suggests that these conditions have not changed except for the logging which was authorized in the old project and the recent Johnson Bar Fire.	In 2005 under the President Bush administration, states were granted the authority to develop their own roadless rules. After numerous public meetings and requests for public comment, in 2008 the State of Idaho signed into law the Idaho Roadless Rule. In accordance with the 2008 Idaho Roadless Rule, the Middle Face area is not a designated roadless area and therefore is not analyzed as a roadless area. An analysis of wilderness was completed as required and did not find that wilderness attributes would be affected as part of the proposed project. The report is part of the project record.	Harry Jageman
	Logging and road construction (even temporary roads) create an irretrievable impact to roadless character that cannot be recovered. I am strongly opposed to entry into this and other existing roadless areas and suggest that an alternative be developed that avoids the Middle Fork Face Roadless Area. Alternative 4 would only require the removal of a few units to totally avoid both	In 2005 under the President Bush administration, states were granted the authority to develop their own roadless rules. After numerous public meetings and requests for public comment, in 2008 the State of Idaho signed into law the Idaho Roadless Rule. In accordance with the 2008 Idaho Roadless Rule, the	Harry Jageman

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	the existing Middle Fork Face Roadless Area and the Wild and Scenic River Corridor.	Middle Face area is not a designated roadless area and therefore is not analyzed as a roadless area. An analysis of wilderness was completed as required and did not find that wilderness attributes would be affected as part of the proposed project.	
Roads	The Lodge Creek Subwatershed in the Big Smith – Clearwater watershed has the highest road density in the project area at 4.1 mi/mi^2. A road density greater than 3 mi/mi^2 is generally considered to be an impaired watershed condition. The Tribe's road density goal is less than 1 mi/mi^2 in all watersheds. The Tribe recommends reducing the road densities within these watersheds.	A transportation analysis was conducted by the IDT with the intent of developing a minimum transportation system. What is displayed in the DEIS is the minimum system, which would be 4.1 mi/mi^2 following implementation.	Nez Perce Tribe
	A study by Lloyd et al. (2013) on the Clearwater National Forest examined how recontouring and abandonment affect ecosystem properties relative to "never-roaded" areas. The study suggests that recontouring can dramatically accelerate recovery of above and below ground properties so they resemble never-roaded reference conditions. Recontouring may be the only way to restore both above and below ground ecosystem processes, accelerating the recovery of these forest	All roads proposed for decommissioning will be put into a stable condition, which in most cases consists of fully recontouring. Some roads or portions of roads may already be well advanced into recovery where the road has little excavated road prism and has regrown with trees and brush. This condition is often seen on flat ridge top roads. The overall objective is to move the road prism area back to	Nez Perce Tribe

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	ecosystems by decades to millennia. The Tribe recommends a full recontour on all roads proposed for decommissioning (1.1 miles of system roads and 20.2 miles of non-system roads).	functioning naturally; accomplishment of this will be based upon on-the-ground assessments of the road needs.	
	How does the DEIS meet the direction to establish a minimum road system? How can roads be considered temporary when they will be on the landscape for several years?	A transportation analysis was conducted for the project area through the interdisciplinary process. Excess roads were identified and are proposed for decommissioning or stabilization with this project.	Friends of the Clearwater
	Indicate in the final EA that all newly constructed temporary roads will be obliterated after use and apply the obliteration method that returns the ground to the natural angle of repose and eliminates the running surface. No other post-use treatment method (including decommissioning) is as effective at eliminating damage to aquatic resources and subsurface water flow as obliteration.	Obliteration is a form of road decommissioning; however, it is not the only category. Road decommissioning may consist of obliteration, removal of fill and culverts, revegetation and waterbarring, etc. Any road decommissioning practices would vary depending upon the road location, the risk of road failure, and are specific for each road. Please see Chapter 2 Design Criteria, Section 2.9.3 Aquatics, #13, Temporary Roads and Appendix F "Road Decommissioning".	Dick Artley
	Please define road obliteration using the following statement (or something similar) in	Please see page 365 for a description of "road	Dick Artley

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	the draft decision document to eliminate confusion: "When roads are obliterated the road is completely eliminated from the landscape. Full recontouring is accomplished by recovering all available fill and burying the cutbank until the surrounding terrain is fully matched."	decommissioning". A definition of road decommissioning has also been added to the Glossary section in the FEIS.	
	Please assure the final NEPA document describes the road obliteration monitoring plan to assure the sediment is being reduced as expected. The resulting draft decision documents should indicate the USFS will provide funding for the monitoring and accomplish the monitoring.	Road decommissioning monitoring is completed at a forest-wide scale on an annual basis and not a project specific scale.	Dick Artley
Soils	How will the effectiveness of soil erosion prevention and control measures be monitored and reported?	Soils mitigations were based on tested erosion control practices for the post-fire environment. Two monitoring projects have been initiated for this project to show the effectiveness of these practices.	Nez Perce Tribe
	What evidence do you have that soils can be recovered?	Soil recovery from fire and disturbance is discussed in scientific literature including the Long-Term Soil Productivity Study and several post-fire research documents which were cited in the Soils Resource Section.	Friends of the Clearwater

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	Why was there no alternative that excluded logging in places where soils standards are exceeded?	Soils standards are not exceeded in any alternative.	Friends of the Clearwater
	How does road building and/or logging in land types rated high for surface erosion and land types rated high for subsurface erosion meet NFMA requirements and regional soil standards? Why are there no alternatives that don't do those activities in those areas?	Design features are included to minimize erosion impacts on these soils types as described in the Soils and Hydrology Resources Analysis.	Friends of the Clearwater
	The issue of an amendment to the plan is not explained in the DEIS. It is merely mentioned in reference to Table 3-29. Is an amendment proposed for soil standards? If so, what is it?	No Forest Plan Amendment for Soils Standards is needed for this project. Soils standards are not exceeded in any alternative.	Friends of the Clearwater
	An analysis of logging units in terms of percentage of detrimentally disturbed soils is missing in the DEIS. There is simply a statement of an increase of 2-8% in terms of detrimentally disturbed soils in units, but no accounting of what is currently disturbed in those units.	The full table disclosing the detrimental soil disturbance can be found in the FEIS Soils Resource Section.	Friends of the Clearwater
	Which of the design criteria for soils have been tested and validated by the Nez Perce-Clearwater National Forest for utilization on burned areas?	Soils mitigations were based on tested erosion control practices for the post-fire environment. Two monitoring projects have been initiated for this project to show the effectiveness of these practices.	Jeff Juel
	The DEIS does not look at soil conditions as affected by the fire in consideration of detrimentally disturbed soils. Why is the	The effect of the wildfire in the detrimental soil disturbance	Jeff Juel

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	case? Is there a difference in soil productivity terms between soils affected by wildfires as compared to soils affected by management fires?	estimates has been included in the FEIS Soils Resource Section.	
	The DEIS states, "Detrimental soil impacts from proposed ground-based skidding are estimated at 8%-12% (average 10%) of an Activity Area based on use of designated skid trails (Archer, 2008)." The DEIS is misrepresenting the results of Archer, 2008.	A combination of monitoring and research results was used to determine the DSD estimate for tractor harvest systems as described in the FEIS Soils Section.	Jeff Juel
	The DEIS doesn't disclose that the R-1 SQS were developed internally by the agency, without following the public processes, such as Forest Planning, NEPA, or independent scientific peer review. It has avoided these public processes from illuminating scientific and ecological deficiencies of the R-1 SQS.	Thank you for your comment. This is outside of the scope of this project.	Jeff Juel
	The R-1 SQS and definition of DSD consider only alterations to physical properties, but not chemical or biological properties. The R-1 SQS does not adequately consider best available science in violation of NEPA.	Thank you for your comment. This is outside of the scope of this project.	Jeff Juel
	The DEIS does not disclose the amount of existing detrimental soils disturbance in each unit, which is required to demonstrate consistency with the forest plan.	The existing DSD is shown in the FEIS Soils Resource Section.	Jeff Juel
	The DEIS does not disclose the expected amount of detrimental soil disturbance in each unit after project activities. Failing to	The cumulative DSD is shown in the FEIS Soils Resource Section.	Jeff Juel

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	demonstrate consistency with the forest plan soil standards violates NFMA.		
	The DEIS does not disclose the analytical data that supports proposed soil mitigation/remediation measures. NEPA requires that an EIS specify the effectiveness of its mitigation.	A discussion on mitigation effectiveness is found in the FEIS Soils Resource Section.	Jeff Juel
	How much total acreage of DSD currently exists in the project area watersheds?	The existing DSD is shown in the FEIS Soils Resource Section.	Jeff Juel
	The DEIS fails to incorporate the best available science on soils, and to have the full extent of soils restoration needs in these watersheds made known.	Thank you for your comment. This is outside of the scope of the purpose and need of this project.	Jeff Juel
	It is unclear why the Forest Service is proposing an amendment to the Forest Plan soil standards with the Johnson Bar Salvage Project. The amendment is only briefly discussed and no language is presented in the DEIS that describes what is being proposed.	No Forest Plan Amendment for Soils Standards is needed for this project. Soils standards are not exceeded in any alternative.	Harry Jageman
	The DEIS suggests that harvest on landslide prone areas will be avoided for all alternatives. It acknowledges that 0.5 mile of temporary and swing trails will be constructed on land types rated as having a high mass erosion potential for Alternatives 2 and 4, and 0.1 mile for Alternative 3. Several miles of road and swing trails are also acknowledged to occur on areas with high	All verified landslide prone lands have been avoided in the project design of treatment areas and any additional areas found during sale layout will be avoided as described in the design features. Areas of high erosion risk will receive additional design features as defined in	Harry Jageman

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	subsurface erosion potential. The Forest Service needs to account for the probability that mass wasting events will occur and incorporate that information into the FEIS.	Chapter 2 to minimize risk of accelerated erosion.	
Timber/Vegetation	How will field evaluations of selected tractor logging units during harvest operations be conducted and reported?	All harvest activities are monitored on a continuous basis by the project sale administrator to insure the work complies with the contract direction, which reflects the NEPA requirements. All work reviewed is documented in inspection reports.	Nez Perce Tribe
	The DEIS notes that large snags should be retained for all units if possible and that safety concerns associated with harvest operations are expected to preclude the retention of specific large snags within units. It further notes that a greater reliance on helicopter logging under some alternatives would result in fewer snags being retained in those units. The discretion afforded by the DEIS language makes it difficult to fully evaluate the extent to which snags will be retained within treatment units.	Snags are site specific safety hazards which are mitigated individually. Snags may be required to be felled to meet OSHA requirements. When possible, snags would be left in clumps with live trees providing a spacing buffer allowing workers to avoid areas with snags. Leave trees and reserve trees are snag replacement trees designed to replace snags lost to hazard tree removal. Non merchantable snags would also be left in units increasing snag retention. Snags or replacement snags will be retained in all units as outlined in the design criteria. Trees will be left	Nez Perce Tribe

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		in clumps to avoid the snags being hazards for the helicopter logging.	
	Strongly recommend that all reasonable steps be taken to plan around snags so that they remain standing wherever possible. The Tribe also recommends avoiding treatment in all areas and leaving all trees that "burned so hot that they do not currently have any timber value", except where limited treatment is required to facilitate replanting.	Areas that are not economical to harvest will be left standing. Snags are site specific safety hazards which are mitigated individually. Snags may be required to be felled to meet OSHA requirements. When possible, snags would be left in clumps with live trees providing a spacing buffer allowing workers to avoid areas with snags. Leave trees and reserve trees are snag replacement trees designed to replace snags lost to hazard tree removal. Non merchantable snags would also be left in units increasing snag retention.	Nez Perce Tribe
	To what extent are the proposed activities expected to trend the overall landscape toward, or away from, its historic range of variability?	The proposed activities are assisting in trending the overall species composition by 8-10% toward the desired species mix of ponderosa pine, larch and white pine, but the stand successional stage has already been changed from mid-seral to early by the fire. Prior to the fire, the overall landscape exceeded the desired range of the mid-seral aged	Nez Perce Tribe

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		stage, 40-100 years, and was greatly lacking in the early successional stage (<40 years old). Following the fire, the landscape has begun trending towards the historical range of early successional species.	
	Where is the need in terms of logging to create the supposed structural diversity if the fire has already done it?	The proposal identified the need to reduce high fuel volumes, restore early seral species which provide structure in old growth stands, and increase species diversity.	Friends of the Clearwater
	The DEIS mentions that old growth units were affected by the fire. Since there were no maps showing where MA 20 is located, meaningful input is impossible. We don't know whether the Nez Perce National Forest is meeting its old growth standards either in the project area or the Forest as a whole because logging and fires have reduced old growth habitat. We don't know the condition of existing stands; whether replacement stands meet Forest Plan standards, how much logging will take place in pre-fire MA 20 stands, etc.	An old growth map has been included in the FEIS. Old growth is being addressed in terms of old growth analysis units for the FEIS. Approximately 99 acres of previously verified old growth stands burned by the fire are proposed for salvage harvest. Within these 99 acres, only dead trees would be harvested. Field verification and stand exams have confirmed the status of these acres. Any re-verified old growth stands would not be harvested. Approximately 110 acres of MA20 burned by the fire would be salvage harvested. These 110 acres were not verified old growth; however,	Friends of the Clearwater

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		they were being managed as old growth replacement.	
	The DEIS notes there were 1,017 acres of old growth before the fire, but also that there are 1,867 acres in MA 20, which are over 150 years old. Figures in Table 3-37 don't necessarily correlate with the narrative, which causes some confusion. The question of whether stands meet the acreage requirements in Appendix N, raises the question of Forest Plan compliance.	Descriptions for measuring old growth is located under the existing conditions section.	Friends of the Clearwater
	Issue of live versus dead tree logging needs to be addressed. While the agency claims it will use the Scott guidelines, the DEIS does not explain how they will be applied on the ground.	Descriptions of tree determinations will be included in the FEIS.	Friends of the Clearwater
	What has been the result of the BAER? Has the effectiveness been monitored? If so, what was the result and were the findings integrated into the DEIS analysis?	Field verification and stand exams are being completed to determine the condition of old growth stands, mortality, and to confirm silviculture prescriptions.	Friends of the Clearwater
	Any salvage logging must be ecologically justified and should ensure that appropriate mitigation and design features are incorporated.	The EIS discloses appropriate design criteria and mitigation, as well as effects in order to assist in a decision.	Idaho Conservation League
	We are concerned that the project fails to incorporate sufficient restoration elements that could offset some of the negative impacts associated with post-fire salvage	The proposed project would include the following restoration elements: • Fuel reduction;	Idaho Conservation League

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	logging. Research has indicated that salvage logging can increase subsequent fire severity, impede successful natural regeneration, and alter the rate and trajectory of forest recovery. A more robust discussion and plan is needed to demonstrate compliance with the upward trend requirements of the Forest Plan. The discussion in Appendix D is insufficient.	• Leaving 17-28 trees for wildlife; • Leaving 17-33 tons of coarse woody debris; • Delaying treatment for 1 year for soil stabilization; • Restoration of early seral species; and • White pine restoration.	
	Avoid logging in areas that burned lightly or where significant portions may have been unburned. We encourage you to utilize a scientifically accepted and tested protocol to determine post-fire mortality. Scott et al. (2002) offers an approach that is worth considering. Where trees, especially larger diameter trees >16-inch DBH, exhibit scorch or fire damage, the Forest Service should carefully consider whether the trees may survive this damage. If tree mortality is uncertain, we encourage you to retain those trees in sufficient numbers to promote long-term forest function.	The project does not propose harvesting in areas with less than 50% mortality. A table showing prescription by unit is located in the draft ROD.	Idaho Conservation League
	With regards to old growth, the DEIS is especially confusing. Table 3-39 displays columns 9, 10, and 11 under Planned Old Growth Recruitment but doesn't explain what they mean. Also the reliance on photo interpretation for recruitment of old growth	An old growth map has been included in the FEIS. Old growth is being addressed in terms of old growth analysis units for the FEIS. Approximately 99 acres of previously verified old growth	Idaho Conservation League

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	is questionable and it is unclear whether the recruitment analysis took the fire effects into account. Finally, the DEIS indicates that it "would take several decades to grow into old growth conditions." The FEIS should clarify this section, should identify best candidates for old growth recruitment based on field review, should display how many acres of verified old growth currently occur in the project area, how the fire may have impacted these stands, and how logging would further impact any old growth stands.	stands burned by the fire are proposed for salvage harvest. Within these 99 acres, only dead trees would be harvested. Field verification and stand exams have confirmed the status of these acres. Any re-verified old growth stands would not be harvested. Approximately 110 acres of MA20 burned by the fire would be salvage harvested. These 110 acres were not verified old growth; however, they were being managed as old growth replacement.	
	Table 3-37 is gibberish. What is the difference between verified old growth and MA 20 verified old growth?	An old growth map has been included in the FEIS. Old growth is being addressed in terms of old growth analysis units for the FEIS. Approximately 99 acres of previously verified old growth stands burned by the fire are proposed for salvage harvest. Within these 99 acres, only dead trees would be harvested. Field verification and stand exams have confirmed the status of these acres. Any re-verified old growth stands would not be harvested.	Jeff Juel

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		Approximately 110 acres of MA20 burned by the fire would be salvage harvested. These 110 acres were not verified old growth; however, they were being managed as old growth replacement.	
	In Table 3-39, the right half shows no difference between the alternatives so it is meaningless. On the left side the headings 9, 10, and 11 are not explained, and neither is (4+9)-6; 10/1. Also the term “recruit” is undefined.	The proposed project would not treat old growth; therefore, there is no difference between alternatives. The tables have been edited to provide clarification. Definitions have been included in the FEIS.	Jeff Juel
	The DEIS states, “Verified old growth is defined by Green et al. (2008) in Old Growth Forest Types of the Northern Region.” Does this “verified old growth” meet the Forest Plan definition of old growth?	Green et al. 1992, errata 2011 does not necessarily meet the Nez Perce Forest Plan definition of verified old growth; however, the Forest has 11% old growth, which does meet the Appendix N Forest Plan direction for old growth.	Jeff Juel
	The Forest Plan states that “Current information indicates that, in order to maintain a viable population of old-growth-dependent species, it is necessary to maintain 10 percent of the total forested acres as old growth with no less than 5 percent of the forested acres maintained as old growth within each prescription watershed or combination of watershed totaling 5,000 to 10,000 acres.” What is this	Thank you for your comment. This is outside the scope of the project.	Jeff Juel

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	"current information" (scientific basis) that the Forest Plan refers to here? Also, please cite the best scientific information available that indicates 10% old growth forest-wide is within the historic range of variability.		
	The DEIS claims the project will only remove dead or dying trees, but it is unclear how this will be determined. It states that the Scott Mortality Guidelines will be utilized, but it is not stated what level or survival probability will be used to determine which trees will be trained or which will be harvested. I recommend that only trees with a "Low" level of survival probability be harvested. As stated in the guidelines, there is a good chance that trees in the moderate category will survive.	Thank you for your comment. Methods for retaining snags is disclosed in the EIS.	Harry Jageman
	There is much discussion about planting the harvest units and opening the existing canopy to favor white pine, larch, and ponderosa pine. This would suggest that the Forest Service is planning regeneration harvest rather than true salvage of dead trees.	The proposed project would only harvest dead trees. The fire intensity and tree mortality were highly variable. Salvage operation guidelines could result in one of the four structure types disclosed in the EIS.	Harry Jageman
	The proposed units contain a great deal of unburned and low severity burn areas where there would seem to be little need for treatment. Why include these areas if your intent is not to treat them?	The project does not propose harvesting in areas with less than 50% mortality and the fire intensity and tree mortality were highly variable. Fire wounded trees that	Harry Jageman

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		are in a weakened condition may also die from secondary fire effects. As such, exact treatment areas are unknown until they can be field verified.	
	The volume projections for Alternative 2 (41,900 MBF) and the other proposed alternatives suggest that the Forest Service would need to harvest over 14,000 board feet per acre for every treated acre or 27,000 board feet per acre for acreages burned at moderate and high intensity. Given the past harvest history of 312 acres and the fact that all live trees will be retained this seems quite optimistic. I am very confused on what is actually going to happen in the proposed treatment units. It appears the Forest Service has a different interpretation of what constitutes a “dead” tree. Please clarify both the existing conditions of the proposed treatment units and the final projected condition of treatment units. Provide the existing number of live trees and what the units will look like when proposed harvest has been completed.	Based on field reviews, the average tree mortality in the treatment areas is 67%. The average timber volume in these high density stands is 40 mbf/acre, which would then equate to a harvest volume of about 27 mbf/acre as the commenter notes. These stands consist of about 200 trees per acre, which based on an average removal of 67%, would leave about 66 trees per acre on the site. As noted in the design criteria, in areas lacking live trees, 14-28 trees/snags would be left for local snags and future down wood. So some units with live trees could have 66 or more trees left per acre, while the heavy mortality areas would have a minimum of 14-28 trees per acre left depending on the amount of tree retention within the unit for riparian areas.	Harry Jageman
	The Scott Mortality Guidelines that the Forest Service intends to use to determine	Effects as a result of the proposed actions are disclosed in the EIS.	Harry Jageman

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	what constitutes a “dead tree” suggest that only 50% of the live trees rated with a moderate severity index will actually die. Thus estimates that harvest will only affect 5% of the green trees and that landings and temporary roads will only affect 50% of the green trees is likely in serious error if these trees are scheduled for harvest. This is also likely true for the existing ECA reported for Alternative 1.		
	The driving force appears to be capturing economic value and the idea that recently burnt stands will regenerate to grand fir, Douglas fir, and cedar without intervention. It is claimed that artificially regenerated stands with a higher proportion of white pine, western larch, and ponderosa pine would be more resistant to fires, strong wind, and root rot than natural stands. I object to this logic and do not agree that artificially regenerated stands will be significantly more resistant to fires, strong winds, and root rot than naturally regenerated stands. Natural stands are likely to have a more diverse component of species and still include a significant component of larch and ponderosa pine. Naturally regenerating white pine may be less dominant in natural stands than it was historically; however, natural regeneration is	Thank you for your comment. Regeneration has been discussed in the EIS.	Harry Jageman

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	likely to be better adapted to local conditions. They are also likely to have some genetic resistance to blister rust from the parent trees.		
	We are dealing with the aftermath of a relatively large mixed severity fire that will give many of the benefits that the Forest and others have been suggesting are important to retain in western landscapes. Many ecological functions will be lost by harvesting fire killed trees and planting them back to white pine, larch, and ponderosa pine. Obvious losses are the contribution that snags and insect infested trees make to a variety of wildlife species. Secondary losses include shortening successional cycles that are important for wildlife, soil development, and a variety of other ecological functions. It would result in the loss of early successional forbs and shrubs that are important for a variety of species, not the suggested increases in early seral species and big game forage that are identified in the Purpose and Need.	Thank you for your comment. Effects to resources have been analyzed in the EIS.	Harry Jageman
	The DEIS suggests that six old growth analysis units could be influenced by the project, but no maps of how the project relates to those old growth units are displayed in the DEIS.	An old growth map has been included in the FEIS.	Harry Jageman

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	One old growth unit (OGAA03040009) is listed as being only 3,911 acres, which does not even come close to the Forest Plan (Appendix N-2) recommended size of 5-10,000 acres. No maps of verified old growth or areas in MA 20 are included in the DEIS.	OGAA03040009 is not a prescription watershed and has been combined with a prescription watershed in the FEIS. An old growth map has been included in the FEIS.	Harry Jageman
	Limited discussion regarding the amount of MA 20 that is actually considered old growth.	Thank you for your comment. Please refer to the Vegetation section of the FEIS for a description of old growth.	Harry Jageman
	No cumulative effects discussion of other activities within each of the identified old growth units.	Thank you for your comment. The EIS analyzes effects based upon the level of effects for each resource.	Harry Jageman
	No maps of the recruitment areas are provided and there is no display of how the proposed treatment units relate to fire impacted old growth stands, verified old growth, and MA 20. This needs to be corrected in the FEIS.	An old growth map has been included in the FEIS.	Harry Jageman
	The DEIS suggests that the project area had 1,017 acres old growth before the Johnson Bar wildfire, but Table 3-37 suggest that the amount of verified old growth is spread over the entire acreage of the six impacted old growth units. The DEIS also suggests there are 1,867 acres in MA 20 in the project area, whereas Table 3-37 suggests the acreage is spread over the entire six impacted old growth units. This would suggest there were	Thank you for your comment. The old growth discussion has been edited to provide clarification.	Harry Jageman

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	only 2,884 acres of verified old growth and MA 20 stands in the entire 51,900 acres of the six impacted old growth units prior to the fire. From this it appears that the actual old growth prior to the fire was less than 5.6% of the 51,900 acres within the six old growth units.		
	The six old growth units are erroneously reported as the project area on page 191.	Thank you for your comment. Page 191 of the DEIS is describing effects to wildlife and did not discuss the six old growth units. Any inconsistencies have been addressed in the FEIS.	Harry Jageman
	According to the DEIS, 950 acres of old growth burned at moderate and high severity fire intensities and there are now 1,934 acres of verified old growth or stands estimated to exceed 150 years of age in MA 20 in the six old growth units. This represents approximately 3.7% of the acreage in the six old growth units. There is no discussion in the DEIS regarding how the loss of 950 acres of old growth is impacting Forest-wide totals.	Thank you for your comment. The EIS analyzes effects to resources. Data from the 2007 Forest Inventory and Analysis indicates than an estimated 13.4% of the Forest is old growth habitat, as defined by Green et al. The lower and upper confidence intervals are 11% and 16.1%, as such the Forest is meeting the Forest Plan old growth standard.	Harry Jageman
	The DEIS does not display or list how many acres of old growth are within the proposed harvest units and how “dead” trees will be determined. It does not discuss what portions of the stands that have been	An old growth map has been included in the FEIS. Old growth is being addressed in terms of old growth analysis units for the FEIS.	Harry Jageman

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	eliminated from old growth consideration were not burned in the fire or were burnt at low intensity. Many individual old growth trees and small patches could still be removed as a result of the proposed project.	Approximately 99 acres of previously verified old growth stands burned by the fire are proposed for salvage harvest. Within these 99 acres, only dead trees would be harvested. Field verification and stand exams have confirmed the status of these acres. Any re-verified old growth stands would not be harvested. Approximately 110 acres of MA20 burned by the fire would be salvage harvested. These 110 acres were not verified old growth; however, they were being managed as old growth replacement.	
	The FEIS needs to do a better job of describing the existing condition of previously verified old growth stands and those in MA 20 that were once considered to be over 150 years of age prior to the Johnson Bar fire. How many acres of these stands will be harvested in the various alternatives and how will risk factors associated with “dead” trees be determined. What is the current ecological value of these stands in a landscape that is now down to 3.7% old growth?	Effects to resources are analyzed in the EIS. Approximately 99 acres of previously verified old growth stands burned by the fire are proposed for salvage harvest. Within these 99 acres, only dead trees would be harvested. Field verification and stand exams have confirmed the status of these acres. Any re-verified old growth stands would not be harvested. Approximately 110 acres of MA20 burned by the fire would be salvage	Harry Jageman

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		harvested. These 110 acres were not verified old growth; however, they were being managed as old growth replacement.	
	The proposed planting density does not appear to align well with recent science related to moist conifer stands.	The proposed planting of 300-400 trees/acre is a reduction from the traditionally planted 600 trees/acre. Ponderosa pine is the most drought tolerant species; and, western larch and ponderosa pine are the most fire resistant species and are more likely to reach the old growth stage of development.	EPA
	The DEIS does not specify how landscape structure and composition will be considered with regard to replanting. If planting is to be applied uniformly across the treated area, the result may be coarser grained, more homogenous patch types, which may be more susceptible to high-severity fires. Research brings into question the extent to which planting post-salvage can reduce fire risk. Research findings suggest that the planted areas may have higher vegetation cover than unmanaged stands, and the higher live and dead fuel continuity may play a role in creating more flammable vegetation types. This raises questions about the long-term landscape structure and fire resilience	Western larch and ponderosa pine are the most fire resistant species, and are also resistant to root rot. As a result they are more likely to reach the old growth stage of development.	EPA

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	that should be examined more closely in the FEIS.		
	Particular attention should be given to anticipated stand development out to 25 years. Research has shown plantation age to be a key predictor in canopy damage due to fire, with the level of fire-related canopy damage reaching its maximum around age 15 and staying relatively high until age 25 before declining.	Thank you for your comment. The plantations described in the comment functioned as fuel breaks during the Johnson Bar Fire.	EPA
	Recommend the FEIS consider historic tree densities and how the proposed project fits within the historic range of variability (HRV). If proposed planting densities fall outside of the HRV, the FEIS should discuss how plantation density will be managed (particularly out to 25 years).	The proposed planting of 300-400 trees/acre is a reduction from the traditionally planted 600 trees/acre. Tree density in 25 years is beyond the scope of effects for this project.	EPA
	Recommend the FEIS provide additional analysis of future landscape structure in terms of species, spatial composition, and seral stages. Where planting densities are high (300-400 seedlings per acre), recommend the FEIS give additional consideration to the potential for increased fire risk.	Treatments would tend to move the project area towards historical ranges of variation by 10%, 9%, and 8% when comparing cover types of early seral species at the project scale for each of the action alternatives respectively. Western larch and ponderosa pine are the most fire resistant species and as a result are more likely to reach the old growth stage of development.	EPA

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Weeds/Plants	The Tribe reiterates that weed prevention and treatment is of utmost importance. The moderate risk of weed expansion probability on 11,700 acres, 90% of the project area, and high risk on 910 acres, 7% of the project area, is alarming. The Tribe recommends the proposed noxious weed treatment plan include re-establishment of native vegetation on bare ground caused by the Johnson Bar wildfire and project disturbance, and aggressive treatment and monitoring of noxious weeds both before and after implementation.	Weed treatments are planned on the entire roaded portion of the Johnson Bar Fire Salvage Area. Last September 2014, weed inventories were conducted during the Burned Area Emergency Response Assessment of the Fire area. Noxious weed treatment control with herbicides was recommended and funded for treating any invasive populations within and adjacent to the fire area. These BAER weed treatments, combined with annual operating program road system control, will contain and suppress existing weed infestations and reduce seed availability.	Nez Perce Tribe
	How will the evaluation of invasive plant species treatment be completed and reported?	Noxious weed treatments during the summer of 2015 will be evaluated and documented during the initial treatments and monitored during the 2nd or follow-up treatments to determine if weed densities have decreased. This post treatment effectiveness monitoring is reported into the Forest Service FACTS Database.	Nez Perce Tribe
	Many treaty-reserved plant resources of the Tribe do not appear on the list.	During the 2014 Burned Area Emergency Response Assessment	Nez Perce Tribe

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		(BAER), noxious weed surveys were conducted in tandem with the BAER archeology survey. One treaty-reserved plant, Camas, was taken into account and surveyed for at each potentially known site. None were found to exist growing within the Johnson Bar Fire Area. It would greatly assist the Forest Service if the Nez Perce Tribe were to provide a list as to what the other species are and the potential effects. The Forest Service works from the State of Idaho Noxious Weeds List. Idaho's noxious weeds are plant species that have been designated "noxious" by law under the Idaho Code (Title 22, Chapter 24). There are 64 noxious weed species that make up the current State list.	
	The DEIS did not disclose how sensitive plant populations have responded to the fire.	Sensitive plant populations could not be surveyed during the winter months of 2014/15 in the aftermath of the burn. So far this spring, no surveys have been conducted and therefore no information on how sensitive plants responded to the fire is currently available.	Jeff Juel

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	The DEIS states that noxious week surveys were conducted right after the fire in 2014, but that makes no sense, if you want to know how the fire has affected weed spread. Please disclose the results of the 2015 weed surveys. What is the expected accuracy of your "Weed Expansion Risk" modeling?	Noxious weed surveys were conducted after the fire in September 2014 to determine the extent of current noxious weed species and therefore assess the seed source that is present and at risk of expansion in the project area. Weed surveys for 2015 will be discussed in a report after all treatments and inventories have been completed and summarized in the Fall. The noxious weed model was developed as a predictive tool based upon local habitats, weed occurrence, disturbance levels, and available vectors. The accuracy cannot be quantified exactly, but should prove accurate and reliable.	Jeff Juel
	Utilizing the Nez Perce National Forest Invasive Plants Treatment from 1988 ROD will provide an excellent starting point for treatment of disturbed areas.	Thank you for your comment	Board of Idaho County Commissioners
	There is a need for additional information about herbicide application and associated design criteria. It is not clear from the document what suite of design criteria or BMPs would apply to weed management. Recommend that the FEIS provide information on the herbicide application	1) The spread of invasive plants would be minimized by chemically treating any noxious weed populations along the existing road systems before and after project implementation. The	EPA

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	BMPs and design criteria and/or clarify the source of any BMPs and design criteria incorporated by reference.	Collaborative Forest Landscape Restoration Program (CFLRP) partners Forest Service, Idaho County and local groups to contain or eliminate noxious weeds within Forest Service and County roads, Campgrounds, Trailheads, and Administrative Sites. Burned Area Emergency Response (BAER) weed treatments will occur in 2015 by Forest Service crews on all weed infested roads within the Johnson Bar Fire Area, whether or not the Proposed Johnson Bar Salvage Project is implemented. 2) Washing all equipment of loose dirt and debris prior to entering the project area to prevent “New Invader” weed establishment. 3) Using only Certified Weed Free Straw and Certified Weed Free Seed for revegetation related seeding projects on exposed soils.	

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	Clarify in Section 3.11 how herbicide application will be directed and managed.	Herbicide application will be directed by priorities outlined in the annual operating plan. The Noxious Weed Coordinator for the Central Zone on the Nez Perce-Clearwater National Forests will manage these priorities and see that they are carried out. Forest Service Weed Crews will conduct weed treatments under the direction of a State of Idaho Licensed Certified Applicator. Any Idaho County weed treatments that occur will also be conducted under the supervision of State of Idaho Licensed Applicator. All herbicide treatments will be recorded and the data entered in the Forest Service FACTS database.	EPA
	Under Section 3.11.2, regulatory framework, reference Forest Service Handbook 2109.14 (chapters 10, 40, 50).	Thank you for your point, the handbook reference will be included in the document	EPA
	Reference or incorporate by reference the BMPs included in the USDA National Best Management Practices for Water Quality Management on National Forest System Lands.	Thank you for your comment. The reference has been added.	EPA
	Indicate the herbicide type or formulation and how it will be applied to noxious weeds.	Weed management would is conducted under the Nez Perce Forest Noxious Weed Control	

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		Program Environmental Assessment (1988) and the Biological Opinion Endangered Species Act – Section 7 Consultation on the effects of the Nez Perce National Forest Noxious Weed Programmatic (2009). The spread of invasive plants would be minimized by chemically treating any noxious weed populations along the existing road systems before and after project implementation. The Collaborative Forest Landscape Restoration Program (CFLRP) partners Forest Service, Idaho County and local groups to contain or eliminate noxious weeds within Forest Service and County roads, Campgrounds, Trailheads, and Administrative Sites. Burned Area Emergency Response (BAER) weed treatments will occur in 2015 by Forest Service crews on all weed infested roads within the Johnson Bar Fire Area, whether or not the Proposed Johnson Bar Salvage Project is implemented.	
Wild and Scenic Rivers	Little assurance is provided that the Wild and Scenic ORVs of the Middle Fork Clearwater and Selway rivers will be protected and	Alternative 4 does not harvest within the Wild and Scenic River Corridor and provides for a	Idaho Rivers United

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	enhanced through the implementation of Alternatives 2, 3, and 4. Forest Service is improperly focusing on its desire to capture the value of fire-killed trees and promoting local economies through commercial salvage logging.	comparison of effects. The effects to the Wild and Scenic River are found in Section 3.12, as well as in the individual resource sections.	
	The Forest Plan for area 8.2 does not allow for commercial objectives, and salvage logging is inherently commercial.	The Forest Plan allows for timber harvest under certain circumstances [see Forest Plan Page III-20 (Timber Harvest item 2)].	Idaho Rivers United
	The existing CRMP does not comply with the requirements of the WSRA; therefore, the Forest Service cannot analyze the impacts of new industrial demands and other proposed activities within the protected river corridor.	Alternative 4 avoids harvesting within the Wild and Scenic River Corridor and provides a comparison of effects.	Idaho Rivers United
	The 1969 CRMP has never been updated. Current Forest planning documents admit that the plan "does not meet the criteria established in Section 3 of the WSRA as amended in 1986" and "lacks sufficient detail in several areas including monitoring, user capacities, and development plans" (NPC Forest Plan Assessment, 2014). Without sufficient details regarding monitoring, user capacities, and development plans, the Clearwater River corridor cannot be managed according to the WSRA.	The River Management Plan sections referenced would have no bearing on the design or implementation of the Johnson Bar Fire Salvage Project. Alternative 4 avoids harvesting activities within the Wild and Scenic River Corridor and provides a comparison of effects.	Idaho Rivers United
	The Wild and Scenic River Management Plan for the Selway River states that a water	There is a USGS gauge at O'Hara. Information from this gauge is	Nez Perce Tribe

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	monitoring station will be setup to permit frequent checking of the quality and quantity of water in the river system. Where in the EIS is the data reported?	available online to the public at http://waterdata.usgs.gov/id/nwis/uv/?site_no=13336500&PARAmeter_cd=00065,00060	
	The Forest has pursued and increasingly accelerated pace of timber management activities in the Wild and Scenic River corridor. Past projects have already constructed unsightly helicopter landings and future projects will do the same. Along Highway 12 there is little evidence that a fire occurred. These impacts are likely to go unnoticed by most casual visitors and do not warrant the extensive timber harvest actions proposed by the project. The more noticeable areas of fire impact near the Fenn Ranger Station appear as natural openings in a landscape mosaic resulting from the mixed severity fire. The viewable landscape is exactly the type of "desired conditions" the Forest Service often describes in its NEPA documents. I do not agree that logging and use of existing helicopter landings are necessary in the existing Wild and Scenic River Corridor.	Alternative 4 avoids harvesting activities and the use of helicopter landings within the Wild and Scenic River Corridor and provides a comparison of effects.	Harry Jageman
	Timber harvest is generally supposed to be excluded within the Wild and Scenic River Corridor according to the Forest Plan and no	The Forest Plan allows timber harvest under certain circumstances but does not distinguish whether harvested trees are dead or alive.	Harry Jageman

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	provisions in the Forest Plan call for salvage of fire killed trees.		
	The discussion of how the project complies with the River Management Plan direction with regards to logging within the Wild and Scenic River corridor was incomplete.	This section has been updated to more clearly show the differences between alternatives.	Idaho Conservation League
	The discussion as to how the project complies with the Coordinating Requirements relies on an analysis of the % of burned area within the Wild and Scenic River Corridor would be logged and fails to explain how this meets the intent or purpose of the WSRA and its implementing regulations.	The WSRA defers site specific management direction to the CRMP. This analysis discloses the effects to free flow and ORVs as required by the Act and the CRMP.	Idaho Conservation League
	How can logging occur in the Wild and Scenic River Corridor and be consistent with the WSRA and the Forest Plan? The Forest Plan sates the entire area is unsuitable for logging. The DEIS does not make the case that this is necessary. Fire has already burned in the corridor and resulted in the kind of mosaic desired by the Forest Service. As such, none of the Forest Plan caveats apply.	The Forest Plan allows timber harvest under certain circumstances. Alternative 4 has been modified to eliminate harvest activities within the Wild and Scenic River Corridor.	Friends of the Clearwater
	Helicopter landings are not consistent with protection of Wild and Scenic Rivers. The current landings are unsightly and should be rehabilitated and revegetated. They detract from the scenic values of the corridor.	Alternative 4 avoids harvest activities and the use of helicopter landings within the Wild and Scenic River Corridor and provides a comparison of effects. Under the other action alternatives, three	Friends of the Clearwater

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		helicopter landings are proposed within the Wild and Scenic River Corridor. Two are located at/within Wild Goose and Johnson Bar campgrounds. The existing conditions within the campgrounds require no rehabilitation. The third landing at Two Shadows is a large turn-out adjacent to the highway. Decompaction and seeding of this site could be considered; however, it is not a component of this proposal.	
	The primary impact of logging and roading the Johnson Bar sale area is on scenery and the Wild and Scenic Rivers. There will be major visual effects to the Three Rivers Resort visitors. Must address the loss of income to the Three Rivers Resort; the scenery for the river rafters; assess the new situation at Three Rivers; and amend the plan to strengthen the VQOs.	The effects to scenic quality and Wild and Scenic Rivers are discussed in the effects sections of the EIS. The Three Rivers Resort did not comment during the scoping or DEIS comment periods indicating they would have a loss of income as a result of the action alternatives. There would be some effects to the scenery for river rafters, which has been analyzed in the EIS. The VQOs for this area are retention and partial retention in the foreground, middleground, and background views, which are appropriate for this area.	Dick Artley

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Wildlife	To what extent are the proposed activities expected to trend the overall landscape toward, or away from, its historic range of variability? Many of the treaty-reserved wildlife resources do not appear on lists.	The proposed activities are in line with the landscape range of variability. Stand re-initiation, whether from wildfires or harvesting activities, is a variable in the process of growing a forest. The various wildlife species adjust to the landscape as it changes and the hunters and gatherers historically have followed them. The Nez Perce National Forest Plan requires analyzing for key wildlife species representing the various wildlife successional habitats.	Nez Perce Tribe
	The analysis is reliant upon an outdated metric for evaluating elk habitat impacts. More recent peer-reviewed literature and studies have expanded our understanding of effects of roads, motorized recreation, nutrition, livestock grazing, and other factors on the distribution and health of elk populations. Recent litigation (Friends of the Clearwater et al. v. U.S. Forest Service, 2015) found that the reliance on Leege's 1984 guidance was inappropriate following development of Servheen et al. 1997, which more accurately reflects the best available science for evaluating summer range impacts. The plaintiffs prevailed on this issue.	Forest Plan Standards direct the use of the Leege 1984 as guidelines for analyzing and managing for elk habitat. Servheen et al. 1997, uses the same co-efficients for road effects as Leege, and same metrics computing EHE. The Elk Vulnerability model is unique to the Servheen et al. analysis. The model attempts to analyze elk depredation from hunting, natural mortality factors, road impacts (access for hunters), and extrapolate this information to	The Nez Perce Tribe

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	The Forest Service's reliance on outdated analytical approaches precludes the "hard look at environmental consequences" required by NEPA. The Tribe also recommends the use of the elk research generated by the Forest Service's Starkey Experimental Forest as a basis for more scientifically defensible and complete analysis of impacts to elk generated by this project.	trends in elk mortality per Game Management Unit (GMU). Liabilities of the model for use with Forest Service projects include the scale of analysis and mortality factors. The desired scale for analysis is at the Game Management Unit (GMU). These units range in size from 262 mi^2 to 1,555 mi^2; while the Clear Creek Project area is 68.3 mi^2. For impacts on elk in the project area, the biologist analyzes smaller polygons called Elk Analysis Areas or EAAs. These units are calculated from the input proposed in guidelines from Leege et al. (1984), which is also used in Servheen et al. (1997). Each EAA in the project area ranges from 7 to 14 mi^2. Extrapolating road densities from Forest service lands, such as the Clear Creek Project, to a GMU is conjecture, and not a dependable source for determining elk vulnerability at the larger scale. Road densities and hunter activities vary on private and corporate lands, in comparison to Forest Service lands. The larger size of the GMUs in	

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		Central Idaho include wilderness, roadless areas and other terrain inaccessible to motorized vehicles, as well as the areas previously stated. Mortality factors in the Vulnerability Model depend on consistencies. Changes in hunting seasons or alteration of gender numbers allowed for hunting would skew trends the Servheen document discusses. The elk vulnerability model only gathers data on legal hunting. Illegal take is not factored. Treaty rights for the Nez Perce tribe allows take of big game throughout the year, of either sex, with any weapon. The model does not address this supplemental mortality. Additionally, the IDFG has recently increased trapping and other controls on the wolf population; which was not a consideration in the Servheen et al. 1997 guidelines. The latter document discusses a 10% natural mortality for elk, but the state's increased predator control must be the result of a known or perceived	

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		natural threat that is creating a larger mortality of elk than originally thought. The IDFG has not contacted the forest about the need or implementation of this model. The public arguing for the change of elk modeling guidelines are requesting the agency replace a 30-year old plan with one that is nearly 20 years old. Both need to be replaced with an analysis that uses the best available science, and more up to date knowledge. As the Forest progresses in its forest plan revision, the best available science will be selected and used for elk analysis. The Forest Service manages habitat for wildlife, while the IDFG manages the state populations for animals that are legally hunted or trapped. It would make more sense for the IDFG to generate and interpret this model, as they gather annual hunter harvest information to determine the management (tags, timing of season, etc.) for elk in each Big Game Unit.	

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		Currently, the forest is undergoing a Forest Plan revision. More recent literature is being reviewed from the Starkey Experimental Forest and others. The result would be an elk analysis that is based on more recent science.	
	The data and modeling make it clear that, factoring in both short-term forage benefits and securing cover losses, the proposed project would degrade elk summer range within the project area. The DEIS states that EHE levels would return to existing condition upon completion of the project, yet EHE depends upon many factors beyond direct effects. Both major EEAs are already below the 30% secure habitat threshold identified in Hillis et al., 1991 and would be further reduced by an average of 7.5% under all action alternatives.	The Johnson Bar Fire was the event that affected elk summer forage. In the short-term (3-10 years) the understory vegetation would produce forage for elk and other big-game. The proposed project will not degrade elk summer range. The fire was also the main event for decreasing cover. There are no Forest Plan standards for elk security. The biologist used Hillis et al. to illustrate an approach recommended by the authors.	Nez Perce Tribe
	The Tribe is concerned that harvest operations during the winter season will negatively impact the availability and condition of elk within the project area. The Tribe recommends that winter harvest operations be dropped from consideration for those portions of the project area within MA 16.	Operations will be in burned areas where available browse for winter will be minor to non-existent. Without available browse, it is highly unlikely that elk would be in or remain near proposed units in such burned areas. For any elk in the area, it is well known to those involved with winter harvest	Nez Perce Tribe

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		operations that big game are attracted to areas being logged in order to eat the edible material on the tree branches of the felled timber. However, public access may need to be controlled to avoid harassment of the animals by excessive vehicle traffic if winter logging is planned.	
	Monitoring of MI and TES species has not been done, which makes any wildlife analysis suspect. The analysis is not based upon field research but instead stand exams, which may give very inaccurate views of habitat. Cumulative impact analysis is weak and activities looked at in other resources is ignored. Cumulative impacts from adjacent projects need to be taken into account.	Recent and past monitoring have occurred for some species and were used to show presence of wildlife in the project area. Projects contributing to cumulative effects are listed on pp 217-221. About 10% of the project area has been affected by commercial harvest in the past 30 years.	Friends of the Clearwater
	Best available science has not been used. It is not clear whether the analysis is based on pre- or post-fire stand data.	The commenter offers no new science. The analysis is based on post-fire conditions from the BARK model developed from overhead photos during the fire, and from field recons to potential unit locations.	Friends of the Clearwater
	Impacts to TE and MIS are of special concern. Fires only provide optimum habitat for black-backed woodpeckers for a period of less than 10 years. The fisher analysis needs to include	Fires are beneficial to many species as they open the tree canopy for wildlife that prefer more open areas: flammulated owl, pygmy	Friends of the Clearwater

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	the latest research done in the Clearwater Basin by Sauder et al. Also the impacts of logging on fisher are not well explained. The cumulative impacts to fisher need to be considered as the front country. The DEIS does not differentiate between the two separate marten species. To what species (or subspecies) do the marten in the project area belong? The best science is not used in coming up with habitat estimates for goshawk and pileated woodpecker.	nuthatch, pileated woodpecker, elk, deer and others. See pages 190-192, 196, 197, and 246 of the DEIS for impacts on fisher. Marten are analyzed as the species- *Martes Americana.* Habitat estimates for all species is on Table 3-47, p. 184 of DEIS. Sections for the goshawk and pileated woodpecker are on pages 204-208.	
	The impacts of Clear Creek, Little Slate Creek, Lolo Insects and Bugs, Lower Orogrande, French Larch, and Barnyard Sheep all need to be evaluated.	Direct effects of these projects have already been analyzed in each respective NEPA document. Any potential cumulative effects of these projects are resource dependent and are analyzed under each respective resource's cumulative effects section, when applicable.	Friends of the Clearwater
	The reported acreages in terms of pre-/post-fire habitat, habitat lost from proposed logging, and existing habitat don't seem to add up.	Proposed logging would occur only in burned areas. Post-fire habitat is the existing condition. See pages 190, 191 for general fire effects on wildlife.	Friends of the Clearwater
	The DEIS does not discuss the adequacy of the NRLMD nor does it discuss the recent federal court decision in Montana that	The project is not in a Lynx Analysis Unit (LAU), and therefore is not affecting lynx habitat- page 302.	Friends of the Clearwater

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	affects lynx and how the agency is supposed to deal with lynx habitat. Connectivity for lynx and other species is important and such a large timber sale with have negative impacts on connectivity.	Other LAUs exist and if activities occur in them, then the NRMLD is discussed, as well as connectivity.	
	The DEIS dismisses the grizzly bear analysis. How does the DEIS comply with the Forest Plan? The allegation that the USFWS has decided on the No Action Alternative for grizzlies in the Bitterroot ecosystem is suspect.	Please see pages 303-304.	Friends of the Clearwater
	None of the alternatives meet the elk security recommendation for the Clear Creek elk analysis area. How does this comport with the forest plan? Whey wasn't an alternative developed that met this standard?	There are no Forest Plan standards for elk security. The biologist used Hillis et al. to illustrate an approach recommended by the authors.	Friends of the Clearwater
	What protocol was used? Was the latest version of the elk habitat guidelines used the analysis? If not, why? Does the agency believe it needs to amend the forest plan to use the latest scientific protocol? If so, why wasn't an amendment proposed, at least for this project area? With regard to summer range, the DEIS uses outdated elk guidelines rather than the newer 1997 ones. Why not use latest and best available science? What about the size of the elk analysis areas? Are Forest Plan standards, objectives, and guidelines being met for elk habitat?	Forest Plan Standards direct the use of the Leege 1984 as guidelines for analyzing and managing for elk habitat. Servheen et al. 1997, uses the same co-efficients for road effects as Leege, and same metrics computing EHE. The Elk Vulnerability model is unique to the Servheen et al. analysis. The model attempts to analyze elk depredation from hunting, natural mortality factors, road impacts (access for hunters),	Friends of the Clearwater

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		and extrapolate this information to trends in elk mortality per Game Management Unit (GMU). Liabilities of the model for use with Forest Service projects include the scale of analysis and mortality factors. The desired scale for analysis is at the Game Management Unit (GMU). These units range in size from 262 mi^2 to 1,555 mi^2; while the Clear Creek Project area is 68.3 mi^2. For impacts on elk in the project area, the biologist analyzes smaller polygons called Elk Analysis Areas or EAAs. These units are calculated from the input proposed in guidelines from Leege et al. (1984), which is also used in Servheen et al. (1997). Each EAA in the project area ranges from 7 to 14 mi^2. Extrapolating road densities from Forest service lands, such as the Clear Creek Project, to a GMU is conjecture, and not a dependable source for determining elk vulnerability at the larger scale. Road densities and hunter activities vary on private and corporate lands, in comparison to Forest Service	

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		lands. The larger size of the GMUs in Central Idaho include wilderness, roadless areas and other terrain inaccessible to motorized vehicles, as well as the areas previously stated. Mortality factors in the Vulnerability Model depend on consistencies. Changes in hunting seasons or alteration of gender numbers allowed for hunting would skew trends the Servheen document discusses. The elk vulnerability model only gathers data on legal hunting. Illegal take is not factored. Treaty rights for the Nez Perce tribe allows take of big game throughout the year, of either sex, with any weapon. The model does not address this supplemental mortality. Additionally, the IDFG has recently increased trapping and other controls on the wolf population; which was not a consideration in the Servheen et al. 1997 guidelines. The latter document discusses a 10% natural mortality for elk, but the state's increased predator control must be	

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		the result of a known or perceived natural threat that is creating a larger mortality of elk than originally thought. The IDFG has not contacted the forest about the need or implementation of this model. The public arguing for the change of elk modeling guidelines are requesting the agency replace a 30-year old plan with one that is nearly 20 years old. Both need to be replaced with an analysis that uses the best available science, and more up to date knowledge. As the Forest progresses in its forest plan revision, the best available science will be selected and used for elk analysis. The Forest Service manages habitat for wildlife, while the IDFG manages the state populations for animals that are legally hunted or trapped. It would make more sense for the IDFG to generate and interpret this model, as they gather annual hunter harvest information to determine the management (tags, timing of	

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		season, etc.) for elk in each Big Game Unit. Currently, the forest is undergoing a Forest Plan revision. More recent literature is being reviewed from the Starkey Experimental Forest and others. The result would be an elk analysis that is based on more recent science.	
	Moose habitat and MA 21 need better explanation. The DEIS reveals that 11 acres will be logged but doesn't say if it is under the 35% slope. How will that meet the requirements for maintaining 50% of Pacific yew component? Will the proposal meet the Peek guidelines for all moose habitat?	Management Area (MA) 21 is described in the Forest Plan. Timber harvests are held to standards such as any land over 35% slope is considered as "unsuitable" for timber management.	Friends of the Clearwater
	The DEIS dismisses the wolverine and Coeur d'Alene salamander. Are there no spray zones in the project area for salamanders? What about Idaho giant salamanders? Is it possible wolverines may use the project area as well, especially in winter searching for carrion?	The salamander is discussed on page 303 and the wolverine on page 305. Giant salamanders are not an animal that is analyzed in this project.	Friends of the Clearwater
	Other species such as the bat species and flammulated owls need to be better analyzed.	Model attributes for species habitat is in Table 3-47 and on page 187; references and direct effects on pages 197-201; and effects determination on pages 246-247.	Friends of the Clearwater

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	Does the Forest Service have more recent population survey data for goshawks for the Nez Perce National Forest and R-1?	The Nez Perce Forest conducts on the ground surveys for goshawks, and updates the regional d-bases.	Jeff Juel
	The DEIS fails to establish that the MIS and ESA-listed vertebrates that exist, or historically are believed to have been present in the analysis area are still part of viable populations.	The determination statements (bold of italics) state that the project would not contribute to a loss of viability for the analyzed species. No effect means the project would not impact the species.	Jeff Juel
	The DEIS ignores many structural habitat components necessary for the pileated woodpecker. The pileated woodpecker's strong preference for trees of rather large diameter is not adequately considered in the DEIS.	Please see pages 206-208.	Jeff Juel
	The DEIS provides absolutely no commitments for leaving specific numbers and sizes of the largest trees favored by so many wildlife species.	Please see pages 138-139- Desired Stand Conditions and Table 3-35; and page 184, Table 3-47.	Jeff Juel
	A substantial portion of the analyses relies upon the use of models. The Forest Service has not undertaken the task of determining the reliability of the data used as input for the models. The validity of various models utilized in the analyses has, by and large, not been established for how agencies utilize them. No studies are cited which establishes their content validity, and no independent	Thank you for your comment; however, this is beyond the scope of this resource to address. Models such as V-Map, Simplle, FSVEG, Lidar are used and supported throughout the region for vegetation, wildlife, roads, elevation and so on.	Jeff Juel

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	expert peer review process of the models has occurred.		
	There is no discussion in the DEIS regarding how the loss of 950 acres of old growth habitat proxies for pileated woodpeckers, goshawks, fishers, and pine martens may be affected by this loss.	Please see pages 186-188 and 190-192. Obviously, the loss of such habitat may displace wildlife species. However, old growth in the project area is meeting the Forest Plan standard of 10% or greater.	Harry Jageman
	The wildlife analysis makes several erroneous conclusions that are not supported by the best available science and fails to answer the "so what" questions of what habitat losses associated with the project mean. In many instances the analysis under estimates potential habitat and in turn potential impacts to species. Most of the analysis is based on stand exam database queries and there is a general lack of monitoring data to confirm the conclusions. Spatial requirements of territorial species have not been considered and no thresholds of management activity have been set for most species.	The commenter fails to identify the best available science. Habitat losses and impacts are discussed for all analyzed species in the wildlife sections. Stand exams show what species and structure existed previous to the fire. With the overlay of the fire effects model, analysis of potential species' habitat can be calculated. Spatial territories are not considered as the fire burned or changed habitat structure for many of the analyzed wildlife species.	Harry Jageman
	The cumulative effects analysis is very weak. Several activities are mentioned under other resources and not included in the wildlife cumulative effects analysis.	Please see pages 217-221 and Table 3-51.	Harry Jageman
	The wildlife analyses do not mention Sampson's long-term viability conclusions	Samson is referenced for the flammulated owl, goshawk, pileated	Harry Jageman

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	and instead only focus in on his short-term projections. This ignores a multitude of factors and makes no assumptions about habitat losses or changes over time.	woodpecker, and American marten. Habitat losses are mentioned in all analyzed species sections. And habitat gains are also discussed.	
	The analyses assume the project will not contribute to cumulative habitat losses at the Forest level. Currently there is no statistically reliable monitoring information on the impacts of Forest Service activities on any wildlife species of concern.	Fire and harvest information is updated annually, allowing the forest to present such history in the cumulative effects table 3-51. So that accusation is false. Disturbance data gives the forest information to address the effects sections in the wildlife report. Periodic reports (Samson, Bush and Lundberg, Global ratings, State ratings and so on) provide snapshots on the species status at a larger scale than the forest. These are mentioned in the Population Trends paragraph for each species.	Harry Jageman
	The analyses did not incorporate the impacts of the Johnson Bar fire. All of the stand exam queries relay on pre-fire data. The Johnson Bar Fire is now the new reality within the project area.	General and common effects of the fire and proposed project are on pages 190-192. The existing condition is the post-fire event. Pre-fire stand exams show what species and structure existed before the fire.	Harry Jageman
	I do not agree with the unresponsive approach for protecting eagle habitat. An alternative needs to be developed that	Please see page 30, Wildlfe Design Criteria #4, which explains what would be done for a detected or	

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	avoids helicopter operations along the Middle Fork and Selway Rivers, or activities need to be timed so that they take place when eagle presence is unlikely. Continued vigilance should be maintained in searching for nests and modifying the project appropriately. Project timing should also acknowledge high use periods during the winter months. Please modify the project to give better consideration to bald eagle habitat.	known active eagle nest. An active nest was located by the biologist near O'Hara Bridge during spring of 2015. Timing and activities would be adjusted according to the design criteria. Page 245 describes the impacts to eagles for the 3 action alternatives.	
	The amount of pre-fire potential habitat for the black-backed woodpecker has been significantly under estimated due to over emphasis on tree species and live tree date in the stand exam queries. The queries did not include western red cedar, grand fir, or stands where the species is unknown. Also the importance of the Johnson Bar fire has been under estimated. The analysis needs to be redone with the latest scientific information and recognition of the importance of wildfires to this species.	Thank you for your comment. The commenter failed to provide any recent information that would warrant the analysis be re-done on the importance of wildfires to the species.	Harry Jageman
	The fisher habitat appears to be based almost entirely on an older investigation of fisher habitat. The analysis needs to be updated to include the current literature, which suggests that fishers are heavily associated with older forests throughout the	This comment is vague and not substantiated by any references that indicate the current report is deficient. The forest updates disturbance data (fires, timber harvest, roads) every	Harry Jageman

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	year. The Forests have no idea what the cumulative impacts are as a result of front country activities. Request that the analysis be redone in accordance with the latest scientific findings.	year, and that is used for analyzing all impacts on wildlife species.	
	There is more potential for flammulated owls to exist in the analysis area than the DEIS suggests. The cumulative effects have not been adequately addressed. There is mention of follow-up surveys in the last 10 years that might help to establish population trends. The analysis needs to be redone.	The habitat criteria used for analyzing potential owl habitat is in Table 3-47, page 184. The biologist will review the habitat burned by the fire in the FEIS. An analysis of population trends for the owl is beyond the scope of this analysis.	Harry Jageman
	The analysis for pine marten is not spatially specific and fails to recognize more recent literature on the effect that habitat fragmentation has on the species. Potential habitat needs to be mapped at the project level. The numbers don't add up if all of the high and moderate severity areas are currently unsuitable as suggested. The FIA query is not spatially explicit and not appropriate for a species that is significantly impacted for fragmentation. The analysis needs to be redone.	The commenter offers no new science. The criteria for analyzing marten habitat at the project level is in Table 3-47, page 184. Page 204 explains the effects to marten habitat. Those areas of moderate to severe burns have already lost habitat function for the marten. Therefore, harvesting in those acres is not creating another "loss" of habitat. Areas proposed for harvest that would reduce marten habitat are areas of low to no burn severity; and are addressed in the analysis.	Harry Jageman

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	The goshawk analysis needs to be redone and use best available science. The analysis does a poor job of identifying potential habitat then addressing the impacts. There is no recognition in the analysis that the species is territorial and there is not analysis of impacts to potential territories. The amount of nesting habitat appears to have been significantly under estimated. The estimate of post-fledgling habitat doesn't agree with the literature. The foraging habitat estimates are very broad. The analysis needs to be redone as it has not sufficiently addressed the project level or cumulative impacts.	The commenter offers no new science. Page 187 shows the change in potential acres from pre to post-fire event. Pages 204 and 205 discuss nest area and territories. The latter includes nest and foraging habitat. Territories are not arbitrarily analyzed. If an active nest is found, then design criteria (page 30, wildlife 1) are implemented: for nest protection and the post-fledgling area.	Harry Jageman
	The pileated woodpecker analysis does not incorporate the best available science and is not spatially explicit. Field tested management guidelines and the latest information on the effects of logging have not been considered. There are no estimates of the amount of nesting habitat that was impacted by the moderate to high intensity burns.	The commenter offers no new science. We are unsure what management guidelines or latest information is being referred to. Please see potential nesting habitat in Table 3-47, page 184 and Pileated section: pages 206-208 and 250.	Harry Jageman
	The mixed severity burn should be ideal summer and winter range for elk. The proposed project has the potential to negate many of the positive benefits of the fire. Logging will result in disturbances, displacement, retard natural successional	The fire was the largest disturbance and impact to elk habitat. The setback in tree succession would allow grass, herbs and shrubs to return to the burned sites, thereby creating new and expanded forage	Harry Jageman

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	patterns, reduce forage production, and expose mineral soils. Section 3.17 mentions that 56 miles of snowmobile routes will be added in 2016. What NEPA document authorized these routes and why is there no discussion in the cumulative effects section? The elk summer range analysis should have been completed using the latest 1997 version of the North Idaho Elk guidelines. The Travel Plan Analysis was recently remanded and the use of older versions of the guidelines should no longer be considered. It also appears that the guidelines have been inappropriately applied in the project area. How was the 25% standard selected for the particular elk units? How does the Forest Service track elk unit management on a forest-wide basis and are elk standards being achieved in all Mas across the Forest (especially the 9 Mas impacted by the project)? Given the lack of elk security in the project area, why hasn't the Forest considered some additional road closures to protect elk habitat?	opportunities for elk and other big game. Proposed project alternatives would remove dead trees and plant the sites with seedlings. The recovery of these new trees would be quicker than natural succession. <u>There was an error in the Table 3-0 depicting the mileage of snowmobile routes. There are no new propsed snowmobile routes. Table 3-0 has been corrected.</u> Forest Plan Amendment 23; which moves the EHE standard for Goddard EAA to 75% and the Lodge Point EAA to 50%. This will be addressed in the FEIS. The forest is planning on closing and decommissioning about 20 miles of non-system roads, 1 mile of system roads, and storage of 5 miles of system roads.	
	The DEIS suggests that 11 acres of MA 21 will be harvested but it does not list how much of MA 21 is scheduled for timber harvest under 35% slope. There is no discussion regarding the existing condition of the 812 acres of MA 21 in the project area and if moose habitat is	Page 190 addresses the amount of MA 21 burned by the fire, page 215 describes impacts to moose and forest plan standards restrict timber harvest to slopes of 35% or less.	Harry Jageman

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	being managed according to Forest Plan standards. Is there any more moose winter range outside of MA 21 within the project area?		

04/20/2015, Jean Public
05/05/2015, Board of Idaho County Commissioners
05/06/2015, Harry Jageman
05/11/2015, EPA
05/12/2015, Idaho Department of Parks and Recreation (IDPR)
05/13/2015, Fred Rabe
05/13/2015, George Wuerthner
05/14/2015, Idaho Forest Group
05/14/2015, Mark Giese
05/15/2015. Idaho Conservation League
05/18/2015, DOI
05/18/2015, Idaho Rivers United (IRU)
05/16/2015, Dick Artley
05/18/2015, Friends of the Clearwater, Gary Macfarlane
05/18/2015, Jeff Juel
05/18/2015, Lynne Haagensen
05/18/2015, Dawn Serra
05/22/2015, Nez Perce Tribe