United States
Department of
Agriculture

Forest Service

Intermountain
Region

Uinta-Wasatch-Cache
National Forest

Evanston-Mountain
View Ranger District

March 2014

Smiths Fork Vegetation Restoration Project

Final Environmental Impact Statement

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Smiths Fork Vegetation Restoration Project
Final Environmental Impact Statement

Uinta-Wasatch-Cache National Forest
Summit County, Utah

Lead Agency: U.S. Department of Agriculture, Forest Service

Responsible Official: Dave Whittekiend, Forest Supervisor
857 West South Jordan Parkway
South Jordan, UT 84095
801-999-2103

For Information Contact: Tim Gill, Forester
1565 Highway 150, Suite A
Evanston, Wyoming 82930
307-789-3194

Abstract: The Evanston-Mountain View Ranger District of the Uinta-Wasatch-Cache National Forest proposes to treat approximately 4,445 acres of a variety of vegetation types within the Smiths Fork drainage. The project is proposed under the insect and disease epidemic authority of Section 102(a)(4) of the Healthy Forests Restoration Act. The project was designed using *The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide*. Treatments would include timber harvest and mechanical thinning with piling and burning. This proposal is being developed in direct response to a continuing mountain pine beetle epidemic and its potential long-term impacts on the north slope of the Uinta Mountains. The purpose of this project includes reducing the effects of tree mortality associated with the mountain pine beetle epidemic, accelerating the regeneration of forested stands killed by pine beetles, and salvaging forest products.

Summary

Under the insect and disease epidemic authority of Section 102(a)(4) of the Healthy Forests Restoration Act, the Uinta-Wasatch-Cache National Forest proposes treatments on units totaling approximately 4,445 acres within the Smiths Fork drainage, located 25 miles southwest of Mountain View, Wyoming.

Proposed treatments include timber harvest and mechanical thinning with piling and burning. This proposal was developed in direct response to the continuing mountain pine beetle epidemic and its potential long-term impacts on the north slope of the Uinta Mountains in general and the Smiths Fork area in particular.

The purpose of this project includes reducing the effects of tree mortality associated with the mountain pine beetle epidemic, accelerating the regeneration of forested stands killed by pine beetles, and salvaging forest products.

The notice of intent to prepare an environmental impact statement was published in the *Federal Register* on May 7, 2012, followed by a second notice on June 11, 2012 which clarified that commenters on the proposal would have objection rights under the authority of 36 CFR 218, as required by the Healthy Forests Restoration Act. The Forest Service mailed a copy of the scoping letter to approximately 90 individuals, groups, and government agencies. Nine comments were received in response to the scoping letter. These comments, as well as Forest Service responses, are found in Appendix A of this document.

The notice of availability of the draft environmental impact statement was published in the *Federal Register* on August 30, 2013. A legal notice requesting comments on the draft environmental impact statement was published in the *Salt Lake Tribune* on August 30, 2013. The official 45-day comment period ended on October 15, 2013. However, comments received after that date were accepted in conjunction with the federal government furlough which began on October 1, 2013. A legal notice informing persons or organizations who had made specific written comments on the Smiths Fork Vegetation Restoration Project that they had the opportunity to object, as per 36 CFR 218, was published in the *Salt Lake Tribune* on March 6, 2014.

Table of Contents

Summary	iv
Table of Contents	v
Chapter 1: Purpose and Need for Action	1
1.1 Background	1
1.2 Project Area	2
1.3 Purpose and Need for Action	2
1.4 Proposed Action	2
1.5 Decision Framework	3
1.5 Scoping and Public Involvement	3
Chapter 2: Alternatives	4
2.1 Introduction	4
2.2 Alternatives Considered in Detail	4
2.3 Forest Plan Standards and Guidelines	7
2.4 Project-Specific Design Criteria and Mitigation Measures	9
2.5 Comparison of Alternatives	12
2.6 Forest Service Preferred Alternative	13
Chapter 3: Affected Environment and Environmental Consequences	14
3.1 List of Past, Present, and Reasonably Foreseeable Activities	14
3.2 Climate Change	16
3.3 Fire and Fuels	17
3.4 Soils	26
3.5 Water Resources	31
3.6 Fisheries and Aquatic Resources	35
3.7 Wildlife	40
3.8 Botany	57
3.9 Cultural Resources	59
3.10 Vegetation	60
3.11 General Review	67
Chapter 4: Consultation and Coordination	69
Appendix A: Response to Scoping Comments	A-1
Appendix B: References	B-1
Appendix C: Map	C-1
Appendix D: Response to Comments on the Draft EIS	D-1

CHAPTER 1: PURPOSE AND NEED FOR ACTION

1.1 Background of this Project and the Healthy Forests Restoration Act of 2003

Section 102(a)(4) of the Healthy Forests Restoration Act ("HFRA") contains provisions to expedite hazardous fuels reduction and forest restoration projects on National Forest System lands that are experiencing insect or disease epidemics. An invitation to participate in the collaborative HFRA effort was made in a July 26, 2011, letter that described the project area and that noted the project was being planned under the HFRA. The letter included a list of meeting dates, including the date and time of the first meeting on August 9. Similar information was included in an August 2, 2011, press release from the Uinta-Wasatch-Cache National Forest. Collaboration for the project included:

August 9, 2011:	Public meeting held in Mountain View, Wyoming.
August 23, 2011:	Public meeting held in Lyman, Wyoming.
September 20, 2011:	Field trip to project area.
September 22, 2011:	Public meeting held in Mountain View, Wyoming.
October 26, 2011:	Public meeting held in Mountain View, Wyoming.

Based on interactions and discussions at these meetings, a document titled "Collaborative Agreement—Framework for Proposed Action" was created at the October 26 public meeting. This framework formed the foundation for the proposed action which was released via an April 25, 2012 scoping letter to the public at large.

Determination of epidemic conditions. As per guidance found in *The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide*, when determining the existence of an insect epidemic under the authority of Section 102(a)(4) of the Healthy Forests Restoration Act, the forest supervisor must consult with forest health specialists who know the factors relevant to such a determination and then to draw a conclusion based on the best available information regarding the scope and extent of a possible epidemic.

In 2008 and 2010 surveys were undertaken by personnel associated with the Ogden Field Office of the Forest Health Protection portion of the Forest Service's State and Private Forestry division. The Mountain View portion of the ranger district was surveyed in 2008; the Evanston portion was surveyed in 2010. Survey results were documented in a report titled "A Biological Evaluation of Bark Beetle Activity in the Uinta-Wasatch-Cache National Forest, Evanston-Mountain View and Heber-Kamas Ranger Districts" (USDA-FS, 2011).

The surveys found that approximately 52 percent of lodgepole pines on the Mountain View portion and approximately 50 percent of the lodgepole pines on the Evanston portion over five inches in diameter were dead. Mountain pine beetle activity was considered the primary causal agent of pine mortality in both locations. The report concluded the high percentage of pine mortality in both locations confirmed the epidemic status of mountain pine beetle activity on the ranger district.

Based on the conclusions of the report, in a letter dated November 8, 2011, the forest supervisor determined that the mountain pine beetle infestation on the Evanston-Mountain View Ranger District could be classified as an epidemic, and that Section 102(a)(4) of HFRA was the appropriate authority

under which to conduct the environmental analysis.

Additional alternative. For authorized HFRA projects in areas outside the wildland/urban interface and more than 1.5 miles from the boundary of an at-risk community, the Forest Service must describe the proposed action, a no-action alternative, and an additional action alternative if one that meets the purpose and need for the project is proposed during scoping or the collaborative process.

During the scoping period, one commenter made the following statement, "Is restoration of willow and aspen communities within the objectives for this project? We believe it should be a key, significant alternative driving issue."

As detailed in the Response to Scoping Comments included as Appendix A of this draft environmental impact statement, restoration of willow and aspen communities is not within the objectives for the project. The rationale for not including the issue as a potential additional alternative is that it does not meet the purpose and need for the project, as required by Section 104(c)(1)(C)(ii) of the HFRA.

1.2 Project Area

The proposed project is located approximately 25 miles southwest of Mountain View, Wyoming. The project area lies within Uinta County, Wyoming, and Summit County, Utah. The analysis area includes 48,775 acres of National Forest System lands, 7,778 acres of private, and 1,279 acres of State of Wyoming lands for a total of approximately 57,832 acres.

1.3 Purpose and Need for Action

The Healthy Forests Restoration Act recognizes forest health as an integral part of forest management. The proposed action responds directly to forest health objectives as described in the HFRA. The purpose of this project is to reduce the effects from current mountain pine beetle infestations in forested stands dominated by lodgepole pine trees and to reduce the susceptibility of vegetation to high-intensity wildfires and future mountain pine beetle attacks. The project is needed to:

1. Salvage forest products from, and manage stand densities on, forested lands classified as suitable for timber production to keep them positively contributing to the national forest's allowable sale quantity;
2. Reduce the effects of tree mortality associated with the mountain pine beetle epidemic to restore healthy ecological conditions and scenic quality;
3. Accelerate regeneration of forested stands killed by the mountain pine beetle; and
4. Manage hazardous fuel loading associated with the mountain pine beetle epidemic and salvage operations to minimize the potential for large, high-intensity/high-severity wildfires.

This action responds to the goals and objectives outlined in the Wasatch-Cache National Forest Land and Resource Management Plan ("Forest Plan"), and helps move the project area toward desired conditions described in that plan.

1.4 Proposed Action

Based on additional field visits to the project area, the proposed action as analyzed was slightly modified from the proposed action initially released in the April 25, 2012 scoping letter. The initial proposed

action included treatment on approximately 4,296 acres. The proposed action now involves treatment of approximately 4,445 acres.

Treatments are intended to reduce both the amount and continuity of woody fuels, to remove hazard trees associated with travel ways, to harvest beetle-killed or infested trees, and to create a mix of tree ages and species.

The proposed action would retain habitat for sensitive or other species, such as the northern goshawk, where needed. The proposed action is also expected to make improvements to visual quality. Mechanical treatments in the vicinity of private land would reduce the threat of wildfire on human life and property.

The proposed action is discussed in more detail in section 2.2 of Chapter 2.

1.5 Decision Framework

Given the purpose and need, the forest supervisor will review the proposed action, any other alternatives, and the environmental consequences to decide whether or not to implement vegetation restoration treatments in the Smiths Fork project area, and if so, to what degree and in which locations.

1.6 Scoping and Public Involvement Summary

Collaborative process. Section 1.1 above summarizes public involvement associated with this collaborative project.

Scoping letter. The initial scoping letter dated April 25, 2012, was mailed to the public. A May 30, 2012, addendum to that letter clarifying that commenters during either the scoping period or the comment period on the draft environmental impact statement ("EIS") had standing to participate in the objection process was also mailed to the public. The scoping letters, as well as the public comments that were received in response to scoping, are posted on the Uinta-Wasatch-Cache NF web page at: http://www.fs.usda.gov/projects/uwcnf/landmanagement/projects.

Comments received from the public in response to scoping are addressed in Appendix A of this draft environmental impact statement.

The **notice of intent** to prepare an EIS was published in the *Federal Register* on May 7, 2012. On June 11, 2012, a correction to the notice of intent was published in the *Federal Register* clarifying that only persons who submitted "specific written comments" during scoping or the comment period on the draft EIS would be eligible to file an objection under the HFRA. A **legal notice** requesting comments on the proposed action initially was published on April 30, 2012. Because a revised notice of intent was published in the *Federal Register* subsequently, a new legal notice requesting comments was published on June 2, 2012. The official 30-day comment period ended on July 2, 2012. However, all scoping comments that were received in response to the initial April 30 legal notice are considered timely. The **notice of availability** of the draft environmental impact statement was published in the *Federal Register* on August 30, 2013. A **legal notice requesting comments** on the draft environmental impact statement was published in the *Salt Lake Tribune* on August 30, 2013. The official 45-day comment period ended on October 15, 2013. However, comments received after that date were accepted in conjunction with the federal government furlough which began on October 1, 2013. Comments received from the public on the draft EIS are addressed in Appendix D of the final EIS.

CHAPTER 2: ALTERNATIVES

2.1 Introduction

This chapter describes and compares the alternatives considered for the Smiths Fork Vegetation Restoration Project. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

2.2 Alternatives Considered in Detail

The Forest Service analyzed Alternative 1, No Action, and Alternative 2, Proposed Action.

Alternative 1, No Action
Under Alternative 1, the proposed salvage clearcuts, sanitation salvage treatments, and thinning, piling, and burning treatments would not occur would not occur.

Alternative 2, Proposed Action
The initial proposed action that was released to the public for scoping comments was modified based on subsequent field visits to the project area. These modifications include:

1. The treatment for **units 75 and 77** was changed to **salvage clearcut** due to the high percentage of dead and dying lodgepole pine.
2. **Unit 79** was dropped due to poor access and a large component of live trees and healthy natural regeneration.
3. **Unit 42** was dropped due to proximity to an active goshawk nest. The Forest Service can treat only15 percent of the acreage within a post-fledging area.
4. Acreage was reduced in **Unit 31** due to an active goshawk nest.
5. Roadside salvage buffers outside goshawk areas were increased to **150 feet** on either side of the roadway, resulting in an **additional 315 acres** in these areas.
6. Changes were made to the proposed roadwork to avoid wet areas and difficult stream crossings.

Alternative 2 would involve treatments on approximately **4,445 acres**. Treatments would reduce both the amount and continuity of woody fuels, would remove hazard trees associated with travel ways, would harvest beetle-killed or -infested trees, and would create a mix of tree ages and species.

Alternative 2 would retain habitat for sensitive and other species, such as the northern goshawk, where needed. Alternative 2 also is expected to make improvements to visual quality. Mechanical treatments in the vicinity of private land would reduce the threat of wildfire on human life and property. A map of Alternative 2 is found in Appendix C. Tables 2.1 through 2.6 below summarize Alternative 2.

Table 2.1: Alternative 2 prescriptions for Archie Creek area.		
Unit	**Acres**	**Proposed activity**
24	153.3	Salvage clearcut
31	56.5	Salvage clearcut
32	250.7	Sanitation salvage
33	38.7	Sanitation salvage
34	14.0	Sanitation salvage
35	14.7	Sanitation salvage
36	31.1	Sanitation salvage
37	47.9	Sanitation salvage
Total	**606.9**	**--**

Table 2.2: Alternative 2 prescriptions for Cutthroat area.		
Unit	**Acres**	**Proposed activity**
75	110.6	Salvage clearcut
77	82.2	Salvage clearcut
78	118.8	Sanitation salvage
Total	**311.6**	**--**

Table 2.3: Alternative 2 prescriptions for Johnson area.		
Unit	**Acres**	**Proposed activity**
52	139.3	Salvage clearcut
54	177.6	Salvage clearcut
55	74.4	Salvage clearcut
57	96.5	Salvage clearcut
58	144.2	Sanitation salvage
59	86.0	Sanitation salvage
60	58.5	Sanitation salvage
61	95.8	Salvage clearcut
67	39.8	Salvage clearcut with piling and burning
101	48.2	Thin, pile, and burn
102	151.0	Thin, pile, and burn
103	118.0	Thin, pile, and burn
104	20.2	Thin, pile, and burn
105	96.6	Thin, pile, and burn
Total	**1346.1**	**--**

Table 2.4: Alternative 2 prescriptions for Porcupine area.		
Unit	**Acres**	**Proposed activity**
1	135.6	Sanitation salvage
3	122.7	Salvage clearcut
4	93.0	Sanitation salvage
5	35.2	Salvage clearcut
6	20.4	Salvage clearcut
9	59.8	Salvage clearcut
12	99.4	Sanitation salvage
13	20.9	Salvage clearcut
14	28.5	Salvage clearcut
15	30.2	Salvage clearcut
17	43.4	Salvage clearcut
18	223.0	Sanitation salvage
19	39.9	Salvage clearcut
20	62.0	Sanitation salvage
21	75.7	Sanitation salvage with piling and burning
100	80.2	Thin, pile, and burn
Total	**1,169.9**	**--**

Table 2.5: Alternative 2 roadside salvage.		
Unit	**Acres**	**Proposed activity**
99	1,010.1	Sanitation salvage, roadside buffer outside other units
Total	**1,010.1**	--

In addition to the use of roads that currently are part of the national forest transportation system, access to these units, as mapped, is anticipated to involve:

1. Approximately **3.1 miles** of new specified road construction.
2. Approximately **6.3 miles** of temporary road construction. (The April 25, 2012 scoping letter initially proposed 10.7 miles of temporary road construction.)
3. Approximately **9.6 miles** of additional temporary road use on the existing road prism. (The April 25, 2012 scoping letter initially proposed 6.7 miles of additional temporary road use on the existing road prism.)
4. Approximately **5.5 miles** of road reconstruction. (The April 25, 2012 scoping letter initially proposed 2.6 miles of road reconstruction.)
5. Approximately **1.4 miles** of easements through private land for access to units 4, 20, and 74. (The April 25, 2012 scoping letter initially proposed 3.8 miles of easements through private land for access to units 4, 20, and 79.)

2.3 Forest Plan Standards and Guidelines

An electronic copy of the Forest Plan for the Wasatch-Cache National Forest is available at: http://www.fs.usda.gov/main/uwcnf/landmanagement/planning

Forest Plan standards that may apply to the project include:

1. (S1) Allow no ground-based skidding and oil and gas surface occupancy on slopes greater than 40 percent (Forest Plan, p. 4-36).
2. (S2) Apply runoff controls during project implementation to prevent pollutants including fuels, sediment, and oils from reaching surface and groundwater (Forest Plan, p. 4-36).
3. (S4) Place new sources of chemical and pathogenic pollutants where such pollutants will not reach surface or ground water (Forest Plan, p. 4-36).
4. (S6) Within legal authorities, ensure that new proposed management activities in watersheds containing 303(d) listed water bodies improve or maintain overall progress toward beneficial use attainment for pollutants which led to listing; and do not allow additions of pollutants in quantities that result in unacceptable adverse effects (Forest Plan, p. 4-37 and Appendix II).
5. (S7) Allow management activities to result in no less than 85 percent of potential ground cover for each vegetation cover type (Forest Plan, p. 4-37 and Appendix VII).
6. (S8) In lynx analysis units with current habitat at 30 percent or more in unsuitable condition (defined in glossary), allow no vegetation management activities that would result in a further increase of unsuitable conditions.
7. (S9) Timber management projects shall not change more than 15 percent of lynx habitat within a lynx analysis unit to an unsuitable condition.
8. (S12) Prohibit forest vegetation treatments within active northern goshawk nest areas (approximately 30 acres) during the active nesting period (Forest Plan, p. 4-39).
9. (S13) At least 20 percent of each forested cover type by ecological section shall be maintained with old forest landscape structure with patch sizes of at least 10 acres. These old forest areas are dynamic, changing location as disturbances occur (Forest Plan, p. 4-39).
10. (S17) All decommissioned roads and/or trails will be properly drained (Forest Plan, p. 4-45).
11. (S20) When constructing or maintaining roads, trails and facilities, use best management practices to minimize sediment discharge into streams, lakes and wetlands (Forest Plan, p. 4-46).

Forest Plan guidelines that may apply to the project include:

1. (G1) Minimize the amount and impact of smoke from “fire use” activities by identifying smoke-sensitive areas, using best available control measures, monitoring smoke impacts, and following guidance in state smoke management plans.
2. (G2) Projects in watersheds with 303(d) listed water bodies should be supported by scale and level of analysis sufficient to permit an understanding of the implications of the project within the larger watershed context (Forest Plan, p. 4-37).
3. (G3) Proposed actions analyzed under NEPA should adhere to the state nonpoint source management plan to best achieve consistency with sections 313 and 319 of the Federal Water Pollution Control Act (Forest Plan, p. 4-37).
4. (G4) At the end of an activity, allow no more than 15 percent of an activity area to have detrimental soil displacement, puddling, compaction and/or to be severely burned (Forest Plan, p. 4-37).

5. (G5) Do not allow activities that could result in water yield increases that would degrade water quality and impact beneficial uses (Forest Plan, p. 4-37).
6. (G6) In riparian habitat conservation areas when projects are implemented, retain natural and beneficial volumes (defined during development of site-specific riparian management objectives) of large woody debris (Forest Plan, p. 4-37).
7. (G7) Manage Class 1 Riparian Area Greenlines for 70 percent or more late-seral vegetation communities as described in Intermountain Region Integrated Riparian Evaluation Guide. Manage Class 2 Riparian Area Greenlines for 60 percent or more late-seral vegetation communities. Manage Class 3 Riparian Area Greenlines for 40 percent or more late-seral vegetation communities (Forest Plan, p. 4-37).
8. (G8) In stream channels naturally occurring debris shall not be removed unless it is a threat to life, property, important resource values, or is otherwise covered by legal agreement (Forest Plan, p. 4-37).
9. (G9) Avoid soil disturbing activities (those that remove surface organic matter exposing mineral soil) on steep, erosive, and unstable slopes, and in riparian, wetlands, floodplains, wet meadows, and alpine areas (Forest Plan, p. 4-38).
10. (G10) Encourage water users that divert, augment, or operate reservoirs to regulate discharges to prevent or reduce damage to downstream properties (Forest Plan, p. 4-38).
11. (G11) Use best management practices and soil and water conservation practices during project level assessment and implementation to ensure maintenance of soil productivity, minimization of sediment discharge into streams, lakes and wetlands to protect of designated beneficial uses (Forest Plan, p. 4-38).
12. (G12) Locate new actions (such as incident bases, fire suppression camps, staging areas, livestock handling facilities, recreation facilities, roads and improvements including trails) outside of riparian habitat conservation areas. If the only suitable location for such actions is within riparian habitat conservation areas, sites will be located to minimize resource impacts (Forest Plan, p. 4-38).
13. (G13) Any long-term crossing of stream channels containing fish habitat will provide for desirable aquatic passage (Forest Plan, p. 4-38).
14. (G14) Manage vegetation for properly functioning condition at the landscape scale. Desired structure and pattern for cover types of the Wasatch-Cache National Forest are listed in the Forest Plan (pp. 4-39 to 4-40) except in the wildland/urban interface, where vegetation structure and pattern should be managed to reduce threat of severe fire to property and human safety.
15. (G15) In goshawk habitat, design all management activities to maintain, restore, or protect desired goshawk and goshawk prey habitats including foraging, nesting, and movement (Forest Plan, p. 4-42).
16. (G16) When treating vegetation in the following cover types, maintain or restore snag and woody debris habitat components at a stand level (where they are available distributed over each treated 10 acres). If the minimum number of snags is unavailable, then use largest trees available on site (Forest Plan, p. 4-42).
17. (G29) Avoid disruptive management activities in elk calving areas and elk spring use areas from May 1 through June 30 (Forest Plan, p. 4-44).
18. (G35) The full range of fuels reduction methods is authorized consistent with management direction for the specific area (Forest Plan, p. 4-45).
19. (G45) Access routes for heavy equipment should be selected to limit disturbance to riparian vegetation and to limit the number of stream crossings (Forest Plan, p. 4-46).
20. (G47) Waste material should be handled in a manner to avoid sidecasting materials to areas where they may enter a stream (Forest Plan, p. 4-46).

21. (G73) Delay livestock use in post-fire and post-harvest created forest openings until successful regeneration of the shrub and tree components occurs (aspen trees reach an average height of 6 feet) (Forest Plan, p. 4-52).
22. (S3.1A-2) Cutting fuelwood larger than five inches in diameter is not allowed.
23. (G3.1A-1) Timber harvest, vegetation/fuel treatments, prescribed fire, and wildland fire use are allowed only for the purposes of maintaining, improving or restoring riparian and aquatic habitat to desired conditions or to protect property in the wildland/urban interface.
24. (G3.2D-1) Timber harvest, road construction, vegetation/fuel treatment, prescribed fire and wildland fire use are allowed for the purposes of maintaining, improving or restoring terrestrial habitat, for oil and gas exploration, for hazardous fuel reduction, and to protect property in the wildland urban interface.
25. (G5.1-1) Timber harvest, vegetation/fuel treatment, prescribed fire and wildland fire use are allowed to maintain or restore proper functioning conditions, for hazardous fuel reduction, to protect property in the wildland/urban interface, and to provide for commodity and non-commodity outputs and services.
26. (G5.1-2) Road construction, new recreation development and new trail construction are allowed.
27. (G5.2-1) Timber harvest, road construction and vegetation/fuel treatment are allowed for the purpose of timber growth and yield while maintaining productive capacity.
28. (G5.2-) Prior to use of prescribed fire and wildland fire use, investments made for timber production, such as road systems and silvicultural improvements, and the value of the timber for wood production receive consideration.
29. (G6.1-1) Timber harvest, vegetation/fuel treatment, prescribed fire and wildland fire use are allowed to maintain or restore proper functioning conditions, for hazardous fuel reduction, to protect property in the wildland urban interface, and to provide for commodity and non-commodity outputs and services.
30. (G6.1-3) Road construction, new recreation development, and new trail construction are allowed.

2.4 Project-specific design criteria and mitigation measures

Soil, Water, Fisheries and Aquatic Resources

1. Erosion control measures will be left in place for one growing season or until no evidence of pedestaling, rills, or surface soil movement is evident.
2. Any burning will be conducted in the fall when soils are moist enough as determined by a forest soil scientist to prevent severe soil damage.
3. Ground-based activities will be restricted to dry or frozen ground conditions generally between June 15 and December 30. Operations outside of the specified conditions may only occur on a case-by-case basis after consultation with a qualified soils specialist.
4. As soon as possible following the completion of harvest operations, not to exceed one year, landings will be recontoured to the original surface contour, ripped, and grass seeded with an approved Wasatch-Cache National Forest native seed mix. Coarse woody debris will be spread on site to provide for long-term soil productivity.
5. Skid trails will be water-barred with slash scattered on their surfaces prior to discontinuing operations each fall, and where appropriate, seeded in compliance with Forest Plan standard S2.
6. Temporary containment pits or barriers will be installed around any fuel storage units located on the forest during timber harvest or road construction operations in compliance with Forest Plan standard S2.

7. Road decommissioning of temporary roads will require recontouring to match the natural slope gradient followed by seeding with Wasatch-Cache National Forest approved native grass species and spreading coarse woody debris on site to provide for long-term soil productivity.
8. Closure of intermittent service roads will include surface scarification and seeding, removal of culverts, removal of fills over culverts, and recontouring of stream banks to meet Forest Plan guideline G13.
9. Erosion control measures will be inspected and maintained on a recurrent basis until the site is stabilized to ensure their effectiveness to meet Forest Plan guideline G13. Additional inspections and maintenance will occur following high rainfall events and prior to fall and spring runoff to ensure their effectiveness.
10. If debris or slash were to enter a stream, it will be removed by hand immediately whenever there is a potential for blockage of the stream or crossing structure, or if the stream has the ability to transport such material.
11. On temporary roads, sediment-buffering devices will be installed below all fill slopes within 300 feet downhill distance of streams or drainage crossings in compliance with Forest Plan standard S2 and guideline G47.
12. For system, intermittent, and temporary service roads used to implement the treatments under this alternative, install drainage dips at a frequency/spacing of no more than 500 feet.
13. Temporary and intermittent roads will avoid wetlands and cross riparian habitat conservation areas at best crossing sites with the least distance across to meet Forest Plan guideline G12.
14. Standard timber sale contract clauses will be applied that address resource and residual timber protection by requiring directional felling, pre-approved skid trails and landings, logs yarded with leading edge free of the ground. These provisions will be used to protect conifer and aspen seedlings and steep slopes during harvests.

Cultural Resources

Historic sites in the area of potential effect will be protected by avoidance of any mechanical timber harvesting or mechanical vegetation treatments on and within a 100-foot buffer of the site. However, timber removal around these sites will then make the dead trees located on and within the-100 foot buffer susceptible to blow down. If a blow down occurs it could result in damage to historic site structures. Therefore, we recommend that the site area can be harvested using hand thinning with chainsaws and directionally felled away from historic structures to remove dead trees that could damage structures if they blow down.

To accomplish the above recommendations, the buffered site area will need to be flagged off to ensure that no mechanical treatment occurs in those areas. Those trees within the buffered site that pose a threat to the site will be marked and then removed using hand thinning treatments. These will need to be monitored by a district timber specialist and a forest archaeologist.

Vegetation and Noxious Weeds

1. Surveys for sensitive plant species have been completed. If any additional populations are located, the Forest Service botanist will be notified, and mitigation will occur as necessary. This could include unit boundary adjustments to exclude populations, alternative harvest methods to minimize ground disturbance, buffers around populations, and adjustments in harvest to meet prescriptions for sensitive plant habitats to meet Forest Plan guideline G23.

2. All equipment that will be used off- road will be washed prior to moving into the project area. All equipment will be inspected and approved before operations will begin.
3. Post-harvest monitoring and control of weeds with herbicides will be required on intermittent service roads, temporary roads, and log landings to meet Forest Plan guideline G25. Use of herbicides will be consistent with the Forest Noxious Weed EIS.
4. Harvest equipment and operations should avoid known infestations.
5. Harvest equipment will be cleaned and free of vegetation, soil and debris prior to beginning work on FS land. If equipment leaves project area it will be cleaned and inspected prior to reentry on to FS land. If the equipment has to work or pass through known infestation areas, the equipment will be cleaned prior to moving into "infestation free" areas of the project area.

Wildlife resources

1. Harvest operations in units within 0.5 mile of active nests will not be allowed during nesting or post-fledging if the wildlife biologist determines that such activities would disrupt nesting or post-fledging activities (Forest Plan Guideline G15). Topography and timber haul routes will be considered.
2. Restrict burning to the fall season, after neotropical nesting is over and fuels cure.
3. Additional surveys will be conducted prior to activities. Mitigation, buffers and/or modification of units will be implemented if these surveys detect goshawk nesting activity. These surveys are in addition to the sensitive species surveys done for the biological evaluation.
4. In accordance with Forest Plan guideline G16, snag and woody debris habitat components at the stand level (where they are available distributed over each treated 10 acres) will be maintained. If the minimum size is unavailable, then the largest trees available on site will be retained.
5. A seasonal restriction for the protection of nesting migratory bird species will be in effect during salvage harvest operations from April 1 through July 15 for the protection of nesting migratory bird species.
6. A seasonal nesting restriction from March 1 through August 15 will be in effect for active post-fledging family areas ("PFA"). A Forest Service wildlife biologist will be responsible on an annual basis for determining if these areas are active prior to commencing salvage harvest activities within the PFAs. Monitoring northern goshawk territories on the North Slope has demonstrated that goshawk nestlings fledged by the end of July and the parents are able to move the fledglings away from any disturbance within the PFA, therefore lifting of the seasonal restriction by August 15 is justified.

Visual resources

1. A Forest Service landscape architect reviewed units to insure that visual quality will be maintained to meet Forest Plan standards and guidelines during implementation of this project.
2. In log decking areas stack logs as close to the travelway access as is safely possible and rip, re-contour, and seed the deck areas with native seed.
3. Where borrow material for road maintenance or relocation is needed, modify existing steep road cuts to remove the geometry of the landscape and re-vegetate.
4. When constructing new roads alignment will follow the natural contour of the land as much as possible. Cuts and fills will be rounded and contoured to the existing landscape to eliminate the geometry of the road in the landscape.

Recreation

1. Suspend operations during holidays and weekends between Memorial Day and Labor Day and the Friday before opening day of the Utah general elk season to minimize impact on campers and other recreationists using the area.
2. Provide members of the public with information so they can choose whether they would like to recreate in the analysis area during the period of timber operations.

Rangeland management

1. Gates or crossings at fences will be kept closed or cattleguards will be installed to prevent livestock from crossing.

Roads

1. Adhere to the closure order on the North Slope Road from December 16 through May 31.

Annual monitoring will occur to determine occupancy and location of active nest sites/nest areas in all goshawk territories in which the proposed project could affect the nest areas or post fledgling areas. In the event that a goshawk selects a new nest site not within the identified nest areas or outside of the post fledgling area (PFA), the new nest site will be incorporated into the existing PFA or changes will be made to modify the PFA to incorporate the new site. If this situation occurs, standards and guidelines will be met to prevent impacts to the active nest area and PFA.

2.5 Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in Table 2.6 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2.6: Summary comparison of alternatives.

	Alternative 1	Alternative 2
Vegetation treatments		
Sanitation salvage of roadside buffer outside other units	0	1010
Sanitation salvage	0	1418
Salvage clearcut	0	1387
Sanitation salvage with pile and burn	0	76
Salvage clearcut with pile and burn	0	40
Thin, pile, and burn	0	514
Total	0	4445

Table 2.6: Summary comparison of alternatives.		
	Alternative 1	**Alternative 2**
Transportation		
Miles of new specified road construction	0	3.1
Miles of temporary road construction	0	6.3
Miles of additional temporary road use on the existing prism	0	9.6
Miles of road reconstruction	0	5.5
Miles of easements through private land for access	0	1.4

2.6 Forest Service Preferred Alternative

The Forest Service preferred alternative is Alternative 2, Proposed Action.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter summarizes the physical, biological, social and economic environments of the project area and the effects of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in the alternatives chapter.

The scientific integrity of the discussions and analyses presented in this chapter are based on **best available science**, which includes discussion of the methodology used in the analysis; scientific sources that are relied upon and referenced; relevant literature that is reviewed; scientific literature that is cited by the public and which is considered when shown to be relevant; opposing views that are discussed when they are raised by the public or other agencies; and the disclosure of incomplete or unavailable information.

During the scoping period for this project, some commenters submitted scientific literature for review. All such literature was made available to specialists to review during analysis for their particular resources. Some literature submitted by the public presents different conclusions reached by researchers. The information is adequately complete for assessing the environmental effects of the proposal. Information gathered in the field during analysis represents most of the conditions found in the area at the present time.

3.1 List of Past, Present, and Reasonably Foreseeable Activities

Table 3.1 shows the actions considered in the cumulative effects disclosure. Past, present, and ongoing activities have resulted in the resource's existing condition. Where applicable, and depending on area of analysis, these existing conditions, activities, and impacts are described by resource in this chapter.

Table 3.1: Past, present and ongoing, and reasonably foreseeable activities in or near the project area.

Action	Description	Date
PAST ACTIONS		
Livestock grazing	Permitted livestock grazing on national forest and adjacent lands. The project area contains three allotments: (1) West Fork Smiths Fork; (2) East Fork Smiths Fork; and (3) Gilbert Creek.	1800 to Present
Timber harvest	Past timber activities in the project area include the Pushover sale (1961); Poison Creek sale (1970); Dahlgreen sale (1976); Willow Creek sale (1976-1979); Thunderbolt sale (1977); Steel Creek sale (1978); Hewinta sale (1978); East Fork Smiths Fork sale (1979); Pushover sale (1982); Lostman sale (1986-1988); Gilbert Creek sale (1987); Jeep Fever sale (1989); Little Dipper sale (1989); Owls Eye sale (1989); Arrowhead sale (1990); Tailfeather sale (1990); Buck Fever Ridge sale (1993-1996); Gilbert Creek II sale (1996); West Fork Smiths Fork sale (1995-1997); Private (1998-2006); State/private (1999); Little Gilbert sale (2001-2003); Gourley Meadows (2006); and Thunder Bug (2009-2011), for a total of 11,196 acres that have been treated.	1961 to 2011

Table 3.1: Past, present and ongoing, and reasonably foreseeable activities in or near the project area.		
Action	**Description**	**Date**
Prescribed burns	The project area has not had any previous fuels projects or prescribed fires.	--
Wildfires	There have been 437 acres of wildfire in the analysis area from 1985 through 2011.	--
National Forest System roads and motorized trails	43 miles of system road (includes open, closed, and administrative roads) and 2.5 miles of motorized trail in the analysis area (Horse Creek). Most motorized trails are also system roads and included in the 43 miles.	Ongoing
Non-motorized trails	Approx. 11 miles of non-motorized trails in project area.	Ongoing
Dispersed recreation use	Dispersed camping near system roads is common in certain areas during certain times. Hunting season in late fall is the predominant period for dispersed camping.	Ongoing
Land and Water Conservation Fund land acquisition	Through appropriated funds, the Forest Service purchased approximately 16,000 acres in the administrative boundary of the Evanston-Mountain View Ranger District	2003-2009
PRESENT AND ONGOING ACTIONS		
Action	**Description**	**Date**
Livestock grazing and management	See previous description.	Ongoing
Timber harvest	No current timber harvest in the project area.	--
Roads and motorized trails	Ongoing road maintenance, such as cleaning culverts and blading existing roads.	Ongoing
Recreation use	Hunting and camping at dispersed sites.	Ongoing
Noxious weeds treatment	Ongoing weed treatments according to the Wasatch-Cache NF Noxious Weed Treatment Program final EIS.	Ongoing
Beetle spraying / suppression	Future beetle spraying or other treatments for ongoing beetle epidemic on the North Slope.	Ongoing
REASONABLY FORESEEABLE ACTIONS		
Action	**Description**	**Date**
Timber harvest	Future timber harvest will take place in the Blacks Fork watershed west of the project area. Timber activities in that location were analyzed in the Blacks Fork EIS and record of decision, signed in November 2011.	2012 and beyond
Prescribed burns	Future prescribed burns and fuel treatments in the Blacks Fork watershed west of the project area were analyzed in the Blacks Fork EIS and record of decision, signed in November 2011.	2012
Main Fork oil and gas development	Possible well pad/drilling sites in West Fork Blacks Fork area.	2015

Table 3.1: Past, present and ongoing, and reasonably foreseeable activities in or near the project area.		
Action	**Description**	**Date**
Geophysical seismic exploration	Two-dimensional geophysical seismic activities may occur approximately 10 miles southwest of the project area; three-dimensional geophysical seismic activities may occur approximately 10 miles east-northeast of the project area. Activities would consist of setting off underground charges along seismic transacts and recording data to create an underground image of potential oil and gas reserves. Disturbance from the charges and drilling is minimal. However, a helicopter would be used to move equipment and personnel between locations. Because of the distance from these activities to the project area, no measurable effects to wildlife are anticipated.	2013
Firewood gatherers	Firewood gathering may occur in the vicinity of motor	Ongoing
Beetle spraying / suppression	Future beetle spraying or other treatments for ongoing beetle epidemic on the North Slope.	Ongoing

3.2 Climate Change

Forests play a major role in the carbon cycle. The carbon stored in live biomass, dead plant material, and soil represents the balance between CO2 absorbed from the atmosphere and its release through respiration, decomposition, and burning. Over longer time periods, as long as forests exist they will continue to absorb carbon. While uncertainties remain regarding the timing, extent, and magnitude of climate change impacts, scientific evidence predicts that continued increases in greenhouse gas emissions will lead to increased climate change. In general, projected climate change impacts include increases in air temperature; rise in sea level; changes in the timing, location, and quantity of precipitation; and increased frequency of extreme weather events. These changes will vary regionally and will affect renewable resources, aquatic and terrestrial ecosystems, and agriculture.

In Utah in particular, climate change is predicted to result in warmer, drier climates:

> "Utah is projected to warm more than the average for the entire globe and more than coastal regions of the contiguous United States. The expected consequences of this warming are fewer frost days, longer growing seasons, and more heat waves. Studies of precipitation and runoff over the past several centuries and climate model projections for the next century indicate that ongoing greenhouse gas emissions at or above current levels will likely result in a decline in Utah's mountain snowpack and the threat of severe and prolonged episodic drought in Utah is real." (State of Utah, 2007)

Although it is possible to quantify a project's direct effects on carbon sequestration and greenhouse gas emissions, there is no certainty about the actual intensity of an individual project's indirect effects on global climate change. Uncertainty in climate change effects is expected because it is not possible to meaningfully link individual project actions to quantitative effects on climatic patterns.

Complete quantifiable information about a project's effect on global climate change is not currently possible and is not essential to a reasoned choice among alternatives. Therefore, actions potentially having effects on climate change that are not discernible at the global scale are unlikely to be determined

significant from a climate change standpoint at the local scale. The context of the Smiths Fork project and its effects are evaluated locally and cannot be meaningfully evaluated globally to inform decision makers about global climate change.

Therefore, while global climate change may affect human health, there is uncertainty and unknown risk associated with global climate change, and the ultimate effects on climate change are indeed the results of incremental cumulative effects of many actions, most of which are beyond the control of the Forest Service. The Forest Service cannot discern significant climate change effects from our proposals, given the context of projects and plans and the lack of effects that can be meaningfully evaluated under current science, modeling, and policies.

The proposed action would have minuscule negative effects, if any at all. Positive impacts of salvage include the restoration of functions and processes characteristic of healthy, resilient ecosystems. More resilient ecosystems have a greater potential to withstand the ecological stresses associated with climate change, and help maintain long-term carbon sequestration capability in forests and grasslands.

However, when this project is isolated and analyzed in the presence of the multitude of human activities occurring over the entire planet, then the impacts from this project would be so insignificant that no consequence can be quantitatively measured. Therefore, climate change will not be evaluated in detail in this document.

3.3 Fire and Fuels

3.3.1 Scope of Analysis

Forest Plan Direction. Forest Plan direction for fire and fuels management includes providing for ecosystem maintenance and restoration consistent with land uses and historic fire regimes, providing public and firefighter safety and protection of other federal, state, and private property and natural resources, and managing fuels to reduce the risk of property damage and uncharacteristic fires (Forest Plan, p. 4-21).

The project area is within the Eastern Uintas Management Area. Forest Plan direction for vegetation management within this management area emphasizes providing a diverse, and therefore resilient, mosaic of aspen, mixed lodgepole pine and aspen, and lodgepole pine with varying patch sizes, species composition, and stand structure, and dead and down fuel component (fuel loading) on a landscape level. These desired conditions will be accomplished through timber harvest, mechanical treatment, prescribed fire, and use of wildland fire as consistent with management prescriptions. The highest priority for treatment will be the mixed stands of aspen and conifer stands where conifers are replacing the aspen due to competition and fire exclusion (Forest Plan, p 4-195).

Standards and Guidelines. Forest Plan standards and guidelines relevant to fire and fuels management in the project area include:

(S12) Prohibit forest vegetation treatments within active northern goshawk nest areas (approximately 30 acres) during the active nesting period (Forest Plan, p 4-39).

(S13) At least 20 percent of each forested cover type by ecological section shall be maintained with old forest landscape structure with patch sizes of at least 10 acres. These old forest areas are dynamic, changing location as disturbances occur (Forest Plan, p 4-39).

(G4) At the end of an activity, allow no more than 15 percent of an activity area to have detrimental soil displacement, puddling, compaction and/or to be severely burned (Forest Plan, p 4-37).

(G14) Manage vegetation for properly functioning condition at the landscape scale. Desired structure and pattern for cover types of the Wasatch-Cache National Forest are listed in the Forest Plan (pp. 4-39 through 4-30) except in the wildland/urban interface, where vegetation structure and pattern should be managed to reduce threat of severe fire to property and human safety (Forest Plan, p 4-39) (Table 3.3.1).

Table 3.3.1: Desired structure and pattern for cover types (Forest Plan, pp. 4-40 through 4.42).

Cover Type	Landscape Structure	Landscape Patterns
Engelmann spruce-subalpine fir	Balanced range: Grass/Forb about 10%; Seedling/Sapling about 10%; Young Forest about 20%; Mid Aged Forest about 20%; Mature Forest about 20%; Old Forest about 20%. 40% of the stands have multiple canopies. Stand density index not greater than 335 and basal area less than 150.	Patterns are within historical ranges. Pattern sizes, shapes and corridors are maintaining processes. Role of fire is to maintain a heterogeneous pattern of species and structure classes. A mixed severity fire regime produces vegetation mosaics due to patchy nature of the fire, preventing development of large continuous blocks of homogeneous ages and species.
Aspen	Balanced range: Grass/Forb and Seedling/Sapling about 40 %; Young, Mid Aged and Mature forests about 30%; Old Forest about 30% Stand density index not greater than 300 and basal area less than 140.	Patterns are within historical ranges. Pattern sizes, shapes and corridors are maintaining processes. The role of fire is to influence distribution of structural classes and patterns across landscapes.
Lodgepole pine	Balanced range: Grass/Forb about 10%; Seedling/Sapling about 10%; Young Forest about 20%; Mid Aged Forest about 20%; Mature Forest about 20%; Old Forest about 20%. 20% of the stands have multiple canopies. Stand density index not greater than 350 and basal area less than 90.	Patterns are within historical ranges. Pattern sizes, shapes and corridors are maintaining processes. The role of fire is to maintain a heterogeneous pattern of age and size classes across the landscape.
Sagebrush/ grassland	Balanced range of structural stages: 40% of area with 15% or more crown cover (as measured by line intercept method).	Patterns are within the historical range.

(G35) The full range of fuels reduction methods is authorized consistent with management direction for the specific area (Forest Plan, p 4-45).

(G73) Delay livestock use in post-fire and post-harvest created forest openings until successful regeneration of the shrub and tree component occurs (aspen trees reach an average height of six feet) (Forest Plan, p. 4-52).

Management Prescriptions. The following management prescriptions are found in the project area. Specific standards and guidelines apply to these prescriptions and are listed below.

Prescription **3.1A** (Aquatic Habitat) consists of the stream and adjacent riparian areas (or 300 feet either side of the stream whichever is greater) (Forest Plan, p. 4-69).

- (S3.1A-2) Cutting fuelwood larger than five inches in diameter is not allowed.
- (G3.1A-1) Timber harvest, vegetation/fuel treatments, prescribed fire, and wildland fire use are allowed only for the purposes of maintaining, improving or restoring riparian and aquatic habitat to desired conditions or to protect property in the wildland urban interface.

Prescription **3.2d** (Terrestrial Habitat) consists of those terrestrial habitat areas where development is allowed for the purpose of maintaining, improving, or restoring key habitat elements (Forest Plan, p. 4-70).

- (G3.2D-1) Timber harvest, road construction, vegetation/fuel treatment, prescribed fire and wildland fire use are allowed for the purposes of maintaining, improving or restoring terrestrial habitat, for oil and gas exploration, for hazardous fuel reduction, and to protect property in the wildland urban interface.

Prescription **4.2** (Emphasis on Recreation Non-motorized Settings) areas provide recreation opportunities in a semi-primitive to modified setting where visitors can obtain various degrees of solitude within a near-natural environment (Forest Plan, p. 4-72).

- (G4.2-1) Vegetation/fuels treatment, prescribed fire, and wildland fire use are allowed to mimic historic conditions and to restore ecosystem functioning.

Prescription **4.4** (Emphasis on Recreation Motorized Settings) areas provide recreation opportunities within a range of semi-primitive to rural settings (Forest Plan, p. 4-73).

- (G4.4-1) Timber harvest, vegetation/fuel treatment, road construction, prescribed fire and wildland fire use are allowed to mimic historic conditions, to restore ecosystem functioning, and to protect property in the wildland urban interface, and are designed to be compatible with motorized recreation, but must not detract from the recreation setting over the long-term.

Prescription **5.1** (Emphasis on maintaining or restoring forested ecosystem integrity while meeting multiple resource objectives)(Forest Plan, p. 4-75).

- (G5.1-1) Timber harvest, vegetation/fuel treatment, prescribed fire and wildland fire use are allowed to maintain or restore proper functioning conditions, for hazardous fuel reduction, to protect property in the wildland urban interface, and to provide for commodity and non-commodity outputs and services.

Prescription **5.2** (Emphasis on managing timber for growth and yield while maintaining or restoring forested ecosystem integrity)(Forest Plan, p. 4-75).

- (G5.2-1) Timber harvest, road construction and vegetation/fuel treatment are allowed for the purpose of timber growth and yield while maintaining productive capacity.

- (G5.2-) Prior to use of prescribed fire and wildland fire use, investments made for timber production, such as road systems and silvicultural improvements, and the value of the timber for wood production receive consideration.

Prescription **6.1** (Emphasis on managing for livestock forage production while maintaining or restoring non-forested ecosystem integrity)(Forest Plan, p. 4-76).

- (G6.2 -1) Timber harvest, vegetation/fuels treatments, prescribed fire, and wildland fire use are allowed to maintain or improve forage production or for hazardous fuel reduction.

3.3.2 Affected Environment

The project area is in the Eastern Uintas Management Area (Forest Plan, p. 4-192), in Uinta County, Wyoming and Summit County, Utah, on the Evanston-Mountain View Ranger District. The forests of the eastern Uintas are characterized by aspen stands along the lower elevation fringes transitioning into mixed aspen and lodgepole pine, then into vast stands of lodgepole pine, and finally into mixed lodgepole pine, subalpine fir, and Engelmann spruce in the higher elevations. The desired fuels and vegetation conditions for this area are described above.

Fire and Disturbance History. The current landscape in the project area has been shaped by a number of disturbance agents, including logging, fire, and pine beetles. In particular, an increase in logging and fire occurrence during the late 1800s and early 1900s contributed to the development of large areas of even-aged stands, approximately 100 to 150 years old, which have fueled a recent mountain pine beetle epidemic. Other disturbances in the area include grazing by sheep and cattle, developed and dispersed recreation, wind-throw, and mistletoe infestations.

3.3.3 Environmental Consequences of Alternative 1, No Action

Overall, in the short- and long-term, the no action alternative will not meet the purpose and need of the project with regard to fire and fuels resources. It will not manage hazardous fuel loading to minimize the potential for large, high intensity or high severity wildfires. The fuels conditions will get worse with time as surface fuels increase and shrubs and trees continue to grow in the understory, posing control issues in areas of concern like the wildland/urban interface.

Effects on Fire Ecology. The no action alternative will have minimal effects on the fire ecology of the analysis area. The fire frequency will not change significantly in the short- or long-term. Studies have found that the effects of beetle outbreaks on the probability of fire occurrence were smaller than other causes, such as climate, topography, and cover type (Bigler et al. 2005; Kulakowski and Veblen 2007; Hicke et al. 2012).

In the short-term, burn severity of the forest floor is largely unchanged, but will increase as surface fuel loads increase. Old phase stands in which the majority of beetle-killed trees have fallen have a higher probability of burning at a high severity (Bigler et al., 2005). However, the burn severity will depend on the extent of beetle damage.

Based on the fire regime condition class assessment (Brown 2012), the no action alternative will reduce the percent departure from reference conditions. Underrepresented early seral and mid to late open stands will increase across the landscape as trees continue to die and fall, opening up stands. However, the

effects are unlikely to reduce departure enough to move the analysis area into a different fire regime condition class.

Effects on Fuels Complex. In the short-term, litter and small woody debris (1-hour and 10-hour fuels) will increase as red needles and small branches fall from the beetle-killed trees. As the trees lose their needles (or canopy), the canopy bulk density will decrease sharply. Large downed woody fuels will increase slightly as some beetle-killed trees begin to fall. Regeneration will slowly begin growing, but ladder fuels will largely remain unchanged. Due to the expected increase in surface fuels, the areas currently represented by fuel models TL3 and TU5 will be better represented by TL5 (high load conifer litter) and SB2 (moderate load activity fuel or low load blowdown) (Table 3.3.3a).

In the long-term, the amount of litter, 1-hour, and 10-hour fuels will decrease due to decomposition, but the 100-hour and 1000-hour fuels will increase significantly as beetle-killed trees fall. Regeneration will begin to grow through the downed trees, thus increasing the ladder fuels and crown bulk density. The species composition of the future stands likely will depend on the advanced regeneration in the understory (Collins et al. 2011). Some areas possibly will be dominated by shade-tolerant species. During this time, areas will be best represented by the fuel models SB3 (high load activity fuel or moderate load blowdown) and SB4 (high load blowdown) (Table 3.3.3a).

Table 3.3.3a: The progression of exiting fuel models over time under the no action alternative.

Vegetation type	Existing fuel model	0 to 20 years	Short-term fuel model	20 to 60+ years	Long-term fuel model
Lodgepole pine	**TL3** Moderate load conifer litter	**Surface fuels increase; crown fuels decrease** (needles and trees fall, grasses and shrubs increase in understory)	**TL5** High load conifer litter	**Surface and crown fuels increase** (trees have fallen, regeneration and shrub understory growing through downed woody fuels)	**SB3** High load activity fuel or moderate load blowdown
Mixed conifer	**TU5** Very high load, dry climate timber-shrub		**SB2** Moderate load activity fuel or low load blowdown		**SB4** High load blowdown

Surface Fire Behavior. "Behave Plus 5" was used to model the expected surface fire behavior for the expected short- and long-term fuel models under the no action alternative (Table 3.3.3b), using the 90th to 97th percentile weather conditions.

For the short-term analysis, the 25 percent basal area lodgepole pine canopy characteristics were used to represent the decrease in canopy due to falling needles. Under these conditions, with reduced basal area and canopy cover, the surface fuels are not sheltered as much from the wind. Therefore, the expected fire behavior results account for this increase in mid-flame wind speed. For fuel model TL5, for which conifer litter is the primary carrier of fire, flame lengths and rate of spread are low, 2.9 feet and 8.1 chains per hour (Table 3.3.3b). Fuel model SB2 represents areas with more of a shrub and small tree understory, plus downed trees. Under these conditions, the flame length and rate of spread are much higher: 9.1 feet and 32.4 chains per hour. Although higher flame lengths and rate of spread are expected for fuel model SB2, the values provided by Behave likely overestimate what would occur in reality. The fuel model SB2 assumes that the primary carrier of fire is dead and down activity fuel or blowdown. For this analysis,

SB2 is being used to represent downed trees (with no needles) amongst a live grass, shrub, and small tree understory, which would not burn at quite the same rate.

For the long-term analysis, the 100 percent basal area lodgepole pine canopy characteristics were used to represent the regeneration of the forest with a stand height of about 15 feet, which is sheltered from the wind. Fuel models SB3 and SB4 were used to represent fuel conditions in the long-term, after all of the beetle-killed trees have fallen and regeneration is growing through the downed trees. Similar to SB2 above, the fire behavior estimates are likely overestimated but still provide a valuable estimate of the potential fire behavior relative to other fuels conditions. Predicted surface fire behavior characteristics are displayed in Table 3.3.3b. Flame lengths range from 8 to 11.1 feet and rates of spread range from 18.3 to 34.9 chains per hour. The large difference between the rates of spread for SB2 and SB3 are due to the unsheltered nature of the stand in the short-term, which is susceptible to greater wind speed.

Table 3.3.3b: Predicted surface fire behavior characteristics with fuels conditions under the no action alternative.

Timeframe	Vegetation type	Fuel model	Rate of spread (chains per hour)	Flame length (feet)
Short-term	Lodgepole pine	TL5	8.1	2.9
	Mixed conifer	SB2	32.4	9.1
Long-term	Lodgepole pine	SB3	18.3	8
	Mixed conifer	SB4	34.9	11.1

In fuel model TL5, fires can generally be attacked and held by persons using hand tools, due to the low rate of spread, flame length, and intensity. In fuel model SB2, control efforts at the fire head will probably be ineffective. Fires may torch, crown, and spot, presenting serious control problems. In fuel model SB3, equipment such as dozers and aircraft may or may not be effective. Fires may torch, crown, and spot, creating control problems. Fires in fuel model SB4 will create the most control problems; crowning, spotting, and major fire runs are probable and control efforts at the head of the fire are ineffective.

Crown Fire Behavior. Table 3.3.3c displays the predicted crown fire behavior characteristics in the short- and long-term, under the no action alternative. Under the short-term fuels conditions (fuel models TL5 and SB2), crown fires are not expected. In the long-term, fires in fuel models SB3 and SB4 have a higher likelihood of exhibiting crown fire behavior, with a low critical surface intensity and higher probability of transitioning to a crown fire.

Table 3.3.3c: Predicted crown fire behavior characteristics with fuels conditions under the no action alternative.

Timeframe	Vegetation type	Fuel model	Critical surface intensity (Btu/ft/s)	Transition to crown fire?	Fire type
Short-term	Lodgepole pine	TL5	1544	No	Surface
	Mixed conifer	SB2	1544	No	Surface
Long-term	Lodgepole pine	SB3	42	Yes	Torching
	Mixed conifer	SB4	42	Yes	Torching

3.3.4 Environmental Consequences of Alternative 2, Proposed Action

Overall, in the short-term and long-term, the proposed action will meet the purpose and need, with the following effects on fire and fuels resources:

1. Increase the mosaic of age classes and fuel loading conditions across the landscape.
2. Help create a forest more resilient to future wildfires and insect outbreaks.
3. Facilitate more effective suppression operations near road systems and private property.
4. Improve public and firefighter egress and safety.
5. Reduce the percent departure from reference conditions as defined in the fire regime condition class assessment.

Fire Ecology. Under the proposed action, the fire frequency will not change significantly in the short- or long-term. As discussed for the no action alternative, fire occurrence in the analysis is heavily influenced by climate, topography, and cover type. However, it is possible that the proposed action may limit the extent of fires in the future by facilitating more effective suppression operations and promoting aspen regeneration. Aspen stands typically slow fire spread across the landscape.

The proposed action will reduce overall fuel loadings in treated stands and promote aspen regeneration in some locations. This reduction in fuel loading within treated stands and an increase of aspen are expected to result in a more patchy mosaic of burn conditions (compared to the large expanses of heavy fuels across the landscape produced by the beetle epidemic) for future wildfires, producing a more resilient landscape.

The proposed action is designed to harvest dead and dying timber, produce healthy, young regeneration stands of aspen and conifers, and reduce hazardous fuels around private lands. In general, the project will convert mid to late seral stands to early seral or more open mid to late seral stands. The specific effect will depend on the species composition, structure, and level of beetle mortality in each stand (i.e., whether or not a stand is converted to early seral or mid-open).

In addition, there may be more beetle mortality in the next few years, which would likely add to the amount of early seral and mid to late open stands on the landscape. Because late seral stands are over-represented on the landscape and early to mid-seral stands are under-represented, the proposed action will reduce the percent departure from reference conditions. However, the scale of the proposed action alone is unlikely to reduce departure enough to move the analysis area into a different fire regime condition class (i.e., from FRCC 2 to FRCC 1), but it will contribute toward reducing departure.

Fuels Complex. Two types of treatments are proposed: salvage clearcut and sanitation salvage. The salvage clearcut treatment would remove dead and beetle infested and/or dwarf mistletoe infected trees, with the exception of some clumps of snags. The sanitation salvage would remove the dead, dying, and mistletoe infested lodgepole pine, leaving most healthy trees. In some units, the activity fuels would be piled and burned and in others a low load of activity fuels may be left. The hazardous fuels reduction treatment would thin mature trees and young, dense stands to increase crown spacing, remove ladder fuels, and pile and burn the activity fuels and/or jackpots of heavy dead and down.

In the short-term, in the timber units, there would be a reduction in the number of standing dead trees, canopy cover, and canopy bulk density, and an increase in crown spacing. Some activity fuels would be left on-site, which would increase the amount of surface fuel loading where they are not piled and burned. Post-treatment, the timber units would be best represented by fuel model TL1 (low load compact conifer

litter), where activity fuels are piled and burned, and fuel model SB1 (low load activity fuel) where some activity fuels are left on-site (Table 3.3.4a). In addition, as the stands are opened up, there would likely be a flush of grass, shrubs, and lodgepole pine and aspen seedlings due to the increase in sunlight. The hazardous fuels reduction treatment units would also be best represented by TL1 (low load compact conifer litter), as fuels are thinned, piled, and burned.

In the long-term, the forest would move toward pre-epidemic conditions, likely dominated by lodgepole pine and aspen that becomes established post-treatment (Collins et al. 2011). Timber units would eventually return to fuel models TL3 and TU5, similar to the existing fuel models. However, the hazardous fuels reduction treatment units would be maintained as a shaded fuelbreak in the long-term, represented by fuel model TL1.

Table 3.3.4a: The progression of existing fuel models over time under the proposed action.

Vegetation type	Existing fuel model	0 to 20 years	Short-term fuel model	20 to 60+ years	Long-term fuel model
Lodegpole pine	**TL3** Moderate load conifer litter	Some activity fuels remain; trees that would be falling and contributing to increases in fuel loading have been removed	**TL1** Low load compact conifer litter	Forest regenerating, gradually moving towards pre-epidemic conditions	**TL1*, TL3** Low to moderate load conifer litter
Mixed conifer	**TU5** Very high load, dry climate timber-shrub		**SB1** Low load activity fuel		**TU5** Very high load, dry climate timber-shrub

***** Hazardous fuels reduction treatments will be maintained in the long-term as shaded fuelbreaks, represented by fuel model TL1.

Surface Fire Behavior. "Behave Plus 5" was used to model the expected surface fire behavior for the expected short- and long-term fuel models under the no action alternative (Table 3.3.4b), using the 90th to 97th percentile weather conditions.

For the short-term analysis, the 25 percent basal area lodgepole pine canopy characteristics were used to represent the decrease in canopy due to the proposed treatment. The 25 percent basal area represents an average post-treatment basal area. Basal area is expected to be less in the clearcut units. Surface fire behavior characteristics in the treatment units will vary depending on the amount of activity fuels left on-site. Areas with higher levels of activity fuels (fuel model SB1) may have flame lengths and rates of spread around 4.5 feet and 12.7 chains per hour. While areas where activity fuels are piled and burned (TL1) will have smaller flame lengths and rates of spread, around 0.7 feet and 1.3 chains per hour.

For the long-term analysis, the 100 percent basal area lodgepole pine canopy characteristics were used to represent conditions after the lodgepole pine and/or mixed conifer forest has begun to return and the regeneration is about 15 feet high. Fuel models TL1, TL3, and TU5 were used to represent fuels conditions during this phase. Surface fire behavior characteristics will be similar to existing conditions. However, stands should have greater canopy cover and be more sheltered from the wind, assuming there is not a lot of beetle mortality. Flame lengths may range from approximately 0.5 to 6.7 feet and with rates of spread around 0.7 to 6.9 chains per hour.

Table 3.3.4b: Expected surface fire behavior characteristics with fuels conditions under the proposed action.				
Timeframe	**Vegetation type**	**Fuel model**	**Rate of spread (chains per hour)**	**Flame length (feet)**
Short-term	Lodgepole pine	TL1	1.3	0.7
	Mixed conifer	SB1	12.7	4.5
Long-term	Lodgepole pine	TL1	0.7	0.5
		TL3	1.2	0.9
	Mixed conifer	TU5	6.9	6.7

In fuel models TL1, TL3, and TL5, fires can generally be attacked and held by persons using hand tools, due to the low rate of spread, flame length, and intensity. In fuel models SB1 and TU5, equipment such as dozers and aircraft may be needed for successful control efforts.

Crown Fire Behavior. Table 3.3.4c displays the predicted crown fire behavior characteristics in the short- and long-term for the proposed action alternative. Under the short-term fuel conditions (fuel models TL1 and SB1), crown fires are not expected. In the long-term, fires in fuel models TL1 and TL3 are also not expected to support crown fires under the 90th to 97th percentile weather conditions. The fuel conditions in the fuelbreaks adjacent to private property will be maintained as a fuel model TL1. In fuel model TU5, there are greater amounts of ladder fuels in the understory and therefore it will have a greater chance of transitioning to a crown fire and exhibiting torching fire behavior.

Table 3.3.4c: Expected crown fire behavior characteristics with fuels conditions under the proposed action.				
Timeframe	**Fuel model**	**Critical surface intensity (Btu/ft/s)**	**Transition to crown?**	**Fire type**
Short-term	TL1	1544	No	Surface
	SB1	1544	No	Surface
Long-term	TL1	42	No	Surface
	TL3	42	No	Surface
	TU5	42	Yes	Torching

3.3.5 Cumulative Effects

The past, present, and ongoing, and reasonably foreseeable activities in or near the Smiths Fork project area are listed above in this chapter. In conjunction with the Smiths Fork Project, timber harvests and prescribed burning activities have and are expected to increase age class diversity, reduce fuels, and/or increase aspen regeneration. These effects will contribute towards the development of a more resilient landscape that is less susceptible to beetle epidemics and high intensity and high severity wildfires. In addition, the reduction in hazardous fuels will allow for the implementation of more effective fire management strategies and tactics, and improve firefighter and public safety.

Irretrievable or Irreversible Commitment of Resources

Irretrievable effects of the proposed action would be the removal of vegetation and tree species

from timber harvest and hazardous fuels reduction activities. Revegetation and reforestation after project completion would occur in most of the timber units, but hazardous fuels reduction units would be maintained as shaded fuelbreaks. No irreversible commitments of resources are anticipated.

3.4 Soils

3.4.1 Affected Environment

The analysis area consists of soils with fine textured subsoil that prevents infiltration of water and contains shallow water tables present throughout the year. This limitation is associated with the Seitz and Dell soil type and in particular where these soils are found on flat or gently sloping terrain. The perennially wet soil conditions, typically occurring within 12 inches of the ground surface, make them susceptible to soil rutting and compaction (Table 3.4.1). Areas where shallow/perched water table exists are too small to be captured accurately in a standard soil survey. These areas contain soils that have a thick organic layer (A Horizon) with a sandy subsurface soil that increases in clay content downward in the profile. Mottles exist in the soil profile, which is an indication of a fluctuating water table.

Table 3.4.1 : Smiths Fork Salvage Analysis Area Soil Types and Properties For Treatment Units Proposed Under the Action Alternatives

Soil Map Unit/ Dominant Type*	Slope*	Texture*	Unified Class*	Rock*	Depth to Bedrock*	Water Table Depth*	Organic Layer Thickness*	Soil Structure*	T Factor (tons/ac/yr)**	Rutting Hazard**	Compaction Potential**	Severe Burning Hazard**
	%			%		inches	inches					
NS102/ Sessions	0 to 10%	loam	ML	0	v.deep	<12	0	mod.	5	sev.	sev.	slight
NS104/ Foxcreek	0 to 4%	loam	ML	0	v.deep	<12	3	mod.	5	sev.	sev.	slight
NS221/ Duschesne	0 to 10%	v. cobbly loamy sand	SC-SM	45	v.deep	>12	2	weak	5	slight	slight	mod.
NS222/ Duschesne	10 to 20%	v. cobbly loamy sand	SC-SM	45	v.deep	>12	2	weak	5	slight	slight	mod.
NS223/ Duschesne	20 to 40%	v. cobbly loamy sand	SC-SM	45	v.deep	>12	2	weak	5	slight	slight	mod.
NS225/ Duschesne	40 to 70%	v. cobbly loamy sand	SC-SM	45	v.deep	>12	2	weak	5	slight	slight	sev.
NS233/ Mirror Lake	10 to 20%	v. cobbly sandy loam	SC-SM	45	v.deep	>12	2	weak	5	slight	slight	slight
NS310/ Seitz	0 to 10%	v. cobbly sandy loam	SC-SM	57	v.deep	<12	2	weak	5	sev.	sev.	slight

NS311/ Seitz	10 to 20%	v. cobbly loamy sand	SC-SM	57	v.deep	<12	2	weak	5	sev.	sev.	slight.
NS312/ Seitz	20 to 40%	v. cobbly loamy sand	SC-SM	57	v.deep	>12	2	weak	5	slight	slight	mod.
NS352/ Seitz	0 to 10%	v. cobbly sandy loam	SC-SM	57	v.deep	<12	2	weak	5	sev.	sev.	slight
NS353/ Seitz	10 to 20%	v. cobbly loamy sand	SC-SM	57	v.deep	<12	2	weak	5	sev.	sev.	slight
NS354/ Seitz	20 to 40%	v. cobbly loamy sand	SC-SM	57	v.deep	>12	2	weak	5	slight	slight	mod.
NS355/ Seitz	40 to 60%	v. cobbly loamy sand	SC-SM	57	v.deep	>12	2	weak	5	slight	slight	sev.
NS371/ Dell	10 to 20%	gravelly clay loam		15	v.deep	>12	3	strng	5	mod.	mod.	slight
NS372/ Dell	20 to 40%	gravelly clay loam		15	v.deep	>12	3	strng	5	mod.	mod.	slight

Sources:

** Soil Resource Inventory, North Slope Uinta Mts., USDA Forest Service. 1992.*

*** Intermountain Region Soil Criteria and Management Interpretations Rating Guide (USDA Forest Service. 2010a.).*

3.4.2 Environmental Consequences

Soil Disturbance Effects. Effects of the Proposed Action Alternative relate to a potential increase in detrimental soil disturbance (compaction and displacement) caused by harvest activities. Soil compaction is associated with an increase in soil bulk density, or a reduction in pore space, within the soil profile, which limits water and air movement, which then affects root movement and nutrient availability. Soil compaction and displacement at landing sites, staging areas, temporary roads, and on main skid trails is expected due to equipment operations.

Field work and GIS analysis was completed for each of the harvest units and associated harvest access roads proposed for this project. It was determined that between 2 and 20 acres within a harvest unit would be detrimentally disturbed based on 8 percent of an activity area. Units 100, 101, 103, and 105 contain areas of wet soils within the units. An additional 6 to 22 acres due to secondary skid trails could be disturbed.

Proposed salvage harvest units were modeled for potential detrimental soil compaction and rutting that might occur if traditional ground based harvesting methods were used. Many proposed harvest treatment areas contain wet soil types with high potential for detrimental soil compaction and/or rutting effects to occur as a result of the use of mechanical harvest equipment.

Because of the shallow wet soil conditions occurring in mid-summer, which is when most of the timber harvest occurs on the North Slope, normal dry season mechanical timber harvest operations in these areas

could not be conducted without causing widespread long term detrimental soil rutting and compaction in amounts that would exceed Guideline G4 (soil disturbance must be kept at less than 15 percent of a sale unit) (Forest Plan, page 4-37).

Field monitoring of the area surrounding the proposed salvage units indicate that the wet soil and shallow water table conditions persist throughout the entire year. Furthermore, because extensive literature research on conducting timber harvest operations in these types of wet soils did not yield any effective mitigation measures that could avoid or limit soil the potential compaction and rutting effects, it is the conclusion of this analysis that detrimental soil disturbances that exceed Forest Plan guidance are an unavoidable consequence of conducting ground based harvesting in the proposed units that contain wet soils.

Soil disturbance monitoring of previous timber harvest areas on the Evanston-Mountain View Ranger District has shown that detrimentally disturbed soils amounts average between 0 and 8 percent of all units that were monitored. Detrimental soil disturbance in these areas was mainly due to soil compaction, and was associated exclusively with the sale area landings, main haul road, and the main (multiple) skid trails. The secondary skid trails, which received at most one or two passes from a skidder and covered between 20 and 30 percent of these units, did not have any detrimental soil compaction. Similar effects are anticipated to occur within proposed Smiths Fork treatment units that have dry soils and deep water tables. However, under the shallow water table conditions which prevail in many of the Smiths Fork Salvage proposed units, the one and two pass skid trails would be detrimentally compacted and rutted. Total detrimentally disturbed soils in units containing shallow water tables would range between 10 and 35 percent.

Effective mitigation measures that follow Forest Plan Guideline 11 (i.e. restriction of ground based harvest operations to the normal dry or frozen soil season) would be required in all action alternatives for harvest areas containing the Dell soil types with a moderate soil compaction and/or rutting hazard.

Guideline G9 provides direction to avoid wetland areas for most management activities that have the potential to cause detrimental rutting and/or soil compaction (Forest Plan, page 4-38).

Under the proposed action, construction of temporary and intermittent service roads to access the individual harvest units could be expected to produce about 4 acres of detrimentally compacted soil. Although these effects would not be a permanent impairment of soil productivity, full recovery of soil quality would not occur within the ten year timeframe for analysis of future effects. Soil quality could be partially restored, but not to pre-timber harvest conditions, on the log landings and temporary roads by mitigation practices such as ripping of the compacted soils and re-vegetating with native forbs and grasses.

Soils Erosion Effects. Effects of the Proposed Action Alternative relate to the potential increase in soil erosion during and after project implementation. Forests generally have very low erosion rates unless they are disturbed in a manner that exposes bare soil to the erosive energy of water and wind. Ground based harvest will reduce ground cover on main skid trails, at trail junctions, and landings. The temporary removal of vegetation cover can cause increased impacts by rain drop splash impact and concentrated flow of water. This in turn can cause increased displacement of soil particles, erosion and sediment transport into streams from increases in concentrated flow and runoff.

Soil productivity could be impacted from loss of topsoil associated hillslope, skid-trail, and temporary road erosion. On lightly used trails (one or two passes) ground cover is not anticipated to be reduced along the entire trail length.

Results of erosion modeling using the FS WEPP methodology indicate that the different types of erosion rates (average, 5 year or 6 year, and 10 year or 30 year return period) for the proposed timber treatments are well below the allowable soil loss ("t" value) for the soil type (Flood, 2011).

3.4.3 Cumulative Effects

The significant cumulative effects issue related to soil resources is that certain past, present, and reasonably foreseeable future management activities have the potential to create disturbances to soils. These disturbances could consist of detrimental amounts of erosion, compaction, or severe burning. The indicator for cumulative effects is the kind and amount of detrimental disturbance observed, predicted, or anticipated from the various types of management activities that have the potential to create disturbances to soils. The geographic area for the analysis of cumulative effects to soils will be the individual activity areas represented by the proposed treatment units and the roads constructed to access them. The time frame for the analysis of reasonably foreseeable actions is about 10 years, which represents the approximate length of time required for areas detrimentally disturbed by prescribed fire, timber harvest, or road building activities to become stabilized with ground protecting native vegetation. The time frame for the analysis of past actions is about 100 years.

Cumulative Effects Affected Environment. Other actions that may have an influence on soil, water, and aquatic resources are livestock grazing, motorized roads and trails, dispersed recreation, and previously implemented vegetation treatments. Livestock grazing is a permitted activity that has been occurring for over 100 years in the analysis area, and is expected to continue in the future. Use of motorized roads and trails and dispersed recreation is occurring now in the analysis area, and is expected to occur in the future. There are no other previously implemented vegetation treatments that intersect with the proposed harvest units as presented in this report.

Determination of Cumulative Effects. Several effects may occur from other activities occurring or that have occurred within the cumulative effects area. Generally, grazing may cause erosion and sedimentation by shearing soil and leaving bare surface soil that can erode during storm events. Motorized roads and trails have the potential to erode during storm events that may cause sedimentation of streams if they are close by. Dispersed recreation may cause soil disturbance and trampling that may lead to erosion and sedimentation. Previous harvest activities using may have varying amounts of detrimental soil erosion and compaction associated with the use of harvesting equipment.

Cumulative Effects of Alternative 1, No Action
The effects of previous and current management activities described in Table 3.1 would continue in the analysis area.

Cumulative Effects of Alternative 2, Proposed Action
Based on analysis**,** cumulative effects to the soil resource from the proposed action would consist of 0.9 acres of detrimentally compacted soil associated with the construction of temporary and intermittent service roads to access the individual harvest units.

With the implementation of recommended mitigation measures and project design features to limit detrimental soil disturbance, the proposed action will have very little direct or indirect effects on soil

quality. Consequently, it is the conclusion of this analysis that cumulative detrimental soil effects would not occur as a result of the proposed treatments.

Within the cumulative effects analysis geographic area, none of the areas proposed for vegetation treatments have been affected by previous timber harvests. None of the areas proposed for vegetation treatments have been affected by wildfire or previous prescribed fire.

Several existing system roads that would be used for access to the proposed treatment areas currently are rutted and/or compacted and also are experiencing accelerated erosion. Implementation of required mitigation measures for the action alternatives would result in a cumulative reduction in erosion on these roads.

All proposed vegetation treatments are within currently permitted livestock grazing allotments. Sheep and cattle grazing resulted in high impacts to soil resources from the 1800s until the 1930s when active grazing management took effect in the area. Since then, a gradual improvement in land conditions has occurred as indicated by increased ground cover and absence of active soil erosion in most areas within grazing allotments.

However, current grazing activities are causing small amounts of detrimental soil compaction as cattle move into to transitory range areas created by lodgepole pine mortality. These effects are confined to areas within the proposed treatment units that contain wet soils and/or shallow water tables. With the implementation of proposed mitigation, these wet soil areas would no longer be considered for salvage harvest activities, and there would be no additional or cumulative impacts upon the soil resources within the cumulative effects analysis geographic area.

3.5 Water Resources

3.5.1 Affected Environment

Water Yield. In the past, 12,929 acres have had timber treated in the subwatersheds (East Fork Smiths Fork, Gilbert Creek, the West Fork Smiths Fork, Willow Creek, and Blacks Fork Meeks Cabin Reservoir) that drain the project analysis area. Timber has been treated since 1979 and many units have dense regrowth of lodgepole pine. This regrowth reduces the amount of water that would be available right after harvest.

Values shown in Table 3.5.1 adjusts the water yield based on the age of the harvest and is described as equivalent clearcut area ("ECA"). The hydrologic recovery is based on research (Potyondy and Stender 1982) that indicates that water yield increase does not diminish after harvest treatment for the first 15 years then diminshes at a linear rate from 15 years to 60 years at which time the water yield increase is 0 percent. It is also assumed that all past treatments and the proposed action are equivalent to a clearcut. It is assumed that the amount of road area is very small in relation to the size of the subwatersheds and is not included in the ECA. An average increase of 0.1 inch is estimated for every 1 percent of watershed area harvested (Stednick 1996) and this analysis assumes that this applies to ECA.

Estimates of water yield increase due to past harvest are shown in Table 3.5.1. The estimate of increased water yield (in inches) for past harvest in the East Fork Smiths Fork, Gilbert Creek, the West Fork Smiths Fork, Willow Creek, and Blacks Fork Meeks Cabin Reservoir are 0.1, 1.5, 1.1, 0.3, and 0.9, respectively.

No measureable change in streamflow is expected from past harvest because less than 20 percent of each subwatershed has been harvested except for Gilbert Creek, which has a calculated value of 24.3 percent. Troendle etal. (2010) states that water yield increases would be measureable if more than 20 percent of the watershed were treated. For Gilbert Creek, water yield due to past harvest is expected to be un-measureable because many of units were harvested more than 15 years ago resulting in conifer regrowth that is using water in the drainage.

Table 3.5.1: Water yield increases for past harvest and alternatives by drainage.

Drainage	Acres		Past Harvest	Alternative 2 (proposed action)
East Fork Smiths Fork	37,084	ECA (acres)	204	394
		ECA (% of drainage)	0.6	1.1
		Water Yield Increase (inches)	0.1	0.1
Gilbert Creek	14,377	ECA (acres)	2190	1,502
		ECA (% of drainage)	15.2	10.4
		Water Yield Increase (inches)	1.5	1.0
West Fork Smiths Fork	34,025	ECA (acres)	3639	2,225
		ECA (% of drainage)	10.7	6.5
		Water Yield Increase (inches)	1.1	0.7
Willow Creek	21,766	ECA (acres)	726	245
		ECA (% of drainage)	3.3	1.1
		Water Yield Increase (inches)	0.3	0.1

Table 3.5.1: Water yield increases for past harvest and alternatives by drainage.				
Drainage	**Acres**		**Past Harvest**	**Alternative 2 (proposed action)**
Blacks Fork Meeks Cabin Reservoir	29,226	ECA (acres)	2,735	62
		ECA (% of drainage)	9.4	0.2
		Water Yield Increase (inches)	0.9	0.0

Water Quality. The direct and indirect effects to water resources would be that water quality (sedimentation and pH, specifically) would remain unchanged from existing conditions because no treatments would be implemented.

Wetlands and Floodplains. The direct and indirect effects to water resources would be that wetlands and floodplains would remain unchanged from existing conditions because no treatments would be implemented.

3.5.2 Environmental Consequences of Alternative 2, Proposed Action

The main issue for water resources is that forest canopy removal and erosion following log skidding, prescribed burning, and/or road construction could lead to adverse effects on water quality, particularly from sedimentation of water and changes in pH of stream water. The indicators for this analysis are:

1. Amount of sediment entering streams or wetlands.
2. Changes in pH of stream water.

1. Direct and Indirect Effects

Water Yield. The proposed action will salvage dead timber caused by a mountain pine beetle epidemic. Using the value for an average increase of 0.1 inch for every 1 percent of watershed area harvested estimates of water yield increase from Alternative 2 is shown in Table 3.5.1. The estimate of increased water yield (in inches) for Alternative 2 in the East Fork Smiths Fork, Gilbert Creek, the West Fork Smiths Fork, Willow Creek, and Blacks Fork Meeks Cabin Reservoir are 0.1, 1.0, 0.7, 1.1, and 0.0 inches, respectively. The estimate of the percent equivalent clearcut area for Alternative 2 ranges from 0.2 to 10.4 percent. Based on research by Troendle et al. (2010), this amount of increase in stream flow would not be measureable.

Water Quality. None of the harvest units are on steep slopes and it is expected that Standard S-1 will be followed resulting in low level of soil erosion (Forest Plan, page 4-36). Standard S-1 prohibits ground based timber skidding on slopes greater than 40 percent.

The direct and indirect effects of Alternative 2 are very little to no sedimentation of streams or springs. Buffer zones in the riparian habitat conservation areas are expected to catch sediment that would move from the treatment units and landings. Where road construction requires crossing a stream, small amount of sediment is expected to reach the stream. Best management practices such as limiting the number of stream crossings, installing culverts and installing proper road drainage minimize the amount of sediment reaching streams. Monitoring of timber harvest and prescribed fire treatments show that when BMPs are implemented properly very little sediment moves from the treatment area of timber harvest units,

vegetation grows back quickly in areas of prescribed burns, roads have proper drainage and shed water into designated areas away from streams, and ground cover is provided by slash left in timber units.

Prescribed burning has the potential to increase pH of streams if runoff carries ash into a stream. The direct effect of the proposed action to the level of pH in streams is expected to be a very little increase in pH and is most likely to occur from a storm event when ash may float in the surface runoff. Most of the ash is expected to be caught in the unburned areas of the treatment unit (mosaic burn pattern) and in the riparian habitat conservation area buffer. If a large storm event occurs there may be a slight increase in pH for a short period of time, likely to be less than 24 hours during the period of increased runoff.

There is expected to be very little to no adverse direct or indirect effects to the water quality of China Lake, Bridger Lake, or Marsh Lake, impaired water bodies listed for dissolved oxygen. This is because the treatment area is relatively flat, the only treatment area is Unit 99, and very little of the treatment areas of Unit 99 is hydrologically connected to these lakes.

Wetlands and Floodplains. It is expected that very little adverse impacts will occur to wetland areas because a buffer of 150 feet will be placed around wetlands greater than one acre. For wetlands less than one acre standard timber contract clauses state that wetland areas are to be avoided if possible. Wetlands are expected to have short-term affects during timber operations where roads would cross wetlands to access treatment units. Roads that cross wetland areas would have best management practices implemented to minimize adverse effects on the wetlands. Mitigation that would be implemented may include avoiding wetland areas or reducing the amount of compaction and rutting using techniques such as laying down geotextile and covering it with road fill that could be obtained from the construction of temporary roads in the upland areas. A total of 0.1 acres of wetlands will be crossed by timber roads associated with proposed timber treatment.

The main areas in the project area where floodplain occurs are along the main channel of the East Fork Smiths Fork, Gilbert Creek, and the West Fork Smiths Fork. Tributary channels to these main channels are small, steep, and have very little floodplain area. None of the harvest units are expected to be located in these areas and no impacts to floodplains are expected in the harvest areas. Where roads are used for timber treatment activities, very little adverse effect is expected to floodplains because of the small amount of area where roads may cross floodplains and conservation practices are expected to be implemented that minimize activities and control soil erosion in these areas.

3.5.3 Cumulative Effects

A review of past, present and foreseeable future activities in the Smiths Fork project area listed in Table 3.1 indicate that activities have varying degrees of effects on water yield, water quality, and wetland and floodplains. These activities are considered in the cumulative effects sections below.

Water Yield. For water yield, only past timber harvest and the future prescribed burns and fuel treatments in the Blacks Fork watershed west of the project area may have a measureable effect of increasing the amount of water that drainages from the watershed. These timber treatments are considered in the cumulative effects water yield analysis.

For the cumulative effects to water yield from Alternative 2, an estimate is based on the amount of timber harvest in Alternative 2 plus the water yield increase from past harvest. Using the value for an average increase of 0.1 inch for every 1 percent of watershed area harvested estimates of the cumulative water

yield increase from background in the East Fork Smiths Fork, Gilbert Creek, the West Fork Smiths Fork, Willow Creek, and Blacks Fork Meeks Cabin Reservoir are 0.2, 2.5, 1.8, 0.4, and 0.9, respectively.

The estimate of the cumulative percent equivalent clearcut area above background ranges from 1.7 to 25.6 percent. Based on research, this amount of increase may be measureable over background in Gilbert Creek. For watershed stability purposes, it is well within the rule of thumb of Potyondy and Stender (1982) that no more than one third of a watershed be in a cut condition at any point in time.

Alternative 2 would salvage timber from a mountain pine beetle epidemic that killed many of the trees in the project area. The cumulative effects of water yield that is expected from Alternative 2, past harvest, and the epidemic is an increase in water yields in the subwatersheds that drain the project area. The proposed treatments in Alternative 2 are expected to result in very little increase in the overall streamflow because the alternative treats areas where conifers have already died and the increase will occur whether timber treatments are implemented or not.

Water Quality. The cumulative effects analysis area for water resources is the subwatersheds that the project treatment areas drain into and represents the extent of the watershed likely to noticeably affect water resources in this landscape. These subwatersheds are:

1. East Fork Smiths Fork (HUC#140401070201);
2. Gilbert Creek (HUC#140401070202);
3. West Fork Smiths Fork (HUC#140401070203);
4. Willow Creek (HUC#140401070205); and
5. Blacks Fork Meeks Cabin Reservoir (HUC#140401070103).

The time scales for watershed effects analysis are less than five years for short term and greater than five years for long term.

For water quality, all past actions and present actions have an effect on the quality of the water draining into the watersheds within the project area. Water quality samples have been collected downstream of the project area and the analysis results represent the cumulative effects to water quality of the activities that occur within the watersheds where the proposed project is located. All of the activities are represented in the water quality analysis results and are considered in the cumulative effects analysis for water quality.

Within the cumulative effects analysis area, several activities have occurred in the past, are occurring in the present, and are anticipated to occur in the future as shown in Table 3.1. Of these activities, the main activities that may have an effect on water quality are timber harvest, livestock grazing, wildfire, and roads. These activities have the potentially contribute sediment to streams or affect the pH of the water.

Past and present and ongoing activities have resulted in the water resource's existing condition. Alternative 2 is expected to have very little effect on sediment reaching streams and very little, short-term effect from increased pH due to prescribed fire. The cumulative effects of Alternative 2 on water resources is expected to have very little change in water quality because of the past and present activities are not causing water quality degradation of streams within watersheds that drain the project area as indicated by the water in the Smiths Fork drainage meeting Utah water quality standards. In the future, the reasonably foreseeable actions and the changes in the forested vegetation conditions are not expected to change water quality of the streams, springs, or wetlands very much because the reasonably foreseeable actions are expected to be implemented in a manner that minimizes sediment to streams.

Wetlands and Floodplains. For wetlands and floodplains, the primary past and present activities that have effects are livestock grazing, timber harvest, and motorized roads and trails. Livestock grazing has some localized stream bank trampling and trampling of some wet areas but the amount of disturbance is low and distributed throughout the watersheds. Roads built during past timber harvest initially compacts the soils but observations of timber access roads that have crossed wetlands indicate that wetland vegetation has grown over the roads and appear to be functioning properly. A few segments of motorized roads and trails run through wetland riparian areas such as the trail that is located just north of Stateline Dam. These roads and trails have caused ruts and soil erosion in a few small areas (for example up to 1,500 square feet north of Stateline Dam) of wetlands and riparian areas.

It is expected that very little direct or indirect effects to wetlands from Alternative 2 because wetlands would be avoided by equipment during treatment operations and mitigation to control sedimentation such as leaving adequate amounts of slash on the ground will minimize erosion and sediment movement. There would be very little change from the existing conditions of the floodplains because very little of the floodplain is expected to be crossed by roads. The cumulative effect of activities in addition to proposed Alternative 2 is expected to have very little change in wetland and floodplain conditions.

Irretrievable or Irreversible Commitment of Resources. No irretrievable or irreversible commitment of water resources is expected from this project because no water is taken from the area and very little effect to water quality of streams and springs is expected.

3.6 Fisheries and Aquatic Resources

3.6.1 Affected Environment

General Drainage Patterns and Aquatic Features. The analysis area is located on the north slope of the Uinta Mountains and is part of the Green River drainage. Stream flows in the project area are primarily influenced by snowmelt. Peak flows generally occur from mid-May to early June and gradually recede to base flows in mid- to late August. Base flows continue from this time until April, when temperatures begin to warm. Rainfall from summer storms is generally localized and results in peak flows that can exceed snowmelt peak flows.

In the project area, fish-bearing streams include the East Fork Smiths Fork, Gilbert Creek, Little Gilbert Creek, West Fork Smiths Fork, Archie Creek, Willow Creek, and Steel Creek.

Fish species include the Colorado River cutthroat trout (which is both a sensitive species and a management indicator species), brook trout, rainbow trout, mountain sucker, speckled dace, and sculpin. A large number of fishless ponds/lakes in the project area support tiger salamanders and boreal chorus frogs. No boreal toads have been identified in this drainage.

Meeks Cabin Reservoir is not in the project area but it does collect waters that flow through the project area. This reservoir was built in the 1970s by the U.S. Bureau of Reclamation to provide water for agricultural purposes in southwest Wyoming and also serves as a popular recreation site for both Wyoming and Utah residents. Water quality in Meeks Cabin Reservoir is very good (see: State of Utah DWQ Lake Report found at: www.waterquality.utah.gov/watersheds/lakes/MEEKSCAB.pdf).

Amphibians. Amphibian surveys were conducted on the Evanston-Mountain View Ranger District during the summers of 2006 through 2012. Monitoring of known boreal toad locations occurs annually.

Boreal toads, tiger salamanders, and chorus frogs were all found on this ranger district (Thompson and Chase, 2009). Over 50 surveys were conducted within the project area in 2012 and no boreal toads were located. Both tiger salamanders and chorus frogs are common throughout suitable habitat in Utah and were identified at most areas with suitable habitat. Boreal toads are a State of Utah sensitive species and were recently added to the Forest Service's sensitive species list for Utah. Habitat conditions at streams, springs, ponds/lakes and reservoirs were good.

3.6.2 Effects of Alternative 2, Proposed Action

Threatened, Endangered, and Sensitive Aquatic Species. No threatened or endangered aquatic species occur on the Uinta-Wasatch-Cache National Forest. The Colorado River cutthroat trout, Bonneville cutthroat trout, northern leatherside chub, boreal toad, and the Columbia spotted frog are the only aquatic sensitive species listed for the national forest. None of these species are found in the project area. Therefore, all alternatives result in a **no impact** determination for these species.

Although no habitat exists in the project area for the bonytail, the Colorado pikeminnow, the humpback chub, and the razorback sucker—all of which are endangered species—the Forest Service determined that, due to downstream habitat and the fact that up to 9.8 acre-feet of water might be depleted over five years from the Smiths Fork sub-basin for road construction and dust abatement, that the proposed project **may affect and is likely to adversely affect (water use)** the four species. Formal consultation was initiated with the U.S. Fish and Wildlife Service, which in a December 20, 2012 letter concurred with the Forest Service determination but concluded that the existing recovery program serves as an appropriate conservation measure and adequately addresses effects to the species. Therefore, no additional conservation measures are needed to reduce the impacts of the proposed action.

Recommended Mitigation Measures Common to All Action Alternatives. Avoid potential detrimental soil rutting effects on wetland areas that occur in any harvest units by following Guideline G9 (Forest Plan, page 4-38), which discourages soil disturbing activities in riparian, wetland, wet meadow, and floodplain areas.

For all harvest units, ground-based mechanical harvest and skidding should be restricted to the normal dry operating season.

For system, intermittent, and temporary service roads used to implement the treatments under this alternative, install drainage dips at a frequency/spacing of no more than 500 feet.

For native surface roads, limit the sustained gradient to no more than 10 percent. Temporary roads will be obliterated using heavy equipment to push and/or lift back in the fill and put the prism back to slope, and then seeded with an appropriate native seed mix. Intermittent service roads will be gated, drained, and seeded.

To protect aquatic and semi-aquatic species, the establishment of riparian habitat conservation areas ("RHCAs") as described by the Forest Plan and by the Inland Native Fish Strategy ("INFISH") is recommended. RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems by 1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams; 2) providing root strength for channel stability; 3) shading the stream; and 4) protecting water quality.

Harvest and treatment related activities within RHCAs would be limited to high-risk, individual tree cutting that will be left on site for woody debris recruitment. RHCAs are:

1. **Category 1, Fish-Bearing Stream.** RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to 300 feet slope distance (600 feet, including both sides of the stream channel).

2. **Category 2, Permanently Flowing Non-Fish-Bearing Streams.** RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to 150 feet slope distance (300 feet, including both sides of the stream channel).

3. **Category 3, Ponds, Lakes, Reservoirs, and Wetlands Greater Than One Acre.** RHCAs consist of the body of water or wetland and the area to 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond, or lake.

4. **Category 4, Seasonally Flowing or Intermittent Streams, Wetlands Less Than One Acre, Landslides, and Landslide-Prone Areas.** This category includes features with high variability in size and site-specific characteristics. At a minimum the interim RHCAs must include, landslides and landslide-prone areas, 100 feet slope distance in watersheds containing Bonneville or Colorado River cutthroat trout, and 50 feet slope distance for watersheds not containing Bonneville or Colorado River cutthroat trout.

3.6.3 Environmental Effects

Timber harvesting and road construction can affect aquatic species through increased sedimentation, reduction of large woody debris, increases in stream temperature variation, and changes in stream flow (Meehan, 1991). The distance from cutting units and roads to watercourses, the topography, and vegetation types between disturbance sites and streams, and amount of disturbance are all important variables in determining effects to aquatic species.

Similarly, the effects of fire to aquatic species is dependent on numerous factors including fire severity, its extent and location within a watershed, the amount and type of fuel consumed and left, soil type, and the frequency, timing, and intensity of subsequent precipitation events. The duration of effects to aquatic biota are dependent on adjacency and connectivity to water bodies, the condition and health of watersheds prior to fire introduction, and any post-fire activities which may occur.

Environmental Consequences of Alternative 1, No Action
Riparian vegetation would continue to undergo changes to ecological succession through normal aging, fire (limited extent), and insect pathology. No changes in water temperature, sedimentation rates, or recruitment of large woody debris to perennial streams below the proposed project area would be expected. Increased stream flow will likely occur as conifers in the proposed project area continue to die. Aquatic conditions will remain unchanged from existing conditions.

Environmental Consequences of Alternative 2, Proposed Action
Colorado River cutthroat trout (MIS, Sensitive Species)
Colorado River cutthroat trout are found in several streams throughout the proposed project area. Over the past few years these populations have remained “up or flat” throughout the project area except for West Fork Smiths Fork, where populations were “down.” However some of this is due to the removal of

the cutthroat trout from the West Fork Smiths Fork to be used in the development of a brood source in Sheep Creek Reservoir.

Streams and ponds in the proposed project area would have established riparian habitat conservation areas around them. This would be a hard buffer for any mechanical treatments. With established riparian habitat conservation areas, direct and indirect effects to Colorado River cutthroat trout would be limited. Field trips to Dahlgreen Creek, Green Fork, Green Fork II, and Pole Canyon timber sales show that regeneration of lodgepole pine is excellent, with ground cover in the harvest units approximately 100 percent (Condrat Hydrologist Report, 2012). Very little erosion or sedimentation has occurred within these harvest units as indicated by no rilling or gullying, with the only place with accelerated erosion was along an old road in the Old Canyon sale that needs a culvert (Condrat Hydrologist Report, 2012).

Further, erosion modeling using the Forest Service "Water Erosion Prediction Project" methodology indicates that little soil erosion would occur (well below the allowable soil loss value), even as a result of a 30-year return period storm event. With less than 7 percent of the sub-watersheds being treated, moderate topography, low to moderate severity of prescribed fire, and limited mechanical harvest, no changes in water temperature, sedimentation rates, or recruitment of large woody debris to perennial streams within the proposed project area would be expected.

Activities proposed under Alternative 2 in the Smiths Fork project for Colorado River cutthroat trout "**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.

Amphibians
Both tiger salamanders and boreal chorus frog are wetland obligate species that rarely move away from water. With the established riparian habitat conservation areas and the timing of vegetative treatments it is unlikely that this project would affect amphibians in this drainage.

3.6.4 Cumulative Effects

Certain natural processes such as drought, wildfire, and flood are outside the influence of the Forest Service and have the potential to result in cumulative effects to aquatic resources, both negative and positive, across land ownership boundaries. It is difficult to predict effects to aquatic resources over the short- or long-term, whether direct, indirect, or cumulative, due to natural processes that operate on aquatic resources at this spatial scale. Existing conditions are the result of past, present, and ongoing management activities such as forest roads, forest and rangeland management, as well as the natural processes discussed above. Past, present, ongoing, and reasonably foreseeable activities are identified in the table at the beginning of this chapter.

Grazing. Grazing in riparian areas can have numerous direct and indirect effects on aquatic species including reductions in abundance, habitat, and diversity (Platts and Nelson 1985). To reduce or eliminate both direct and indirect effects to aquatic species and their habitat, several grazing strategies have been implemented on the Uinta-Wasatch-Cache National Forest, as well as several standards and guidelines. Grazing standards and guidelines that apply within the proposed project area include:

> (S25) As a tool to achieve desired conditions of riparian areas, maximum forage utilization standards (stubble height) for low to mid elevation greenline species apply (Forest Plan, page 4-51).

(G73) Delay livestock use in post-fire and post-harvest created forest openings until successful regeneration of the shrub and tree components occurs (aspen trees reach an average height of 6 feet) (Forest Plan, page 4-52).

Grazing has occurred within the proposed project area since the late 1800s. High impacts to aquatic resources likely occurred from the late 1800s through the 1930s when active management was started. An improvement in land conditions have occurred as indicated by good ground cover and absence of active soil erosion in most of the proposed project area.

Timber Harvest . Timber harvesting and road construction can affect aquatic species through increased sedimentation, reduction of large woody debris, increases in temperature variation, and changes in stream flow (Meehan, 1991). The distance from cutting units and roads to watercourses, the topography and vegetation types between disturbance sites and streams, and amount of disturbance are all important variables in determining effects to aquatic species. Within the proposed project area, several historical timber projects have occurred. Currently, past harvest units have been restocked and show very little to no soil erosion.

Fire. Effects of fire are difficult to predict due to the variation inherent to wildfires (e.g., intensity, size, location). Fire effects to vegetation and watersheds influencing hydrologic and temperature regimes and erosion may persist for years. Cutthroat trout populations have evolved with fire, and have developed characteristics that provide for resilience in the face of such events. However, they likely depend on large, well connected, and spatially complex habitats. In the case of small, isolated populations, wildfires could extirpate entire populations.

Travel Plan (road and trail management). Erosion can be expected from roads and trails that are not adequately maintained. Roads also provide access, and the activities that accompany access, and magnify their negative effects on aquatic habitats. Activities associated with roads within the analysis area include recreation, timber harvest, livestock grazing, prescribed fire, and fire suppression. Numerous roads occur within the proposed project area, most of which occur a long distance from water features and have very little effects on aquatic resources.

Recreation. Most recreation within the proposed project area occurs in association with roads. Most roads occur along ridgelines and away from water. No known impacts to aquatic species are known to occur from recreation with the exception of the introduction of non-native fish. Brook trout have been stocked within the proposed project area for a number of years and their numbers continue to expand. It is likely that brook trout will continue to expand and impact Colorado River cutthroat trout.

Within the cumulative effects analysis area for aquatic resources, several activities have occurred in the past, are occurring in the present or are anticipated to occur in the future. Of these activities that may have an effect on aquatic resources, livestock grazing, wildfire, roads and brook trout. The cumulative effects under Alternatives 2 are expected to have little change in water quality, temperature, sedimentation since these activities are not causing problems currently. Brook trout are likely to continue to expand in these watersheds regardless of the proposed project and represent the greatest threat to Colorado River cutthroat trout.

3.6.5 Additional Information

Irretrievable or Irreversible Commitment of Resources. No irretrievable or irreversible commitment of aquatic resources are expected from this project because very little effect to water quality of streams and springs and aquatic species is expected.

3.7 Wildlife

3.7.1 Scope of the Analysis

Spatial boundaries for this project are lynx analysis units 32, 33, and 34, which are encompassed by, or are part of, the project boundary. Timeframes used for this analysis are as follows:

- Short-term can be considered to be 5 to 10 years after the proposed treatment is completed.
- Long-term can be described as 20 years or more after the completion of the proposed treatment.

This section summarizes analysis found in the biological assessment, the biological evaluation, and the wildlife technical report found in the project record. Those documents are incorporated by reference into this environmental impact statement.

3.7.2 Effects to Big Game, Upland Game, and Small Mammal Species

The big game species that inhabit the area within the boundary of the proposed project are mule deer, elk, and moose. The proposed project area is part of the Utah Hunt Unit 8 A (Summit) and Wyoming Hunt Areas 132, 106 and 107, and 27 and 35 for mule deer, elk, and moose respectively. A detailed description of the boundary of the North Slope Harvest Unit can be found in the Utah Division of Wildlife Resources' Big Game Annual Report (UDWR 2010a).

Effects to Elk
The miles of new temporary roads that will be developed in elk habitat will be used to evaluate impacts of the alternatives on elk. Additionally, the acres of habitat that may be avoided by elk due to disturbance in the cutting units will be used in the evaluation.

Alternative 1, No Action. Under the no action alternative there would be no salvage activities occurring within the project area. Hiding cover would decrease in the short term because the trees will continue to die and lose their needles causing the timber stands to become more open and recover more slowly in the long-term. Beetle-killed timber will fall and create a large increase of down woody debris. Some young trees, that currently provide good hiding cover, will be lost to falling dead timber. This large increase in down material will provide some cover while making many areas inaccessible for foraging or seasonal migratory movement by elk. Elk will lose large areas of habitat that provided hiding and thermal cover because of beetle mortality. Potential scenarios for elk are addressed in Appendix A of the wildlife technical report in the project record.

It is expected that under this alternative the main disturbance that would displace elk from available habitat would be from vehicular traffic. All of the open roads can be expected to have high volume and thus would have a 1,300 meter zone of influence around them. After buffering the roads, there is a total of 9,557 spring, summer, and fall acres and 5,698 parturition acres in Wyoming that can be utilized

outside of that zone of influence. On the Utah portion of the project area, 7,710 acres of crucial summer and calving habitat can be utilized outside of that 1,300 meter zone of influence.

Alternative 2, Proposed Action. Implementation of Alternative 2 has the potential to affect elk parturition (calving), spring, summer, and fall range as well as migration routes in the analysis area. On the Wyoming portion of the project area, there are 27,228 acres of habitat classified as spring, summer, and fall habitat. Of these 27,228 acres, 1,775 or 7 percent would be treated through the proposed action. Within the spring, summer, and fall habitat, 14,437 acres are also classified as parturition acres, of which 1,208, or 8 percent, of these acres would be treated under this alternative. There are 23 miles of migration routes that the WGFD has laid out for the proposed project area. Of these 23 miles, approximately 1.3 miles would be treated in this alternative. Under this alternative there would be no treatment of the 2.4 acres of winter-year-long habitat that is located in the extreme northern part of the project area. On the Utah portion of the project area, there are 30,211 acres of crucial summer and calving habitat, of which 2,633 acres, or 9 percent, will be treated.

Under this alternative, 9.6 miles of temporary roads will be constructed. After adding the 1,300 meter buffer to these roads, it is assumed that there will be an additional 6,586 acres of spring, summer, and fall habitat, 5,940 of parturition habitat, and 7,478 acres of crucial summer and calving habitat that will be influenced by the disturbance on the temporary roads.

During active logging, Edge and Marcum (1985) found that elk maintained an average distance of approximately 2,000 meters from active logging units. Based on the number of drainages and the topography in the project area it is assumed that the buffer of 2,000 meters for active logging units will be sufficient enough to allow for the dispersal of elk in the project area. In using the buffer of 2,000 meters around active logging units, there will be a total of 26,295 acres of spring, summer, and fall habitat and 14,354 acres of parturition habitat in Wyoming, and a total of 28,087 acres in Utah of crucial summer and calving habitat that will be affected by the treatment of vegetation that will influence elk use in the project area.

Elk will avoid areas within 500 to 1,000 meters (1,640 to 3,282 feet) from the logging disturbance area after the logging has been completed and/or during periods of inactivity. In the analysis, we used 500 m of influence to reflect this avoidance area. This displacement effectively reduces the availability of elk habitat which may increase elk use beyond the limits of the buffer around the disturbance (Edge and Marcum 1985). With the 500 m unit buffer and 1,300 m road buffer there would be a total of 20,057 acres of spring, summer, and fall habitat including 10,404 acres of parturition habitat on the Wyoming portion of the project area that will be affected by the project.

In Utah there will be a total of 24,211 acres of elk crucial summer and calving habitat that could be affected by the project. Even though the assumptions are made regarding buffers for elk in this area, it is recognized that disturbance and the associated elk movements may vary based on site specific conditions.

After salvage harvesting, forbs and grasses will invade the units for the first 5 to 10 years as the lodgepole pine seedlings and aspen suckers become established. The Smiths Fork area is considered an elk calving concentration area (personal communication with Dave Rich UDWR wildlife biologist), therefore the seasonal restriction (as outlined in the Revised Forest Plan Guideline 29) from May 1 to June 30 should be implemented. With the exception of the removal of hazard trees along roads, timber salvage activities associated with the proposed action would mostly occur away from roads currently open to the public including areas that are gated and closed to motorized vehicles. These existing closed roads would remain closed to the public which will minimize disturbance and harassment to elk. All newly constructed

temporary roads would be closed and rehabilitated at the completion of the project. Roadside salvaging may impact elk hiding cover; however the trees being removed are already dead and currently provide limited hiding cover. Over the next 15-25 years as the new forest regenerates, hiding cover along roads will increase.

In order to view the broader picture of the potential impacts on the elk population, the number and percentage of acres proposed to be treated with this alternative were evaluated in terms of the Utah and Wyoming hunting areas. In Utah, of the 638,602 acres in the North Slope Hunting Unit, the proposed project would treat 2, 670 acres (0.4%). Of this hunting unit, 30,391 acres or 5% are located in the Smiths Fork Project Area. In Wyoming, portions of Hunting Units 106 and 107 are located in the Smiths Fork Project Area. Hunting Units 106 covers 468,197 acres, while Hunting Area 107 has 976,151 acres. Under this alternative treatment would occur on 1,761 acres, or 6.5%, of Hunting Units 106 and 14 acres, or 7.1%, of Hunting Units 107 within the Smiths Fork Project Boundary. Of the total acres of Hunting Units 106 and 107, 0.4% and 0.001% of the hunt units would be treated respectively.

Effects to Mule Deer
For the evaluation of impacts of the alternatives to mule deer, the number of acres that will provide increased forage in the early successional stage will be used.

Alternative 1, No Action. Under the no action alternative there would be no salvage activities occurring with the project area beyond fuel wood cutting. Hiding cover would decrease in the short term (5-10 years) and recover slowly in the long-term (15+ years). As dead timber from pine beetle mortality begin to fall and create a large increase in fallen down woody debris, some areas of existing hiding cover from natural regeneration would be lost to the jack-strawed or falling dead timber which would also create a form of hiding cover for deer, but unfortunately this event will make many areas inaccessible for foraging or seasonal migratory movement by deer. The biggest loss to deer under the No Action alternative would be loss of large areas of once existing interior habitat or thermal cover which is extremely important for protection from inclement weather conditions, security and protection from harassment and predation because of beetle mortality.

Alternative 2, Proposed Action. The action alternative will not result in an increased open road density and thus no changes will occur to the road density index. Temporary roads will be decommissioned following implementation so that the road profile is neither visible nor accessible to forest users.

Implementation of the proposed action has the potential to affect mule deer spring, summer, fall, and winter-year-long range in the analysis area. There are 1,848 acres of winter-year-long habitat on the Wyoming portion of the project area. Of this area, 174 acres, or 9 percent, or the winter-year-long habitat will be altered under this alternative. There are 25,576 acres of spring, summer, and fall habitat in the project area. Under this alternative, 1,601 acres, or 6 percent, would be treated. The WGFD has identified 4.2 miles of migration routes in the project area. Through the proposed action, approximately 0.33 miles of the migration routes would be altered. On the Utah portion of the project area, there are 30,210 acres of crucial summer and fawning habitat, of which 2,632 acres, or 9 percent, would be treated under this alternative.

With the exception of a few areas, timber salvage activities associated with Alternative 2 would mostly occur away from roads currently open to the public including areas that are gated and closed to the public. The existing gates would remain locked following implementation and will minimize disturbance and harassment to mule deer and all new temporary road construction would be closed and rehabilitated. It is expected that salvage activities may impact mule deer hiding cover along roads. However, the trees being

removed are already dead and currently provide limited value as hiding cover. Over the next 15 to 25 years as the new forest regenerates, hiding cover along roads will increase.

Under this alternative there will be an increase in forage production for all of the treatments, with forage increase being greatest in areas that are clearcut. Under this alternative, there would be approximately 4,445 acres that will show increased forage production over the next 5 to 10 years after the treatment has been completed.

In the long term, these areas will exhibit an increase in hiding cover as regeneration of lodgepole pine seedlings and aspen suckering occurs over time. In harvested areas the regeneration would come in faster and thicker than most of the uncut beetle infested forest, which will eventually fall over and create potential barriers along the ridges and slopes in areas for deer movement and where much of the ground for future regeneration would become compromised from wind fallen timber. Distribution and pattern of proposed salvage units do not create a movement barrier for deer.

Interior habitat or thermal cover is extremely important to mule deer for protection from inclement weather conditions, security and protection from harassment and predation. At the very least the action alternative would provide small and large openings where additional forage would be available to deer in the short term (Wallmo et al. 1972) followed by rapid thick growth of naturally regenerating aspen and lodgepole pine, culminating in creating thermal cover much faster than the surrounding untreated beetle killed areas.

In order to view the broader picture of the potential impacts on the mule deer population, the number and percentage of acres proposed to be treated with this alternative were evaluated in terms of the Utah hunting unit and Wyoming hunting area. In Utah, the North Slope Hunting Unit for mule deer is comprised of 783,523 acres. There are 30,391 acres of the hunting unit located in the Smiths Fork Project Area. Of those acres located in the project area, 2,651 acres, or 9 percent, would be treated under this alternative. Out of the entire hunting unit, 0.3 percent would be treated. Wyoming Hunting Area 132 is comprised of 1,078,477 acres of which 27,406 acres are located in the Smiths Fork Project Area. Under this alternative there are 1,775 acres, or 6 percent, of Hunting Area 132 that are proposed to be treated within the Smiths Fork Project Boundary. Of the total acres of Hunting Area 132, 0.2 percent of the area would be treated through the proposed action.

Effects to Moose

Acres of winter-year-long and crucial winter habitat removed or influenced from salvage treatments and roads will be used to evaluate the effects of the timber treatment on moose.

Alternative 1, No Action. Under the No Action alternative there would be no salvage activities occurring in the project area. Therefore, hiding cover would decrease in the short term and recover slowly in the long-term. As dead timber from pine beetle mortality begin to fall and create a large increase in fallen down woody debris, some areas of existing hiding cover from natural regeneration would be lost to the jack-strawed or falling dead timber which would also create a form of hiding cover for moose, but unfortunately this event will make many areas inaccessible for foraging or seasonal migratory movement by moose. The biggest loss to moose under the No Action alternative would be loss of large areas of once existing interior habitat or thermal cover extremely important for protection from inclement weather conditions, security and protection from harassment and predation because of beetle mortality. In general, lodgepole pine forests are not important winter habitat for ungulates like elk and deer, but local populations of moose, will utilize pure lodgepole pine stands in their winter range near forage areas as shelter in the winter months and security cover from predators. The current infestation may have gradual

long term negative impacts on moose winter habitat (Wong 2008) as green stands die and dead stands lose their branches and cover value.

Under this alternative the main disturbance that would displace moose from available habitat would be from vehicular traffic. After buffering the roads with a 1,000m buffer (Shanley and Pyare 2011) for the road-influence zone, there is a total of 8,716 winter-year-long acres and 5,895 crucial winter-year-long acres in Wyoming that will be influenced by existing roads. On the Utah portion of the project area, 20,229 acres of crucial winter habitat will be influenced by the road influence zone.

Alternative 2, Proposed Action. Implementation of Alternative 2 has the potential to affect moose winter-year long and crucial winter-year-long range in the analysis area. In Wyoming, there are 20,065 acres of winter-year-long and 7,345 crucial winter-year-long classified habitat in the project area. Of the moose habitat located in the Smiths Fork project boundary, 1,143 acres (6%) of winter-year-long and 633 acres (9%) of crucial winter-year-long habitat would be treated under this alternative. The WGFD has defined 11 miles of migration routes in the proposed project area, of which .6 miles would be altered by the Proposed Action. Of the portion of the project in Utah, there are 30,211 acres of crucial winter habitat of which 2,632 acres (9%), would be treated.

The timber treatments identified in the Proposed Action would affect the habitat structural stages in the Smiths Fork proposed project area and thus would affect year-long moose hiding cover. Salvage activities that open the canopy cover would increase transitional summer range forage and browse habitat quality in the short-term. Distribution and pattern of proposed salvage units do not create a movement barrier for moose.

Interior habitat or thermal cover is extremely important to moose for protection from inclement weather conditions, security and protection from harassment and predation. Moose are year-long residents in the proposed project area and use lodgepole pine as thermal cover. The salvage activities will create some small and large openings that will reduce the thermal winter cover for moose in the short-term. In the long-term, however, the treated areas will exhibit an increase in hiding cover as regeneration of lodgepole pine seedlings and aspen suckering occurs over time. In these harvested areas the regeneration would come in faster and thicker than most of the uncut beetle infested forest, thus increasing yearlong thermal cover for moose faster.

The moose hunting unit covers 783,523 acres in Utah on the North Slope of the Uinta Mountains. Of these, there are 30,391 acres in the Smiths Fork project area. Of the acres in the project area, 2,651 acres, or 9 percent, would be treated under this alternative. Out of the entire hunting unit, 0.3 percent would be treated.

Portions of Wyoming Hunting Areas 27 and 35 are located in the project boundary. There are 468,197 acres and 976,151 acres that make up Hunting Areas 27 and 35 respectively. The total acres of hunting areas 27 and 35 located in the project area are 27,230 and 180 respectively. Under this alternative there are 1,766 acres, or 6%, of Hunting Area 27 and 11 acres, or 6%, of Hunting Area 35 that are proposed to be treated. Of the total acres of Hunting Areas 27 and 35, 0.4% and 0.001% respectively would be altered under this alternative.

Effects to Upland Game

Alternative 1, No Action. Under the no action alternative there would be no salvage activities in the project area. Upland game species that are completely dependent on conifers for most of their life histories would decline in population because there would be a loss of available food and habitat from the

beetle kill epidemc. Under the no action alternative, there would be no direct effects to upland game species. Indirect effects to upland game species may occur in the project area from impacts associated with large-scale natural disturbances such as continued mountain pine beetle tree mortality and wildfire. This indirect effect scenario is speculative and the amount of impact would vary depending on the scale of the natural disturbance.

Alternative 2. The Proposed Action would not make a big difference in upland game effects beyond what is projected to occur under the No Action alternative. After salvage harvesting, forbs and grasses will invade the units for the first 5 to 10 years as the lodgepole and aspen suckers become established. Hiding cover is driven by structural stages of the forest cover types, thus actions that affect the habitat structural stages (timber management) will affect hiding cover. These areas will increase in hiding cover from regeneration of lodgepole pine seedlings and aspen suckers over time. In harvested areas the regeneration would come in faster and thicker than most of the untreated beetle infested forest which will eventually fall and result in an excess of large down woody debris, where much of the ground for available forage and future regeneration would become compromised from wind fallen timber. The locations of the harvest units within the sale would not be an issue for small game species as it is with some other species and their seasonal movements.

Effects to Small Mammals

Alternative 1. A steady decline in the populations of small mammals, which totally depend on coniferous forests for most of their life histories, in the proposed project area is expected as beetle mortality continues under the no action alternative. Over time, small mammal species associated with meadows and other natural openings would benefit and expand to areas where new openings in the forest matrix have been created from trees that have fallen. These benefits would only be for the short-term because within 15 to 30 years aspen suckers and lodgepole pine saplings would take over the open areas and regenerate the forest. Under the no action alternative this succession would take a greater amount of time to occur.

Alternative 2. Under Alternative 2 effects to small mammal species would not be much different than the effects seen in the no action alternative, other than the timing of the regeneration of aspen suckers and lodgepole saplings. After salvage harvesting, forbs and grasses would invade the units for the first 5 to 10 years as the lodgepole and aspen suckers become established. Under this alternative forest habitat would regenerate thicker and more rapidly. The quicker regeneration would benefit those species that are completely dependent on early aspen and lodgepole regeneration for food and cover. In the long-term, the small mammal species that depend on mid-age and mature aspen and conifer forests would benefit from expedited regeneration.

It is difficult to determine potential changes in hiding cover caused by tree mortality from the mountain pine beetle outbreak. Because hiding cover is driven by structural stages of the forest cover types, action alternatives that affect the habitat structural stages (timber management) would affect hiding cover. Timber cutting and management actions or salvage activities that open the canopy cover would increase forage and browse habitat quality (i.e., forbs, grasses, and aspen suckers). Hiding cover from the regenerating lodgepole saplings and aspen suckers in these areas is expected to increase over time. In harvested areas regeneration would be faster and thicker than most uncut beetle infested areas, which would eventually fall and result in an excess of large down woody debris, where much of the ground for available forage and future regeneration would become compromised from wind fallen timber.

In conclusion, for small mammals the potential benefits from salvage logging the units within the proposed project area outweigh the potential negative impacts from the initial loss of mature aspen and conifer habitat.

3.7.3 Management Indicator Species

Management indicator species (MIS) are species selected because changes in their populations could indicate the impacts of management actions on the overall quality of habitat for other species that utilize the same habitat type. For the Wasatch-Cache National Forest, the **northern goshawk** is the MIS for the aspen, conifer, and mixed conifer cover type; the **snowshoe hare** is the MIS for pole/sapling aspen, conifer, and mixed conifer cover type; and the **beaver** is the MIS for riparian cover type (Forest Service 2003b:J4-J5).

Effects to Northern Goshawk

Alternative 1, No Action. Salvage activities would not take place, resulting in a loss of up to 4,445 acres of treatment areas that would potentially begin to regenerate 10 to 20 years faster than the surrounding beetle killed area that in the short term would provide foraging habitat for prey base associated with grass/forb and early seral stages. Potential scenarios for the northern goshawk are addressed in Appendix A of the wildlife technical report.

Alternative 2, Proposed Action. As the timber becomes more bug-infested and dies, goshawk suitability of these stands decreases and goshawks will likely have to travel greater distances to meet their energy and nesting resource needs. As habitat degrades the territories become larger and fewer birds can inhabit a specific area (Pers. Comm. Paul Cowley and Russell Graham, 2012). Implementation of the Proposed Action will speed up the loss of suitable habitat but will allow for a new stand of timber to become established and return to mature trees sooner (Gill 2012). Conversion of the stand may result in a decrease in the population numbers in the analysis area in the short term but will allow the population to recover more quickly in the long-term because suitable habitat can provide for smaller territories and a potential increased number of birds in an area. The proposed action is not expected to result in a change in the population numbers or trend of northern goshawks forest-wide.

Implementation of Alternative 2 would benefit the goshawk prey base, especially those species that frequent open meadows and early succession areas in the form of young lodgepole, mixed conifer and aspen dominated stands. Considering the current mountain pine beetle outbreak on the North Slope, an increase in hiding cover over time would be beneficial to northern goshawk small mammal prey base species such as rabbits and ground squirrels. Because the goshawk does not rely on a specific prey base and has a variety of species available to choose from that use many different habitats and may or may not be influenced by proposed salvage treatments, implementation of the Proposed Action will not negatively impact their ability to forage successfully.

In territories with proposed salvage units, no more than 10 to 15 percent in salvage treatment would occur in the post-fledging family area (PFA). The only treatments proposed within the 30 acre nest buffers are roadside salvage that are proposed for public safety located in the Buck Fever Ridge II, Slab Park and Suicide Park goshawk territories. These treatments will not occur during the active nesting period if the nests are determined to be active by the biologist the year the treatments will be completed. Northern goshawk habitat to be salvaged under the action alternative consists of approximately 4,058 acres, and represents approximately 0.8 percent of the suitable goshawk habitat on the Wasatch-Cache portion of the national forest.

Effects to Snowshoe Hares

Alternative 1, No Action. No immediate human-caused management effects to snowshoe hare habitat in the analysis area would occur, but the current bark beetle epidemic is altering the lodgepole pine at the landscape-scale. Currently there are approximately 211,000 acres of lodgepole pine on the Evanston/Mt. View Ranger District being heavily impacted by the mountain pine beetle. Mortality of mature conifer species is occurring and the potential for wildfire may increase during certain phases of forest mortality and regeneration. Although both bark beetle mortality and wildfire are natural events, they too have the potential for affecting snowshoe hare populations. As previously stated bark beetles are causing high levels of lodgepole pine mortality within the analysis area. This will likely influence snowshoe hares even under the no-action scenario.

Alternative 2, Proposed Action. Effects under the proposed action will not make a big difference to the snowshoe hare beyond what is projected to occur under the no action alternative with the mountain pine beetle outbreak on the North Slope. After salvage harvesting, forbs and grasses will invade the units for the first 5 to 10 years as the lodgepole and aspen suckers become established. Because hiding cover is driven by structural stages of the forest cover types, actions that affect the habitat structural stages (timber management) will affect hiding cover.

Timber cutting and management actions or salvage activities that open the canopy cover will increase forage and browse habitat quality (i.e., forbs, grasses and aspen suckers). These areas will increase in hiding cover from new growth of regenerating lodgepole pine seedlings and aspen suckers over time. In harvested areas the regeneration would come in faster and thicker than most of the untreated beetle infested forest which will eventually fall and result in an excess of large down woody debris, where much of the ground for available forage and future regeneration would become compromised from wind fallen timber. The position of the harvest units within the sale would not be an issue for snowshoe hare seasonal movements.

Effects to Beaver

Alternative 1, No Action. The No Action alternative would not impact beaver habitat. Although the benefits to beaver and beaver habitat of regenerating aspen and willow, resulting from salvage units near riparian, would be foregone. The mountain pine beetle outbreak will continue to spread throughout the Smiths Fork drainage resulting in less water being taken up by the conifer forest. The result will be more water available in the streams and an increase in the water flows that can impact beaver. High water flows could create a loss of existing beaver dams & lodges, and in some instances will push beaver downstream until flows subside. It is not expected to be a problem to the overall population of beaver within the Smiths Fork drainage.

Positive results include the spread of aspen clones through regeneration in the form of suckering. It is anticipated that there will be a large change in the vegetative composition of the drainage over to aspen but, with time, young lodgepole regeneration will become established amongst the aspen. The lodgepole will begin to overtake the aspen in the long term. Willow habitat would spread in those areas where the increase in the water table favors their growth. Willow, like aspen, is an important food source and building material for beaver within the Smiths Fork area. Most of the riparian areas within the Smiths Fork drainage have willow growing in them. The willows that are found along the riparian areas include Drummond, planeleaf, and Booth's willow and are the most dominant species, but others exist in smaller populations.

Alternative 2, Proposed Action. Implementation of salvage harvest under Alternative 2 would not impact beaver habitat, since there are no harvest units proposed within or in close proximity to ponds, seep, springs or the riparian habitat component.

3.7.4 Endangered, Threatened, Proposed, and Candidate Species (Wildlife)

Effects to Canada Lynx

Alternative 1, No Action. There are no proposed salvage activities under the No Action alternative. The direct effects to lynx and their prey base under the No Action alternative are associated with the timeline and effects of the mountain pine beetle epidemic which is devastating suitable lynx habitat within the project area. A large percentage of the lodgepole pine overstory has been killed by mountain pine beetle. Over time there would be a long lasting impact from the mountain pine beetle epidemic before thick natural regeneration would begin to fill in the wind blown trees in the project area. The habitat would see an increase in the down woody component supplementing additional denning habitat within the LAU, but currently denning habitat is abundant and well distributed within the project area. Thermal and hiding cover would be lost from the stands as trees begin to fall within the project area making a large portion of the area unsuitable lynx habitat.

Under the No Action, there would be a loss of suitable snowshoe hare cover and foraging habitat until regeneration begins to take hold in the available openings. As the dead lodgepole pine overstory begins to fall over time, the large down woody debris would be jack-strawed in places. Regeneration would be slow and patchy at best with some areas coming in thick and others somewhat sparse. Regeneration would vary throughout the project area and would occur 10 to 30 years slower than under the action alternative.

Alternative 2, Proposed Action. Potential direct effects include the displacing of any animals and/or the removal of primary and secondary habitat, which is high elevation mixed conifer forest. The proposed action occurs in suitable, high elevation mixed conifer-dominated forest. Direct effects are expected since the area may function as a lynx travel corridor, and the proposed action involves salvage of approximately 3,813 acres of suitable lynx habitat. But it is also important to recognize that there is a mountain pine beetle epidemic on the North Slope of the Uintas and a large percentage of the existing mature lodgepole pine is being lost to pine beetle attacks. Therefore, regeneration of the lodgepole pine component to produce the future forests of habitat for lynx as well as their prey base the snowshoe hare is of vital importance. The units will begin to define the potential locations of future interior habitat where thick regeneration response is required to produce future forests with quality hiding and thermal cover over time. The proposed project **may affect, but is not likely to adversely affect this species**. Formal consultation was initiated with the U.S. Fish and Wildlife Service, which in a December 20, 2012 letter concurred with the Forest Service determination.

3.7.5 Forest Service Intermountain Region Sensitive Species

Effects of Alternative 2 to Gray Wolves

The UDWR considers the gray wolf to be extirpated from the state of Utah. There are currently no known packs or breeding pairs inhabiting Utah. There are occasional sightings reported by individuals but there have been no confirmed sightings on the North Slope of the Uintas (Pers. Comm. Dave Rich UDWR wildlife biologist). In 2009, however, a radio collared wolf from the Yellowstone area traveled through the North Slope and into Colorado unseen by anyone. The North Slope of the Uintas contains suitable habitat for the gray wolf, but presently there are no known packs or breeding pairs on the Evanston-Mt. View Ranger District (Pers. Comm. Dave Rich, UDWR wildlife biologist, and Jeff Short, WGFD wildlife

biologist) and wolves that have crossed into the District were just dispersing through. Therefore, implementation of the Proposed Action **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**.

Effects of Alternative 2 to Wolverines

Wolverines are considered wanderers and travel great distances over their home range. In fact, estimates generally suggest that female home ranges can encompass an area of 28 to 129 mi^2 and males ranging from 163 to 581 mi^2 (Whitman et al. 1986, Copeland 1996, Landa et al. 1998, Persson et al. 2010). Vegetative characteristics appear less important to wolverine than physiographic structure of the habitat. Montane coniferous forests, suitable for winter foraging and summer kit rearing, may only be useful if connected with subalpine cirque habitats required for natal denning, security areas, and summer foraging (Wolverine Foundation, 2012). Natal den habitat on talus slopes may exist within the High Uintas Wilderness, but salvage logging will not occur in these areas, nor will disturbance at lower elevations occur during the winter months when this habitat is potentially utilized by wolverine. Prey base in the summer months will include snowshoe hare and ground squirrels and these species can be affected by salvage logging. In the short term, salvage unit openings will provide habitat for ground squirrels, but over time as the regenerating conifer grow in size and height, this will become quality snowshoe hare habitat. The short term and mid-term results from post-harvest will be very beneficial to prey base such as ground squirrels and snowshoe hare. The overall impact of salvage harvest on the landscape will be minimal to wolverine which occupies a very large home range. In addition, harvest activities would occur at lower elevations away from den and kit rearing habitat found at higher elevations in the High Uintas Wilderness. Therefore implementation of the Proposed Action **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.**

Effects of Alternative 2 to Boreal Owls

Implementation of the Proposed Action would salvage harvest beetle kill lodgepole pine which could provide future conifers with cavities used for nesting by boreal owls. But with the current pine beetle outbreak on the North Slope there will be no shortage of suitable nesting habitat for boreal owls. Unfortunately the pine beetle outbreak will significantly impact the existing interior forest habitat which will be lost over time. Also, the availability of small mammals limits populations of boreal owls in many areas; therefore, factors that influence small mammal abundance and availability will directly influence the abundance of boreal owls. The openings and down woody debris created by salvaged units could have a positive impact to the boreal owl's small mammal prey base by regenerating the forest sooner than what would occur naturally in the surrounding pine beetle mortality landscape. In the long-term, the loss of this conifer component is important since boreal owls are interior forest hunters and rarely hunt in open areas. Therefore implementation of the Proposed Action **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.**

Effects of Alternative 2 to American Three-toed Woodpeckers

The pine beetle outbreak will temporarily increase populations of three-toed woodpeckers, but over time their habitat will be significantly impacted. Three-toed woodpeckers are dependent on dead conifers for both nesting and foraging and species may be affected by salvage operations, but the mountain pine beetle outbreak will benefit this species in the short-term and there is substantial nesting habitat available if some individuals are inadvertently displaced during implementation of salvage harvest activities. Therefore, implementation of the Proposed Action **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.

Effects of Alternative 2 to Great Gray Owls
In general, salvage logging through implementation of the Proposed Action would not result in the loss of large broken top conifers used for nesting by great gray owls, but is expected to have potential positive impacts to the great grey owl's small mammal prey base with the openings and down woody debris created through timber salvage harvest operations.

Availability of nest sites and suitable foraging habitat are considered the most important factors governing habitat use by breeding great gray owls. With the current pine beetle outbreak on the North Slope there will be no shortage of suitable nesting structures in the future for great gray owls. Unfortunately the pine beetle outbreak will also significantly impact the existing interior forest habitat surrounding nest sites, and could significantly impact the habitat of great gray owls on the North Slope.

Great gray owls forage in relatively open, grassy habitat, including bogs, selective and clear-cut logged areas, natural meadows, and open forests (Hayward and Verner 1994). Salvage harvest activities associated with the action alternatives would not have a negative impact to the great gray owl and would actually provide openings important for foraging owls and in the short-term provide early successional habitat for their small mammal prey base. Therefore implementation of the Proposed Action **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.**

Effects of Alternative 2 to Northern Goshawks
The northern goshawk is also a Management Indicator Species (MIS) and is discussed in detail in the MIS section above. Salvage harvest units within the foraging area would begin to define areas of interior habitat that are being lost to the current mountain pine beetle outbreak. Goshawks prefer to forage in closed canopy forest with moderate tree densities as compared to young open forests. During the breeding season, medium to large birds (woodpeckers, grouse, jays, robins, etc.) and mammals (ground and tree squirrels and hares) dominate the goshawk's diet (Graham et al. 1999). The goshawk does not have a specific prey base that is relied on which provides the species with an abundance of species to choose from. Since their prey base is varied and the prey species may or may not be influenced by salvage logging, implementation of the action alternative is not expected to negatively impact the goshawks ability to forage successfully in the proposed project area. Therefore, implementation of the proposed action **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.**

Northern Goshawk Mitigation. A seasonal nesting restriction from March 1 through August 1 will be in effect for any active territory in Lost Man, Buck Fever Ridge, Slab Park, Gourley Meadows, Buck Fever Ridge II, Loop Road, West Smiths Fork, Suicide Park, and Archie Creek. The District Biologist will be responsible on an annual basis for determining if any of these nine territories are active or not prior to commencing salvage harvest activities within their PFAs or the nesting areas for the Buck Fever Ridge II, Slab Park and Suicide Park territories. Monitoring of northern goshawk territories on the North Slope have demonstrated that goshawk nestlings fledged by the end of July and the parents are able to move the fledglings away from any disturbance within the PFA, therefore lifting of the seasonal restriction by August 1 is justified.

Summary of Effects to Sensitive Species

Alternative 1, No Action. The No Action Alternative would not implement any proposed salvage harvest activities. This would result in timber stands regenerating at a slower rate. Species like boreal owls or northern goshawk would be vacant or at a lower density for a longer period of time.

Alternative 2, Proposed Action. Implementation of Alternative 2 will provide benefits for Forest Service Sensitive Species and their prey base. There may be short term negative impacts associated with salvage harvest activities, but these will be minimal and insignificant compared to the large overriding negative impacts associated with the current mountain pine beetle outbreak on the North Slope. Because wolverines have large home ranges, do not tolerate human disturbance and most likely spend most of their time in high elevation wilderness areas, it is not anticipated that the Smiths Fork Salvage will have any significant impact to wolverine or its habitat. Prey base in the summer months will include snowshoe hare and ground squirrels and these species can be affected by salvage logging. In the short term, salvage units will provide habitat for ground squirrels, but over time as the regenerating conifers grow in size and height, this area will become quality snowshoe hare habitat. Therefore, overall the short term and mid-term results from post-harvest will be very beneficial to wolverine prey base.

Implementation of Alternative 2 would not impact large conifers with cavities used for nesting by boreal owls nor would it result in the loss of large broken top conifers used for nesting by great gray owls, but salvage logging could have potential impacts to the boreal and great gray owl's small mammal prey base. The availability of small mammals limits populations of boreal owls in many areas. Therefore, factors that influence small mammal abundance and availability will directly influence the abundance of boreal owls. Availability of nest sites and suitable foraging habitat are considered the most important factors governing habitat use by breeding great gray owls. They forage in relatively open, grassy habitat, including bogs, selective and clear-cut logged areas, natural meadows, and open forests (Hayward and Verner, 1994). Implementation of Alternative 2 would not create a significant impact to the habitat or a decline to the small mammal prey base to potentially foraging boreal and great gray owls or any other sensitive species dependent on them.

Three-toed woodpeckers will not be impacted by salvage harvest activities, but over time their habitat will be significantly impacted. Three-toed woodpeckers are dependent on dead conifers for both nesting and foraging and species may be affected by salvage operations, but the mountain pine beetle outbreak will benefit this species in the short term by temporarily increasing populations of three-toed woodpeckers. Because of the current beetle outbreak on the North Slope, there is substantial nesting habitat available if some individuals are inadvertently displaced during implementation of salvage harvest activities.

There are nine northern goshawk territories within the Smiths Fork Salvage analysis area. In territories with proposed salvage, no more than 10-15% in salvage treatment would occur in the post-fledging family area (PFA) and no treatment is proposed within any known 30 acre nest site during the active nesting period. In addition a seasonal nesting restriction would be in effect for territories with harvest units in active territories (See northern goshawk mitigation above). Salvage harvest units would potentially begin to regenerate 10-20 years faster than the surrounding beetle killed area that in the short term would provide foraging habitat for prey base associated with grass/forb and early seral stages. But in the long term will create the mature forest and key interior habitat components for northern goshawks.

3.7.6 Effects on Neo-tropical Migratory/Song Birds

Alternative 1, No Action. Of the neotropical migrants (Williamson's sapsucker, olive-sided flycatcher, golden eagle, Cordilleran flycatcher, Cassin's finch, broad-tailed hummingbird, and black rosy-finch)

analyzed for this project, those species that have both nesting and foraging activities associated with conifer forest will be impacted by the No Action alternative. With the No Action alternative there are no immediate management action effects to the lands within the analysis area, or to wildlife resources. However, the current mountain pine beetle outbreak is altering the lodgepole pine and the spruce bark beetle some spruce cover types at an alarming rate throughout the North Slope. Mortality of mature conifer species is occurring and it is expected that the potential for wildfire will increase during certain phases of forest mortality and regeneration. Although both bark beetle mortality and wildfire are natural events, they have the most potential for affecting wildlife populations in the future. Potential scenarios for a variety of important wildlife species resulting from beetle mortality are addressed in Appendix A. Under the No Action alternative, there would be no direct effects to wildlife resources. Indirect effects to wildlife species may occur in the project area from impacts associated with large-scale natural disturbances such as continued tree mortality and wildfire. This indirect effect scenario is speculative and the amount of impact would vary depending on the scale of the natural disturbance associated with beetle kill conifer mortality.

Alternative 2, Proposed Action. Any action, or non-action, that affects habitat on National Forest System lands will adversely affect some species and be beneficial to other species. This is very evident when considering birds whether they are migratory or not. Implementation of Alternative 2 would have the greatest effect on migratory birds associated with nesting and foraging in conifer habitat. Species that nest in open meadows, along edges, shrub-lands, and aspen will be least affected by salvage operations. Of the species listed above, the black rosy finch is a ground nester but is found in the rocky tundra and cliffs that would not be impacted during this project. The Williamson's sapsucker's habitat would not be impacted by salvage logging since efforts will concentrate in removing lodgepole pine beetle killed overstory and this species is closely associated with aspen. In the long term, neotropical migratory bird species dependent on aspen would benefit from the regeneration of aspen resulting from salvage activities planned under the action alternative. The rest of the species listed nest on cliffs and would not be affected unless their nesting and foraging habits are interrupted or otherwise modified by salvage activities. Salvage logging would target recent beetle killed conifers and not old snags with rot, cavities or other defects that are important for cavity nesters. Proper monitoring as outlined in the Forest Plan would minimize effects on birds, including migratory birds.

It is not anticipated that implementation of Alternative 2 would have any significant negative impacts to neotropical migratory bird species in the project area. It is anticipated that in these areas regeneration of the forest, both conifer and aspen, will occur 10-20 years faster than in the surrounding beetle killed forest matrix. Therefore, it is my determination that the Smiths Fork Salvage logging would not be detrimental to migratory bird species. The intent for both the Migratory Bird Treaty Act and Executive Order 13186 are being met by reducing the negative impacts and incidental take of migratory bird species on Smiths Fork Salvage and by meeting guidelines and standards established in the Forest Plan.

3.7.7 Cumulative Effects

Big Game

Timber. Since 1961, there have been 11,196 acres that have undergone timber treatments within the Smiths Fork Drainage. Treatments that have taken place prior to 1992 will have already regenerated into habitat that provides thermal and hiding cover for big game species. Treatments that occurred from 1993 to 2002 will be in the intermittent stage that will provide some foraging for big game, as well as some hiding and thermal cover. Any treatments that occurred from 2002 to present will be more open and not

provide big game with much, if any, thermal and hiding cover. Past actions from 2002 to present have created a total of 3,415 acres that may not provide adequate cover for elk and may keep the species from fully utilizing these areas regardless of increased forage production in these areas. The past actions from 2002 to present have created 2,336 acres of areas that could be considered to be in the early successional stage and provide increased forage for mule deer. For moose, the past actions from 2002 to present have reduced the amount of thermal cover and protection on 2,337 acres, indicating that moose may not fully utilize these areas. These areas over time will begin to provide adequate thermal cover and protection as regeneration takes place and therefore, in conjunction with the proposed project, are not expected to have major, long-term impacts on big game populations.

Roads/Recreation. Cumulative impacts associated with recreation activities (e.g., hiking, camping, off-highway vehicle use, fishing, hunting, etc.) within Smiths Fork drainage, constitute disturbance from noise and human presence during these activities. This disturbance may displace wildlife into other areas within the drainage. The displacement is the same as discussed in the effects of Alternative 2 on each big game species and is not expected to change since there are no new permanent roads planned as a result of implementing the Proposed Action and no increase in the number of roads per square mile, there would be no measurable long-term negative impacts to the big game species.

Livestock Grazing. There are three cattle allotments and a portion of a sheep allotment within the proposed project boundary. Livestock will compete with wildlife for forage on forest lands. Cattle are mainly grazers; therefore, their diets overlap largely with elk who consume mainly grasses. There is some overlap with deer and moose as well. Elk generally do not use areas concurrently where livestock are grazing, but will use these areas when livestock move out (Stewart et al. 2002). Riparian areas, which are used by elk and moose for forage, watering, and as wallows, will continue to be affected by livestock grazing. The effects of cattle grazing in conjunction with the proposed salvage treatments will not have measurable long-term impacts to big game species or their populations, due largely in part to the increase in forage over the next 5 to 10 years that will be seen in the treated areas.

Sensitive Species

Timber. Past timber harvests in the Smiths Fork area can have varying effects on sensitive species based on the age of the treatment. Treatments that were completed between 5 and 10 years ago will increase the amount of forage in a treated stand, which will in turn increase the abundance of prey species for many of the sensitive species. As the regeneration begins, hiding cover increases for larger prey species, but the forage component decreases due to an increase in the canopy cover. As the regenerated trees thin out and increase in size, they become more suitable habitat for species such as the boreal owl and northern goshawk. Since there are stands treated at various times since 1961, there is a variety of age classes and suitable habitat for the various sensitive species and in conjunction with the Proposed Action, past timber treatments will not result in long-term negative impacts to sensitive species.

Roads/Recreation. Cumulative impacts associated with recreation activities (e.g., hiking, camping, off-highway vehicle use, fishing, hunting, etc.) within the Smiths Fork drainage, constitute disturbance from noise and human presence during these activities. This disturbance may displace wildlife into other areas within the drainage. The majority of the recreational activity in Smiths Fork is concentrated near FS roads 80058, 80072, 80073, 80074, 80075 and the adjacent roads, dispersed sites, campgrounds and the wilderness trail system. This will leave large areas that are undisturbed and can provide sanctuary for sensitive wildlife species within the project area.

Livestock Grazing. Livestock grazing reduces hiding and nesting cover for species that depend on cover for security. In general, livestock grazing has decreased vegetative structural diversity in portions of the allotments, particularly those in riparian areas, and in some areas of intensive use such as those near water where livestock concentrate. Reduced cover in open areas and riparian areas can have impacts on the prey species for the gray wolf, wolverine, boreal owl, great gray owl, and northern goshawk. Livestock grazing has minimal to no impact on three-toed woodpeckers since this species nests, roosts, and forages in conifer and conifer/aspen stands and is not dependent on understory vegetation.

Management Indicator Species

Timber. Effects of past timber harvests vary between northern goshawks and snowshoe hares, the only MIS species that may be impacted by the Proposed Action. Areas that have been treated create good foraging grounds for goshawks during the 5 to 10 years in which there is an increase in the amount of forage for small prey species. As the lodgepole saplings and aspen suckers begin to regenerate, the stands are very thick and not suitable for goshawks. During the period in which the treated stands have thick regrowth, the habitat becomes suitable for snowshoe hares. The stands can remain suitable snowshoe hare habitat until about year 40 after the treatment. When the trees become too large, there is not enough forage and cover for snowshoe hares during the winter months and the species moves to more suitable habitat. After the trees have started thinning out, the habitat once again becomes suitable to goshawks. Goshawks will begin to start nesting in these stands when the trees become large enough to hold nests.

Since there are varying stand age classes created by the treatments, and in conjunction with the proposed project there will be no more than 10 to 15 percent of the habitat within a known goshawk PFA, the past timber actions do not result in adverse long-term impacts to MIS species.

Roads/Recreation. Cumulative impacts associated with recreation activities (e.g., hiking, camping, off-highway vehicle use, fishing, hunting, etc.) within the Smiths Fork drainage, constitute disturbance from noise and human presence during these activities. This disturbance may displace wildlife into other areas within the drainage. The majority of the recreational activity in Smiths Fork is concentrated near FS roads 80058, 80072, 80073, 80074, 80075 and the adjacent roads, dispersed sites, campgrounds and the wilderness trail system. This will leave large areas that are undisturbed and can provide sanctuary for wildlife species within the project area.

Livestock Grazing. The effects of grazing on goshawks are related to the effect on their prey habitat and prey populations. Livestock grazing can impact goshawk prey species that require higher levels of litter and residual vegetation, particularly in riparian areas and aspen stands. Grazing can interfere with aspen regeneration which reduces goshawk prey (Graham et al. 1999). Grazing also affects habitat by altering vegetative structure and diversity of aspen stands, which changes goshawk foraging habitat (Graham et al. 1999, Reynolds et al. 1992). Grazing can reduce or eliminate foraging habitat potential within riparian areas, which are sometimes selected for goshawk nesting sites (Hargis et al. 1994, Lilieholm 1994, Reynolds et al. 1992).

The Wasatch-Cache portion of the UWCNF contains approximately 511,649 acres of goshawk habitat of which 25 percent is grazed. Of the 511,649 acres of goshawk habitat, 287,115 acres occur in the Uinta Mountains sub-region of which 16 percent (45,487 acres) is grazed by either sheep or cattle. Because goshawk habitat within the allotments represents a small portion of the overall habitat available to goshawks within the Forest planning area, and because only a portion of the goshawk habitat within the allotments in the proposed project area will likely be grazed by livestock, grazing in conjunction with the

proposed action is not likely to have any long-term negative impacts on the goshawk population within the Wasatch-Cache National Forest Planning Area.

Browsing or grazing can have impacts on snowshoe hare habitat by reducing the amount of forage and altering the structure or composition of native plant communities. Grazing by livestock and wild ungulates may increase competition with snowshoe hare for forage resources, particularly in riparian areas. Browsing or grazing can also impact snowshoe hare habitat by reducing the amount of available winter browse.

Cattle are not likely to use the conifer habitats extensively because they do not produce more than 200 lbs of forage per acre (USDA Forest Service 2007). Therefore these effects occur only within conifer/aspen and aspen/conifer habitats that are used both by snowshoe hares and grazed by livestock. Potential habitat for snowshoe hare within the Smiths Fork Salvage proposed project area, based on vegetation cover type, is approximately 44,738 acres with 6,689 acres of aspen/conifer and conifer/aspen habitat. Therefore these effects are largely limited to 15 percent of the total snowshoe hare habitat within the proposed project area.

Lynx

Timber. Lodgepole pine stands that are at least 20 years old can be considered suitable lynx habitat. Tree stands at least 20 years old have already begun thinning out, which allow lynx access to the stand, as well as provide a good amount of cover and forage for snowshoe hare populations to be abundant (Fisher and Wilkinson 2005, Koehler 1990, Koehler and Brittell 1990, Koehler et al. 1979, Parker et al. 1983, Thompson et al. 1989). From 1993 to 2011, there were 6,183 acres of lynx habitat treated between LAUs 32, 33, and 34. The LAU with the highest percent of lynx habitat that has been altered to unsuitable is LAU 33, with 4.7 percent of the habitat altered by past treatments. After including the proposed treatment acreage to previously treated acreage, in conjunction with the proposed timber treatments within LAUs 32, 33, and 34, there will be a total of 2,375 acres (4.7 %), 5,719 acres (7.8%), and 1,678 acres (2.7%) of habitat that will be unsuitable lynx habitat is each respective LAU. These percentages are in compliance with the 2003 Revised Forest Plan.

Roads/Recreation. Roads and trails increase fragmentation of habitat across the landscape. Isolated island areas may become unsuitable habitat and affect lynx by increasing forest edge and changing the amount of structural complexity of the forest. There are no permanent new roads planned as a result of implementing the Proposed Action and no increase in the number of roads per square mile, therefore there would be no measurable negative effects to lynx. Ruediger et al. (2000) recommends keeping road densities below two-miles per square mile. Thomas (1979) recommends <1.5 miles of road/square mile for maintaining ~ 70 percent habitat effectiveness within ¼- ½ mile of secondary roads. The existing open road densities for LAUs in the analysis area are less than one mile/square mile. All of the LAUs are well below the recommendations for open road density to maintain habitat effectiveness adjacent to secondary roads. Current open road densities in the LAUs combined with salvage logging will have minimal cumulative effects to lynx.

Cumulative impacts associated with recreation activities (e.g., hiking, camping, off-highway vehicle use, fishing, hunting, etc.) within Smiths Fork in LAUs 32, 33, and 34, constitute disturbance from noise and human presence during these activities. This disturbance may displace any lynx present within the proposed project area into other areas within the LAUs. The majority of the recreational activity in Smiths Fork is concentrated near FS roads 80058, 80072, 80073, 80074, 80075 and the adjacent roads, dispersed sites, campgrounds and the wilderness trail system. This will leave large areas that are

undisturbed and can provide sanctuary for lynx within the project area. Since a lot of the disturbance occurs within specified areas, in most instances wildlife in and near these areas have habituated to the level of noise and disturbance that currently exists. So within these areas of disturbance, recreational activities combined with salvage logging activities should have minimal effects to lynx.

Livestock Grazing. Livestock grazing impacts snowshoe hares from a light to moderate degree in habitats, such as aspen-conifer habitats, that are both grazed and contain snowshoe hares. Conifer habitats probably do not receive much grazing pressure because they do not produce enough forage to sustain livestock. Livestock grazing impacts approximately 15% (6,689 acres) of the snowshoe hare habitat on the allotments in the proposed project area (44,738 acres total). These effects have modest impacts on the population of snowshoe hares that use these grazed snowshoe hare habitats.

The impacts of livestock grazing on small mammals vary considerably among species because of their differing habitat requirements. Livestock grazing impacts species that require high levels of litter and residual vegetation within the allotments of the proposed project area. Prey species abundance can be impacted by livestock grazing, though this would not likely influence the habitat effectiveness of the area for lynx.

All species

Oil and Gas/Seismic Exploration. There are no proposed geophysical seismic activities or scheduled well drilling sites within the Smiths Fork drainage, but 2-dimensional and 3-dimensional geophysical seismic activities may occur in the foreseeable future approximately 10 miles to the southwest and 10 miles east-northeast, respectively, of the proposed project area. These activities consist of setting off underground charges along seismic transacts and recording data to create an underground image of potential oil and gas reserves. The disturbance from the underground charges and drilling is minimal. However, a helicopter is used to move equipment and personnel between locations. Because of the distance of these activities to the project area, no measurable effects to wildlife are anticipated.

3.7.8 Forest Plan Direction Common to All Alternatives

Forest Plan standards S9 and S10, and Forest Plan guidelines G15, G18, G21, G26, and G29 are common to the alternatives. See the relevant sections of the Forest Plan for detailed discussions of these standards and guidelines.

3.8 Botany

3.8.1 Effects to Threatened and Endangered Plant Species

There are no known populations of any federally listed plant species on the Evanston-Mountain View Ranger District.

3.8.2 Effects to Forest Service Sensitive Plant Species

Slender Moonwort (*Botrychium lineare*)
Slender moonwort is an early to mid-successional species that is found in a variety of habitats across the northwest United States, including mid-height grasslands, grazed rangelands, limestone shelves on a steep slope, woodland trails, along creek floodplains, roadside gravels, and in grass under conifers. The only common habitat requirement is high elevation, northern latitude, and the associated mycorrhizal fungi. The vegetation associated with slender moonwort is often sparse and non-native, with wild strawberry, shrubby cinquefoil, field chickweed, common juniper, and Engelmann's spruce being the most commonly associated species.

Slender moonwort is one of the least sighted moonworts with 34 populations known to have existed. Currently 18 populations have not been relocated and may be extirpated. Specimens from some of the other known populations have not been identified for at least 20 years, but are still considered to be extant because of their diminutive size and their ability to live underground for part of the life-cycle. It is unclear how the presence of the stem above ground correlates to what is below ground and the species may actually be more abundant than what is found in surveys.

Little is known about the requirements for slender moonwort to germinate. The known requirements are water, mycorrhizal, fungi, and absence of light. The fungi are required in all life stages of slender moonwort. Mycorrhizal fungi most likely provide carbohydrates, minerals, and water, and it is suggested that mycorrhizal health may influence the appearance or absence of slender moonwort from year to year. Mycorrhizal fungi is likely the most limiting factor in the growth and reproduction of slender moonwort and habitat requirements for the plant are limited by where the appropriate type of mycorrhizal fungi can grow. Currently, little is known about the associated mycorrhizal fungi.

***Direct/Indirect Effects*.** Timber harvest would not likely directly affect slender moonwort. The plant has not been found in the vicinity of the project area, but depending on the microhabitat, viable habitat may be disturbed during harvest. It is possible that harvest would create new habitat for slender moonwort, because it is an early to mid-succession species and colonizes disturbed areas. Spores may be able to disperse from one of the extant sites to the project area.

Effect Determination. Slender moonwort was not observed during the 2010 and 2012 surveys. The proposed action will have no impact.

Brownie Ladyslipper (*Cypripedium fasciculatum*)
In Utah, brownie ladyslipper is found in the Uinta Mountains as well as Daggett, Salt Lake, Uintah and Summit counties where it grows in spruce-fir forests and along shaded streams between 8,000 and 9,000 feet in elevation. Forest Service personnel have been monitoring a small population found in lodgepole pine in Coyote Hollow near Whitney Reservoir on the Evanston Mountain View Ranger District.

The general habitat across the range for brownie ladyslipper is mixed conifer forest, but associated tree species vary greatly. In Colorado, Wyoming, and the Uinta Mountains of Utah, the species is found mostly in spruce-fir dominant forests. The common habitat feature is a dense and continuous canopy cover.

This ladyslipper may take as long as 12 years to reach reproductive maturity and is self-compatible in reproduction, but requires a biotic vector (possibly a bumblebee *Bombus sp*.) for successful pollination. The resulting seeds are small and dust-like, but unable to travel any further than 3 to 7 feet from the parent plant. Seeds are able to stay dormant in the soil for one or more years before aboveground growth is observed.

In the Uinta Mountains the species occurs in duff of moderately dense (less often dense) lodgepole pine forests with most trees 3 to 8 inches dbh where understory species are sparse and mostly limited to scattered plants of this species and a few others. Extensive surveys on the Uinta-Wasatch-Cache National Forest portion of the Uinta Mountains have located small populations numbering not more than 10 in any population. In the Wasatch Mountains and Bear River Range this species occurs in duff of dense to fairly open spruce-fir communities.

Direct/Indirect Effects. Brownie ladyslipper is affected by deforestation and soil disturbance. Salvage timber harvest and the resulting habitat loss may potentially affect this species if there is suitable habitat. The one common habitat requirement across the entire range of habitat is continuous and dense tree cover. Surveys of the units over the 2010 to 2012 field season showed that there were isolated pockets of good potential habitat, but most of the units themselves were not considered to be good potential habitat. There were no populations or individuals of brownie ladyslipper found in any of the surveys in the project area and the majority of the harvest units are considered to have marginal habitat at best.

Effect Determination. No brownie ladyslippers were observed during the 2010 and 2012 surveys. The proposed action will have no impact.

Noxious Weeds

The project area remains fairly clean and free of noxious weeds with only 116.12 acres of weeds inventoried. This includes approximately 0.01 acres of white top, 26 acres of musk thistle, 90 acres of Canada thistle, 0.01 acres of broadleaved pepperweed, and 0.01 acres of shaggyfruit pepperweed. White top, broadleaved pepperweed, and shaggyfruit pepperweed are considered 1A species and are targeted for aggressive treatment. Musk thistle and Canada thistle are 3B listed species and are targeted for containment and control and eradication where possible.

Timber harvest and prescribed fire would create the disturbance that favors noxious weed establishment. Standard mitigations should apply to prevent introduction and minimize any increase in infestation size that may occur:

- Harvest equipment and operations should avoid known infestations.
- Harvest equipment should be cleaned and free of vegetation, soil and debris prior to beginning work on FS land. If equipment leaves project area it should be cleaned and inspected prior to reentry on to forest. If the equipment has to work or pass through known infestation areas, the equipment should be cleaned prior to moving into “infestation free” areas of the project area.
- Funding should be allocated to the weed treatment crews to establish a program to monitor and treat any infestations that may be expanded or introduced as a result of this project. Monitoring

should take place as long as necessary until natural vegetation has been established rehabilitation is complete.

3.9 Cultural Resources

Historic properties exist in the area of potential effect ("APE") for the project. Implementation of the recommendations below will mitigate potential adverse effects during project implementation and will protect these sites from inadvertent impacts of the mountain pine beetle epidemic such as wildfire and damage due to falling hazard trees. In light of these proposed mitigation measures, the Forest Service has made the determination of **no adverse effect to historic properties**, as per 36 CFR 800.5(b).

Recommendation 1: Timber Harvest (Salvage Sanitation/Salvage Clearcut) Treatments for Historic era properties. Potential effects to the historic era properties within the APE will be mitigated through avoidance of any mechanical timber harvesting on, and within, a 100-foot buffer around each site. Potential adverse effects to site features could be caused by beetle killed trees which will eventually fall down and are highly susceptible to blow over. Due to the risk that hazard trees pose to the sites, it is recommended that the buffered site area be hand-treated with chainsaws to fell dead trees away from site structures to mitigate adverse effects. The buffered site area will need to be flagged prior to the timber sale, to ensure that no mechanical treatment occurs in those areas. Trees in the buffered site area that pose a threat to site features will be identified, marked, and then removed through hand thinning. Hazard tree removal will require organization between a timber specialist and heritage personnel.

Recommendation 2: Timber Harvest (Salvage Sanitation/Salvage Clearcut) Treatments for Prehistoric Sites. Mechanical treatments have the potential to adversely affect prehistoric sites. There are likely prehistoric sites within the APE, but as a result of dense ground vegetation on the North Slope, no sites have been located in the project area. If additional surveys yield any prehistoric sites, potential affects will be mitigated through avoidance of historic properties. Recommended mitigation consists of no mechanical timber harvesting on and in a 100-foot buffer of the site. To implement the mitigation measures, the buffered site area will need to be flagged prior to the timber sale to ensure that no mechanical treatment occurs in those areas. Trees in the buffered site area that pose a threat to site features will be identified, marked, and then removed through hand thinning. Hazard tree removal will require organization between a timber specialist and heritage personnel.

Recommendation 3: Pile Burning Treatment after Timber Harvest Treatment for Historic and Prehistoric Sites, if necessary. Post timber harvest removal of organic debris from the landscape through the use of fire, if necessary, should be conducted outside the buffered site areas. Ignition should take place at a safe distance from those buffers to prevent fire from being carried into the buffer itself. Hazard tree removal should occur prior to pile burning in order to protect sites against accidental ignition from pile burns located nearby.

Recommendation 4: Fuels Prescribed (Hand Thinning and Pile Burning) Treatments for Historic Sites, if necessary. Adverse effects to historic era properties within the APE will be mitigated through avoidance of any pile burning treatment, if necessary, within the buffered zones. Pile burning should be conducted outside of buffers, and at a safe distance to prevent an ignition from being carried into the buffer. The buffered site area should be flagged prior to the fuels treatment. Hand thinning of hazard trees in the buffer zones will mitigate potential adverse effects from blow over. Trees within the buffer zones that pose a threat to site features will be identified, marked, and then removed. Hazard tree removal will require organization between a timber specialist and heritage personnel.

Recommendation 5: Fuels Prescribed (Hand Thinning and Pile Burning) Treatments for Prehistoric Sites, if necessary. Pile burning has the potential to adversely affect prehistoric sites due to prolonged exposure to high temperatures. It is likely that there are prehistoric sites within the APE, but remain unidentified due to thick ground cover vegetation. If additional surveys identify prehistoric sites, they should be buffered from pile burning. Sites should be protected by avoidance of any fuels pile burning treatment within a 100-foot buffer of the site boundary. Pile burning should occur at a distance safe enough to prevent an ignition from being carried inside the buffer. Trees within the buffered site area that pose a threat to site features will be identified, marked, and then removed. Hazard tree removal will require organization between a timber specialist and heritage personnel.

3.10 Vegetation

3.10.1 Existing Condition

The Smiths Fork project area is on a mixture of poor to moderately productive soils with lodgepole pine predominating. Mixed aspen and lodgepole pine are more abundant in the northern part of the project area and at lower elevations. Mixed conifer and lodgepole pine are more common in the southern part of the project area and at higher elevations. A fire burned approximately 290 acres in the project area in 1999 adjacent to units 4 and 20. A severe mountain pine beetle epidemic has developed over the last few years in the entire mid and lower elevations of the area. Mistletoe infection is prevalent in most stands of lodgepole pine leading to infection of understory lodgepole. There has been past timber harvest in parts of the project area that totals approximately 11,000 acres of regeneration harvests. Fire suppression may have led to the current preponderance of older age classes of conifers and aspen. Aspen is gradually being replaced by conifers in the mixed aspen/conifer stands.

Aspen (including mixed aspen and conifer)
Aspen and aspen/conifer stands occupy the lowest elevations within the analysis area. Together, they represent approximately 15 percent of the analysis area (8,417 acres). Most of these acres (6,666) are mixed aspen and conifer in which conifers make up close to half the canopy cover. There is relatively little pure aspen in the area proposed for treatment.

Aspen stands on the North Slope of the Uinta Mountains are generally either stable, meaning that they are able to reproduce under their own canopies, or seral, meaning that they are stands that occupy sites after disturbance and are gradually replaced by other more tolerant species. Stable aspen is located on lower elevation, drier sites where competition from conifers is limited.

Seral aspen requires periodic disturbance to perpetuate itself. In the absence of disturbance, aspen will be replaced by conifers (Bartos, 2000). Historically, fires most likely began in the sagebrush and burned up into aspen stands where the cooler temperatures and increasing moisture would stop the fires' advance. During those times of drier, warmer, and cured fuel conditions, top kill of aspen was more likely followed by profuse suckering. These fires occurred frequently enough to remove the seed source for conifer species' encroachment.

Aspen has been recognized for many years as being very intolerant of shade (Jones and Debyle 1985) and thus is lost once conifer gains dominance and shade increases.

Aspen is a fire-adapted species that suckers profusely after fire or other disturbance (Debyle and Winokur 1985). Stands that succeed from aspen to aspen/conifer and later to conifer/aspen will eventually lose the aspen component and become less likely to return to early seral aspen with stand treatments be they prescribed fire or mechanical treatments. Campbell and Bartos (2000) suggest that a minimum of 20 mature live stems per acre need to be remaining in the stand in order to assure regeneration to aspen.

Lodgepole pine

Most of the lodgepole pine in the project area is either dead or dying from the current mountain pine beetle epidemic. Lodgepole pine is a pioneer species that regenerates prolifically after stand-replacing fires or harvest. As stands age, become denser and begin reaching a diameter threshold they become susceptible to mountain pine beetles. In larger, continuous stands, beetle outbreaks can result in high levels of mortality. The susceptibility to this level of mortality increases with stand conditions that include stand average diameter greater than 8 inches, and stand age greater than 80 years (Samman and Logan 2000). Elevation and latitude are also important as indicators of climatic conditions favorable to brood development (Samman and Logan 2000; Amman et al. 1977).

The pure lodgepole pine cover type represents 20 percent of the analysis area acreage or about 11,600 acres. However, lodgepole pine is common in all the cover types represented in the project area. Within much of the analysis area, lodgepole pine can be considered long-persistent. While under a long-term successional process (and in the absence of disturbance), these stands usually convert to more shade tolerant spruce and fir species, lodgepole pine remains dominant because of the interplay of fire history, site, and climatic factors that have kept the later shade tolerant spruce and fir from dominating these sites. Composition, structure, and fire history studies indicate that these stand types naturally included stand replacing disturbances at intervals of 100 to 300 years followed by rapid regeneration of trees. Evidence of historic fire is common across the lodgepole pine type indicating widespread stand replacing events in the late 1800s.

Dwarf-mistletoe, a major pathogen in lodgepole pine stands causing growth loss and increasing susceptibility to other diseases, is found in these stands. Because the lodgepole pine in this community type occurs primarily as even-aged stands, the spread of the disease is mainly lateral. Lateral spread is slow due to the trajectory of the mistletoe seeds, whereas the spread to an understory of lodgepole pine can be more rapid.

The majority of stands that experienced stand replacing fires exhibit lodgepole pine as the dominant species. Because of the dense stand conditions of the species, fires that reach into the crown can be pushed by winds and cover hundreds or thousands of acres very quickly. This gave rise to large even-aged stands of almost pure lodgepole pine.

Most lodgepole pine stands in the analysis area historically would not have reached very old ages because of the susceptibility of the species to mountain pine beetles. By the time lodgepole stands have reached 150 years or more, they generally have developed other characteristics that leave them vulnerable to insects, such as average diameters in excess of 8 inches and stand basal areas in excess of 120 square feet per acre (Samman and Logan 2000). Beetle-killed trees would have increased fuel loadings as they fell, eventually providing the conditions for a stand replacing fire.

Subalpine fir, which is shade tolerant, develops in the understory of the lodgepole pine over time and can eventually replace the shade intolerant pine as it dies out of the overstory and is unable to regenerate due to the shade now provided by the subalpine fir.

Pure lodgepole pine stands are limited in their distribution on the landscape. Many stands have developed an understory of subalpine fir, and occasionally spruce regeneration. These stands are in the older and mature age classes.

Where more recent fires have occurred, or there has been timber harvest, lodgepole pine is generally found as even-aged, single-storied stands, usually without an understory of subalpine fir since the younger stands have not yet developed this later seral condition.

Mixed Conifer

Mixed conifer stands comprise the largest forest type in the analysis area at 54 percent, or roughly 31,400 acres. The stands within the project area represent a transition from the spruce- and fir-dominated forests at higher elevations to the lower elevation forests dominated by lodgepole pine, aspen and aspen/conifer.

As was the case with the lodgepole pine, the mixed conifer stands are primarily in the mature age classes. The ages of the stands vary, depending on whether the overstory is dominated by spruce or lodgepole pine, but the majority exceeds 120 years. The understory trees are primarily subalpine fir.

The mixed conifer type generally represents stands that are in a mid-seral successional stage, containing both seral species (aspen and lodgepole pine) and climax species (spruce and fir). Uninterrupted by disturbance, these stands would succeed to the more tolerant climax species.

Mixed conifer stands historically occurred on the landscape primarily as a result of non-lethal fires. Species composition would have changed over time based on presence or absence of stand-replacing fires. In the absence of lethal fire, spruce and fir would have become the dominant species, while the shorter-lived lodgepole pine gradually was replaced. However, with lethal fires, lodgepole pine would have a competitive advantage and would dominate the site for several decades.

Approximately 89 percent of the project area is forested. Table 3.10.1a displays the number of acres by each forest cover type in the project area landscape. These data were queried from the corporate geographic information system (GIS) database.

Table 3.10.1a: Summary of acres by vegetation type in the project area.

Cover type	Acres	Percent project area	Percent vegetated, non-riparian
Aspen/conifer	6,666	11.5	13
Aspen	1,751	3	3
Barren	84	0.1	--
Conifer/aspen	27	<1	<1
Lodgepole pine	11,585	20	23
Mixed conifer	31,365	54.2	61
Sagebrush/grass	1,281	2.2	--
Water	389	0.7	--
Willow	1,866	3.2	--
Wet meadow	2,824	4.9	--
Total:	**57,839**	**100%**	**100%**

Table 3.10.1b summarizes the current structure of conifer cover types within the Smiths Fork project boundary using the best available data found in the corporate GIS database (data are not available for aspen).

Table 3.10.1b: Summary of Conifer Size classes in the Project Area		
Size class	**Total acres**	**% conifer in each size class**
Grass/forb (recently regenerated)	1,539	3
Seedling/shrub (less than 1 inch dbh)	645	1
Sapling/small tree (1 to 8.9 inch dbh)	7,468	13
Mature/large tree (9 inch and greater dbh)	34.078	59
Unknown	14,110	24
Total:	**57,839**	**100**

Table 3.10.1c shows acres of structural stage distribution of forested types in the Smith's Fork project area.

Table 3.10.1c: Acres of Structural Distribution of Forested Types in the Smith's Fork Vegetation Restoration Project Area					
Cover Type (Acres)	**Distribution**	**Acres**			
		Grass/forb	**Seedling/ sapling**	**Young/mid/ mature**	**Old**
Lodgepole Pine (11,585)	**Current**	981 (8.5%)	509 (4%)	10,095 (87%)	0 (0%)
	Desired	1,158 (10%)	1,158 (10%)	6,951 (60%)	2,317 (20%)
	Difference	**-177 (-1.5%)**	**-649 (-6%)**	**+3,144 (+27%)**	**-2,327 (-20%)**
Mixed Conifer (31,365)	**Current**	0 (0%)	0 (0%)	31,365 (100%)	0 (0%)
	Desired	3,137 (10%)	3,137 (10%)	18,819 (60%)	6,273 (20%)
	Difference	**-3,137(-10%)**	**-3,137(-10%)**	**+12,546 (+40%)**	**-6,273 (-20%)**

The above data were queried and analyzed using the best available information from the corporate GIS database. Data for aspen stands are not available. The early and old age classes tend to be deficient. This is due primarily to the timber harvesting and wildfires in the late 1800s that initiated many of the stands in this area. In the Forest Plan, subgoal 3e for biodiversity and viability require that 60 percent of the total conifer be young and mid aged at the landscape level (Forest Plan, p. 4-19). The project area is currently deficient with only 21 percent of the conifer currently in young and mid aged classes. The proposed action would create approximately 3000 acres of additional young acres and increase the young age classes in the project area to 28 percent after treatment under the proposed action. However, the mountain pine beetle epidemic will ultimately move more acres into the young age classes as the over-story deteriorates and young seedlings develop in the under-story.

3.10.2 NFMA Timber Management Requirements

The minimum specific management requirements for projects and activities that must be met in carrying out projects and activities for the National Forest System (NFS) are set forth in Forest Service Manual 1921.12a. Under 16 U.S.C. 1604 (g)(3)(E), a responsible official may authorize site-specific projects and activities to harvest timber on NFS lands only where:

1. Soil, slope, or other watershed conditions will not be irreversibly damaged. Timber harvesting in the Smith's Fork Vegetation Rehabilitation project area is designed to comply with Forest Plan standards and guidelines to protect soil, slope and watershed conditions, including limiting ground based skidding to slopes under 40 percent, use of erosion control measures, and use of all other best management practices. No harvest is being planned in riparian habitat conservations areas. Analysis by the hydrologist and soil scientist discloses that there would be no irreversible damage to soils, slopes or other watershed conditions.

2. There is assurance that the lands can be adequately restocked within five years after final regeneration harvest (Forest Service Manual 1921.12g). All harvesting is planned in areas that can be adequately restocked within five years. Treatments include salvage of trees killed by mountain pine beetles that will result in creation of some openings. The openings resulting from salvage harvests are expected to regenerate naturally based on similar past treatments on similar soils with lodgepole pine cover types on the north slope of the Uinta Mountains. Natural regeneration of lodgepole pine on the north slope is generally dense and rapid (less than five years) and planting is rarely necessary, however, we would plant seedlings if necessary.

3. Streams, streambanks, shorelines, lakes, wetlands, and other bodies of water are protected from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment where harvests are likely to seriously and adversely affect water conditions or fish habitat. No vegetation treatments will be conducted in riparian habitat conservation areas. Analysis by the hydrologist and the fisheries biologist discloses that harvests are unlikely to seriously or adversely affect water conditions or fish habitat.

4. The harvesting system to be used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber. The harvesting systems analyzed were not selected primarily because they would give greatest dollar return or the greatest unit output of timber. Ground based yarding is the only logging system widely available and in use on the Uinta-Wasatch-Cache NF. This is due primarily to the generally gentle slopes where timber is managed on NFS lands. The silvicultural systems analyzed for this project were chosen to promote forest health and not to gain the greatest output of timber.

Under 16 U.S.C. 1604 (g) (3)(E) a responsible official may authorize projects and activities on NFS lands using cutting methods, such as clearcutting, seed tree cutting, shelterwood cutting, and other cuts designed to regenerate an even-aged stand of timber, only where:

1. For clearcutting, it is the optimum method; or where seed tree, shelterwood, and other cuts are determined to be appropriate to meeting the objectives and requirements of the relevant plan (16 U.S.C. 1604 (g)(3)(F)(i)). The proposed units are planned for even aged management. In the lodgepole pine and aspen vegetation types even aged stands are naturally occurring and are historically a result of stand replacing disturbance events such as wildfire or widespread insect and disease outbreaks. Establishment of young even aged stands in these types is consistent with the purpose and need of the

project to move the landscape towards a more balanced range of age classes including seedling and sapling stands. This is also necessary to meet the forest health objectives of salvaging the dead lodgepole pine and removing the presence of mistletoe from the overstory.

2. The interdisciplinary review has been completed and the potential environmental, biological, aesthetic, engineering, and economic impacts have been assessed on each advertised sale area and the cutting methods are consistent with the multiple use of the general area (16 U.S.C. 1604 (g)(3)(F)(ii)). The Smith's Fork Vegetation Rehabilitation Project DEIS presents an interdisciplinary analysis of the proposal. This shows that there are no significant adverse biological or environmental effects and that the project is consistent with the Forest Plan.

3. Cut blocks, patches, or strips are shaped and blended to the extent practicable with the natural terrain (16 U.S.C. 1604 (g)(3)(F)(iii)). Treatment units are designed to blend with the natural terrain. There may be some short-term impact on the landscape as a result of this project. However, this is not inconsistent with the overall long-term scenery management objectives.

4. Cuts are carried out according to the maximum size limit requirements for areas to be cut during one harvest operation (FSM 1921.12e). The proposed treatments are in direct response to the current and ongoing mountain pine beetle epidemic. Standard S23A states that maximum size limits do not apply to the size of areas harvested as a result of natural catastrophic conditions such as fire, *insects or disease attack*, or windstorm (Forest Plan, page 4-49, and errata/correction #3 of June 2010).

5. Timber cuts are carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, esthetic resources, cultural and historic resources, and the regeneration of timber resources. Each of these areas is considered in detail in this EIS and in the project record and shows that the proposal is consistent with protection of these resources. The project design, mitigation and the incorporation of best management practices ensure this protection.

6. Stands of trees are harvested according to requirements for culmination of mean annual increment of growth (16 U.S.C. 1604 (m); Forest Service Manual 1921.12f; Forest Service Handbook 1909.12, ch. 60). The proposed treatments are salvage and sanitation harvests in response to the current and ongoing mountain pine beetle epidemic. Culmination of mean annual increment may or may not have been reached in individual stands.

3.10.3 Environmental Consequences of Alternative 1, No Action

Under Alternative 1, management would not change from the current practice. Fire would continue to be suppressed as it has been and no new timber harvest would occur. In the short term there would continue be high mortality from the mountain pine beetle moving the stands towards early seral conditions. However, this alternative would not treat the mistletoe in the overstory and therefore mistletoe would be spread to the new regeneration. The standing dead trees killed by the mountain pine beetle would eventually fall over creating a greater fuel hazard. No timber supply to local industry would be generated from this area for the foreseeable future.

3.10.4 Environmental Consequences of Alternative 2, Proposed Action

Under Alternative 2, management would change from the current regime to one of more timber harvesting in order to create and/or expedite early seral vegetation and move the project area overall towards properly functioning condition as described in the Forest Plan.

Approximately 3,000 treated acres would be moved directly to an early seral structural stage. The abundance of dead trees on the landscape from the current mountain pine beetle epidemic prohibits meeting the landscape structure for lodgepole pine as described in the Forest Plan (Forest Plan, page 4-40, Table G14) in the near future. However, the created openings would be expected to accelerate the natural regeneration and growth of lodgepole pine by creating an exposed mineral seedbed and allowing increased sunlight to reach the forest floor (Collins et al., 2010). Development of older age classes of lodgepole pine recently killed by the mountain pine beetle that are favorable for northern goshawk habitat would be accelerated by the proposed treatments.

Timber supply to local industry would be increased through the offering of an estimated 58,000 CCF of timber product volume including post, poles, sawtimber and other products.

Harvest activities would focus on dead, damaged, and beetle infested lodgepole pine larger than 8 inches DBH. Given the current levels of mortality and infestation it can be expected that there will be very little live or non-infested trees by the time the harvest occurs in approximately 2013 to 2015. Ample numbers of dead snags (wildlife trees) will be left to meet the required 300 per 100 acres for wildlife (Forest Plan, page 4-42, Table G16). These will be left in islands or clumps so that they are wind firm and located in wind protected areas.

Slash will be scattered throughout the units to provide for nutrient cycling and micro site protection for the regeneration. The requirement outlined in Guideline Veg-18 of the Forest Plan (USDA, 2003) specifies 100 tons per 10 acres be left in a minimum of 50 pieces 12 inches in diameter by 8 feet long for mixed conifer and 50 tons per 10 acres be left in a minimum of 50 pieces 8 inches in diameter and 8 feet long for lodgepole pine. Visual observation of the stands indicates there will be more than a sufficient quantity of dead snags and down woody debris in the area following the planned harvests.

3.10.5 Cumulative Effects

The cumulative effects analysis area for vegetation is the Smiths Fork project area boundary. This boundary is chosen because changes to the indicators under each alternative would be measurable at the project area scale. The time period for analysis includes approximately the late 1800s (last period of large scale disturbance in the area) and approximately 120 years from the present (typical “rotation” age for most forested vegetation). Evidence on the ground and stand ages demonstrates there was both timber harvest and fire historically, however, records of activities such as timber harvest or historic fire are essentially absent prior to 1960.

Alternative 1, No Action. There would be no harvest acres added to the approximately 4,200 acres which are the current total of past harvesting in the project area on Forest Service and private lands. It is reasonable to expect that there would be some harvest on private land. Therefore, there would be no cumulative effect. Natural conditions including the mountain pine beetle outbreak in the stands of lodgepole pine would create some early seral structural stage. Other insect and disease agents could cause areas of mortality in other species as well.

Alternative 2, Proposed Action. There are approximately 11,000 acres of past harvesting identified within the project area boundary; 3,300 of these acres are on private or state lands. The dates of these harvests range from 1961 to 2011. Currently these stands are at varied stages of development (based mostly on time since the harvest) and contribute to nearly all of the mid seral forested vegetation within the project area. The effects of past vegetation treatments were incorporated into the assessment of

existing condition. Not all treatments created early seral vegetation however, because some involved thinning. Under the action alternative approximately 3,000 more acres would be treated by the proposed harvests. None of these proposed harvests overlap past treatments. It is reasonable to expect that there would be some future harvesting on private and state land.

3.11 General Review

3.11.1 Short-Term Uses and Long-Term Productivity

NEPA requires consideration of the "relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). As declared by Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which humans and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Harvesting provides timber products for public use and jobs associated with the timber harvest and manufacturing of products. Using timber harvest and prescribed fire as tools to maintain or improve forest species and age class diversity and decrease fuel loading mimics natural disturbances. Maintaining or improving forest species and age class diversity ensures continued long-term productivity of the forest resource and wildlife habitat, as well as reducing the likelihood or severity of catastrophic insect infestations and wildfire.

3.11.2 Unavoidable Adverse Effects

Unavoidable adverse impacts could occur if there are no reasonably practicable mitigation measures to eliminate the impacts and if there are no reasonable alternatives to the proposed project that would meet the purpose and need, eliminate the impact, and not cause other or similar significant adverse impacts.

Through modification of the proposed action and application of mitigation measures, no unavoidable adverse impacts are anticipated.

3.11.3 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. *Irretrievable* commitments are those that are lost for a period of time, such as the temporary loss of timber productivity in forested areas that are kept clear for use as power line rights-of-way or roads.

3.11.4 Other Required Disclosures

The Forest Service has consulted with Utah State Historic Preservation Office in accordance with the National Historic Preservation Act for causing ground-disturbing actions in historical places. The Forest Service has fulfilled consultation requirements with U.S. Fish and Wildlife Service in accordance with the Endangered Species Act implementing regulations for projects with habitat for threatened or endangered species.

CHAPTER 4: CONSULTATION AND COORDINATION

Preparers and Contributors

Bernard Asay: Recreation, wilderness, roadless
Ed Coates: Forester
Paul Cowley: Fisheries, aquatic resources
Tom Flanigan: Heritage
Ashly Hererra: Terrestrial wildlife
David Hatch: Scenery
Christine Brown: Fire ecology
Rick Schuler: District ranger
Paul Chase: Fisheries, aquatic resources
Charlie Condrat: Hydrology, air quality
Mike Duncan: Botany
Stacey Weems: Soils
Tim Gill: Vegetation
Pete Gomben: Environmental coordinator
Christina Anabel: Fire ecology

Distribution of the Environmental Impact Statement

This EIS was provided to persons who either commented on the draft EIS, requested the document, or are a required federal agency recipient:

(1) Kevin Mueller, Utah Environmental Congress; (2) Jonathan Ratner, Western Watersheds Project; (3) John Carter, Yellowstone to Uintas Connection; (4) Jean Public (via email); (5) BLM state planning and environmental coordinator; (6) Jack Walker; (7) Wyoming Game and Fish Department; (8) Garie Henry; (9) US Environmental Protection Agency; (10) EIS Review Coordinator, US Environmental Protection Agency, Region 8; (11) Acquisitions and Serials Branch, National Agricultural Library; and (12) Director, USDI Office of Environmental Policy and Compliance, Washington, D.C.

Federal, State, and Local Agencies

Notification that the EIS is available on the Forest Service webpage has been sent to the following federal agencies, federally recognized tribes, state and local governments, organizations, and/or individuals:

(1) National Environmental Coordinator, NRCS; (2) U.S. Army Corps of Engineers, South Pacific Division; (3) USDA APHIS PPD/EAD Deputy Director; (4) Director, Planning and Review, Advisory Council on Historic Preservation; (5) Director, Public Lands Policy Coordination, State of Utah; (6) Director, Northwest Mountain Region, Federal Aviation Administration; (7) Chief of Naval Operations, Energy and Environmental Readiness Division; (8) US Coast Guard, Environmental Impact Branch; (9) USDI Office of Environmental Policy and Compliance, Denver; (10) Director, NEPA Policy and Compliance, Department of Energy; (11) Utah State Division Administrator, Federal Highways Administration.

Appendix A: Response to Scoping Comments

A legal notice requesting comments on the proposed action initially was published on **April 30, 2012**. Because a revised notice of intent was published in the *Federal Register* subsequently, a new legal notice requesting comments was published on **June 2, 2012**. The official 30-day comment period ended on **July 2, 2012**. However, all scoping comments that were received in response to the initial April 30 legal notice are considered timely.

***

Commenter 1: **Utah Environmental Congress**
Received: **Via email on July 2, 2012**

Comment 1-1: This project is being analyzed under the authorities of the HFRA. The scoping comment solicitation letter additionally explains, "The proposed action responds directly to forest health objectives as described in the HFRA." The HFRA imposes certain procedural duties and substantive sideboards that are different from, and in certain cases more restrictive than the more traditional authorities.

The HFRA of 2003 sets out legal requirements for the agency in implementing any authorized projects. In particular, we would like to know if the Forest has completed a "community wildfire protection plan" (CWWP) that encompasses the planning area. The CWWPs are to be collaboratively developed with local governments, fire departments, state foresters and citizens and identify and prioritize areas for hazardous fuels reduction projects on federal and non-federal lands that will protect communities.

It will be critical that the Forest describe in detail how the proposed project is or is not in compliance with any CWWP that encompasses the planning area. A fundamental objective of the HFRA is that CWWP be developed collaboratively and that projects authorized by the HFRA are developed directly out of those CWWPs.

Response 1-1: Consistent with *The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide*, which provides the Forest Service with guidance in undertaking activities under the Healthy Forests Restoration Act ("HFRA"), and as noted in the scoping letter dated April 25, 2012, the project is proposed under the insect and disease epidemic authority of Section 102(a)(4) of the HFRA. The project is not proposed under an authority of the HFRA that requires a community wildfire protection plan.

Comment 1-2: Lands on which hazardous fuel reduction projects may occur under the HFRA are limited to:

1) The wildland-urban interface areas of at-risk communities;
2) All condition class 3 lands, as well as condition class 2 lands within fire regimes I, II or III, that are in such proximity to a municipal watershed or its feeder streams that a significant risk exists that a wildfire event will have adverse effects on the water quality of the municipal water supply or the maintenance of the system;
3) Where windthrow or blowdown or the existence of an epidemic of disease or *insects that significantly threatens* ecosystems or resources;

4) Areas that have threatened and endangered species habitat, where the natural fire regimes are important for (or where wildfire poses a threat to) the species or their habitat and the fuel reduction project will enhance protection from catastrophic wildfire (and complies with applicable guidelines in management or recovery plans).

Please provide documentation supporting the suitability of each acre proposed for treatments in the Smiths Fork planning area.

Response 1-2: Section 102(a)(4) of the Healthy Forests Restoration Act ("HFRA") authorizes projects on federal lands on which an epidemic of diseases or insects occurs.

The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide, which provides the Forest Service with guidance in undertaking activities under the HFRA, requires that the forest supervisor determine whether an epidemic exists under Section 102(a)(4) after consulting with forest health specialists.

In a November 8, 2011 letter, the forest supervisor determined, based on an evaluation of bark beetle activity on the Uinta-Wasatch-Cache National Forest by a forest health specialist—in this case, a Forest Service entomologist—that the mountain pine beetle infestation on the Evanston-Mountain View Ranger District can be classified as an epidemic under the authority of the Section 102(a)(4) of the HFRA.

Comment 1-3: The HFRA sets out new NEPA requirements for the range of alternatives to be considered in projects authorized under the Act:

1) Within 1½ miles of the boundary of an at-risk community, federal agencies are not required to analyze any alternative other than the proposed action unless it is different than the recommendations contained in the applicable *community wildfire protection plan* related to proposed locations and methods of treatment, in which case both alternatives must be described.
2) For areas beyond 1½ miles of the boundary of an at-risk community, but that are within the Wildland Urban Interface ("WUI" as described in a <u>community wildfire protection plan</u>), federal agencies are not required to analyze more than the proposed agency action and one additional action alternative.
3) For authorized projects in areas not encompassed by the previous two categories of land, the environmental analysis must describe the proposed action, a no action alternative, and an additional action alternative, if one is proposed during scoping or the collaborative process. This additional alternative must still meet the purpose and need of the project. If more than one additional alternative is proposed, the agency will select which one to consider and provide a written record describing the reasons for the selection.

Please provide supporting documentation, preferably in the form of maps, for each acre in the Smiths Fork planning area that prescribes which category of WUI those acres fall into (i.e. within 1.5 miles of the boundary of a community, outside of 1.5 miles but within the interface as defined by the CWPP, and areas outside of those). UEC is requesting consideration of an additional alternative (described below) for any lands outside of the first two categories of WUI lands.

Response 1-3: Consistent with *The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide*, which provides the Forest Service with guidance in undertaking activities under the

Healthy Forests Restoration Act ("HFRA"), and as noted in the scoping letter dated April 25, 2012, the project is proposed under the insect and disease epidemic authority of Section 102(a)(4) of the HFRA. The project is not proposed under an authority of the HFRA that requires a community wildfire protection plan.

With regard to the request for consideration of an additional alternative "(described below)," the commenter then proceeded from Comment 1-3 into Comment 1-4 with no evident discussion of a clear alternative to the proposed action. As noted in Response 1-4, the old-growth and large-tree retention provisions of the HFRA do not apply to the current situation because the proposed action falls under the authority of Section 102(a)(4) of the HFRA.

Comment 1-4: The HFRA of 2003 contains old growth protection language that the Forest Service is required to follow. In certain areas it may exceed the old growth protection provisions in the WCNF LRMP. The HFRA requires the Forest Service "to fully maintain, or contribute toward the restoration of the structure and composition of structurally complex old growth stands according to the pre-fire suppression old growth conditions characteristic of the forest type, while considering the contribution of the stand to landscape fire adaptation and watershed health, and retaining the large trees contributing to old growth structure." Assuming the Forest relies on the methodology for old growth inventory identified in the Intermountain Region's Characteristics of Old-Growth Forests in the Intermountain Region (Hamilton, 1993), we recommend you consider applying the criteria for: high elevation Engelmann spruce-subalpine fir, middle elevation interior Aspen, and middle elevation interior lodgepole.

The HFRA requires that covered projects outside of old growth focus "largely on small diameter trees, thinning, strategic fuel breaks, and prescribed fire to modify fire behavior, as measured by the projected reduction of uncharacteristically severe wildfire effects for the forest type;" and, maximize "the retention of large trees, as appropriate for the forest type, to the extent that the large trees promote fire-resilient stands."

UEC requests that a table and narrative be provided disclosing the number of trees in each diameter class to be cut. UEC also requests a simple statistical analysis demonstrating whether or not the tree cutting treatments in the Smiths Fork project focus "largely" on small trees. We also believe that a diameter cap will be necessary to comply with this statutory provision. A conditional release mechanism on this diameter cap could be developed for cases where the sale administrators identify a tree or trees that are greater than the diameter cap and need to be cut to meet the purpose and need of the project.

Response 1-4: *The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide*, which provides the Forest Service with guidance in undertaking activities under the HFRA, notes that the old-growth and large-tree retention provisions of the HFRA only apply to "covered" projects. Covered projects, as defined in Section 102(e)(1)(B), include all projects authorized under the HFRA on Forest Service lands, except those carried out under Section 102(a)(4).

Because the current project is proposed under the authority of Section 102(a)(4) of the HFRA, the old-growth and large-tree retention provisions do not apply.

However, Forest Plan guidance for old growth will be followed.

Comment 1-5: At this time, the UEC is, additionally, requesting the Forest Service consider the potential impacts of the proposed action to the threatened gray wolf and primary prey species such as mule deer and elk.

Response 1-5: The wildlife technical report and the biological evaluation for the project discuss the gray wolf. The wildlife technical report discusses elk and mule deer.

Comment 1-6: Is restoration of willow and aspen communities within the objectives for this project? We believe it should be a key, significant alternative driving issue.

Response 1-6: Restoration of willow and aspen communities is not within the objectives for the project. Comment 1-6 may be the additional alternative referenced above in Comment 1-3. If so, the rationale for not considering it is that it does not meet the purpose and need for the project (which is cited in Response 1-12 below) as required by Section 104(c)(1)(C)(ii) of the Healthy Forests Restoration Act.

Comment 1-7: With regard to the other species listed within the scoping letter, we are concerned there is insufficient monitoring data either collected or analyzed to establish population status and trend. Boreal owl, flammulated owl and three-toed woodpecker are all species that benefit from the presence of dead or dying trees, which in this case would be removed in substantial numbers if the proposed action as described is approved.

Response 1-7: Project analysis concluded that habitat is present in the project area for both the boreal owl and the American three-toed woodpecker, and that the proposed action may impact individuals or habitat for either or both species, but will not likely contribute to a trend towards federal listing or a cause a loss of viability to the population or species. No impact is expected to the flammulated owl because it is an insectivorous, lower-elevation, old forest ponderosa pine open habitat species and is very rare if present on north slope.

Comment 1-8: Pine Marten, like the gray wolf, is absent from your list of species that may be affected by the proposed action. We request it be added.

Response 1-8: The pine marten is not a species of any special legal status and is not discussed in the biological evaluation or the biological assessment.

Comment 1-9: Salvage logging operations could have long-term consequences for vegetative recovery caused by negative impacts to soils and other resources. These longer term consequences, together with historic logging on both Forest Service and adjoining private lands, may impact the ability of the area to sustain marten populations in the future. This associated potential impact of the proposed action needs to be considered.

The potential for erosion associated with both the past/proposed fires and the proposed logging is a real concern.

Response 1-9: The pine marten is not a species of any special legal status and is not discussed in the biological evaluation or the biological assessment. Potential effects to soil are discussed in the soils report for the project.

Comment 1-10: The effects of historic grazing on the vegetation, soils, water quality, fuel loading and fire regime should be considered within the EIS.

Response 1-10: Historic grazing was included in the analysis as one of the past, present, and/or ongoing, and reasonably foreseeable activities in or near the project area.

Comment 1-11: Because (temporary) road construction would be needed to facilitate this action, we request the EIS disclose the current road density within the area. Roads are known to fragment habitat for big game, wolverine, Canada lynx and other species. Temporary roads also have the potential to open the area up to future snowmobile use and illegal ATV activity. Species such as wolverine are particularly shy of roads and the human activity they bring. Additional roads, even temporary ones, could have impacts on wolverine and other wildlife species far beyond the narrow right of way associated with their construction.

Response 1-11: Temporary roads associated with the proposed project will be rehabilitated after completion of all project related activities. Effects of the proposed action on the species listed above, and others, are discussed in the wildlife technical report, the biological assessment, and the biological evaluation for the project.

Comment 1-12: According to the three page scoping letter, a part of the purpose and need for this proposal is to recover economically valuable beetle-hit timber before deterioration results in loss of commercial value. The scoping letter goes on and generally suggests there is a need to provide opportunities for industry and communities in Utah and Wyoming that are dependent on national forest timber for a portion of their supply and economy. Due to the reliance on economics as a justification for the proposed action, we believe NEPA requires a detailed economic analysis within the EIS. This includes a list of timber dependent communities and local mills allegedly served by this sale, payment to counties that will result from this sale, and a determination of potential negative consequences that may result due to short or long-term degradation of valuable fisheries and wildlife habitat, soil erosion and other potential negative consequences. It is our understanding that many timber inventories can't even be valued because there is effectively no demand. This is tied to and very much parallels the situation with 'toxic mortgages' in the banking industry. Simply put, we believe there is absolutely no demonstrated need to further increase supply in wood markets now. The opposite may in fact be the case (a need to reduce supply).

The scoping letter relies heavily upon the assumption that local communities or mills will benefit from the proposed action. However, the size of the sale creates the very real potential for larger non-local companies to purchase the timber. The purchase of this timber by a mill outside the local area, or even the region, would largely remove any benefits the local economy might receive from the sale beyond the usual payment to counties. We believe a history of timber sale purchases should be provided documenting the amount of timber provided to locally owned mills vs. larger regional, national or multi-national mills.

Response 1-12: The scoping letter dated April 25, 2012, contains a purpose and need that reads, in its entirety:

> "The HFRA [Healthy Forests Restoration Act] recognizes healthy forests or forest health as an integral part of forest management. The proposed action responds directly to forest health objectives as described in the HFRA. The purpose of this project is to reduce the effects from current mountain pine beetle infestations in forested stands dominated by lodgepole pine trees and to reduce the susceptibility of vegetation to high-intensity wildfires and future mountain pine beetle attacks. The project is needed to:
>
> 1. Salvage forest products from, and manage stand densities on, forested lands classified as suitable for timber production to keep them positively contributing to the national forest's allowable sale quantity;
> 2. Reduce the effects of tree mortality associated with the mountain pine beetle epidemic to restore healthy ecological conditions and scenic quality;
> 3. Accelerate regeneration of forested stands killed by the mountain pine beetle; and
> 4. Manage hazardous fuel loading associated with the mountain pine beetle epidemic and salvage operations to minimize the potential for large, high-intensity/high-severity wildfires."

The April 25, 2012, scoping letter does not discuss loss of commercial value, local communities or mills, etc. The commenter may have been referring to a proposed action in a scoping letter for a previous project that involved an economic rationale.

Comment 1-13: Finally, rather than logging the area in an effort to recover the economic value of the wood, an invitation to local universities and researchers should be made to visit the area and analyze the impacts of the beetle kill and upcoming successional changes.

Response 1-13: The Uinta-Wasatch-Cache National Forest would be willing to consider any research proposals from local universities and researchers to study the impacts of beetle kill and successional changes. However, such proposals do not meet the purpose and need of the current proposed project.

Comment 1-14: We incorporate by reference our emails and communications with the Regional Office, Supervisor's and District Offices that relate to this Smiths Fork project. The so-called underlying collaborative process mentioned in the scoping comment solicitation letter was the subject of most of this communication spanning the last two years. BLM-prepared and even peer-reviewed literature specific to the central subject of increased/decreased risks of ignition and spread of high intensity fire so great it is outside the historic range of variability that Kevin Mueller of UEC brought to these meetings was explicitly banned from public mention. Examples of such BLM PowerPoint presentations and peer reviewed journal literature were presented by Kevin Mueller of UEC in electronic and hardcopy format.

The process referenced involved no fair, respectful or fair exchange of scientific information. The USFS-hired "facilitator" (a recent USFS retiree from the Black Hills N.F.) would present a scary and biased intro for USFS staff who then said due to past management we've a horrifying and scary situation where unnaturally catastrophic fire is poised to unnaturally decimate our towns, watersheds, and mountains … and the proven fix is salvage logging. After such fear-based presentations the USFS staff passed out maps and gave marching orders to circle where the public wanted most to log. This was after explicitly

prohibiting even mention of the newer and conflicting peer reviewed literature that challenges the premise and the thrust of the scare tactics presented by the government.

Meeting times were changed with NO or LATE notice to all but Wyoming residents for this predominantly Utah timber sale on an National Forest in Utah. The impacted Utah County (Summit County) wasn't even involved. When UEC staff asked why, the response in public meeting was nobody had thought. UEC does not believe such responses. The so-called collaborative process was a staged setup; it was a shameful scam based on fear mongering and hateful tactics. In the event you have lost or deleted our emails please notice UEC that is so, and we will resubmit such literature. We suspect some was left by openly hateful and bitter USFS staff and their USFS retiree being paid as a supposed facilitator, who openly belittled and mocked the USIECR, whose existence he openly questioned. Please notice us if it was left or deleted, and we'll resend the BLM, USFS, and journal materials that were rejected and prohibited from mention at the 'collaborative meetings.

Not to beat a dead horse, but in the event it's been omitted from the record, the so-called "collaborative meeting" times were changes

Response 1-14: Many of these comments related to the collaborative process initially were raised by the commenter in two letters dated September 19, 2011 and September 27, 2011 and were addressed in an October 7, 2011 response from the forest supervisor to the commenter, all of which are part of the project record.

The meeting time that was referenced in the comment above refers to the August 23 meeting, which was altered from a 6 p.m. to a 5 p.m. starting time to accommodate participants with longer travel distances, particularly attendees from Salt Lake City who had to contend with evening and nighttime road construction delays after a late meeting adjournment.

In his September 19 letter to the Forest Service, the commenter withdrew from the collaborative process for the project. In his October 7 response, the forest supervisor invited the commenter to re-engage in the process.

***

Commenter 2: **Western Watersheds Project**
Received: **Via email on May 16, 2012**

Comment 2-1: This project is interesting in the fact that it shows the continually shifting excuses that the Forest Service puts up to justify logging. The Forest Service manufactures a "crisis" and then proposes the "solution" which is always logging. Prior to the beetle kill situation, the crisis du jour was a supposed imbalance in age classes with the solution being more logging. Other excuses have been mimicking 'fire regimes' that are supposedly out of balance due to an artificially manufactured fire return interval that has little basis in reality. Again, logging was the answer. During the Bush era the manufactured crisis was supposedly overly dense forests caused by 50 years of fire suppression with the solution being more logging.

This is a classic case of what I call a 'boys with toys' manufactured problem. It is analogous to little boys wanting to play with big toys in their sandbox and so they spin a story for themselves.

Response 2-1: The purpose and need for the project is described in its entirety in Response 1-12 above.

The project has been proposed under the insect and disease epidemic authority of Section 102(a)(4) of the Healthy Forests Restoration Act, which was passed by the United States Congress. The project has been designed to be consistent with *The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide*.

Comment 2-2: We also provide as attachments to these comments various Forest Service handbooks, manuals and other direction documents, highlighted in the sections applicable to this process, since due to the fact of the Forest Service not allowing comment on the actual NEPA document we are unable to determine at this stage whether the Forest Service is complying with its requirements are not. We request a thorough review of these documents and full implementation.

Response 2-2: The referenced attachments were made available to all members of the interdisciplinary team for review. The actual draft environmental impact statement is available for public comment.

Comment 2-3: Regarding archaeological resources the scoping document fails to provide any information regarding current conditions or class III survey coverage and results. Of course, this needs to be done during the NEPA process.

Response 2-3: Chapter 3 of the draft environmental impact statement discusses archaeological resources.

Comment 2-4: We also provide various literature regarding the economic value of timber sales. A cost-benefit analysis of timber sales is required by the Forest plan.

Response 2-4: The purpose and need of the Smiths Fork project is described in the April 25, 2012 scoping letter and above in Response 1-12. The purpose and need include contributing to the national forest's allowable sale quantity and improving the forest health of the area.

Comment 2-5: Unfortunately, the scoping notice does not provide the information necessary to provide comments on such issues as current fuel type and loading by cutblock.

Responses 2-5: The scoping letter provided the purpose and need for the project and a summary and map of the proposed action, as well as the telephone number and email address of a person to contact if a commenter required additional information regarding the proposal.

Comment 2-6: While the process originated in what the Forest Service calls a "collaborative process", by experience trying to take part in the process found it far from collaborative. It was not a consensus-based process and I certainly did not agree to these so-called "agreement".

Response 2-6: A discussion of the collaborative process is found in Response 1-14 above as well as in the October 7, 2011 response letter from the forest supervisor to Commenter 1 and which is filed in the project record. The April 25, 2012 scoping letter also summarizes the collaborative process.

Comment 2-7: The purpose and need ignore the fact that nearly all the timber sale cut blocks are within forest types that naturally burn in high-intensity fires. With a few small exceptions the proposed treatment areas are not near housing areas.

Response 2-7: Consistent with *The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide*, which provides the Forest Service with guidance in undertaking activities under the Healthy Forests Restoration Act ("HFRA"), and as noted in the scoping letter dated April 25, 2012, the project is proposed under the insect and disease epidemic authority of Section 102(a)(4) of the HFRA.

Comment 2-8: The NEPA document likewise must disclose information regard demand. We are familiar will many timber sales that the Forest Service has spent millions of dollars on yet they remain unsold.

Response 2-8: The purpose and need of the Smiths Fork project is described in the April 25, 2012 scoping letter and above in Response 1-12. The purpose and need include contributing to the national forest's allowable sale quantity and improving the forest health of the area.

***

Commenter 3: **Yellowstone to Uintas Coalition, John Carter, Manager**
Received: **Via email on May 22, 2012**

Comment 3-1: We are concerned that the Forest Service has not addressed the buildup of fuels from this combination of uses (grazing and fire suppression) and has ignored the contribution of livestock grazing where it occurs. We are also concerned that the Forest Service is not proposing a sustainable situation in this and many other cases we are familiar with.

Response 3-1: Whereas any buildup of fuels that may have occurred from grazing is not addressed per se, historic grazing was included in the analysis as one of the past, present, and/or ongoing, and reasonably foreseeable activities in or near the project area.

With regard to a "sustainable" situation, this project is proposed under the insect and disease epidemic authority of Section 102(a)(4) of the Healthy Forests Restoration Act, which was passed by the United States Congress. The project has been designed to be consistent with *The Healthy Forests Initiative and Healthy Forests Restoration Act Interim Field Guide*.

Comment 3-2: We are also concerned about the additional habitat fragmentation by creating new roads for this project. These are magnets for off road vehicles to make additional illegal routes, which in many cases, Travel Plans legitimize.

Response 3-2: Temporary roads associated with the proposed project will be rehabilitated after completion of all project related activities. Effects of the proposed action on wildlife species are discussed in the wildlife technical report, the biological assessment, and the biological evaluation for the project.

***

Commenter 4: **Jean Public**
Received: **Via email on May 16, 2012**

Comment 4-1: salvage should always be left in place. many birds and other animals use tha salvage. leave it in place. you are hurting forest by removing.

Response 4-1: The effects of the proposed action on birds and other animals are described in the wildlife technical report, the biological assessment, and the biological evaluation.

Comment 4-2: exactly what ar eyou planning under the heading "sanitation salvage"?

Response 4-2: "Sanitation" refers to removing dwarf mistletoe-infested lodgepole pine trees from the stand.

Comment 4-3: prescribed burning pollutes the air so that you send babies and senior citizens to the hospital or the morgue. burning of vegetation releases both mercury and fine particulate matter. the fine particulate matter is microscopic and causes LUNG CANCER, HEART ATTACKS, STROKES, PNEUMONIA, ALLERGIES AND ASTHMA. WHY DO YOU WANT TO BE ALLOWED TO POLLUTE THE AIR AND SENDAMERICAN CITIZENS TO THE HOSPITAL OR MORGUE?THE TREES CAN IN FACT NATURALLY LEARN TO RESIST THE BEETLE. AND THAT IS THE NATURAL WAY TO GO. THIS PLAN IS NOT LONG TERM, JUST SHORT TERM POLLUTING AND HARMFUL. THIS PLAN POLLUTES AND KILLS ALL WILDLIFE AND BIRDS IN THE 4300 ACRES. THEY HAVE NO HOME. THEY HAVE NO FOOD. THE ANIMALS CAN LIVE WITH THE BEETLES BUT NOT WITH YOUR PLAN. LEAVE THE AREA ALONE. THIS SITE IS NOT A LUMBERYARD FOR GREED FOR YOUR AGENCY.

Response 4-3: No prescribed burning is associated with the proposed action. The proposal does involve thinning, piling, and burning of woody material, but such piles would be burned only when conditions—such as moisture levels and atmospheric conditions—allow.

Comment 4-4: THIS AGENCY IS ALL ABOUUT MONEY AND GREED. THIS PROJECTIS ABOUT MONEY, GREED AND MAKE WORK JOBS THAT ARE NOT NEEDED AND WHICH THE TAXPAYERS CANNOT AFFORD. AMERICA IS BETTER OFF WITHOUT FUNDING THIS PROJECT. THE BUDGET FOR THIS PROJECTSHOULD BE ZERO. NOT IS THE ANSWER. THIS COMMENT IS FOR THE PUBLIC RECORD.

Response 4-4: Thank you for your comment.

***

Commenter 5: **Jean Public**
Received: **Via email on June 11, 2012**

Comment 5-1: the following should not take place at this site:
1. no hunting or trapping
2. no new roads

3. no toxic chemical use of any kind including no monsanto rodeo
4. no prescribed burning

Response 5-1: The Forest Service does not control hunting or trapping on the lands that it manages. Hunting and trapping regulations are promulgated by the respective states.

Some new specified roads are part of the proposed action.

Any chemicals used during implementation of the project will be used in accordance with all applicable legal and health and safety guidelines.

No prescribed burning is associated with the project.

***

Commenter 6: **Utah State Office, Bureau of Land Management, Planning and Environmental Coordinator**
Received: **Via email on May 29, 2012**

Comment 6-1: The Bureau of Land Management appreciates the opportunity to review and provide comment regarding the [Smiths Fork vegetation restoration project]. However, the BLM has no jurisdiction or authority and therefore does not intend to submit comments regarding the project.

Response 6-1: Thank you for the information.

***

Commenter 7: **Jack Walker**
Received: **Via email on May 30, 2012**

Comment 7-1: Repair / replacement of all fencing damage during operations, while not leaving damage for extended time frames and ranching operations are being conducted in the private lands of interest here.

Response 7-1: The Forest Service foresees no such damage, but if it were to occur, timely repairs would be made.

Comment 7-2: New temporary roads, in all effected units ,to be closed to any and all motorized traffic at the completion of the project.

Response 7-2: Proposed temporary roads will be rehabilitated after all project-related activities have been completed.

Comment 7-3: Northern end of Unit 9 (against private property), for 200 yards, be included in ***Unit 100*** which would lend this affected (200 yards) area to be; thinned, piled, and burned as opposed to clear cut.

Response 7-3: Thank you for your comment.

Comment 7-4: Roadside salvage, how far back on each side?

Response 7-4: For the roadside salvage areas, salvage could occur up to 150 feet on each side of the road, except for areas within goshawk areas, in which salvage could occur up to 100 feet on each side of the road.

***

Commenter 8: **Wyoming Game and Fish Department**
Received: **Via email on May 31, 2012**

Comment 8-1: We support this project from a terrestrial wildlife perspective. Roadless security habitats are essential for wildlife so we recommend that the USFS close and rehabilitate newly constructed roads after access to the treatment units are no longer needed.

Response 8-1: Temporary roads associated with the project will be rehabilitated after all project-related activities have been completed.

***

Commenter 9: **Garie Henry**
Received: **Via email on May 24, 2012**

Comment 9-1: I appreciate the opportunity to comment on this proposed vegetation restoration project. Even though, this proposed project consists of **only** 4,296 acres out of an area more than ten times the size of the of the proposed project, it is definitely needed to enhance the vegetation of the area.

Response 9-1: Thank you for your comment.

Comment 9-2: All of the proposed treatment areas could be easily enlarged without endangering any of the surrounding areas, there is also the possibility of adding more areas which are accessible to mechanical treatment. The area around the State Line Reservoir being one which is in very bad need of consideration, the area bounded by the state line, to the North, the North slope road on the South, the Westfork Smiths road on the East and the Blacks fork cattle allotment to the West, in other words the Units 2, Horse CR.-Willow, and West Fk pastures,West Fk. Smiths Fk Grazing Allotment, is another which is in need of treatment.

Response 9-2: Many areas that could be proposed for treatment are beyond the bounds of possible timber treatments because doing so would affect, for example, nesting habitat for raptors. The need to protect other natural resources and to be consistent with the standards and guidelines of the Forest Plan bound the amount of land in the Smiths Fork area that is available for timber harvest.

Appendix B: References

General

USDA-FS. 2011. A biological evaluation of bark beetle activity in the Uinta-Wasatch-Cache National Forest, Evanston-Mountain View and Heber-Kamas ranger districts. OFO-BE-11-03. 10 pages.

USDA-FS. 2004. The Healthy Forests Initiative and Healthy Forests Restoration Act interim field guide. FS-799. 58 pages.

Fire and Fuel

Amman, G., G. Lessard, L. Rasmussen, C. O'Neil. 1988. Lodgepole Pine Vigor, Regeneration, and Infestation by Mountain Pine Beetle Following Partial Cutting on the Shoshone National Forest, Wyoming. USDA Forest Service, Intermountian forest and Range Experiment Station, Research Paper INT-396, p. 8.

Astrup, R., K. Coates, E. Hall. 2008. Recruitment limitations in forests: lessons from and unprecedented mountain pine beetle epidemic. Forest Ecology and Management 256, 1743-1750.

Axelson, J., R. Alfaro, B. Hawkes. 2009. Influence of fire and mountain pine beetle on the dynamics of lodgepole pine stands in British Columbia, Canada. Forest Ecology and Management 257, 1874-1882.

Barrett, S. 2003. Interior West Lower Subalpine Forest #1. Fire Regime Condition Class Interagency Handbook Reference Conditions. USDA Forest Service, US Department of Interior, and The Nature Conservancy. Available at: http://www.frames.gov/documents/niftt/docs/bps/west/SPFI1.pdf

Bigler, C., D. Kulakowski, T. Veblen. 2005. Multiple disturbance interactions and drought influence fire severity in Rocky Mountain subalpine forest. Ecology 86, 3018-3029.

Blackford, D. 2011. A Biological Evaluation of Bark Beetle Activity in the Uinta-Wasatch-Cache National Forest, Evanston-Mountain View and Heber-Kamas Ranger Districts. State and Private Forestry, Forest Health Protection, USDA Forest Service. Publication Number OFO-BE-11-03, February 2011.

Bradshaw, L.S. and Tirmenstein, D. 2010 (Draft). FireFamilyPlus user's guide, version 4.1. Available at: http://www.firemodels.org/index.php/firefamilyplus-introduction/firefamilyplus-publications

Brown, C. 2012. Smiths Fork Project Fire Regime Condition Class Assessment. Uinta-Wasatch-Cache National Forest.

Claveau, Y., C. Messier, P. Comeau, D. Coates. 2002. Growth and crown morphological responses of boreal conifer seedlings and saplings with contrasting shade tolerance to a gradient of light and height. Canadian Journal of Forest Research 32, 458-468.

Collins, B., C. Rhoades, R. Hubbard, M. Battaglia. 2011. Tree Regeneration and future stand development after bark beetle infestation and harvesting in Colorado lodgepole pine stands. Forest Ecology and Management 261, 2168-2175.

Diskin, M. M. Rocca, K. Nelson, C. Aoki, and W. Romme. 2011. Forest developmental trajectories in mountain pine beetle disturbed forests of Rocky Mountain National Park, Colorado. Canadian Journal of Forest Research. 41: 782-792.

Finney, M., R. Parsons, A. Hadlow, G. Cohn, S. Mcallister, J. Popp, R. Hubbard, and J. Negron. 2012. Modeling fire behavior in mountain pine beetle-altered fuels. USDA Forest Service Rocky Mountain Research Station Fire Sciences Lab, Region 4 Fuels Meeting Powerpoint Presentation.

Heinsch, F. A.; Andrews, P. L. 2010. BehavePlus fire modeling system, version 5.0: Design and Features. General Technical Report RMRS-GTR-249. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Hicke, J., M. Johnson, J. Hayes, P. Haiganoush. 2012. Effects of Bark Beetle-Caused Tree Mortality on Wildfire. *The Bark Beetles, Fuels, and Fire Bibliography*. Paper223. http://digitalcommons.usu.edu/barkbeetles/223.

Kayes, L. and D. Tinker. 2012. Forest structure and regeneration following a mountain pine beetle epidemic in southeastern Wyoming. Forest Ecology and Management 263, 57-66.

Kulakowski, D. and T. Veblen. 2007. Effect of prior disturbances on the extent and severity wildfire in Colorado subalpine forests. Ecology 88, 759-769.

Nigh, G. J. Antos, R. Parish. 2008. Density and distribution of advance regeneration in mountain pine beetle killed lodgepole pine stands of the Montane Spruce zone of southern British Columbia. Canadian Journal of Forest Research 38, 2826-2836.

Ottmar, R. D., Wihnanek, R. E., Wright, C.S. 2000. Stereo photo series for quantifying fuels. Volume III: Lodgepole pine, quaking aspen, and gambel oak types in the Rocky Mountains. PMS 832. Boise, ID: National Wildfire Coordinating Group, National Interagency Fire Center.

Scott, J. H. and Burgan, R. E. 2005. Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model. USDA FS Rocky Mountain Research Station RMRS-GTR-153.

Scott, Joe H.; Reinhardt, Elizabeth D. 2005. Stereo photo guide for estimating canopy fuel characteristics in conifer stands. Gen. Tech. Rep. RMRS-GTR-145. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 49 p. plus stereoscope.

USDA Forest Service. 2003. Revised Forest Plan Wasatch-Cache National Forest.

Utah State University and USDA Forest Service. 2009. Smiths Fork Watershed Landscape Analysis.

Wadleigh, L. 1997. North Slope Fire History Study. USDA Forest Service correspondence, March 3, 1997.

Biological Assessment

Aubry, K.B., G.M. Koehler, and J.R. Squires. 2000. Ecology of Canada lynx in southern boreal forests. Pages 373–396 in L.F. Ruggiero, K.B. Aubry, S.W.Buskirk, G.M. Koehler, C. J. Krebs, K.S. McKelvey, and J.S. Squires, editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado, Niwot, USA.

Fisher, J.T. and L. Wilkinson. 2005. The response of mammals to forest fire and timber harvest in the North American boreal forest. *Mammal Review*. 35(1): 51-81.

Giusti, G.A., R.H. Schmidt, R.M. Timm, J.E. Borrecco, and T.P. Sullivan. 1992. The lagomorphs: rabbits, hares, and pika. In: Silvicultural approaches to animal damage management in Pacific Northwest forests. Gen. Tech. Rep. PNW-GTR-287. *U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station*: 289-307. Portland, OR.

Hodges, K.E. 2000. Ecology of snowshoe hares in southern boreal and montane forests. Pages 163–206 in L. F. Ruggiero, C. Krebs, K. B. Aubry, S. W. Buskirk, G. M. Koehler, K. S. McKelvey, J. R. Squires, and C. J. Krebs, editors. *The ecology and conservation of lynx in the United States*. University of Colorado Press, Boulder, USA.

Koch, P. 1996. Lodgepole pine commercial forests: an essay comparing the natural cycle of insect kill and subsequent wildfire with management for utilization and wildlife. Gen. Tech. Rep. INT-GTR-342. *U.S. Department of Agriculture, Forest Service, Intermountain Research Station*. Ogden, UT. 24 p.

Koehler, G.M. and K.B. Aubry. 1994. Lynx. In: Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, L.J. Lyon, and W.J. Zielinski, tech. eds. The scientific basis for conserving carnivores: American marten, fisher, lynx, and wolverine in the western United States. Gen. Tech. Rep. RM-254. *U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station*: Fort Collins, CO. 74-98.

Koehler, G.M. 1990. Population and habitat characteristics of lynx and snowshoe hares in north central Washington. *Canadian Journal of Zoology* 68:845–851.

Koehler, G.M. and J.D. Brittell. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. *Journal of Forestry* 88(10): 10-14.

Koehler, G.M., M.G. Hornocker, and H.S. Hash. 1979. Lynx movements and habitat use in Montana. *The Canadian Field-Naturalist* 93(4): 441-442.

Murray, D.L., S. Boutin, and M. O'Donoghue. 1994. Winter habitat selection by lynx and

coyotes in relation to snowshoe hare abundance. *Canadian Journal of Zoology* 72(8): 1444-1451.

Parker, G.R., J.W. Maxwell, L.D. Morton, and G.E.J. Smith. 1983. The ecology of the lynx (Lynx canadensis) on Cape Breton Island. *Canadian Journal of Zoology* 61(4): 770-786.

Poole, K.G., L.A. Wakelyn, and P.N. Nicklen. 1996. Habitat selection by lynx in the Northwest Territories. *Canadian Journal of Zoology* 74(5): 845-850.

Ruediger, B., J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, and A. Williamson. 2000. Canada lynx conservation assessment and strategy. *USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service*. Missoula, MT.

Thompson, I.D., I.J. Davidson, S. O'Donnell, and F. Brazeau. 1989. Use of track transects to measure the relative occurrence of some boreal mammals in uncut forest and regeneration stands. *Canadian Journal of Zoology* 67: 1816-1823.

Ulev, E. 2007. Lynx canadensis. In: Fire Effects Information System, [Online]. *U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory* (Producer). Available: http://www.fs.fed.us/database/feis/ [2012, August 17].

USDI. 2003. Endangered and Threatened Wildlife and Plants; Notice of Remanded Determination of Status for the Contiguous United States Distinct Population Segment of the Canada Lynx; Clarification of Findings; Final Rule. *Federal Register*. July 3, 2003

USDI Fish and Wildlife Service. 2006. Service's new regional directors oversee endangered fish recovery efforts. Upper Colorado River Endnagered Fish Recovery Program,Winter 2006 newletter "Swimming Upstream".

USDI Fish and Wildlife Service. 2012. Ute ladies'-tresses (spiranthes diluvialis) Species Profile. http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q2WA#crithab. Accessed November 1, 2012.

Vashon, J.H., A.L. Meehan, W.J. Jakubas, J.F. Organ, A.D. Vashon, C.R. McLaughlin, G.J. Matula, and S.M. Crowley. 2008. Spatial ecology of a Canada lynx population in northern Maine. *Journal of Wildlife Management* 72(7):1479–1487.

Wolfe, M.L., N.V. Debyle, C.S. Winchell, and T.R. McCabe. 1982. Snowshoe hare cover relationships in northern Utah. *Journal of Wildlife Management* 46(3):662-670.

Wolff, J.O. 1980. The role of habitat patchiness in the population dynamics of snowshoe hares. *Ecological Monographs* 50(1): 111-130.

Biological Evaluation

Copeland, J.P. 1996. Biology of the wolverine in central Idaho. M.Sc. thesis, *University of Idaho*, Moscow, ID.

Graham, R.T., R.L. Rodriguez, K.M. Paulin, R.L. Player, A.P. Heap, R. Williams. 1999. The Northern goshawk in Utah: habitat assessment and management recommendations. *General Technical Report RMRS-GTR-22*. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 48 p.

Hayward, G.D. and J. Verner, tech. editors. 1994. Flammulated, boreal, and great gray owls in the United States: **A** technical conservation assessment. Gen. Tech. Rep. RM-253. *U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station*. Fort Collins, CO. 214 p. 3 Maps.

Landa, A., O. Strand, J.D.C. Linell, and T. Skogland. 1998. Home-range sizes and altitude selection for arctic foxes and wolverines in an alpine environment. *Canadian Journal of Zoology* 76:448-457.

Leonard, Jr., D.L. 2001. American Three-toed Woodpecker (Picoides dorsalis), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the *Birds of North America Online*: http://bna.birds.cornell.edu/bna/species/588.

Persson, J., P. Wedholm, and P. Segerstrom. 2010. Space use and territoriality of wolverines (*Gulo gulo*) in northern Scandinavia. *European Journal of Wildlife Research* 56(19):49 57.

Sauer, J.R., J.E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966 - 2007. Version 5.15.2008. *USGS Patuxent Wildlife Research Center*, Laurel, MD.

Utah Division of Wildlife Resources (UDWR). 2005. Utah Statewide Management Plan for Gray Wolf. DWR Publication 05-17. http://wildlife.utah.gov/wolf/wolf_management_plan.pdf.

Whitman, J.S., W.B. Ballard, C.L. Gardner. 1986. Home range and habitat use by wolverines in south central Alaska. *Journal of Wildlife Management* 50(3):460-463.

Wolverine Foundation. 2012. http://wolverinefoundation.org/habitat-use/.

Watershed References

Ashcroft, Gaylen L., Jensen, Donald T. and Jeffrey L. Brown. 1992. Utah Climate. Utah Climate Center, Utah State University, Logan ,UT.

Bettinger, Pete and K. Norman Johnson. 1998. Evaluating the Association Among Alternative Measures of Cumulative Watershed Effects on a Forested Watershed in Eastern Oregon. Western Journal of Applied Forestry 13(1):15-22.

Bjornn, T. C. and D. W. Reiser. 1991. Habitat Requirements of Salmonids in Streams. American Fisheries Society Special Publication 19: 83-138.

Burroughs, E. R., Jr., and J. G. King. 1989. Reduction of Soil Erosion on Forest Roads. General Technical Report INT-264. USDA Forest Service, Intermountain Research Station.

Fulton, Stephanie and Ben West. 2002. Forestry Impacts on Water Quality *in Southern forest resource assessment, Gen. Tech. Rep. SRS-53. Asheville, NC: U.S. Department of Agriculture. Forest Service, Southern Research Station by Wear, David, Greis, John G., eds. 2002.*

Furniss, M. J., T. D. Roelofs, and C. S. Yee. 1991. "Road construction and maintenance." American Fisheries Society Special Publication 19: 297-324.

Harr, R. D., et al. 1975. Changes in Storm Hydrographs after Road Building and Clear-cutting in the Oregon Coast Range. Water Resources Research 11: 436-444.

Hauge, C. J., M. J. Furniss and F. D. Euphrat. 1979. "Soil Erosion in California's Coast Forest District." California Geology (June):120-129.

Jones, J. A., and G. E. Grant. 1996. "Peak Flow Responses to Clear-cutting and Roads in Small and Large Basins, Western Cascades, Oregon." *Water Resources Research* 32(4): 959-974.

MacDonald, L.H., 2000. Evaluating and managing cumulative effects, process, and constraints. Environmental Management. 26(3): 299-315.

Megahan, W. F. 1972. "Subsurface Flow Interception by a Logging Road in Mountains of Central Idaho. In *Proceedings, Watersheds in Transition Symposium, American Water Resources Association*, edited by S. C. Csallany, T. G. McGlaughlin and W. D. Striffler. Urbana, Illinois.

Phillips, R. W., et al. 1975. "Some Effects of Gravel Mixtures on Emergence of Coho Salmon and Steelhead Trout Fry." *Transactions of the American Fisheries Society* 104:461-466.

Potyondy, John P. and Peter J. Stender. 1982. Guide for Determining Water Yield Improvement Opportunities. June 1982. U.S. Forest Service, Intermountain Region Soil and Water Management.

Rashin, Edward B., Casey J. Clishe, Andrew T. Loch, and Johanna M. Bell, 2006. Effectiveness of Timber Harvest Practices for Controlling Sediment Related Water Quality Impacts. Journal of the American Water Resources Association (JAWRA) 42(5):1307-1327.

Reid, L. M. and T. Dunne. 1984. "Sediment Production from Forest Road Surfaces." *Water Resources Research* 20: 1753-1761.

Roby, K. B., D. C. Erman, and J. D. Newbold. 1977. "Biological Assessment of Timber Management Activity Impacts and Buffer Strip Effectiveness on National Forest Streams in Northern California." *Earth Resources Monograph* 11. Washington, DC: U.S. Department of Agriculture.

Seyedbagheri, Kathleen A. 1996. ldaho forestry best management practices: compilation of research on their effectiveness. Gen. Tech. Rep. INT-GTR-339. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 89 p.

Stednick, J. D. 1996. Monitoring the effects of timber harvest on annual water yield. Journal of Hydrology. 176: 79-95.

Stednick. 2006. Effects of Fuel Management Practices on Water Quality. John D. Stednick, Ph.D. Department of Forest, Rangeland, and Watershed Stewardship, Colorado State University, Fort Collins, CO 0523-1472.

Swanston, D. N. 1991. Chapter 5, Natural Processes in *Influences of Forest and Rangeland Management on Salmonid Fisheries and Their Habitats*. American Fisheries Society Special Publication 19:139-179, 1991.

Swanston, D. N. and F. J. Swanson. 1976. "Timber Harvesting, Mass Erosion, and Steepland Forest Geomorphology in the Pacific Northwest." In Geomorphology and Engineering, edited by D.R. Coates. Stroudsburg, PA: Dowden, Hutchinson, and Ross.

Troendle C.A. 1987. The Potential Effect of Partial Cutting and Thinning on Streamflow from the Subalpine Forest. Rocky Mountain Research Station, Research Paper RM-274.

Troendle, Charles A. and James M. Nankervis. 2000. Estimating Additional Water Yield From Changes in Management of National Forests in the North Platte Basin. Submitted to the Platte River Office, Bureau of Reclamation, Lakewood, Colorado.

Troendle, C.A., J.M. Nankervis, and A. Peavy. 2007. Final Report, The Heger-Feinstein Quincy Library Group Project – Impacts of Vegetation Management on Water Yield. Colin Dillingham, HFQLG Monitoring Team Leader, Vegetation Management Solutions Forest Service Enterprise Team. U.S. Forest Service

Troendle, Charles A., Lee H. MacDonald, Charles H. Luce, and I.J. Larsen. 2010. Cumulative Watershed Effects of Fuel Management in the Western United States, Chapter 7. Fuel Management and Water Yield.

USDA Forest Service. 2003. Wasatch-Cache National Forest Plan. USDA Forest Service.

USDA Forest Service. 2012a. *Compilation of Unpublished Riparian, Stream Type and Stream Stability Surveys and Field Reports Relating to the Smiths Fork Analysis* dated November 2012 by Charles R. Condrat, Wasatch-Cache National Forest hydrologist. U.S. Department of Agriculture.

USDA Forest Service. 2012b. *Compilation of Stream data consisting of Rosgen stream classification and Pfankuch stream stability ratingsfor selected streamsin the Smiths Fork drainage* dated November 2012 by Charles R. Condrat, Wasatch-Cache National Forest hydrologist. U.S. Department of Agriculture.

USEPA. 2005. *National Management Measures to Control Nonpoint Source Pollution from Forestry*. EPA-841-B-05-001. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC. October.

USGS. 2009. Water Data Report 2009, 09217900 Blacks Fork Near Robertson, WY. U.S. Geological Survey.

Utah, State of. 2010. Utah 2010 Integrated Report, Part 3, USEPA approved 2010 303(d) list. Utah Department of Environmental Quality, Division of Water Quality.

Utah, State of. 2006b. Wasatch-Cache National Forest Lakes Report, March 1, 2006. Utah Department of Environmental Quality, Division of Water Quality.

Utah, State of. 2012. *Standards of Quality of Waters of the State*, Section R317-2, Utah Administrative Code. Utah Department of Environmental Quality, Division of Water Quality.

Wemple, B. C., J. A. Jones, and G. E. Grant. 1996. "Channel Network Extension by Logging Roads in Two Basins, Western Cascades, Oregon." *Water Resources Bulletin* 32(6): 1195-1207.

Wyoming, State of. 2001. Green River Basin Water Plan, Chapter 5, Prepared for the Wyoming Water Development Commission, September 2001.

Wyoming, State of. 2010. Wyoming Water Quality Assessment and Impaired Waters List (2010 Integrated 305(b) and 303(d) Report).

Aquatic References

Beche, Leah A., Scott L. Stephens, and Vincent H. Resh. 2005. Effects of prescribed fire on a Sierra Nevada (California, USA) stream and its riparian zone. Forest Ecology and Management 218 (2005): 37-59.

Condrat, Charlie R., 2012. Smiths Fork Salvage, Water Resources Technical Report. U.S.D.A. Forest Service, Uinta-Wasatch-Cache National Forest, Salt Lake City Utah.

Flood, Paul K., Stacey Weems 2012. Smiths Fork Salvage Vegetation Treatment Project. Soil Specialist Report. USDA Forest Service, Uinta-Wasatch-Cache National Forest, Salt Lake City, Utah.

Hickman, T., and R. Raleigh. 1982. Habitat suitability index models: cutthroat trout. Western Energy and Land Use Team, Office of Biological Services. Fish and Wildlife Service. USDI, Washington, DC.

Meehan, W. R., editor. 1991. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19.

McKell, Matthew D., Craig J. Schaugaard, 2006. Blacks Fork River Drainage Management Plan Hydrologic Unit 14040107. Publication #06. Utah Department of Natural Resources. Utah Division of Wildlife Resources.

Overton, C.K., S.P. Wollrab, B.C. Roberts and M.A. Radko. 1997. R1/R4 (Northern/Intermountain Regions) Fish and Fish Habitat Standard Inventory Procedures Handbook. U.S.D.A. Forest Service, Intermountain Research Station, General Technical Report INT-GTR-346. Ogden, UT.

Rosgen, D. 1996. Applied river morphology. Wildlife Hydrology, Pagosa Springs, CO.

Thompson, P., M. McKell and P. Chase. 2006. Native Cutthroat Trout (Oncorhynchus clarkii ssp.) Conservation Activities in the Northern Region. Utah Division of Wildlife Resources, Salt Lake City, Utah.

Thompson, P. and P. Chase. 2009. Boreal Toad (Bufo boreas boreas) Distributional Surveys and Monitoring in Northern Utah, 2008. Annual Report. Utah Division of Wildlife Resources. Salt Lake City, Utah.

Thompson, P. and P. Chase. 2011. Boreal Toad (Bufo boreas boreas) Distributional Surveys and Monitoring in Northern Utah, 2010. Annual Report. Utah Division of Wildlife Resources. Salt Lake City, Utah.

USDA Forest Service. 2003. Wasatch-Cache National Forest Plan, Chapter 4, Bear Management Area. USDA Forest Service.

Wasatch-Cache National Forest. 2009. Management Indicator Species of the Wasatch-Cache National Forest. Salt Lake City, Utah Version 2009-1.

Vegetation References

Amman, Gene D.; McGregor, Mark D.; Cahill, Donn B.; Klein, William H. 1977. Guidelines for reducing losses of lodgepole pine to the mountain pine beetle in unmanaged stands in the Rocky Mountains. Gen. Tech. Rep. GTR-INT-36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Region.

Bartos, Dale L. 2008. Great Basin aspen ecosystems. In: Chambers, Jeanne C.; Devoe, Nora; Evenden, Angela, eds. Collaborative management and research in the Great Basin - examining the issues and developing a framework for action. Gen. Tech. Rep. RMRS-GTR-204. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 57-60.

Burns, R.M., Honkala, B.H., Tech. cords. 1990. Silvics of North America: 1. Conifers, Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC. Vol. 1, 675p.

Burns, R.M., Honkala, B.H., Tech. cords. 1990. Silvics of North America: 1. Hardwoods, Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC. Vol. 2, 877p.

Black, S.H. 2005. Logging to Control Insects: The Science and Myths Behind Managing Forest Insect "Pests". A Synthesis of Independently Reviewed Research. The Xerces Society for Invertebrate Conservation, Portland, OR.

Campbell, Robert B., Jr.; Bartos, Dale L. 2000. Aspen ecosystems: Objectives for sustaining biodiversity. USDA Proceedings RMRS-P-0. Presented at the September 2004 managing Aspen in Western Landscapes Symposium in Cedar City, UT.

Collins, B.J., C.C. Rhoades, R.M. Hubbard, and M.A. Battaglia. 2010. Tree regeneration and future stand development after bark beetle infestation and harvesting in Colorado lodgepole pine stands. Forest Ecology and Management 261: 2168-2175.

Debyle, Norbert V.; Winokur, Robert P. 1985. Aspen: Ecology and management in the Western United States. Gen. Tech. Rep. GTR RM-119. Fort Collins, CO: U.S. Department of Agriculture, Rocky Mountain Forest and Range Experiment Station.

Fettig, Christopher J.; Klepzig, Kier D.; Billings, Ronald f.; Munson, A. Steven; Nebeker, T. Evan; Negron, Jose F.; Nowak, John T. 2007. The effectiveness of vegetation management practices for prevention and control of bark beetle infestations in coniferous forests of the western and southern United States Forest ecology and management. 238(1-3): 24-53.

Jones, John R.; Debyle, Norbert V. 1985. Fire section in: Aspen: Ecology and management in the Western United States. Gen. Tech. Rep. GTR RM-119. Fort Collins, CO: U.S. Department of Agriculture, Rocky Mountain Forest and Range Experiment Station.

Kaufmann, M. R.; Graham, R. T.; Boyce, D. A.; Moir, W. H.; Perry, L.; Reynolds, R. T.; Bassett, R. L.; Mehlhop, P.; Edminster, C. B.; Block, W. M.; Corn, P. S. 1994. An ecological basis for ecosystem management. Gen. Tech. Rep. GTR-RM-246. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.

Margolis, Ellis Q.; Swetnam, Thomas W.; Allen, Craig D. 2007. A Stand-replacing fire history in upper montane forests of the southern Rocky Mountains. Canadian Journal of Forestry Research. 37: 2227-2241.

Prichard, D.; Barrett, H.; Cagney, J.; Clark, R.; Fogg, J.; Gebhardt, K.; Hansen, P.; Mitchell, B.; Tippy, D. 1993. Riparian area management: process for assessing proper functioning condition. TR 1737-9. Bureau of Land Management, BLM/SC/ST-93/003+1737, Service Center, Co.

Reynolds, R.T.; Graham, R.T.; Reiser, M.H.; Bassett, R.L.; Kennedy, P.L.; Boyce, D.A.; Goodwin, G.; Smith, R.; Fisher, E.L. 1992. Management recommendations for the northern goshawk in the Southwestern United States. Gen. Tech. Rep. RM-217. U.S. Department of Agriculture, Forest Service.

Ripple, William J.; Larsen, Eric J. 2000. Historic aspen recruitment, elk, and wolves in northern Yellowstone National Park, USA. Biological Conservation. 95 (2000): 361-370.

Ripple, William J.; Larsen, Eric J.; Renkin, Roy A.; Smith, Douglas W. 2001. Trophic cascades among wolves, elk and aspen on Yellowstone National Park's northern range. Biological Conservation. 102 (2001): 227–234.

Romme, William H. 1982. Fire and Landscape diverstiy in subalpine forests of Yellowstone National Park. Ecological Monographs. 52(2): 199-221.

Samman, Safiya; Logan, Jesse, tech. eds. 2000. Assessment and response to bark beetle outbreaks in the Rocky Mountain Area. Report to Congress from Forest Health Protection, Washington Office, Forest Service, U.S. Department of Agriculture. Gen. Tech. Rpt. RMRS-GTR-62. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 46p.

USDA 2003, Intermountain Region, Wasatch-Cache National Forest. Revised Forest Plan and Record of Decision. Salt Lake City, UT. 2003

USDA 2008, Intermountain Region, Wasatch-Cache National Forest. Evanston – Mountain View Ranger Districts. Blacks Fork Salvage Projects, FRCC Assessment. Salt Lake City, UT.

Soils References

Adams, P.W.1990. Soil Compaction in Woodland Properties; the Woodland Workbook. Oregon State University, Corvallis, Oregon.

Adams, P.W. and Froelich, H.A. 1984. Compaction of Forest Soils. USDA Forest Service Research Paper. PNW-217.

Curran, M. 1999. Harvest Systems and Strategies to Reduce Soil and Regeneration Impacts (and Costs). *In Impacts of Machine Traffic on Soil and Regeneration—Proceedings of FERIC's Machine Traffic / Soil Interaction Workshop, Edmonton, Alberta. Special Report No. SR-133. FERIC. Vancouver, BC.*

Elliot et al. 2000. Elliot, William J.; Hall, David E.; Scheele, Dayna L. Disturbed WEPP: WEPP Interface for Disturbed Forest and Range Runoff, Erosion, and Sediment Delivery. Draft Technical Documentation. U.S.D.A. Forest Service Rocky Mountain Research Station and San Dimas Technology and Development Center. February 2000.

Flood, Paul K. 2010a. Blacks Fork Salvage Vegetation Treatment Project. Soil Monitoring and Assessment Field Plots. USDA Forest Service, Wasatch Cache National Forest, Salt Lake City, Utah.

Flood, Paul K. 2010c. Soil Disturbance Sampling Results. Blacks Fork Salvage Sale. Units 10-15. Unpublished summary report of field monitoring activities. USDA Forest Service, Wasatch Cache National Forest, Salt Lake City, Utah. October 2007.

Flood, Paul K. 2011a. Smiths Fork Salvage Vegetation Treatment Project. Soil Monitoring and Assessment Field Plots. USDA Forest Service, Wasatch Cache National Forest, Salt Lake City, Utah.

Flood, Paul K. 2011b. FS WEPP Erosion and sediment delivery modeling results for proposed vegetation treatments in the Smiths Fork Salvage Sale Analysis Area. USDA Forest Service, Wasatch Cache National Forest, Salt Lake City, Utah.

Forest Service. 1992. Soil Resource Inventory for the North Slope of the Uinta Mountains. Unpublished maps and descriptions. Uinta-Wasatch-Cache National Forest, Salt Lake City, UT. June 1992.

Forest Service. 2010a. General Guidelines for Assigning Soil loss Tolerance "T". in: Intermountain Region Soil Criteria and Management Interpretation Guide, pp 89-98, 157-158, 164-165, and 194-195.USDA Forest Service, Wasatch Cache National Forest, Salt Lake City, Utah. Revised 2010.

Forest Service. 2010b. Potential Damage to Soil by Fire Rating Guide. in: Intermountain Region Soil Criteria and Management Interpretation Guide, pp 164-165. USDA Forest Service, Wasatch Cache National Forest, Salt Lake City, Utah. Revised 2010.

Forest Service. 2010c. Soil Compaction Potential Rating Guide. in: Intermountain Region Soil Criteria and Management Interpretation Guide pp 194-195.USDA Forest Service, Wasatch Cache National Forest, Salt Lake City, Utah. Revised 2010.

Froehlich, H.A. 1978. The Effect of Soil Compaction by Logging on Forest Productivity Final Report, Contract No. 53500-CT4-5-5(N). Bureau of Land Management, Portland, OR, 19 pp.

Froehlich, H.A. and D.H. McNabb. 1984. Minimizing soil compaction in Pacific Northwest Forests. *In E.L. Stone (ed.). Forest Soils and Treatment Impacts. Proc. 6th American Forest Soils Conf. Knoxville, TN. pp. 159–192.*

Fulton, Stephanie and Ben West. 2002. Forestry Impacts on Water Quality. *In Southern forest resource assessment, Gen. Tech. Rep. SRS-53. Asheville, NC: U.S. Department of Agriculture. Forest Service, Southern Research Station by Wear, David, Greis, John G., eds. 2002.*

Greacen, E.L. and R. Sands. 1980. Compaction of forest soils - a review. Aust. J.Soil Res. 18:163–189.

Han, S. et al. 2007. Impacts on soils from cut-to-length and whole tree harvesting. University of Idaho, Moscow, Idaho.

Reisinger, T.W., G.L. Simmons, and P.E. Pope. 1988. The impact of timber harvesting on soil properties and seedling growth in the South. South. J. Appl. For. **12**(1):58–67.

Stone, D.M. 2002. Logging Options to Minimize Soil Disturbance in the Northern Lake States. Northern Journal of Applied Forestry. **19**(3): 115-121.

Wildlife References

Ager, A.A., B.K. Johnson, J.W. Kern, and J.G. Kie. 2003. Daily and seasonal movements and habitat use by female Rocky Mountain elk and mule deer. *Journal of Mammalogy* 84(3):1076-1088

Andersen, D., Macmahon, J., & Wolf, D. 1980. Herbivorous mammals along a montane sere: community structure and energetics. *Journal of Mammalology* 61(3):500-519.

Ashley National Forest. 1998. Northern goshawk monitoring information 1996-1998, *U.S. Department of Agriculture, Forest Service, Ashley National Forest.* Vernal, UT.

Aubry, K.B., G.M. Koehler, and J.R. Squires. 2000. Ecology of Canada lynx in southern boreal forests. Pages 373–396 in L.F. Ruggiero, K.B. Aubry, S.W.Buskirk, G.M. Koehler, C. J. Krebs, K.S. McKelvey, and J.S. Squires, editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado, Niwot, USA

Baicich, P.J., and C.J.O. Harrison. 1997. A guide to the nests, eggs, and nestlings of North American Birds. *Second Ed. Academic Press, San Diego, CA.* 347 pp.

Benkobi, L., M.A. Rumble, G.C. Brundige, and J.J. Millspaugh. 2004. Refinement of the Arc Habcap model to predict habitat effectiveness for elk. *Res. Pap. RMRS-RP-51. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station*. 18 p.

BirdNote. 2004. Williamson's Sapsucker. http://www.birdnote.org/birdnote.cfm?id=675.

Bunnell, K. 2005. Factors potentially limiting Canada lynx conservation in the Uinta Mountains and the intermountain west. *Ph.D. Dissertation, Utah State University*. Logan, UT.

Cerovski, A., M. Gorges, T. Byer, K. Duffy, and D. Felley. 2001. Wyoming Partners in Flight Wyoming Bird Conservation Plan Version 1.0.

Cole, E.K., M.D. Pope, and R.G. Anthony. 1997. Effects of road management on movement and survival of Roosevelt elk. *Journal of Wildlife Management* 61(4):1115-1126.

Collins, W.B. and P.J. Urness. 1983. Feeding behavior and habitat selection of mule deer and elk on northern Utah summer range. *Journal of Wildlife Management* 47(3):646-663.

Copeland, J.P. 1996. Biology of the wolverine in central Idaho. M.Sc. thesis, *University of Idaho*, Moscow, ID.

Dolbeer, R. and W. Clark. 1975. Population ecology of snowshoe hares in the central Rocky Mountains. *Journal of Wildlife Management* 39(3):535-549.

Dewey, S.R. 1996. Ashley National Forest: Northern goshawk inventory and monitoring report: 1991-1996. Unpublished Monitoring Report. *U.S. Department of*

Agriculture, Forest Service, Ashley National Forest. Vernal, UT. 29 p.

Edge, W.D. and C.L. Marcum. 1985. Movements of elk in relation to logging disturbances. *Journal of Wildlife Management* 49(4):926-930.

Farrand, Jr., J. 2009. National Audubon Society field guide to North American birds: western region. Second edition, eleventh printing. New York, New York. *Alfred A. Knopf a division of Random House Inc.*

Fisher, J.T. and L. Wilkinson. 2005. The response of mammals to forest fire and timber harvest in the North American boreal forest. *Mammal Review*. 35(1): 51-81.

Gaines, W.L., P. H. Singleton, and R. C. Ross. 2003. Assessing the cumulative effects of linear recreation routes on wildlife habitats on the Okanogan and Wenatchee National Forests. *Gen Tech. Rep. PNW-GTR-586. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station*. Portland, OR.

Gelbard, J.L. and J. Belnap. 2003. Roads as conduits for exotic plant invasions in a semiarid landscape. *Conservation Biology* 17(2):420-432.

Gill, T. 2012. Smiths Fork Silvicultural Specialist Report. *U.S. Department of Agriculture, Forest Service, Evanston-Mt. View Ranger District*, Evanston, WY.

Graham, R.T., R.L. Rodriguez, K.M. Paulin, R.L. Player, A.P. Heap, R. Williams. 1999. The Northern goshawk in Utah: habitat assessment and management recommendations. *General Technical Report RMRS-GTR-22*. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 48 p.

Gratson, M.W. and C.L. Whitman. 2000. Road closures and density and success of elk hunters in Idaho. *Wildlife Society Bulletin* 28(2):302-310.

Giusti, G.A., R.H. Schmidt, R.M. Timm, J.E. Borrecco, and T.P. Sullivan. 1992. The lagomorphs: rabbits, hares, and pika. In: Silvicultural approaches to animal damage management in Pacific Northwest forests. Gen. Tech. Rep. PNW-GTR-287. *U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station*: 289-307. Portland, OR.

Hahn, T. P. 1996. Cassin's finch (*Carpodacus cassinii*). *Birds of North America* 240: 20 pp.

Hargis, C.D., R.D. Perloff, and C.D. McCarthy. 1994. Home ranges and habitats of northern goshawks in eastern California. *Studies in Avian Biology* 16:66-74.

Hayes, S.G., D.J. Leptich, and P. Zager. 2002. Proximate factors affecting male elk hunting mortality in northern Idaho. *Journal of Wildlife Management* 66(2):491-499.

Hayward, G.D. and J. Verner, tech. editors. 1994. Flammulated, boreal, and great gray owls in the United States: **A** technical conservation assessment. Gen. Tech. Rep. RM-253. *U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range*

Experiment Station. Fort Collins, CO. 214 p. 3 Maps.

Hayward, G.D. 2008. Response of boreal owl to epidemic mountain pine beetle-caused mortality under a no-action alternative. *USDA Forest Service Rocky Mountain Region*.

Hayward, G.D. 2008b. Response of pine squirrel under a no-action alternative to tree mortality resulting from a mountain pine beetle epidemic. *USDA Forest Service Rocky Mountain Region.*

Hodges, K.E. 2000. Ecology of snowshoe hares in southern boreal and montane forests. Pages 163–206 in L. F. Ruggiero, C. Krebs, K. B. Aubry, S. W. Buskirk, G. M. Koehler, K. S. McKelvey, J. R. Squires, and C. J. Krebs, editors. *The ecology and conservation of lynx in the United States*. University of Colorado Press, Boulder, USA.

Johnson, B.K., J.W. Kern, M.J. Wisdom, S.L. Findholt, and J.G. Kie. 2000. Resource selection and spatial separation of mule deer and elk during spring. *Journal of Wildlife Management* 64(3):685-697.

Koch, P. 1996. Lodgepole pine commercial forests: an essay comparing the natural cycle of insect kill and subsequent wildfire with management for utilization and wildlife. Gen. Tech. Rep. INT-GTR-342. *U.S. Department of Agriculture, Forest Service, Intermountain Research Station*. Ogden, UT. 24 p.

Koehler, G.M. and K.B. Aubry. 1994. Lynx. In: Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, L.J. Lyon, and W.J. Zielinski, tech. eds. The scientific basis for conserving carnivores: American marten, fisher, lynx, and wolverine in the western United States. Gen. Tech. Rep. RM-254. *U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station*: Fort Collins, CO. 74-98.

Koehler, G.M. 1990. Population and habitat characteristics of lynx and snowshoe hares in north central Washington. *Canadian Journal of Zoology* 68:845–851.

Koehler, G.M. and J.D. Brittell. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. *Journal of Forestry* 88(10): 10-14.

Koehler, G.M., M.G. Hornocker, and H.S. Hash. 1979. Lynx movements and habitat use in Montana. *The Canadian Field-Naturalist* 93(4): 441-442.

Landa, A., O. Strand, J.D.C. Linell, and T. Skogland. 1998. Home-range sizes and altitude selection for arctic foxes and wolverines in an alpine environment. *Canadian Journal of Zoology* 76:448-457.

Leonard, Jr., D.L. 2001. American Three-toed Woodpecker (Picoides dorsalis), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the *Birds of North America Online*: http://bna.birds.cornell.edu/bna/species/588.

Leptich, D.J. and P. Zager. 1991. Road access management effects on elk mortality and population dynamics. *Reprinted from the 1991 Elk Vulnerability Symposium, MSU,*

Bozeman, MT.

Lilieholm, R.J., J.N. Long, and S. Patla. 1994. Assessment of goshawk nest area habitat using stand density index. *Studies in Avian Biology* 16:18-23.

Loose, S. 2009. Response of three-toed woodpecker to environmental conditions under a no action alternative. *USDA Forest Service, Rocky Mountain Region.*

Lowther, P.E. 2000. Cordilleran Flycatcher (*Empidonax occidentalis*), *The Birds of North America Online (A. Poole, Ed.).* Ithaca: Cornell Lab of Ornithology; Retrieved from the *Birds of North America Online*: http://bna.birds.cornell.edu/bna/species/556b

Lyon, L.J. 1979. Habitat effectiveness for elk as influenced by roads and cover. *Journal of Forestry* 77(10):658-660.

Lyon, L.J. and C.E. Jensen. 1980. Management implications of elk and deer use of clear-cuts in Montana. *Journal of Wildlife Management* 44(2):352-362.

Lyon, L.J. 1983. Road density models describing habitat effectiveness for elk. *Journal of Forestry* 81(9):592-613.

Lyon, L.J. 1984. Field tests of elk/timber coordination guidelines. *U.S. Department of Agriculture, Forest Service, Research Paper INT-RP-325*, Ogden, Utah.

Lyon, L.J., T.N. Lonner, J.P. Weigand, C.L. Marcum, W.D. Edge, J.D. Jones, D.W. McCleerey, and L.L. Hicks. 1985. *Coordinating elk and timber management: Final report of the Montana Cooperative Elk-Logging Study.* Helena: Montana Department of Fish, Wildlife, and Parks.

McCorquodale, S.M., R. Wiseman, and C.L. Marcum. 2003. Survival and harvest vulnerability of elk in the Cascade Range of Washington. *Journal of Wildlife Management* 67(2):248 257.

Millspaugh, J.J., R.J. Woods, K.E. Hunt, K.J. Raedeke, G.C. Brundige, B.E. Washburn, and S.K. Wasser. 2001. Fecal glucocorticoid assays and the physiological stress response in elk. *Wildlife Society Bulletin* 29(3):899-907.

Murray, D.L., S. Boutin, and M. O'Donoghue. 1994. Winter habitat selection by lynx and coyotes in relation to snowshoe hare abundance. *Canadian Journal of Zoology* 72(8): 1444-1451.

Murray, D., J. Roth, E. Ellsworth, A. Wirsing, and T. Steury. 2002. Estimating low-density snowshoe hare poppulations using fecal pellet counts. *Candian Journal of Zoology* 80:771-781.

Nicholoff, S.H. 2003. Wyoming Partners in Flight Wyoming Bird Conservation Plan. http://www.partnersinflight.org/bcps/plan/WY/menu.htm.

Parker, G.R., J.W. Maxwell, L.D. Morton, and G.E.J. Smith. 1983. The ecology of the lynx (Lynx canadensis) on Cape Breton Island. *Canadian Journal of Zoology* 61(4): 770-786.

Parrish, J.R., F.P. Howe, and R.E. Norvell. 2002. Utah Partners in Flight Avian Conservation Strategy Version 2.0. Utah Partners in Flight Program, *Utah Division of Wildlife Resources*, 1594 West North Temple, Salt Lake City, UT 84116, UDWR Publication Number 02-27. i–xiv + 302 pp.

Persson, J., P. Wedholm, and P. Segerstrom. 2010. Space use and territoriality of wolverines (*Gulo gulo*) in northern Scandinavia. *European Journal of Wildlife Research* 56(19):49 57.

Poole, K.G., L.A. Wakelyn, and P.N. Nicklen. 1996. Habitat selection by lynx in the Northwest Territories. *Canadian Journal of Zoology* 74(5): 845-850.

Rawley, E.V., W.J. Bailey, D.L. Mitchell, J. Roberson, and J. Leatham. 1996. Utah upland game. Publication number 63-12. *Utah Division of Wildlife Resources*, Salt Lake City.

Reynolds, R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A. Boyce, G. Goodwin, R. Smith, and E.L. Fisher. 1992. Management Recommendations for the Northern Goshawk in the Southwestern United States. USDA Forest Service General Technical Report RM-217.

Rodriguez, R.L., R.L. Player, K.M. Paulin, and R.L. Williams. Conservation Strategy and Agreement for the Management of Northern Goshawk Habitat in Utah. *Utah National Forests, Bureau of Land Management, Utah Division of Wildlife Resources, United States Department of Interior, Fish and Wildlife Service* [Unpublished data].

Roloff, G.J. 1998. Habitat potential model for Rocky Mountain elk. *In Proceedings 1997 Deer/Elk Workshop*, Rio Rico, Arizona, ed. J. C. deVos, Jr., 158-175. Phoenix: Arizona Game and Fish Department.

Rowland, M.M., M.J. Wisdom, B.K. Johnson, and J.G. Kie. 2000. Elk distribution and modeling in relation to roads. *Journal of Wildlife Management* 64(3):672-684.

Rowland, M.M., M.J. Wisdom, B.K. Johnson, and M.A. Penninger. 2005. Effects of roads on elk: Implications for management in forested ecosystems. Pages 42-52 in Wisdom, M.J., technical editor, The Starkey Project: a synthesis of long term studies of elk and mule deer. *Reprinted from the 2004 Transactions of the North American Wildlife and Natural Resources Conference, Alliance Communications Group*, Lawrence, Kansas, USA.

Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 1999. Ecology and conservation of lynx in the United States. Gen. Tech. Rep. RMRS-GTR-30WWW. *U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.*

Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R.

Squires. 2000. The scientific basis for lynx conservation: qualified insights. Pages 443-454 In L.F. Ruggiero, K.B Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.S. Squires, editors. *Ecology and conservation of lynx in the contiguous United States*. University Press of Colorado, Boulder.

Ruediger, B., J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, and A. Williamson. 2000. Canada lynx conservation assessment and strategy. *USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service*. Missoula, MT.

Sauer, J.R., J.E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966 - 2007. Version 5.15.2008. *USGS Patuxent Wildlife Research Center*, Laurel, MD.

Sawyer, H. and R. Nielson. 2005. Seasonal distribution and habitat use patterns of elk in the Jack Morrow Kills Planning Area, Wyoming. *Bureau of Land Management, Rock Springs Field Office and Wyoming Cooperative Fish and Wildlife Research Unit.*

Shanley, C.S. and S. Pyare. 2011. Evaluating the road-effect zone on wildlife distribution in a rural landscape. *Ecosphere* 2(2):1-16.

Skorkowsky, R.C. 2009. Response of northern goshawk to epidemic mountain pine beetle caused mortality under a no-action alternative. *USDA Forest Service Rocky Mountain Region.*

Stewart, K.M., R.T. Bowyer, J.G. Kie, N.J. Cimon, B.K. Johnson. 2002. Temporospatial, distributions of Elk, Mule Deer, and Cattle: Resource Partitioning and competitive displacement. Journal of Mammalogy, Vol. 83, No. 1, pp. 229-244.

Squires, J.R., and T. Laurion. 1999. Lynx home range and movements in Montana and Wyoming: preliminary results. Pages 337–350 In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.S. Squires, editors. *Ecology and conservation of lynx in the United States.* University Press of Colorado, Boulder.

Thomas, J.W. USDA Forest Service. 1979. Wildlife habitats in managed forests, the Blue mountains of Oregon and Washington. *Ag. Handbook No*. 553. Portland, OR. 512pp.

Thompson, I.D., I.J. Davidson, S. O'Donnell, and F. Brazeau. 1989. Use of track transects to measure the relative occurrence of some boreal mammals in uncut forest and regeneration stands. *Canadian Journal of Zoology* 67: 1816-1823.

Utah Conservation Data Center (UCDC). 2009. *Utah Division of Wildlife Resources*. http://dwrcdc.nr.utah.gov/ucdc/default.asp

Uinta-Wasatch-Cache National Forest (UWCNF). 2012. Management Indicator Species Monitoring on the Wasatch-Cache National Forest Planning Area. Version 2012-1, March 10, 2012.

Ulev, E. 2007. Lynx canadensis. In: Fire Effects Information System, [Online]. *U.S.*

Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2012, August 17].

Unsworth, J.W., L. Kuck, M.D. Scott, and E.O. Garton. 1993. Elk mortality in the Clearwater Drainage of northcentral Idaho. *Journal of Wildlife Management* 57(3):495-502.

USDA Forest Service. 2003. "Revised Forest Plan Uinta-Wasatch-Cache National Forest" and "Final Environmental Impact Statement Uinta-Wasatch-Cache National Forest".

USDA Forest Service WCNF. 2007. Assessment of Management Indicator Species Capability and Suitability on the Wasatch-Cache National Forest with the Management and Restoration Direction.

USDI. 2003. Endangered and Threatened Wildlife and Plants; Notice of Remanded Determination of Status for the Contiguous United States Distinct Population Segment of the Canada Lynx; Clarification of Findings; Final Rule. *Federal Register*. July 3, 2003

USFWS. 1998. Notice of 12-month finding on a petition to list the northern goshawk in the contiguous United States west of the 100th Meridian. *Federal Register*. June 29, 1998.

USFWS. 2008. Birds of Conservation Concern. U.S. Fish and Wildlife Service, Division of Migratory Bird Management. Arlington, VA.

Utah Division of Wildlife Resources (UDWR). 2000. Utah Statewide Management Plan for Moose.

Utah Division of Wildlife Resources (UDWR). 2005. Utah Statewide Management Plan for Gray Wolf. DWR Publication 05-17. http://wildlife.utah.gov/wolf/wolf_management_plan.pdf.

Utah Division of Wildlife Resources (UDWR). 2008. Utah Mule Deer Statewide Management Plan. http://wildlife.utah.gov/hunting/biggame/pdf/mule_deer_plan.pdf

Utah Division of Wildlife Resources (UDWR). 2009. Utah Moose Statewide Management Plan. http://wildlife.utah.gov/hunting/biggame/pdf/moose_plan.pdf

Utah Division of Wildlife Resources (UDWR). 2010a. Utah Big Game Annual Report. http://wildlife.utah.gov/hunting/biggame/pdf/annual_reports/10_bg_report.pdf.

Utah Division of Wildlife Resources (UDWR). 2010b. Utah Elk Statewide Management Plan. http://wildlife.utah.gov/public_meetings/info/2010-03-02.pdf

Utah Division of Wildlife Resources (UDWR). 2010c. Utah Beaver Statewide Management Plan. DWR Publication 09-29. http://wildlife.utah.gov/furbearer/pdf/beaver_plan_2010 2020.pdf.

Vashon, J.H., A.L. Meehan, W.J. Jakubas, J.F. Organ, A.D. Vashon, C.R. McLaughlin, G.J.

Matula, and S.M. Crowley. 2008. Spatial ecology of a Canada lynx population in northern Maine. *Journal of Wildlife Management* 72(7):1479–1487.

Wallmo, O.C., W.L. Regelin, and D.W. Reichert. 1972. Forage use by mule deer relative to logging in Colorado. *Journal of Wildlife Management* 36(4):1025-1033.

Weber, K.T., C.L. Marcum, M.G. Burcham, and L.J. Lyon. 2000. Landscape influences on elk vulnerability to hunting. *Intermountain Journal of Science* 6:86-94.

Wertz, T.L., A. Blumton, and L.E. Erickson. 2004. Conflict resolution by adaptive management: moving elk where they want to go. *In Proceedings 2001 Western States and Provinces Deer and Elk* Rowland et al. 10 Workshop, ed. J. Mortensen, D. G. Whittaker, E. C. Meslow et al., 59-66. Salem: Oregon Department of Fish and Wildlife.

White, C.M., L. Holman, and D. Beal. 1992. A preliminary survey of northern goshawk nesting habitat: Manila Ranger District, Ashley National Forest and Evanston and Mountain View District, Wasatch-Cache National Forest. [Unpublished Data]. U*.S. Department of Agriculture, Forest Service*, Logan, UT.

Whitman, J.S., W.B. Ballard, C.L. Gardner. 1986. Home range and habitat use by wolverines in south central Alaska. *Journal of Wildlife Management* 50(3):460-463.

Wisdom, M.J., A.A. Ager, H.K. Preisler, N.J. Cimon, and B.K. Johnson. 2005. Effects of off-road recreation on mule deer and elk. Pages 67-80 in Wisdom, M.J., technical editor, The Starkey Project: a synthesis of long term studies of elk and mule deer. *Reprinted from the 2004 Transactions of the North American Wildlife and Natural Resources Conference, Alliance Communications Group*, Lawrence, Kansas, USA.

Wisdom, M.J., N.J. Cimon, B.K. Johnson, E.O. Garton, and J.W. Thomas. 2005b. Spatial partitioning by mule deer and elk in relation to traffic. Pages 53-66 in Wisdom, M. J., technical editor, The Starkey Project: a synthesis of long-term studies of elk and mule deer. *Reprinted from the 2004 Transactions of the North American Wildlife and Natural Resources Conference, Alliance Communications Group*, Lawrence, Kansas, USA.

Witmer, G.W. and D.S. deCalesta. 1985. Effect of forest roads on habitat use by Roosevelt elk. *Northwest Science* 9(2):122-125.

Wolfe, M.L., N.V. Debyle, C.S. Winchell, and T.R. McCabe. 1982. Snowshoe hare cover relationships in northern Utah. *Journal of Wildlife Management* 46(3):662-670.

Wolff, J.O. 1978. Food habits of snowshoe hares in interior Alaska. *Journal of Wildlife Management* 42(1):148-153.

Wolff, J.O. 1980. The role of habitat patchiness in the population dynamics of snowshoe hares. *Ecological Monographs* 50(1): 111-130.

Wolverine Foundation. 2012. http://wolverinefoundation.org/habitat-use/.

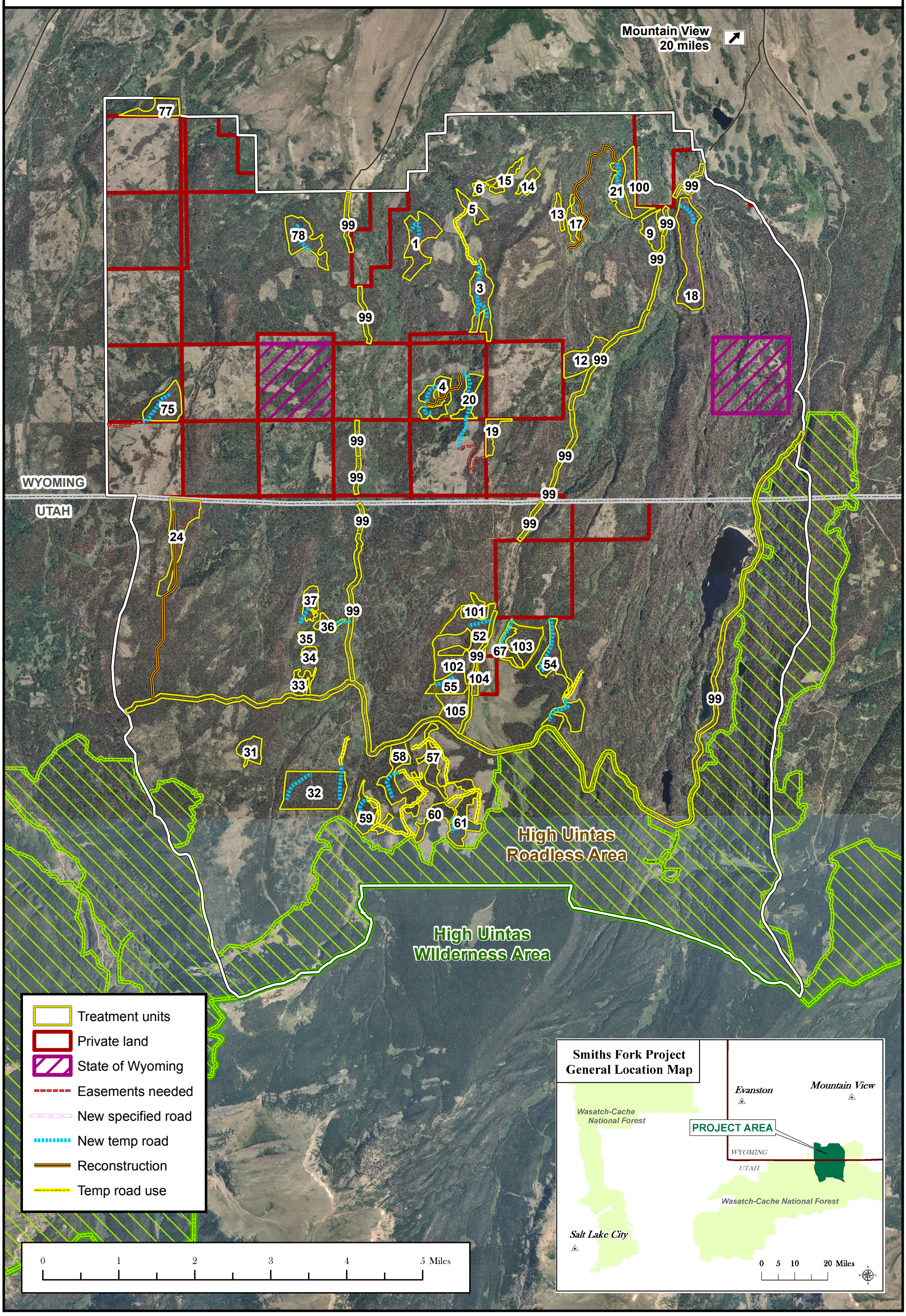
Wong, C. 2008. Environmental impacts of mountain pine beetle in the southern interior. *On behalf of Provincial Beetle Response Project Environmental Stewardship.* British Columbia Ministry of Environment, Prince George, BC.

Wyoming Game and Fish Department (WGFD) 2010. Green River Region Annual Big Game Herd Unit Reports. http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/JCR_BGGRCOMP_20100001033.pdf.

Zwickel, F.C. and J.F. Bendell. 2005. Blue Grouse (*Dendragapus obscurus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the *Birds of North America Online*: http://bna.birds.cornell.edu/bna/species/015doi:10.2173/bna.15

Appendix C: Smiths Fork Vegetation Restoration Project

Evanston-Mountain View Ranger District, Uinta-Wasatch-Cache National Forest



Appendix D: Response to Comments on the Draft EIS

A legal notice requesting comments on the draft environmental impact statement ("draft EIS") was published on **August 30, 2013**. A notice of availability of the draft EIS was published in the *Federal Register* on **August 30, 2013**. The official 45-day comment period on the draft EIS ended on **October 15, 2013**. However, comments received after that date were accepted in conjunction with the federal government furlough which began on October 1.

****

Commenter 1; **United States Department of the Interior**
Received: **Letter dated October 17 received via email on October 17**

Comment 1-1: The U.S. Department of the Interior has reviewed the Draft Environmental Impact Statement for the Smiths Fork Vegetation Restoration Project, Evanston-Mountain View Ranger District; Uinta-Wasatch-Cache National Forest; Uinta and Summit County, Utah, and has no comments on the document. The U.S. Fish and Wildlife Service's letter of December 20, 2012, documents completion of the Section 7 consultation process.

Response 1-1: Thank you for your comment.

****

Commenter 2: **Utah Environmental Congress**
Received: **Email dated October 15**

Comment 2-1: The Utah Environmental Congress (UEC) appreciates this opportunity to provide comments on the proposed action being considered in the Smiths Fork Vegetation Restoration Project Draft Environmental Impact Statement (DEIS). At this stage UEC continues to be an interested party with concerns, recommendations, and objections relating to the proposed action. Please add and maintain UEC on the contact and mailing lists for this and all related proposed actions. Please mail UEC copies of the environmental documents for this project when each becomes available to the public.

Response 2-1: The Forest Service will maintain the Utah Environmental Congress (UEC) on the contact list for the Smiths Fork project, as well as related and future projects, and will provide UEC copies of the environmental documents for the Smiths Fork project when they become available to the public.

****

Comment 2-2: UEC is a signatory on Yellowstone to Uintas Connection's comments dated October 14, 2013 for this comment period. Y2U's comments are direct, concise and to the point. They hit on most of our concerns. We wish not to repeat. Therefore, other additional concerns, many directly concerning treatment of UEC staff and concerns, are added in our comments below.

Response 2-2: Thank you for the clarification. Comments provided by the Yellowstone to Uintas Connection, as well as Forest Service responses, are found below under **Commenter 3**.

***

Comment 2-3: As a preliminary matter we desire to incorporate our scoping input into these comments. A good deal of that written input you already should have on record from the HFRA scoping period. Some you may not. UEC cannot be certain as UEC staff persons were directly denied permission to provide prepared science-based input at public things or events incorrectly pitched as collaborative meetings held during the formal scoping period for this EIS. Such meetings were hostile in reality. For one example, UEC's Kevin Mueller was arbitrarily and unfairly gagged from speaking by the USFS staff and the just retired USFS timber employee that claimed to be the final word for what parties could be heard or not – and the paid staff made clear UEC was barred from speech. This is by written and oral submission. The process was and remains today morally and legally inadequate.

In light of these things, such as rejection of oral and (electronic) written input by UEC staff at so-called HFRA collaborative meeting(s), we assume the record is arbitrary, capricious and inadequate due to these and other such biased (if not hostile) rejections.

Response 2-3: The Forest Service response to scoping comments, including those provided by the Utah Environmental Congress, can be found in Appendix A of the environmental impact statement.

***

Comment 2-4: This brings us to chapter one of the DEIS, which reads as completely consistent with the above. We'll be polite and repeat that it is an arbitrarily constructed yarn; a lie; an insult. That might in some situations seem to be strong words. In light of public insults lobbed at Utahans who care about the project telling them they can drive for hours each way but not speak … it is not.

Scoping meetings were rigged towards extractive logging, and Wyoming activists openly hostile about anyone from Utah showing up. At times the clear appearance was that the just-retired USFS employee from Wyoming seemed to be making the environment more socially hostile towards attendees who resided in Utah. This was so, for example, for Kevin Mueller and Bob Brister. Among the pile of examples is that that the start time of that falsely-labeled collaborative meeting was changed by USFS staff (or at least the USFS paid and just retired USFS "facilitator") in conjunction with verbal and email string noticing to anti-environmental and anti-federalist lobbies in Wyoming … with not so much as considering the same noticing for conservation groups such as UEC, Wild Utah Project and others in Utah. Summit County Utah was similarly excluded from that process. This was in light of request to raise important bias issues at the beginning of the meeting by the Utah-based interest groups including UEC. In response to that the start time was bumped up with no timely notice to such interests in Utah. This is one among a list of such abusive examples. Now that the 2012 DEIS with finalized supporting and signed 2012 BEs, BAs, and final 2012 specialist reports are first released a year after completion (late 2013) … this underlines the fact that this process has been an insult to credulity.

Of course the DEIS chapter 1 systematically fails to reflect any of this. After all, in response to requests to present the most current published peer-reviewed science, to run quickly through USDI BLM scientist's findings on stand replacement fire risks in the middle Rocky Mountains … UEC staff were told absolutely no. In fact, UEC staff was (embarrassingly) told they could not speak in that so-called public collaborative situation. Chapter I of the DEIS is not accurate. Submission of meaningfully written, .ppt, .pdf, .doc material and supporting verbal synthesis attempted to be offered by UEC staff after driving hours to another state for a timber sale half in Utah has been summarily denied and rejected. Short of this

being a mockery, we believe you cannot be serious professionally when claiming the process said to support this project has been collaborative.

Such patterns of omission and/or inaccuracy continue throughout the rest of the DEIS. You (e.g. USFS staff that publically represented the USFS and/or the just-retired USFS timber staff person hired to "facilitate this HFRA collaboration") have rejected our science and policy based input in a heretofore uncommon, arbitrary and derogatory fashion. In light of such things we offer you the following input in addition to Y2U's comments that you have already received:

- HFRA's objectives, direction, and intent is not and has not been met by the proposed action;
- The intent of LRMP and NFMA duties are not being met by the proposed action;
- Just one of a string of case examples, the DEIS appears to go on about Forest desired conditions in a way that would indicate to the unknowing reader that they matter or are central when there are no desired conditions in the Forest Plan.
- The same is so for policies and laws relating to water, soils, and species.

In conclusion: It is unfortunate that this collaborative process was acutely derogatory, exclusionary, and full of the appearance of anti-Utah bias; egged on by the USFS-paid contractor. Please ensure that you mail hard copies of the environmental documents and supporting information for this project to UEC's office as soon as any public is permitted to review each.

Response 2-4: The collaborative process is described in detail in Chapter 1 of the final EIS. With regard to the collaborative process, the UEC made similar comments in its response to scoping, as well as in letters dated September 19, 2011, and September 27, 2011. These comments are addressed both in Appendix A in the EIS and in an October 7, 2011 response from the forest supervisor to the commenter. In its September 19, 2011 letter the UEC withdrew from the collaborative process. In his October 7, 2011 response, the forest supervisor invited the commenter to re-engage in the process. On January 31, 2014, the Evanston-Mountain View district ranger visited the commenter at the UEC office in Salt Lake City to try to reestablish lines of communication.

With regard to the objectives, direction, and intent of the Healthy Forests Restoration Act ("HFRA"), section 1.1 of the draft and final environmental impact statements describes the conditions that led to the declaration of an insect and disease epidemic in the project area as well as the justification for using Section 102(a)(4) of the HFRA as the appropriate authority under which to conduct the environmental analysis.

With regard to the intent of the Revised Forest Plan [for the] Wasatch-Cache National Forest ("Forest Plan") and the National Forest Management Act ("NFMA") duties, section 2.3 of the draft and the final environmental impact statements describe the Forest Plan standards and guidelines that may apply to the project. Section 3.10.2 of the draft and final EISs describe the NFMA timber management requirements for projects and activities as per Forest Service Manual 1921.12(a) and 16 USC 1604(g)(3)(E). As described in section 3.10.2, proposed activities are consistent with the law and associated direction.

Desired conditions are found throughout the Forest Plan, including: air quality and smoke management (Forest Plan, pg. 4-5); soil, water, riparian, and aquatic resources (Forest Plan, pg. 4-5); wildlife resources (Forest Plan, pg. 4-6); vegetation (Forest Plan, pg. 4-7); botanical resources (Forest Plan, pg. 4-9); non-native plants (Forest Plan, pg. 4-10); fire management (Forest Plan, pg. 4-10); facilities and roads (Forest Plan, pg. 4-11); scenic environment (Forest Plan, pg. 4-11); heritage resources (Forest Plan, pg. 4-12);

and roadless area values (Forest Plan, pg. 4-13).

The draft EIS summarized the effects of the proposed action on water, soils, species, and other resources. As described in section 1.5 of the draft and the final EISs, the responsible official will review the proposed action and the environmental consequences to decide whether or not to implement the project.

****

Commenter 3: **John Carter, Yellowstone to Uintas Connection (also on behalf of the Utah Environmental Congress and the Western Watersheds Project)**
Received: **Letter dated October 14 received via email on October 15**

Comment 3-1: Maps of the habitats occupied or potentially occupied by T&E, MIS, and Sensitive Species in relation to the specific project elements (roads, clearcuts, thinning areas, other) are lacking. For example, northern goshawk home, PFA and nesting areas are not mapped so we have no idea of the portion of habitat affected directly and indirectly. These should be mapped for the project area and a suitable adjacent buffer. Past projects should also be mapped to provide an understanding of the extent of manipulation of the Forest. Grazing allotments, water developments, and fences should be mapped to show elements related to habitat fragmentation and livestock concentrations.

Response 3-1: Northern goshawk nesting, post-fledging family, and forage areas were mapped as part of the analysis. Treatments in those areas are different than treatments proposed for similar stands that are not in goshawk habitat. Section 3.7.3 of the EIS describes the effects of the proposed action on goshawk, including the fact that in northern goshawk territories with proposed salvage units, "no more than 10 to 15 percent in salvage treatment would occur in the post-fledging family area (PFA). The only treatments proposed within the 30 acre nest buffers are roadside salvage proposed for public safety... These treatments will not occur during the active nesting period if the nests are determined to be active by the biologist the year the treatments will be completed."

Information on specific locations of northern goshawk nests is available for release to the public and may be obtained if requested. However, the Forest Service is reluctant to release such information openly because it can be used by persons to illegally capture fledglings for use by falconers.

Past, present, ongoing, and reasonably foreseeable activities in or near the project area are listed in Table 3.1 of the EIS.

***

Comment 3-2: There are large blocks of private land in the project area. It is unclear if these are logged or treated around the boundary with the Forest lands, are logged or treated just around buildings present today, whether road corridors on private land are cleared. The details of how these "urban" or private properties are managed should be included.

Response 3-2: The analysis area for the project includes approximately 48,775 acres of Forest Service land, 7,778 acres of private land, and 1,279 acres of State of Wyoming land. Table 3.1 in the EIS includes private timber activities as part of the past, present, ongoing, and reasonably foreseeable actions in or near the project area. Section 3.10.5 of the EIS notes that approximately 3,300 acres of past harvesting in the area have been on private or state lands, and that those harvested lands are at varied stages of development and contribute to nearly all of the mid seral forest forested vegetation in the project area. The effects of past vegetation treatments were incorporated into the assessment of the existing

condition for the project. Not all treatments created early seral vegetation, however, because some treatments involved thinning. The EIS notes that expecting future harvesting on private and state lands is reasonable.

***

Comment 3-3: The presumption that "treated" areas regenerate faster than beetle killed or burned areas is carried throughout the documents, yet no data from other projects either in the project area or adjacent areas is presented to show how regeneration rates differ between these "treated" areas and non-treated areas. This is a central argument used to justify the preferred alternative, yet is left in the status of merely being an unsubstantiated claim. Are there differences in regeneration in areas that have logged live trees, salvaged dead trees, been thinned, or burned either naturally or by prescribed fire? We question why this is needed because dead trees are ecologically important.

Response 3-3: The results of recent research from Colorado show that created openings in mountain pine beetle-killed lodgepole pine stands would be expected to accelerate the natural regeneration and growth of lodgepole pine by creating an exposed mineral seedbed and allowing increased sunlight to reach the forest floor (Collins et al. 2010). The majority of the analysis area would not be harvested, which would leave an abundance of ecologically important dead trees. The tree species in non-harvested areas would be expected to shift from lodgepole pine dominance to the shade tolerant Engelmann spruce and subalpine fir. However, field observations have shown that many of the stands in the Smiths Fork project area already have small lodgepole pine advanced regeneration developing under the dead overstory trees. This lodgepole pine advanced regeneration would be suppressed by the standing dead trees and out-competed by spruce and fir if not released from the dead overstory. Most of the Smiths Fork project area would not be harvested and can be expected to increase in the percentage of spruce and fir and decrease in the percentage of lodgepole pine. Therefore, harvesting a small percentage of the area favors the natural regeneration of lodgepole pine. The result would be greater species diversity in the area by favoring ecologically important lodgepole pine in harvested areas and favoring ecologically important spruce, fir, and standing dead trees in the non-harvested areas.

***

Comment 3-4: The presumption that "treated" areas will provide more herbaceous vegetation than untreated areas is used to make claims that prey bases for predatory species such as goshawk, owls or food and habitat for snowshoe hares will be benefited. Yet these areas are grazed by livestock, which remove the herbaceous vegetation. Our experience is that these logged areas remain lacking in herbaceous species because forage is consumed by the livestock attracted to these openings. Once again, the Forest Service should document the status of the understory community with data from previously treated areas in grazing allotments.

Response 3-4: GIS analysis shows that approximately 21 percent (that is, 940 acres) of areas proposed for treatment under Alternative 2 are considered capable range for livestock, leaving approximately 79 percent of the area to be treated that is considered not capable. Livestock grazing was considered as a past, present, ongoing, and reasonably foreseeable activities in or near the project area, as per Table 3.1 of the EIS.

***

Comment 3-5: The presumption is made that MIS, Sensitive Species and Migratory Birds will not suffer listing under the ESA because there is habitat elsewhere in spite of "May Affect" determinations for many

of the species described. There are site specific impacts that can occur due to fragmentation, disturbance and human activity, yet these are dismissed due to the claimed benefits of the project and this presumed habitat that occurs elsewhere or in the future.

Response 3-5: The rationale for the determinations made for various species is found in the wildlife technical report, the biological assessment, the biological evaluation, and section 3.7 of the EIS. In order to mitigate potential negative impacts to migratory birds during the breeding season, pre-disturbance surveys will be conducted to identify active nests. When an active nest is identified, a no activity buffer zone, which has been set by the USFWS Utah Ecological Services Salt Lake City Field Office, will be applied to the nesting area to avoid potential take. Salvage activities may resume after the young have fledged the nest, or if it has been determined by a wildlife professional that the nest has failed. If pre-disturbance surveys are not completed, salvage activities should not take place until after the migratory bird breeding season is complete on July 31.

***

Comment 3-6: The DEIS and Wildlife Report document numerous past logging or timber projects, future projects and various human activities that indicate disturbance will continue to occur in this and adjacent areas. A map of these past and proposed or future projects and activities should be provided that shows the extent of this known disturbance.

Response 3-6: Past, present, ongoing, and reasonably foreseeable activities in or near the project area are listed in Table 3.1 of the EIS.

***

Comment 3-7: Many miles of roads are planned that are either open or temporarily open, then closed. Having spent considerable time in the Uintas and observed trespassing OHVs even in the wilderness, as well as other logging project areas here in northern Utah, I am concerned that these "closed" roads or logging trails will be used by OHVs, provide access for hunters, livestock and further fragment the area. All temporary roads should be removed, recontoured to the original contours and revegetated. Roads are a major and chronic source of sediment in streams. They also are a vector source for the spread of weeds. So "temporary" roads have many of the same effects and impacts as open roads, providing travelways for livestock, which are major vectors for weeds as well. Further consideration should be given to reducing road and trail density in the project area to mitigate past impacts to MIS and other species with May Affect determinations, and limit snowmobiles to specific travelways with enforcement plans that are disclosed to the public.

Response 3-7: Section 2.3 of the EIS lists Forest Plan standards and guidelines that will be applied to the project, and section 2.4 of the EIS lists project-specific design criteria and mitigation measures that will be applied to the project to address potential impacts. In addition to the potential effects of roads associated with the proposed action, existing National Forest System roads and motorized trails were considered as part of the past, present, ongoing and reasonably foreseeable activities as per Table 3.1 in the EIS. Temporary roads will be closed to the public after completion of the project.

***

Comment 3-8: Livestock grazing in the three allotments includes cattle and sheep. The Wildlife Report mentions grazing in the Cumulative Impacts section, but dismisses it out of hand as a factor based on the forage to be generated by opening up the Forest thru salvage logging. Yet sheep bedding grounds and

cattle concentrations in aspen, near water, in meadows and forest openings deplete the vegetation and denude the soil. These are tremendous impacts yet the DEIS only indicates livestock management in relation to the project until aspen reach 6' in height. How many years will livestock be excluded from the project area? Where are the data that describe the current conditions of the various habitat and vegetation types as a result of livestock grazing in the project area and compares this to potential? We note that the Wildlife Report indicates mature aspen lacks herbaceous understory. If you examine NRCS ecological site descriptions, you find that most aspen types have a very productive herbaceous understory. It is only the removal of this vegetation by livestock along with the aspen suckers that results in the "even-aged" stands of aspen described. A review of aspen literature is included on the accompanying CD.

Response 3-8: The literature provided by the commenter was reviewed and summarized by members of the interdisciplinary team, and has been entered into the project record. Livestock grazing is included in the past, present, ongoing, and reasonably foreseeable activities in or near the project area are listed in Table 3.1 of the EIS

***

Comment 3-9: Lynx impacts are dismissed even though this project occurs in Lynx Analysis Units. The Wildlife Report indicates no sign of lynx was found in surveys, which are likely surveys by snowmobile along active snowmobile trails. What is the probability that snowmobile trails and noise discourage any lynx from occupying these areas? We should be closing these and other areas bordering the wilderness area to snowmobiles to eliminate the source of noise and disturbance that likely precludes lynx from using the area. Furthermore, snowmobile trails can provide access to coyotes to prey on hares and thus compete with both Lynx and goshawk. Snowmobiles and roads should be eliminated in LAUs. See review on Motorized Recreation on the accompanying CD.

Response 3-9: Impacts to various species, including Canada lynx, are discussed in the wildlife technical report and the biological assessment. The U.S. Fish and Wildlife Service concurred with the Forest Service determination that the Smiths Fork project may affect, but is not likely to adversely affect the lynx.

***

Comment 3-10: Goshawk home range is not delineated within the project area. Recommendations from the Forest Service's own research provide guidelines for limiting livestock use of herbaceous vegetation in goshawk home range to 20% and emphasize protection of mycorrhizal fungi layers in forest soils. The Carter et al (2011) paper provided in the CD demonstrates that livestock affect the forest understory and soils. Yet the DEIS and Wildlife Report do not provide data or analysis of the effects of livestock grazing combined with the project and other activities on forest health, sustainability and the forage base for small mammals that are needed as a prey base for the MIS, Sensitive and T&E species.

Response 3-10: Please see responses 3-1 and 3-5 above.

***

Comment 3-11: The soils in the project area are described as containing clays and holding water near the surface. This implies moist soils in their natural state. This should enhance decomposition of downed woody debris including beetle killed trees. It should also hinder or lower fire intensity. Livestock grazing removes ground covering vegetation, tramples and puddle these susceptible soils, and results in

drying of the soils. Removal of the forest overstory and creation of clearings thru salvage logging will further exacerbate this problem. There was no data or analysis of this problem, no mapping of soils to how which soils occur in relation to the particular "treatment" unit. Our experience in the Uinta Wilderness as reflected in the West Fork Black's Fork report on the accompanying CD indicates that the forest understory in grazed lodgepole habitat is dry and barren, while in ungrazed lodgepole it is moist and productive.

Response 3-11: Soil maps of the area are in the project record. Units that were initially proposed for treatment but which had high water tables were dropped from the analysis. The soil report for the project notes that even though the analysis area is actively grazed by both sheep and cattle, ground cover values within areas proposed for mechanical harvesting were consistently near 100 percent.

***

Comment 3-12: Leaving the beetle killed trees in place and cancelling this project would benefit the ecosystem by retaining nutrients and providing organic matter to build soils. The more open canopy would allow understory production to increase, benefiting many species. Falling trees and woody debris would hinder livestock access and provide a real benefit to wildlife. Dead trees are a biological legacy for future forests. They have many benefits to wildlife, but also affect things like soil moisture, provide habitat for things like mollusk, fungi and lichens which tend to be ignored in Forest decision making.

Response 3-12: All treatments will occur in management prescription areas that are considered suitable for timber harvesting, as per the Revised Forest Plan [for the] Wasatch-Cache National Forest. In addition, the project meets the National Forest Management Act timber management requirements as outlined in section 3.10.2 of the EIS.

***

Comment 3-13: Declining population trends for MIS, goshawk, beaver, and snowshoe hare are dismissed, yet they are declining. The Forest Service obligation is to protect these species and address this decline. Are beavers being trapped and therefore dams abandoned? Are grazed watersheds leading to flash floods that destroy dams? Are sediment loads filling dams? Are livestock eliminating desirable aspen and willow food and material sources for beaver? Are livestock eliminating the food base for snowshoe hare? Is the prey base for goshawk depleted due to livestock consuming the food base for their prey? These issues need addressing and mitigating by correcting the problems with watersheds and habitat that exist today.

Response 3-13: The rationale for the determinations made for various species is found in the wildlife technical report, the biological assessment, the biological evaluation, and section 3.7 of the EIS.

****

Commenter 4: **Wyoming Game and Fish Department**
Received: **Letter dated October 10 received via email on October 11**

Comment 4-1: The staff of the Wyoming Game and Fish Department has reviewed the Draft Environmental Impact statement for the Smiths Fork Vegetation Restoration Project on the Evanston-Mountain View Ranger District. We offer the following comments.

Terrestrial Considerations:

We support this project from a terrestrial wildlife perspective. Roadless security habitats are essential for wildlife so we recommend that the USFS close and rehabilitate newly constructed roads after access to the treatment units are no longer needed.

Aquatic Considerations:

We have no aquatic concerns pertaining to this project.

Response 4-1: Thank you for your comments.

****

Commenter 5: **Larson Livestock, Inc.**
Received: **Letter dated September 20**

Comment 5-1: We request that you select the preferred alternative, Alternative 2, to be implemented as soon as possible. Thank you for the opportunity to comment and also be a part of the collaborative process.

Response 5-1: Thank you for your comments.

****

Commenter 6: **Uinta County Citizens Coalition for Sound Resource Use**
Received: **Letter dated September 19 received via FAX on September 20**

Comment 6-1: On behalf of the Uinta County Citizens Coalition I am submitting a comment regarding the Draft Environmental Impact Statement on this cooperative effort. We have been involved from the beginning of this project, have attended the meetings, the field tours and reviewed the documents.

We recommend the adoption and implementation of alternative #2 as a viable solution to this effort.

Response 6-1: Thank you for your comments.

****

Commenter 7: **Uinta County Farm Bureau**
Received: **Letter dated October 17**

Comment 7-1: We request you select the preferred alternative, Alternative 2, to be implemented as soon as possible. Alternative 2, which provides for removal of affected trees to prevent loss of habitat and will improve the overall health and safety of the forest that is enjoyed and utilized by many, is the alternative we feel best meets the desired conditions.

Response 7-1: Thank you for your comments.

****

Commenter 8: **Summit County Council**
Received: **Letter dated October 14**

Comment 8-1: The Council endorses the environmental analysis stated in Alternative 2 that mitigates the mountain pine beetle epidemic directly and cumulatively.

Response 8-1: Thank you for your comments.

****

Commenter 9: **Erin Mapes**
Received: **Email dated October 14, 2013**

Comment 9-1: Although much consideration has been given to preserving important wildlife habitat, particularly for the northern goshawk, it is inevitable that this project will affect individuals and potentially communities. While it has not been predicted that the proposed action would contribute to a downward trend for any of the species, it is certain to affect them adversely on some level, at least temporarily. I am particularly concerned about how the introduction of noise and artificial light could affect animals. Would two members of a species be able to hear each other over the sound of saws? Would artificially lit operations at night attract moths, which then might attract hungry owls? Additionally, there is mention of limiting operations around goshawk nests during nesting seasons, but little description of what happens after. Presumably, the birds are still in the area. How will their habitat be treated once they are grown?

Response 9-1: The effects of the proposed action on wildlife species are summarized in the wildlife technical report, the biological evaluation, and the biological assessment, as well as addressed in section 3.7 of the EIS.

***

Comment 9-2: An operation of this magnitude will bring jobs to the surrounding community, which might have impacts on the community and the habitat. More cars on the road from workers going to and from jobs will intensify the edge effect that roads have on habitat. There may also be effects from day to day life, like providing homes to the new workers. If temporary housing is set up to accommodate employees attention should be paid to where it is and how it can best fit into the community and environment with minimal impact on its surroundings.

Response 9-2: Temporary housing of employees off National Forest System lands is beyond the scope of the analysis.

***

Comment 9-3: The soils here are moist and prone to compaction, which will be inevitable in heavily used areas. There is little to be done other than ensuring that it is occurs on a minimal area of land.

Response 9-3: Section 3.4.2 of the EIS notes that, based on analysis, cumulative effects to the soil from the proposed action would consist of 0.9 acres of detrimentally compacted soil associated with the construction of temporary and intermittent roads for access to the harvest units. With the implementation of recommended mitigation measures and project design features to limit detrimental soil disturbance, the

proposed action would have very little direct or indirect effect on soil quality. The soil resource technical report for the project, which is located in the project record, describes impacts to soil in detail.

***

Comment 9-4: Alternative 2 appears to have the greatest potential for benefit to the area and consideration has clearly been given with regard to mitigating any adverse effects. Future environmental projections favor the pine beetle, meaning this epidemic is likely to grow and spread. Allowing the debris to accumulate under in the forest Alternative 1, No Action, would very likely be worse for habitat and species than the proposed action. The marginal negative consequences of temporary habitat disruption do not outweigh the benefits of intervention to maintain a healthy forest.

Response 9-4: Thank you for your comment.

****

Commenter 10: **Environmental Protection Agency**
Received: **Letter dated September 25**

Comment 10-1: The EPA considers protection of aquatic resources to be among the most important issues addressed in any NEPA analysis for vegetation management projects in our national forests. Most treatments contemplated under the proposed action (e.g., salvage clearcut, sanitation salvage, thinning, pile burning and road construction) have the potential to adversely impact aquatic resources, including surface and ground waters, wetlands, streams, riparian areas, and their supporting hydrology.

The Draft EIS provides very little description of existing aquatic conditions in the project area, which makes it difficult to determine whether there may be impacts associated with the proposed project. Given the potential for vegetation management projects to affect aquatic resources, we recommend that the Final EIS compare existing conditions to existing water quality standards or other reference conditions, and provide associated aquatic resource and water quality status and trends, including the following:

A thorough characterization, including available data and maps, of existing aquatic resources and discussion of baseline conditions in the proposed project area, including quality and location of resources, i.e., wetlands, streams (intermittent, perennial, and ephemeral), rivers, lakes, reservoirs, and surface water drinking water sources; watershed conditions; water quality conditions; sediment loads; streambank conditions; vegetation cover; and fish population health and habitat;

Response 10-1: The water resources technical report for the project includes more information on affected environment than what was included in the draft EIS. This report contains a thorough description of the affected environment including precipitation patterns, physiography, water features, stream channel and upland soil conditions, wetland, riparian features, floodplains, and municipal watersheds, water quality, and water features in relation to proposed treatment units and roads.

***

Comment 10-2: A map and list of Clean Water Act (CWA) impaired or threatened water body segments within, or downstream of, the project area, including the designated uses of the water bodies and the specific pollutants of concern. It appears that impaired segments of the Smiths Fork are

downstream of the project area, while China, Bridger and Marsh Lakes are impaired water bodies within the project area. The Wyoming Department of Environmental Quality (WDEQ) and the Utah Department of Environmental Quality (UDEQ) can identify/validate any such CWA Section 303(d) listed water bodies potentially affected by the project;

A map of municipal watersheds and designated source water protection zones; and

A map of soil units identified in Table 3.4.1.

It appears that some of this information is available, or could be updated, from the 2009 Smiths Fork Watershed Landscape Analysis included in the electronic file for the project. Data for the streams and lakes of the project area would provide a baseline for future monitoring of impacts and evaluation of potential influence on downstream water quality. Critical parameters to include are those of interest for impaired water bodies within or downstream of the project area. In addition, identification of any significant gaps in the data may be helpful in developing the project monitoring plan.

Response 10-2: The water resources technical report for the project includes more information on affected environment than what was included in the draft EIS. China, Bridger and Marsh lakes are impaired water bodies are within the project area. The locations of China, Bridger and Marsh lakes are shown on maps available at the Uinta-Wasatch-Cache National Forest public website that was listed in the web notice letter sent to interested parties.

Municipal watersheds are described in the water resources technical report and the source of municipal water for communities downstream of the project is in the Blacks Fork watershed and the project would not have an adverse effect to a municipal watershed. The only source protection zone in the project area is above Bridger Lake. No project treatment areas are hydrologically connected to this source protection zone. Maps of the municipal watershed and source protection zones were not considered to be needed. A map of the soil units identified in Table 3.4.1 has been included in the project record.

***

Comment 10-3: We support the Best Management Practices (BMPs) and project-specific design criteria proposed to protect aquatic resources, including requirements for road construction to avoid wetlands and riparian habitat conservation areas. We recommend expanding the avoidance areas to include ground water- dependent ecosystems (e.g., fens and springs), slopes greater than 20% and areas with sensitive soils.

To ensure that project activities do not adversely impact aquatic resources, we also recommend that the project-specific design criteria include the following:

Minimize the number of road stream crossings;

- Construct unavoidable road stream crossings during periods of low flow to avoid fish spawning and incubation periods, and/or dewater relevant stream segments prior to construction;
- Use existing landing locations and roads when reasonable;
- Minimize landing size and design for proper drainage;
- Specify steps to protect range improvements such as water developments and spring exclosures;

- Monitor impacts to water quality from treatments proposed adjacent to high value surface waters (e.g., China, Bridger and Marsh Lakes), and adjust BMPs/design criteria, if necessary;
- Monitor effectiveness of road closures and adjust closure methods, if necessary; and
- Monitor revegetation efforts for 5 years or until success is achieved.

Response 10-3: Thank you for your recommended mitigation. All of the project-specific design criteria that you have listed are part of or implied in the Best Management Practices listed in the water resources technical report or are practices intended to be implemented through provisions of the timber sale contract.

***

Comment 10-4: We recommend that the Final EIS describe how approval of the proposed project might affect the CWA Section 303(d) listed water bodies within, or downstream of, the project area, particularly the water quality parameters causing the CWA Section 303(d) listing. The Draft EIS briefly mentions China, Bridger and Marsh Lakes, which the UDEQ has identified as CWA Section 303(d) listed water bodies for low levels of dissolved oxygen (China Lake is also listed for temperature). The Draft EIS notes that the project would result in little or no adverse effects to the water quality of these lakes because the treatment area is relatively flat and very little of the treatment area is hydrologically connected to these lakes. We recommend expanding this important discussion given that sanitation salvage treatments are proposed adjacent to these lakes. In addition, we recommend the Final EIS assess potential impacts to two impaired segments of the Smiths Fork that are downstream of the project area in Wyoming. Both segments are impaired for recreation due to pathogens and one segment is also impaired for aquatic life other than fish, coldwater fishery and physical substrate habitat alterations for aquatic life and fishery.

Although Total Maximum Daily Load analyses for these water bodies still need to be developed by the states, we recommend that proposed activities in the drainages of CWA impaired or threatened water bodies be either carefully limited to prevent any worsening of the impairment or avoided where such impacts cannot be prevented. We recommend that mitigation or restoration activities be included to reduce existing sources of pollution, and to offset or compensate for pollutants generated.

Water Quality Impacts of Beetle Epidemic

We recommend the Final EIS expand Table 3.5.1 to include the No Action Alternative to show a comparison of taking no action on beetle-impacted trees versus removing them. Since impacts will vary by watershed, we recommend that the Final EIS disclose the positive and negative impacts of both leaving the beetle-infested/beetle-killed trees in place and removing them.

In addition, the presence and handling of beetle-killed trees has the potential to impact public water supplies if it leads to organic loading of area water bodies that are sources of drinking water. Organic matter interacts with disinfectants used in the drinking water treatment process to form disinfection byproducts, which are a human health concern. Organic loading may also decrease oxygen levels leading to the release of metals such as arsenic, manganese, and iron from sediments. If the project area contains any public drinking water supply reservoirs, then we recommend that the Final EIS identify the reservoirs and provide an assessment of the potential for organic loading impacts to such drinking water supplies.

Response 10-4: The water resources technical report for the project includes more information on affected environment and environmental effects than what was included in the DEIS. The affected environment section of this report contains a description of the China, Bridger and Marsh Lakes, which the UDEQ has identified as CWA Section 303(d) listed water bodies and the Wyoming CWA Section 303(d) listed water bodies. The report states:

> Bridger Lake, Marsh Lake, and China Lake were included on the 2010 State of Utah 303(d) List of Impaired Waters for low levels of dissolved oxygen (and temperature for China Lake) that did not meet State water quality standards. In 2004 and 2005, chemical, nutrient and dissolved oxygen data was collected on these lakes and streams flowing into and out of the lakes. The results of the study indicate that water in these lakes do not support standards for dissolved oxygen during the winter months, but the cause of the impairment is from consumption of oxygen during respiration of plants and not by sources of pollution from land use within the drainage around the lake.

The State of Wyoming has conducted water quality monitoring and has summarized the results in the 2010 305(b) and 303(d) integrated report (Wyoming 2010). The summary is presented below.

The East and West Forks of Smiths Fork, and Willow Creek above the Black's Fork, were added to the 1998 303(d) List due to threats to aquatic life use support from stream channel degradation. UCCD completed a Section 319 project in 1999 to improve stream channels and riparian areas. Data submitted by UCCD were not sufficient to determine use support, but indicated improvement of the habitat in these streams … WDEQ [Wyoming Department of Environmental Quality] monitored these streams, and data indeed showed habitat improvement, and that East and West Forks of Smiths Fork fully support their aquatic life uses. These streams were removed from the 303(d) List, and Section 319 Nonpoint Source Success Stories have written for both the East and West forks of Smiths Fork.

However, data collected on Willow Creek in 2003 indicated high temperatures and pH, and a degraded biological community in the lower reach. These conditions contrast with the noted improvements in riparian habitat and management. These discrepancies may be related to drought. WDEQ plans to allow several more years for stream health to recover before conducting further monitoring. Willow Creek remains on the 303(d) List. TMDLs for E. coli on the Blacks and Smiths forks and habitat on the Smiths Fork and Willow Creek are expected by 2011.

In the environmental effects section for the proposed action, the report states:

> There is expected to be very little to no adverse direct or indirect effects to the water quality of China Lake, Bridger Lake, or Marsh Lake, impaired water bodies listed for dissolved oxygen. This is because the treatment area is relatively flat, the only treatment area is Unit 99, and very little of the treatment areas of Unit 99 is hydrologically connected to these lakes.

Regarding the Wyoming parameters that lead to the 303(d) listing, increases in bacteria from this project are not expected because this type of project does not produce sources of bacterial pollution and increases in stream temperature and stream channel degradation is not expected form this project because of the location of the treatment units that have riparian habitat conservation area buffers between the units and water features.

China Lake is a drinking water supply reservoir but no adverse effects from the project such as organic loading impacts to such drinking water supplies is expected because there is 500 feet of undisturbed, relatively flat forest buffer between the treatment along the main road and China Lake and Bridger Lake is not hydrologically connected to any treatment area.

***

Comment 10-5: The Preferred Alternative includes the burning of piles on approximately 625 acres. We recommend the Final EIS describe potential short-term air quality impacts associated with the burning of these piles.

Response 10-5: Air quality would be affected in the short-term during the prescribed burning of piles. Impacts would be short lived after firing operations cease and the smoke dissipates. Areas closer to firing operations could result in a higher negative impact than those farther downwind. All prescribed pile burns will be implemented under an approved Burn Plan according to the *Interagency Prescribed Fire Planning and Implementation Procedures Guide* (November 2013) and comply with the states of Utah and Wyoming smoke regulations. As a result, planned prescribed fire emissions are not expected have long-term or significant impacts to National Ambient Air Quality Standards.

***

Comment 10-6: Please ensure that the total acreage numbers presented in Table 2.6, Summary Comparison of Alternatives, match the acreage totals presented in Tables 2.1 - 2.5. There appear to be some discrepancies under the "clearcut" and "clearcut with pile and burn" categories.

Response 10-6: The requested adjustments have been made to Table 2.6.

****

Commenter 11: **Office of the Governor, State of Wyoming**
Received: **Letter dated October 14**

Comment 11-1: Alternative 2 retains and improves the habitat for all species, including goshawk. In contrast to the No Action Alternative, Alternative 2 allows for the creation of fire breaks that may increase the possibility of fire containment. Implementation of the Proposed Action also contributes to meeting the Forest Service's desired condition….

I support Alternative 2….

Response 11-1: Thank you for your comments.

****