United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Medford District Office
3040 Biddle Road
Medford, Oregon 97504
email address: Medford_Mail@blm.gov

IN REPLY REFER TO:

1792(ORM060)

JUN 02 2011

Dear Interested Public:

The enclosed *Environmental Assessment* (EA) for the Howard Prairie Fuels Reduction project is available for public review. The public review period, advertised on the Medford BLM Website, ends on June 23, 2011.

The Bureau of Land Management (BLM) proposes to reduce hazardous fuels by thinning approximately 795 acres of vegetation; approximately 665 acres are BLM-administered lands and 130 acres are Bureau of Reclamation (BOR) withdrawn lands, in the Upper Jenny Creek Watershed and adjacent to Howard Prairie Reservoir. Only small diameter conifer trees (less than or equal to 7 inches diameter breast height) creating dense understory vegetation would be thinned to reduce the fire hazard and the risk for fire to move from the forest floor to the canopies of overstory trees. Fire hazard rating in the project area is high and the entire project area is located within the Wildland Urban Interface (WUI). Fuels reduction treatments are needed to reduce hazardous fuels and the threat of large-scale high intensity wildfires threatening resources on federally-administered lands and private property, and adjacent homes in the WUI.

We welcome your comments on the content of the EA. We are particularly interested in comments that address one or more of the following: (1) new information that would affect the analysis, (2) information or evidence of flawed or incomplete analysis; (3) BLM's determination that there are no significant impacts associated with the proposed action, and (4) alternatives to the Proposed Action that would respond to purpose and need. Specific comments are the most useful. **Comments are due by 4:30 PM, June 23, 2011.**

Before including your address, telephone number, email address, or other personal identifying information in your comment, be advised that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

All comments should be made in writing and mailed or delivered to Stephanie Kelleher, Ashland Resource Area, 3040 Biddle Road, Medford, OR 97504. Further information on this proposed project is available at the Medford District Office, 3040 Biddle Road, Medford, Oregon 97504 or by calling the Ashland Resource Area Planning Department. Contact Kristi Mastrofini at (541) 618-2384 or Stephanie Kelleher at (541) 618-2205.

Sincerely,

John Gerritsma
Field Manager
Ashland Resource Area

Enclosure

ENVIRONMENTAL ASSESSMENT

for the

HOWARD PRAIRIE FUELS REDUCTION PROJECT

United States
Department of the Interior
Bureau of Land Management
Medford District

Jackson County, Oregon

June 2011

ENVIRONMENTAL ASSESSMENT (EA)

HOWARD PRAIRIE FUELS REDUCTION PROJECT

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT
JACKSON COUNTY OREGON

EA COVER SHEET

RESOURCE AREA: Ashland

RESPONSIBLE OFFICIAL: John Gerritsma, Ashland Field Manager,
3040 Biddle Road
Medford, OR 97504

ACTION/TITLE: Howard Prairie Fuels Reduction Project

EA NUMBER: DOI-BLM-OR-M060-2011-0009-EA

LOCATION: Upper Jenny Creek Watershed and adjacent to Howard Prairie Reservoir; the Public Land Survey System (PLSS) description is T. 38 S., R. 3 E., in Sections 19, 29, and 32, T. 39 S., R. 4 E., in Sections 5 and 6, Willamette Meridian, Jackson County, Oregon.

List of Preparers	Responsibility
Greg Chandler	Project Lead, Fuels
Armand Rebischke	Botany (including T&E) & Noxious Weeds
Mike Derrig	Hydrology
Ted Hass	Soils
Carole Jorgensen	Wildlife (including T&E)
Chris Volpe	Fisheries (including T&E) & Riparian
Lisa Brennan	Cultural Resources
Nicholas Schade	Recreation & Visual Resources
Kristi Mastrofini	NEPA Compliance

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CHAPTER 1 - PURPOSE AND NEED FOR THE PROPOSED ACTION

A. INTRODUCTION

The Bureau of Land Management (BLM), Ashland Resource Area, proposes to implement the Howard Prairie Fuels Reduction Project. This Environmental Assessment (EA) documents the environmental analysis conducted to estimate the site-specific effects on the human environment that may result from the implementation of this fuels reduction proposal. The analysis documented in this EA will provide the BLM authorized officer, the Ashland Resource Area Field Manager, with current information to aid in the decision-making process. This EA complies with the Council on Environmental Quality's (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA; 40 CFR Parts 1500-1508) and the Department of the Interior's regulations on Implementation of the National Environmental Policy Act of 1969 (43 CFR part 46).

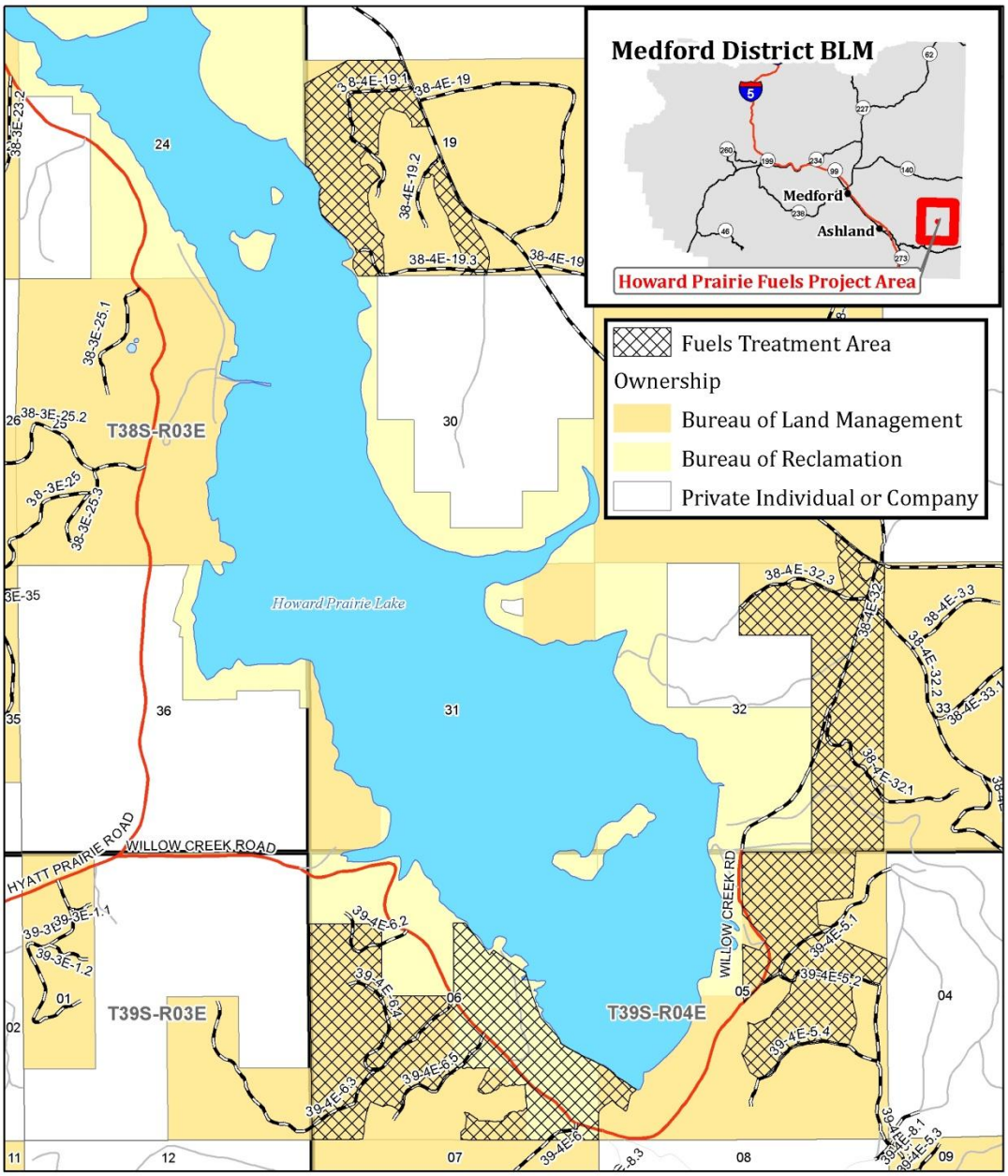
B. WHAT IS BLM PROPOSING AND WHY?

The Bureau of Land Management (BLM) proposes to reduce hazardous fuels by thinning approximately 795 acres of vegetation; approximately 665 acres are BLM-administered lands and 130 acres are Bureau of Reclamation (BOR) withdrawn lands, in the Upper Jenny Creek Watershed and adjacent to Howard Prairie Reservoir (Map 1-1). Only small diameter conifer trees (7 inches diameter breast height (dbh) and smaller) creating dense understory vegetation would be thinned to reduce the fire hazard and the risk for fire to move from the forest floor to the canopies of overstory trees.

Fire hazard rating in the project area is high and the entire project area is located within the Wildland Urban Interface (WUI). Fire hazard assesses vegetation by type, arrangement, volume, condition and location; these characteristics combine to determine the threat of fire ignition, the potential for fire to spread if ignited, and the difficulty of fire control. Activities within the vicinity of the project area such as increased development of homes, dispersed and developed camping and recreational use, and travel corridors add to the risk that human-caused wildfire ignitions may occur. Fuels reduction treatments are needed to reduce hazardous fuels and the threat of large-scale high intensity wildfires threatening resources on federally-administered lands and private property, and adjacent homes in the WUI.

The Public Land Survey System (PLSS) description for the Ashland Fuels project is:
T. 38 S., R. 3 E., in Sections 19, 29, and 32, T. 39 S., R. 4 E., in Sections 5 and 6, Willamette Meridian, Jackson County, Oregon.

Map 1-1. Vicinity Map



Howard Prairie Fuels Reduction Project
(795 acres)

No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of this data for individual or aggregate use with other data.

1:30,568

0.4 0.2 0 0.4 0.8 Miles

C. DECISION FRAMEWORK

This Environmental Assessment will provide the information needed for the authorized officer, the Ashland Resource Area Field Manager, to select a course of action to be implemented for the Howard Prairie Fuels Reduction Project. The Ashland Resource Area Field Manager must decide whether to implement the Proposed Action as designed or whether to select the No-Action Alternative. In choosing an alternative, the Field Manager will consider how well the alternative responds to the identified project need, along with the relative merits and consequences of each alternative related to the relevant issues.

The decision will also include a determination of whether or not the impacts of the proposed action are significant to the human environment. If the impacts are determined to be insignificant, a Finding of No Significant Impact (FONSI) can be issued and a decision implemented. If this EA determines there are significant impacts or that the significance of impacts are unknown, then a project specific EIS must be prepared.

D. LEGAL REQUIREMENTS

The BLM initiated planning and design for this project to conform and be consistent with the Medford District's 1995 Record of Decision (ROD) and Resource Management Plan (RMP), which incorporated the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (Northwest Forest Plan) (USDA and USDI 1994). The 1995 Medford District Resource Management Plan was amended by the 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines.*

Following the March 31, 2011 decision by the United States District Court for the District of Columbia in Douglas Timber Operators et al. v. Salazar, which vacated and remanded the administrative withdrawal of the Medford District's 2008 ROD and RMP, we evaluated this project for consistency with the 2008 ROD and RMP. The Howard Prairie Fuels Reduction Project contains project design features that apply Best Management Practices of the 1995 RMP (Appendix D); these Project Design Features are also consistent with Best Management Practices of the 2008 ROD and RMP. Based upon this review, this proposed action is clearly consistent with the goals and objectives in the 2008 ROD and RMP. The 2008 Medford District ROD/RMP specifically states: *"reduce fire hazards to communities at risk from uncharacteristic wildfires, decrease the risk of large wildfires, and reduce the risk of resource damage from uncharacteristic wildfires"* (USDI, 2008: 46).

The proposed action is also in conformance with the direction given for the management of public lands in the Medford District by the Oregon and California Lands Act of 1937 (O&C Act), Federal Land Policy and Management Act of 1976 (FLPMA), the Endangered Species Act (ESA) of 1973, the Clean Water Act of 1987, Safe Drinking Water Act of 1974 (as amended 1986 and 1996), Clean Air Act, and the Archaeological Resources Protection Act of 1979.

E. RELEVANT ASSESSMENTS AND PLANS

Southwest Oregon Fire Management Plan

The Southwest Oregon Fire Management Plan (FMP) provides Southwest Oregon with an integrated concept in coordinated wildland fire planning and protection among Federal, State, local government entities and citizen initiatives.

The FMP introduces fire management concepts addressing fire management activities in relation to resource objectives stated in the current Land and Resource Plans (parent documents) of the Federal agencies, the laws and statutes that guide the state agencies and private protective associations, and serve as a vehicle for local agencies and cooperators to more fully coordinate their participation in relation to those activities.

Jenny Creek Watershed Analysis (1995)

Watershed Analysis is a procedure used to characterize conditions, processes, and functions related to human, aquatic, riparian, and terrestrial features within a watershed. Watershed analyses are issue driven. Analysis teams of resource specialists identify and describe ecological processes of greatest concern in a particular "fifth field" watershed and recommend restoration activities and conditions under which other management activities should occur. Watershed analysis is not a decision making process. Rather, watershed analysis provides information and non-binding recommendations for agencies to establish the context for subsequent planning, project development, regulatory compliance and agency decisions (See Federal Guide for Watershed Analysis 1995 p. 1).

The Howard Prairie Fuels Reduction project area falls within the Jenny Creek Watershed Analysis Area. The watershed analysis focused on the use of existing information available at the time the analysis was conducted, and provides baseline information. Additional information, determined to be necessary for completing an analysis of the fuels project, has been collected and is considered along with existing information provided by the 1995 Jenny Creek Watershed Analysis.

Water Quality Restoration Plan for the Jenny Creek Watershed (2008)

The BLM is recognized by Oregon Department of Environmental Quality (DEQ) as a Designated Management Agency for implementing the Clean Water Act on BLM-administered lands in Oregon. The BLM signed a Memorandum of Understanding (MOU) with the DEQ that defines the process by which the BLM will cooperatively meet State and Federal water quality rules and regulations.

To comply with the BLM-DEQ MOU, the BLM completed the Water Quality Restoration Plan (WQRP) for BLM-administered lands in the Jenny Creek Watershed (USDI 2011), within the Upper Klamath Subbasin. This document describes how the BLM will meet Oregon water quality standards for 303(d) listed streams on BLM-administered lands within the Jenny Creek Watershed. The WQRP was originally submitted to the DEQ in May 2008, prior to completion of the Total Maximum Daily Load (TMDL). The DEQ issued the Upper Klamath and Lost River Subbasins TMDL and Water Quality Management Plan (WQMP) in December 2010. The Jenny Creek WQRP was updated to reflect the Upper Klamath and Lost River Subbasins TMDL

and re-submitted to the DEQ in January 2011. The DEQ has not responded with feedback on the BLM's WQRP.

U.S. Department of Interior, Bureau of Land Management, Western Oregon Districts, Transportation Management Plan (1996, updated 2002).

The Western Oregon Transportation Management Plan provides goals, objectives, and guidelines for managing BLMs road and trail transportation system throughout Western Oregon. This transportation management plan, is not a decision document, rather it provides guidance for implementing applicable decisions of the Medford District Resource Management Plan (which incorporated the Northwest Forest Plan).

Medford District Integrated Weed Management Plan of 1998

The Medford District Integrated Weed Management Plan provides a proactive ecosystem-based approach to reduce populations of alien plant species to a level which will allow for the restoration of native plant species, and provide for overall ecosystem health.

F. SCOPING AND ISSUES

Scoping is the process the BLM uses to identify issues related to the proposal (40 CFR 1501.7) and determine the extent of environmental analysis necessary for an informed decision. It is used early in the NEPA process to identify (1) the issues to be addressed, (2) the depth of the analysis, and (3) potential environmental impacts of the Proposed Action.

A letter briefly describing the Proposed Action and inviting comments was mailed to adjacent landowners, interested individuals, organizations, and other agencies on January 19, 2011. The comment period ended on February 4, 2011; three comment letters were received.

An interdisciplinary (ID) team of resource specialists reviewed the proposal and all pertinent information, including public input received, and identified relevant issues to be addressed during the environmental analysis. Some issues identified as relevant to this project proposal were analyzed in association with broader level environmental analyses. Where appropriate, this EA will incorporate by reference the analysis from broader level NEPA documents (40 CFR §1508.28), to be considered along with project specific analysis. The issues, restated as questions, listed below were identified as relevant to this project proposal.

Relevant Issues

(1) What is the potential for effects to soils and site productivity?

(2) What is the potential for effects to water resources?

(3) What is the potential for effects to wildlife species and their habitat?

(4) What is the potential for effects to recreation and visual resources?

(5) What is the potential for effects to botanical resources?

(6) What is the potential for impacts to aquatic habitat and fish?

(7) What is the potential for this fuels proposal to increase off-highway vehicle use in the project area?

(8) What is the potential for effects to cultural resources?

(9) What is the potential for effects to air quality?

CHAPTER 2: ALTERNATIVES

A. DESCRIPTION OF THE NO-ACTION ALTERNATIVE (ALTERNATIVE 1)

The No-Action Alternative describes a baseline against which the effects of the action alternative can be compared. This alternative describes the existing condition and the continuing trends. Under the No-Action Alternative, no fuels reduction treatments would be implemented. Future fuels reduction in this area would not be precluded and could be analyzed under a subsequent EA.

It is also assumed that fire suppression activities would continue on federal and non-federal lands. The Bureau of Land Management has a master cooperative fire protection agreement with the Oregon Department of Forestry (ODF). This agreement gives the responsibility of fire protection of all lands within the project area to the Oregon Department of Forestry. This contract directs ODF to take immediate action to control and suppress all fires. Their primary objective is to minimize total acres burned while providing for fire fighter safety. The agreement requires ODF to control 94 percent of all fires before they exceed 10 acres in size.

B. DESCRIPTION OF THE PROPOSED ACTION (ALTERNATIVE 2)

An estimated 795 acres would be thinned using chainsaws; the cut material would be hand piled and burned on site when fuel moisture and weather conditions allow for the safe burning of material. Follow-up maintenance underburning is planned in approximately 1 to 5 years for many of the acres treated. Post treatment evaluations are used to determine the need for follow-up maintenance underburning. Follow-up burning provides a low cost method to maintain fuel loadings at a low level and prevent accumulations of additional fuel

Fuels Reduction Thinning Prescriptions

- No hardwoods or brush species would be cut due to the limited number of these species that exist in the project area.
- Thin conifer trees that are 7 inches diameter breast height (DBH) and smaller. The dense understory is not uniform across the stands. Areas exist in all the stands where no material will be thinned because the understory is light. Thinning will be generally on a 25 foot by 25 foot spacing. Due to the irregular spacing that exists in the understory spacing requirements under fuels contracts allow a variance of plus or minus 20%. Spacing therefore can be as little as 20 feet by 20 feet and as great as 30 by 30 feet.
- Trees should be selected as leave trees based on the following preferred species order: sugar pine, ponderosa pine, cedar, Douglas-fir, last choice white fir.
- All handpiles would be burned within 6 to 18 months from when they are created; handpiles need to cure prior to burning. Handpile burning would be done as early as mid-October and normally not after late-November due to snow fall that occurs in the project area.
- Follow-up maintenance underburning would involve the controlled application of fire to understory vegetation and downed woody material when fuel moisture, soil moisture, and

weather and atmospheric conditions allow for the fire to be confined to a predetermined area at a prescribed intensity to achieve the planned resource objectives. Maintenance burning usually occurs within 2 to 5 years following initial fuels reduction treatments.

Project Design Features

Project Design Features are an integral part of the Proposed Action. They are developed to avoid or reduce the potential for adverse impacts to resources. The Project Design Features **(**PDFs) also incorporated Best Management Practices (BMPs) to reduce nonpoint source pollution to the maximum extent practicable. BMPs are considered the primary mechanisms to achieve Oregon Water Quality standards. The following Project Design Features (PDFs) are included in this project.

1. Prevent Offsite Soil Erosion and Soil Productivity Loss

a) Underburns would be conducted only when a light to moderate burn can be achieved (i.e. spring-like conditions when soil and duff are moist).

b) Fire lines for underburns would be constructed manually on all slopes greater than 35 percent.

c) Waterbars on fire lines would be constructed according to District guidelines (USDI 1995a:167).

d) Fire lines would be avoided to the extent possible within Riparian Reserves, in order to prevent the creation of pathways that could route sediment into water bodies. Where fire lines are constructed within Riparian Reserves, following burning, place slash and other native mulch materials to provide 80 percent effective ground cover.

e) In addition to waterbars described above, all fire lines constructed for this project, including those in upland areas, that intersect existing roads or trails shall be sufficiently blocked along their entire length to preclude use by off-highway vehicles (OHVs). This would include such measures as placing logs and slash, falling trees less than 8" dbh (excluding riparian reserves) or other actions as necessary. Effectiveness monitoring of these closures shall be conducted annually for two (2) years. Where OHV use is occurring on former project fire lines, measures shall be taken to eliminate such use.

f) Piles would be dispersed across treatment areas. Pile burning would occur when soil and fuel moistures are high to ensure the pile would burn with 90% consumption while leaving an unburned ring of woody material on the ground surrounding the burn ring.

g) Hand piles (or hand pile burning) would not be allowed in the channel bottom of short-duration intermittent streams, or within the draw bottom of dry draws.

h) Restrict all vehicles to open and existing roads.

i) Limit road use during the wet season on native surface (unsurfaced) roads to between May 15th and Oct 15th. Road use may occur outside this period if the road is sufficiently dry to protect both the road and resource values. Road use shall be suspended during precipitation events or if monitoring indicates that saturated soils exist to the extent that there is potential for causing elevated stream turbidity and sedimentation. No snow plowing of native surface roads will occur. Consultation with appropriate resource

specialists (hydro, soils, fish) shall occur if road use is proposed during the wet season to determine if additional mitigation is required or use is appropriate for the conditions.

j) Road use is permitted during the wet season on surfaced (aggregate, chip seal, paved) roads; however road use shall be suspended when there is potential for causing elevated stream turbidity and sedimentation. Snow plowing is permitted, but shall occur in a manner that will protect roads and adjacent resources by removing or placing snow berms to prevent concentration on the roadway or on erodible sideslopes and soils.

2. *Prevent Chemical Water Pollution*

a) Foam retardant would not be used in Riparian Reserves.

b) Equipment refueling would be conducted within a confined area outside Riparian Reserves.

3. *Watershed Protection (soils, water quality, hydrologic function, and Riparian Reserves)*

a) Vegetation treatments would not be allowed within 25 feet of long-duration intermittent streams or within 50 feet from the edge of perennial springs, seeps, and wetlands. Only the outer portions of the NWFP-width Riparian Reserve would be treated (Table 2-1).

b) Vegetation treatments would be allowed within the entire Riparian Reserve of short-duration intermittent streams and dry draws, except for hand piling and handpile burning. Handpiles and handpile burning would not be allowed in the channel bottom of short-duration intermittent streams, or within the draw bottom of dry draws (Table 2-1).

Table 2-1. Within-Riparian Reserve (RR) Buffer Widths for Fuels Treatments

Riparian Reserve Type	***Manual treatments***	***Pile burning***
Fish-bearing	50' buffer	50' buffer
Perennial	50' buffer	50' buffer
Long-duration intermittent	25' buffer	25' buffer
Short-duration intermittent	Where necessary (treating through is OK, as prescribed)	No piles in the channel or draw bottoms
Springs/seeps/wetlands, includes lakeshore (reservoir)	50' buffer	50' buffer
Unstable areas	Not allowed in RR	No Piles in Unstable RR
Treatments are allowed in all dry draws unless specifically withdrawn (e.g. unstable area) from treatment. ***Note****: Fuels treatments are permitted within Riparian Reserves (USDI 1995a) as needed to reduce the potential for uncharacteristic wildfires which would negatively impact aquatic resources. The above are project specific guidelines to ensure sufficient stream shade and minimize erosion potential. Buffers also pertain to any newly discovered springs/seeps/wetlands by fuels crews (and unknown to hydrology crews at this time, therefore not marked on maps).*		

c) When thinning within Riparian Reserves, reserve all riparian and hardwood species such as willow, ash, maple, vine maple, ninebark, ocean spray, snowberry, spirea, current, alder, and black oak where they occur.

d) Crossing stream channels—including perennial, long-duration intermittent, and short-duration intermittent streams—with vehicles or equipment, including ATVs, would be limited to existing system roads.

e) Dry draws (channels not protected by Riparian Reserves) may be crossed but only if the vehicle drives perpendicular to the channel and where the terrain allows the crossing to be made without destabilizing banks or gouging and displacing soils. Crossings through dry draws would be limited and approved by the authorized officer; mechanical equipment would not drive up or down the draw bottoms.

f) Foam would not be used in Riparian Reserves.

g) Prescribed burning and prescriptions would be designed to contribute to the attainment of Aquatic Conservation Strategy objectives.

h) Down large woody material over 16" diameter would not be driven over, bucked into short pieces, or used for firewood.

i) The removal of material for firewood, poles, or other special forest products would not occur within Riparian Reserves.

4. <u>To Protect Northern Spotted Owl Nest Reserves</u>

a) Reserve from harvest the designated 100-acre core area for northern spotted owl sites designated as known sites on January 1, 1994.

b) Activities (such as tree felling, yarding, road construction, hauling on roads not generally used by the public, prescribed fire, muffled blasting) that produce loud noises above ambient levels will not occur within specified distances (Table 2-2) of any documented or projected owl site between March 1 and June 30 (or until two weeks after the fledging period) – unless protocol surveys have determined the activity center is non-nesting or failed in their nesting attempt. The distances may be shortened if significant topographical breaks or blast blankets (or other devices) muffle sound traveling between the work location and nest sites.

c) The action agency has the option to extend the restricted season until September 30 during the year of harvest, based on site-specific knowledge (such as a late or recycle nesting attempt) if project would cause a nesting spotted owl to flush. (See disturbance distance).

d) Burning will not take place within 0.25 miles of spotted owl sites (documented or projected) between 1 March and 30 June (or until two weeks after the fledging period) unless substantial smoke will not drift into the nest stand.

Table 2-2. Mandatory Spotted Owl Seasonal Restriction Distances

Activity	***Buffer Distance Around Owl Site***
Heavy Equipment (including non-blasting quarry operations)	105 feet
Chain saws	195 feet

5. *Provide Wildlife Trees & Habitat for Cavity Dependent Species*

   a) A minimum of 3 snags per acre greater than 17 inches dbh will be retained where available. Retention of snags greater than 17 inches dbh within the interior of the stands would mitigate impacts to cavity-dependent species. No trees or snags greater than 7 inches diameter are targeted for removal under this project. If snags greater than 7inches diameter must be felled for safety requirements, they would be left on the forest floor to meet coarse woody material requirements.

   b) Do not mark large, broken-top trees and large snags with loose bark. Retain and protect these structures where possible. No trees or snags greater than 7 inches diameter are targeted for removal under this project.

6. *Protect Special Status Wildlife Species*

   a) Northern goshawks are known to inhabit forested habitat of the type found within the Howard Prairie Project Area. No known nest sites occur within the Project Area. Any nest sites located prior to or during fuels reduction activity would be protected with a 30-acre buffer.

   b) There are known bald eagle nest sites in the project area. Provide seasonal protection. Avoid disturbance within ½ mile from February 1 through August 15 (USDI 1994:57).

   c) If found, locations of *Vespericola sierraus* and *Monadenia fidelis celeuthia*, Bureau Sensitive mollusks, would be protected from pile burning or broadcast burning unless burning would occur when these species would be underground.

7. *Manage Wildlife Species Protected as Survey and Manage Species*

   a) No treatment within a 50 foot radius of the great gray owl nest site to protect structure important to fledglings such as leaning trees; buffer to be clearly marked on the ground by BLMs wildlife biologist.

   b) Seasonal operating restriction will be enforced within ¼ mile of great gray owl nest site from March 1 to June 30 to avoid disturbance during the nesting season.

   c) If found, locations of the Survey and Manage (and Bureau Sensitive) snails, *Monadenia chaceana* and *Helmithoglypta hertleini* would be protected through the application of no treatment buffers.

   d) Suitable habitat for *Pristiloma arcticum crateris* snail species would be protected through no-treatment in Riparian Reserves (which includes suitable habitat within 30 feet on each side of the channel).

8. *Habitat for cavity dwellers and down wood associates will be protected by RMP standards*

   a) Important habitat components such as large standing and down dead wood will be retained to RMP standards (USDI 1994). No active nest trees or den sites will be cut, removed or disturbed.

9. *To ensure a quality recreation experience within the Hyatt-Howard SRMA and the Pacific Crest National Scenic Trail SRMA*

   a) No hand piling on the Lily Glenn Trail.

   b) No hand piling on the Pacific Crest National Scenic Trail (PCNST).

   c) No forest thinning within a 100 foot (50 feet of either side of the trail centerline) of the PCNST.

10 *Cultural Resource Site Protection*

   a) Prior to any project implementation, cultural resource surveys would be completed and site-specific protection measures would be implemented to preserve the integrity of all significant recorded cultural sites.

CHAPTER 3:
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

A. INTRODUCTION

This chapter describes the present conditions of each affected resource, followed by a comparison of the estimated environmental effects of implementing the No-Action Alternative and the Proposed Action Alternative. The Environmental Effects portion of this chapter provides the analytical basis for the comparisons of the alternatives (40 CFR § 1502.16) and the reasonably foreseeable environmental consequences to the human environment that each alternative would have on the relevant resources. Impacts can be beneficial, neutral or detrimental. The affected environment is described to the level of detail needed to determine the significance of impacts to the environment of implementing the Proposed Action. The analysis of the direct, indirect, and cumulative effects are organized by resource and the analysis areas for actions proposed under this EA vary by resource. For all resources it includes the project area, which encompasses the areas where actions are proposed for the Howard Prairie Fuels Project.

The terms **Project Area** and **analysis areas** are used throughout this chapter. The following defines each term:

> The terms **Project Area,** or treatment area, are used interchangeably to describe where action is proposed, such as units where forest thinning is proposed and where road construction or road improvements are proposed.
>
> **Analysis areas** vary by resource and include those areas that could potentially be affected by the proposed action. In some cases the analysis area is confined to the project area and in others the analysis area extends beyond the project area.

B. FIRE & FUELS

Affected Environment

The landscapes that comprise the project area evolved with frequent fires affecting the vegetation and other key components of the ecosystem. Since the establishment of Euro-settlement in this area human relations and interactions with these landscapes have affected many of the processes that had previously played a large part in the evolution of the site. Of these interactions one management decision that has affected one of the evolutionary processes has been that of fire exclusion.

Fire is recognized as a key natural disturbance process throughout Southwest Oregon (Atzet and Wheeler 1982). Human-caused and lightning fires have been a source of disturbance to the landscape for thousands of years. Native Americans influenced vegetation patterns for over a thousand years by igniting fires to enhance values that were important to their culture (Pullen 1996). Early settlers to this area used fire to improve grazing and farming and to expose rock and soil for mining. Fire has played an important role in influencing successional processes.

Fire Regimes

Climate and topography combine to create the fire regime found throughout the project area. Fire regime refers to the frequency, severity and extent of fires occurring in an area. Agee (1993) suggests that variable fire history, complex geology, land use history and steep environmental gradients of Douglas-fir hardwood forests of southwest Oregon and Northern California Siskiyous prevents generalizations about fire and its ecological effects (Agee 1993: 283-284). However, plant association groups are a credible link to historic ecological process, including fire regimes that occurred on sites in the past (Franklin and Agee 2003). Historic fire regimes and the departure from them, correlate's to the change from historical to current vegetative structure. The change in vegetation also helps to describe the difference in fuel loading (dead fuels and live in the form of increased vegetation) from historical to current conditions.

These changes in vegetation and fuel conditions help to determine the expected change in fire behavior and its effects. This difference in many respects is attributed to fire exclusion, but also includes all human practices that would affect the extent, severity, or frequency of fire events compared to historical accounts. These practices include road building, livestock grazing, and some logging practices as well as fire suppression.

One historic fire regimes is found within the analysis area (Schmidt et al. 2002)

> Fire Regime 3: < 50 years fire return interval, Mixed Severity
> Typical plant communities include mixed conifer and dry Douglas-fir forests. Lower severity fire tends to predominate in many events. This regime usually results in heterogeneous landscapes. Large, stand-replacing fires may occur but are usually rare events.

Approximately 795 acres proposed for treatment are classified as Fire Regime 3. Mixed-severity fire regimes are characterized by mosaics of frequent, low severity and infrequent but high severity, and therefore are more difficult to describe due to complexities that result in a mosaics of fire effects.

Several studies that model climatic change into the next century also caution land managers in the Pacific Northwest to plan for increased temperatures and possibly some increase in winter moisture in the form of rain over the coming years in the Pacific Northwest (The JISAO Climate Impact Group- Mote et al 2003; Drought and Pacific Decadal Oscillation Linked to Fire Occurrence in the Pacific Northwest Hessl 2004; Preparing for Climatic Change: The Water, Salmon, and Forests of the Pacific Northwest- Mote et al 2003). These forecasts would indicate and suggest that climatic factors may, in the future, have a more dramatic impact on wildland fire extent and severity. With increases in warmer winter moisture to inspire vegetation growth along with warmer and dryer conditions in the summer months what is considered to be extreme drought conditions now, could easily be experienced with Pacific Dacadal Oscillations (PDO) or El Nino Southern Oscillation (ENSO) in the first half of this century. Change in ecosystem structure and spatial distribution is expected to be a product from this climatic variation and wildland fire will be one of the agents that causes the changes in the ecosystems. One option land managers have to affect the change, protect private property, and ecosystems are through silvicultural and fuels management treatments.

Condition Class

The process for making an assessment on how much fire exclusion along with other management activities has affected an ecosystem is through classifying the current condition of the site based on a reference usually pre-dating when fire exclusion became an influence. Condition class descriptions are used to describe these affected ecosystems. Condition classes are a function of the degree of departure from historical fire regimes resulting in alterations of components such as species composition, structural stage, stand age, and canopy closure. There are three condition classes:

> Condition Class 1 - Fire regimes are within or near an historic range. The risk of losing key ecosystem components is low. Vegetation species composition and structure are intact and functioning within an historical range.
>
> Condition Class 2 - Fire regimes have been moderately altered from their historical range (more than one return interval). This change results in moderate changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns.
>
> Condition Class 3 - Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. This change results in dramatic changes to fire size, frequency, severity, or landscape patterns.

The forest stands proposed for treatment, primarily mixed conifer stands (Fire Regime 3), are in condition class 2 and 3. Stand densities are very dense in most areas due to the absence of fire.

Fire Hazard

Fire hazard assesses vegetation by type, arrangement, volume, condition and location. These characteristics combine to determine the threat of fire ignition, the spread of a fire and the difficulty of fire control. Fire hazard is a useful tool in the planning process because it helps in the identification of broad areas within a watershed that could benefit from fuels management treatment. Hazard ratings were developed for the project area and reflect the results of past human and natural disturbances. In general the existing fuel profile within the project area represents a moderate to high resistance to control under average climatic conditions. All of the units proposed for fuels treatment are in the high fire hazard rating.

Past Actions and Events Affecting the Fire Environment

Past actions that have cumulatively contributed to the current wildfire behavior and potential include timber harvesting, fuels reduction, and fire suppression. Drought, in combination with dense forest stands, has resulted in high tree mortality. This has resulted in increased fuel loads in these areas. Road building and land development (on private lands) have contributed to the current level of risk by expanding human influence further into the wildlands. Fire history recorded over the past 20 years in southwest Oregon indicate a trend of more large fires which burn at higher intensities in vegetation types associated with low to mixed severity fire regimes.

Human-caused and lightning fires have been a source of disturbance to the landscape for thousands of years. Native Americans influenced vegetation patterns for over a thousand years by igniting fires to enhance values that were important to their culture (Pullen 1996). Early settlers to this area used fire to improve grazing and farming and to expose rock and soil for mining. Fire has played an important role in influencing successional processes. Historically, large fires were a common occurrence in the area; based on fire scars and vegetative patterns fires were of varying severities.

Historically, frequent, low intensity fires maintained the low to mid elevation forests in more open conditions, which were dominated by large-diameter trees. In the early 1900s, uncontrolled fires were considered to be detrimental to forests. Suppression of all fires became a major goal of land management agencies. As a result of the absence of fire, there have been a build-up fuels and a change to more fire-prone vegetative conditions. This is particularly true for mixed-conifer forest types.

Environmental Effects

Alternative 1 - No-Action

Because no new management is proposed under this alternative, the effects described reflect current conditions and trends that are shaped by ongoing management and events unrelated to the Howard Prairie Fuels Reduction project described under the Affected Environment. This section will highlight key findings related to the question "What would it mean to not meet the objective of fire hazard reduction.

The current trend of increasing stand density which results in increased mortality to the timbered stands would continue. Trees growing under these conditions often become weakened and are highly susceptible to insect epidemics and tree pathogens. High numbers of younger trees (mostly conifers) contribute to stress and mortality of mature conifers and hardwoods.

The 795 acres of fuels reduction, which are in condition classes 2 and 3, would not be treated and fuels reduction objectives for these areas would not be accomplished. Without treatment the condition class of these stands would continue to deteriorate to a condition class 3.

The units proposed for treatment would remain in a high fire hazard resulting in a continued high chance that when a wildfire occurs, a large portion of the burn would exhibit high severity fire effects. Under the No-action Alternative, high fire hazard would remain in the project area, with a higher potential than the action alternative for increased fire behavior if predicted climate changes (discussed above) do occur.

With no management, changes in canopy closure would occur only as a result of natural events such as insect infestation, windstorms, mortality from competition/drought, and wildfire. Where natural disturbances create more open stand conditions there would be more wind and solar radiation resulting in a drier microclimate compared to closed canopy stands. A drier microclimate generally contributes to more severe fire behavior. Under the No-Action alternative there would be no treatment of existing surface and ladder fuels to help mitigate the effects of microclimate changes caused by natural disturbances. Ladder and surface fuels would

also increase within these stands. Increasing stand densities and fuel loadings would increase the chance of more acres that would burn in high intensity fires within the project area. Fire fighter safety would continue to be an issue as well as the potential of resource damage.

Fire Suppression

Fire suppression would continue because there are no policies in place or being proposed that will allow fires to burn naturally within the project area. The entire project area is within the Wildland Urban Interface (WUI) and is a priority for fire suppression especially in close proximity to homes.

The Bureau of Land Management has a master cooperative fire protection agreement with the Oregon Department of Forestry (ODF). This agreement gives the responsibility of fire protection of all lands within the project area to the Oregon Department of Forestry. This contract directs ODF to take immediate action to control and suppress all fires. Their primary objective is to minimize total acres burned while providing for fire fighter safety. The agreement requires ODF to control 94 percent of all fires before they exceed 10 acres in size.

Due to ownership patterns and political constraints in southwest Oregon, the use of wildfire to meet resource objectives is not possible. There are stipulations within the protection agreement with ODF that allows BLM to designate areas that require special fire management activities during suppression efforts in order to insure damage to resources are minimized. It is recognized that restrictions could increase the cost of suppression which the Bureau of Land Management would incur and would require a modification of the contract. During suppression activities conducted on BLM lands the following guidelines would be followed:

> BLM resource advisors will be dispatched to fires which occur on BLM lands. These resource advisors are utilized to ensure that suppression forces are aware of all sensitive areas and to insure damage to resources is minimized from suppression efforts.
>
> When feasible, existing roads or trails will be used as a starting point for burn-out or backfire operations designed to stop fire spread. Backfires will be designed to minimize fire effects on habitat. Natural barriers will be used whenever possible and fires will be allowed to burn to them.
>
> In the construction of fire lines, minimum width and depth will be used to stop the spread of fire. The use of dozers should be minimized and resource advisors will be consulted when appropriate. Live fuels will be cut or limbed only to the extent needed to stop fire spread. Rehabilitation of fire lines will be considered.
>
> The felling of snags and live trees will only occur when they pose a safety hazard or will cause a fire to spread across the fire line.
>
> The construction of helispots should be minimized. Past locations or natural openings should be used when possible. Helispots will not be constructed within riparian reserves, or areas of special concern.

Retardant or foam will not be dropped on surface waters or on occupied spotted owl nests.

Resource advisors will determine rehabilitation needs and standards in order to reduce the impacts associated with fire suppression efforts.

Alternative 2 - Proposed Action

Fuels reduction is proposed on 795 acres. The stands proposed for treatment are mature timber stands with a dense understory of conifers less than 8 inches in diameter consisting mainly of white fir. The proposed action is to thin the dense understory trees (trees 7 inches in diameter breast height and smaller), and handpile and burn the thinned material. The dense understory is not uniform across the stands. Areas exist in all the stands where no material will be thinned because the understory is light. Thinning will be generally on a 25 foot by 25 foot spacing. Due to the irregular spacing that exists in the understory spacing requirements under fuels contracts allow a variance of plus or minus 20 percent. Spacing therefore can be as little as 20 feet by 20 feet and as great as 30 by 30 feet. No hardwoods or brush species would be cut due to the limited number of these species that exist in the project area. Handpile burning would be done as early as mid-October and normally not after late November due to snow fall that occurs in the project area. Handpiles that are created would have to cure through one summer season before they are burned. All handpiles would be burned within 6 to 18 months (the majority within one year) from when they are created.

Fire Severity

The current science in determining extent and severity of wildland fire is based on three environmental variables, weather, topography and fuels (Rothermel 1972, Albini 1976). Management activities on landscapes and within ecosystems seeking to affect wildland fire extent and severity have focused on treating of fuels for obvious reasons. Forest fuels (including live and dead material), can be changed in terms of fire behavior and fire effects characteristics by silvicultural and fuels treatments (Agee 1996; Weatherspoon 1996), fire exclusion practices, and natural events.

Weather and topographic effects on fire behavior and severity are interrelated with the amount and distribution of fuels on a site with respect to the aspect, steepness of slope, and position on slope, along with atmospheric elements of temperature, relative humidity, in relation to fuel moisture, and wind speed and direction. When the environmental and atmospheric conditions are conducive to drying fuels and/or heating them to the ignition point during a fire we refer to them available fuels. The interrelationship between slope and wind in relation to the amount and arrangement of available fuel is critical in terms of allowing a fire to spread and increase in intensity. Without fuel loading becoming available to burn in a fire due to the effects of extreme weather there is no adverse effects to the vegetation or other site qualities. For example in some desert areas where vegetation is sparse and extreme fire weather is the norm (high temps, low RH, windy unstable atmospheric conditions) fires often don’t spread except under unusual wind conditions, due to the lack of continuous fuels.

Activity Fuels / Surface Fuels

Fuels treatments proposed should ensure that under most climate conditions, flame lengths would be less than three feet allowing for direct attack of a wildfire. The reduction of this material, along with reduced fire ladders would reduce fire behavior such as flame length, rate of spread and fire duration. With the reduction of flame length and fire duration the chance of a crown fire initiating in treated stands would be greatly reduced. Also, mortality of the smaller diameter conifers would be reduced.

Fire resiliency

A forest that is fire-resilient has characteristics that allow it to readily recover from a fire event. A forest's resiliency to fire can be increased by applying fire safe principles. This means managing surface fuels to limit the flame length, removing ladder fuels to keep flames from transcending to tree crowns where trees have no defense against fire, and keeping large diameter trees that are more fire resistant (Agee and Skinner 2005 In Press; Agee 1996; Agee 1993).

Fuels reduction prescriptions would result in a reduction in ladder fuels and an increase in the height to the base of tree crowns. Both of these are important factors in reducing the potential for initiating and sustaining a crown fire in these stands (Omi and Martinson 2002) (Agee 1996) (Agee and Skinner 2005) (Agee et al. 2000).

Fuels reduction projects which have occurred within the past five years are in the close proximity of the proposed action. Two fuels projects (Plantation Thin and Howard Hyatt) have treated approximately 923 acres utilizing the same prescription as the proposed action. There is also proposed commercial harvest in association with the Swinning Timber Sale, which would result in fuels reduction within the vicinity of the project area.

These projects combined will result in a landscape approach to vegetation management including fuels reduction. "A landscape-level approach to fuels looks at the large areas as a whole, in an attempt to fragment existing continuous, heavy fuel in high risk areas" (Weatherspoon and Skinner 1996). A Landscape-level approach to fuels management is the most effective method in modifying fire behavior (intensity and size) of a wildfire. Landscape-level treatments have been proposed as a fuel management strategy that can aid wildfire control and help achieve more broad-based ecosystem management goals (Weatherspoon 1996, Weatherspoon and Skinner 1996, Agee et al., 2000), particularly in areas that have historically low- to moderate severity fire regimes (Agee 1993).

C. SOIL RESOURCES

Affected Environment - Soil Characteristics and Conditions

The soils identified in this allotment are Farva, Kanutchan, Pinehurst, and Sibannac series. These soils are found on slope ranging from 5 to 30 percent.

The Farva soil is moderately deep, well-drained soil is on hillslopes. Permeability is moderately rapid and available water capacity is about 3 inches. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate.

The Kanutchan soil is deep, somewhat poorly drained soil is in basins. Permeability is very slow and available water capacity is about 7 inches. The effective rooting depth is limited by the water table, which is within a depth of 1.5 feet from December through May. Runoff is slow, and the hazard of water erosion is slight.

The Pinehurst soil is very deep, well-drained soil is on plateaus. Permeability is moderately slow and available water capacity is about 10 inches. The effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight.

The Sibannac soil is very deep, poorly drained soil is in basins. Permeability is moderately slow and available water capacity is about 12 inches. The effective rooting depth is limited by the water table, which is within a depth of 1 foot from January through June. Runoff is slow, and the hazard of water erosion is slight.

Environmental Effects

Alternative 1 – No Action

Because no new management is proposed under Alternative 1, there would be no impacts on soil resources from project activities.

Alternative 2 – Proposed Action

An estimated 795 acres would be thinned using chainsaws; the cut material would be hand piled and burned on site when fuel moisture and weather conditions allow for the safe burning of material. Follow-up maintenance underburning is planned in approximately 1 to 5 years for many of the acres treated. Post treatment evaluations are used to determine the need for follow-up maintenance underburning.

Prescribed burning planned under this proposal would be in the form of handpile burning or broadcast burning. As the broadcast burning planned in this project would be an underburn, the intensity of the burn would be light to moderate and have slight direct short-term effect on soil properties. A light surface fire will generally only char the litter, leaving most of the mineral soil at least partially covered. A moderate burn would result in the duff, rotten wood, or other woody debris partially consumed; mineral soil under the ash not appreciably changed in color. Most soil and ash movement occurs during the first rainy season after the slash is burned and quickly diminishes as vegetation cover re-establishes. A recent study concluded that prescribed restoration fires did not have a significant effect on soil solution and stream chemistry or stream sediment concentrations and that low-intensity, low-severity fires could be used effectively as a tool to restore vegetation structure and composition (Elliot 2005:5).

The increase in erosion rates over present levels would be less than 15 percent as a result of burning handpiles because the piles would be spaced throughout and occupy approximately 3 to 5 percent of the total area. The increased potential of soil particles reaching the local waterways as a result of the prescribed burning would be low because of prescribed riparian buffers and handpiling of slash would not occur near waterways. High soil temperatures generated by burning piles would severely and negatively affect soil properties in the 3 to 5 percent of the unit

by physically changing soil structure and reducing nutrient content. In most pile burning operations, the duff and woody debris is completely consumed. Duff and woody debris represent a storehouse of minerals and protection for the soil surface. Since Nitrogen losses are roughly proportional to the amount of duff consumed, burn prescriptions that allow greater retention of woody debris benefit long-term site productivity. Burning volatizes organic Nitrogen or changes it into a readily available form (for plant use). Large proportions of the total Nitrogen budget can be lost through volatilization in the sites where pile burning occurs. Total foliar Nitrogen content also is reduced (14% in moderate burns, 33% in intense burns), and the effects last at least 4 years (Atzet 1987:193). Overall, soil productivity would experience a slight (<15%), negative decrease short-term effects but potential long-term positive effects would be realized from the proposed actions as the risk of catastrophic fire is diminished.

D. WATER RESOURCES

Affected Environment

The proposed project area is located within the Jenny Creek watershed adjacent to Howard Prairie Reservoir. The Jenny Creek watershed is a 5th field Hydrologic Unit Code (HUC) and is a tributary to the Klamath River. Grizzly Creek flows from Howard Prairie Reservoir and eventually flows into Jenny Creek. Jenny Creek is designated as a Tier 1 Key Watershed in the Resource Management Plan for the Medford District (USDI 1995a). Key watersheds serve as refugia and are crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. They also have a high potential of being restored as part of a watershed restoration program. All the drainages (7th field HUCs) where treatments are proposed flow into Howard Prairie Reservoir and are therefore considered the analysis area. Below the reservoir a portion of the flow is diverted from Grizzly Creek, a tributary of Jenny Creek and the Klamath River, to Bear Creek, a tributary of the Rogue River. Essentially all the water originating in the affected drainages is impounded and a portion diverted from the Klamath Basin to the Rogue Basin. It is important to note that the drainages where treatments are to occur represent an area that currently has little direct effect on Grizzly and Jenny Creek due to impoundment and diversion from Howard Prairie Reservoir. The entire analysis area is within the snow dominated precipitation zone.

The main disturbance mechanisms occurring within the area are timber harvest on public and private lands, along with associated roads, widespread recreational use including OHVs, and wildfire. Currently portions of both Grizzly and Jenny Creeks are listed as water quality impaired (303d) for summer water temperatures. These concerns are primarily associated with impacts occurring in the lower reaches, although forest management has the potential to affect stream shade and ultimately water temperatures.

The primary water quality concerns associated with this proposal are delivery of sediment to watercourses by roads, increased soil erosion resulting from burning and fireline construction, and to a lesser extent, increases in water temperature. Road use from project activities during wet periods or when snow is plowed on native surface roads can result in adverse effects to water quality. This is accomplished by: 1) the surface can be loosened and available for transport; 2) rutting and tire impressions could render drainage ineffective, resulting in routing and concentrated flow. Bare areas resulting from pile and prescribed burning, particularly within

Riparian Management Areas (RMA's) can result in sediment transport to stream channels. Stream shade can be affected by reductions in canopy closure within Riparian Reserves. A secondary or indirect effect resulting from fuels activities is increased OHV use of firelines and openings resulting from project implementation. These impacts can also result in transport and routing of sediments to stream channels, and may become severe in some instances.

Environmental Consequences

Alternative 1 - No-Action

Under the No-Action Alternative, fuel treatments would not occur. Watershed resources would likely remain unchanged with both anthropogenic and natural disturbances continuing to affect processes. The affected areas would continue to remain vulnerable to high intensity wildfire. Should a wildfire occur, negative impacts to water resources are likely. This would include increased erosion and sediment transport; loss of riparian shade and increased water temperatures; and increases in peakflows, baseflows and water yields. These effects could manifest themselves in the analysis area drainages and adversely alter channel geometry and water quality and may persist over time.

Alternative 2 – Proposed Action

Under Alternative 2, a total of 795 acres of fuels treatments are proposed in the drainages described above. All fuels treatments and fireline construction will be accomplished by hand; therefore ground disturbance would be minimal. Given the implementation of Best Management Practices (BMPs) and project design features (PDFs), increased erosion and sedimentation would not appreciably increase beyond background rates.

Only understory conifer trees would be thinned and hand piled. Overstory vegetation and hardwoods would not be treated and buffers would be applied to perennial and intermittent streams. Prescribed fire, if implemented correctly would not appreciably reduce ground cover or increase tree mortality within Riparian Reserves. All the affected drainages flow into Howard Prairie Reservoir, which would impound any water originating in the affected drainages. During the summer, reservoir releases are the primary controlling factor in stream temperatures immediately below the dam in both Grizzly and Jenny Creeks. This, in addition to maintaining the percent effective shade target as specified in the Upper Klamath and Lost River TMDL (DEQ 2010) along perennial and intermittent streams, would ensure that stream temperatures will remain unaffected in the listed stream segments. In the long term, there is a possibility that these treatments could improve stream temperatures in the long term by increasing growth and vigor of remaining conifers and hardwoods.

Given the right conditions, high intensity wildfire can occur with impunity across the landscape, including areas where fuel treatments have occurred. In the short and possibly intermediate terms, these treatments will reduce that likelihood. Implementation of Alternative 2 would not result in adverse impacts to the water resources described above and if applied correctly may result in improvements to riparian conditions.

With the implementation of the PDFs identified in Chapter 2, together with diligent administration of the contract, this project will have little direct effect on hydrology related

processes because stream channels and riparian areas are being protected from ground disturbance. Stream shading will likely not be affected by the project, so there will be no effect to stream temperatures. The project has some benefit to functioning of Riparian Reserves by promoting conditions that may allow late-seral conditions to develop more quickly in these areas.

An indirect and potential cumulative effect would be an increase in road/trail density resulting from fireline construction and opening of the understory. The area is heavily used by vehicles seeking access to the lakeshore. There is a network of user created routes on both public and private lands. This project has the potential to increase user created road and trail densities in the area. Mitigations designed to minimize those effects will be implemented, however their success depends on numerous factors including effectiveness monitoring and adaptive management when deficiencies are identified. Timing and magnitude of stream flows will be unaffected. The area is entirely within the snow zone and canopy cover will not be appreciably decreased.

Required project design features are included in Chapter 2 to address the concerns described above. Correct implementation of project design features would, under most circumstances, minimize adverse effects, and ensure compliance with all applicable statutes and management direction, including cumulative impacts and impacts to wetlands, floodplains, and drinking water aquifers.

E. FISHERIES

Affected Environment

Proposed fuel treatment units would be within the Jenny Creek Watershed. Jenny Creek is a tier 1 “key” watershed designated under the Aquatic Conservation Strategy (ACS) of the Northwest Forest Plan. Key watersheds were designated to provide refugia to at risk stocks of both anadromous and resident fish species. In this case, the Jenny Creek Watershed provides refugia for two resident fish species uniquely adapted to their environment; the Jenny Creek sucker and redband trout. All but approximately 150 acres of the units would be in the upper portion of the watershed, which drains into Howard Prairie Reservoir.

The Howard Prairie Reservoir is a large impoundment that has significantly altered the hydrologic and biotic regime of Jenny Creek. Water is stored during the winter and spring months, and released for irrigation and hydro power from late spring to early fall. In the process, an estimated 28% of outflow is diverted from the Jenny Creek system (a Klamath River tributary), and transferred via extensive water works to the Bear Creek Watershed (a Rogue River tributary). The reservoir also acts as a very effective sediment trap, as particulates that are washed into it settle out in the ponded water behind the dam. The dam and associated reservoir essentially divide the Jenny Creek Watershed into two separate halves; the impounded and inter-basin transferred drainage that flows into the reservoir, and the free flowing, more natural system that exists downstream of the reservoir.

While the reservoir does provide a sport fishery for introduced species of fish, the endemic Jenny Creek sucker is not known to occur in the watershed above the Howard Prairie Dam. Rainbow trout are present in both the reservoir and in some of the larger tributaries that feed the reservoir, though it is unclear if these fish are descendants of hatchery stocked fish, native redbands, or hybridized crosses between the two.

The portion of the proposed treatment unit which drains into Jenny Creek below Howard Prairie Reservoir includes either side of a segment of Grizzly Creek, which is the outlet stream below Howard Prairie dam. Grizzly Creek is a fish bearing stream, known to support populations of resident redband trout. No other fuels units would be in the vicinity of fish bearing streams, though units do extend down to the shorefront of Howard Prairie Reservoir, and also include six other stream adjacent reaches, only one of which is identified as a perennial stream. These other streams terminate in the reservoir.

Environmental Consequences

Alternative 1: No-Action

Under the No-Action Alternative, hazardous fuels would not be treated. Aquatic habitats would remain as they are, subject to past and ongoing perturbations. The untreated areas would remain at an elevated risk of unnaturally intense wildfire. Though fire is a natural component of these environments, unnaturally high fuel loadings could potentially cause a fire to be much more impacting than it historically would have. Should a particular drainage experience a large, intense, and severe (i.e. stand replacing) wildfire, it could potentially have negative impacts to aquatic habitat. Anticipated effects in such a scenario would be increased peak flows if enough overstory vegetation succumbed to fire, increased sediment transport from severely burned landscapes, and elevated water temperatures in the event that riparian vegetation was lost. All of which would further degrade aquatic habitat, leading to decreases in biological productivity. However, as the affected areas drain into Howard Prairie Reservoir, and do not include any fish bearing drainages, it is unlikely that fish habitat would be adversely impacted. Aquatic Conservation Strategy objectives would remain unchanged under this alternative.

Alternative 2: Proposed Action

Under this alternative, roughly 795 acres of forest stands would be thinned to reduce hazardous fuel loading. Treatment activities would consist of cutting small diameter vegetation, piling and burning the slash, and potentially follow-up underburning where applicable to accomplish fuel loading objectives, as described in Chapter 2 of this document. Project Design Features (PDFs) would be incorporated in the project to minimize the potential for adverse impacts to aquatic habitats.

Overstory vegetation is not proposed to be treated. As such, canopy cover would not be measurably reduced at the landscape level. Fuel reduction activities would not increase ground compaction. Because canopy cover and compaction would remain unaffected, treatments would have no mechanism to affect peak stream flows. Reduced vegetative density may allow for reduced evapotranspiration rates, and hence greater ground water availability during the summer months. However, this is unlikely to measurably affect low flows, as remaining vegetation would likely utilize any extra available ground water.

The topography in the project area is relatively low gradient. As such, it is very unlikely that soil disturbed from underburning would have the potential to migrate off site, and towards downslope aquatic features. In any case, the vegetative buffers left around stream channels and other aquatic features and the debris rings around burned piles would be sufficient to capture any off-site movement of disturbed particulates, in the unlikely event it did occur. As such, sediment or ash delivery to aquatic habitats is not anticipated as a result of this project. Furthermore, the buffers would ensure that shade levels are maintained around streams that would be susceptible to increased water temperature during the summer months (the perennial and long duration intermittent streams. The other channels would be dry during the summer). Hence, summer water temperatures would not be increased as a result of the treatments.

Implementation of this project with the described PDFs would reduce the likelihood of an unnaturally severe wildfire occurring to some extent in the small drainage basins involved, and would not negatively affect any aquatic habitat parameters. For this reason, this project would have no direct effects to fish or aquatic habitat.

As discussed in the hydrology section of this document, there is the potential for increased OHV use to occur in the treated units. PDFs, properly implemented, would minimize this potential. However, should new trails become established in treatment units with hydrological connectivity, a potential indirect and cumulative effect of the fuels treatments could be an increase in erosion rates coupled with increased sediment transport to aquatic habitats. As indicated, the bulk of the proposed units would interface with streams which drain into the reservoir. It is not possible to quantify the amount (if any) of sediment that could be contributed to aquatic habitat in this scenario, too many variables exist, not least of which there is no way of knowing where a new trail would be likely to be created. Any increased sediment delivery to these streams would adversely impact aquatic habitat in affected streams. However, it would not meaningfully impact fish habitat in the reservoir, as any contributed sediment would settle out in the ponded water and become assimilated into the existing mud substrate inherit to the system.

There is little potential that units in areas draining to Grizzly Creek downstream of the reservoir would indirectly contribute sediment to aquatic habitat due to new OHV trails because only two short segments of stream channels would be within the unit, and hence there would be limited potential for hydrological connectivity. Additionally, both of these channels currently flow through open ground (meadows) already, and fuels treatments would not appreciably change the accessibility to these areas beyond what currently exists.

Consistency with Aquatic Conservation Strategy Objectives

The Northwest Forest Plan's (NWFP) Aquatic Conservation Strategy (ACS) has four components: Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration. It is guided by nine objectives which are meant to focus agency actions to protect ecological processes at the 5th-field hydrologic scale, or watershed, at the 6th and or 7th fields (subwatershed and or drainage), and at the site level. The fuels treatments would occur within the Jenny Creek fifth field Watershed, a designated Key Watershed. The site level analysis areas are the actual on the ground locations where the treatments are proposed, which would occur in portions of five separate 7th field drainages. How the four components of ACS relate to the proposed Howard Prairie Fuels Project is explained below:

1. Riparian Reserves: Riparian Reserve widths for streams, springs, wetlands, and unstable soils have been determined according to the protocol outlined in the NWFPs ACS. Smaller buffers have been established around active channels (perennial and long duration streams). In this case, fuels treatments could occur in outer portions of Riparian Reserves, but not within the smaller stream adjacent buffers.

2. Key Watersheds: Tier 1 Key Watersheds contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential of being restored as part of a watershed restoration program. Jenny Creek is a designated Key Watershed, as it supports populations of two endemic fishes, the Jenny Creek Sucker and redband trout. Both populations are isolated from other populations of like species by two large waterfalls near the mouth of Jenny Creek. The majority (80%) of the fuels treatments would occur above Howard Prairie Reservoir, which blocks access by native fishes to the upper portion of the Jenny Creek Watershed.

3. Watershed Analysis: BLM completed the Jenny Creek Watershed Analysis in 1995. The analysis covers the project area.

4. Watershed Restoration: Most of the restoration activities in the watershed have focused on restoring habitat on private and federal lands. Projects include culvert removal and replacement, road decommissioning, irrigation ditch fish screens and siphoning, land acquisition, retirement of grazing rights, and planting of riparian vegetation.

Evaluation of This Action's Consistency with Northwest Forest Plan Aquatic Conservation Strategy Objectives

1. Maintain and restore the distribution, diversity, and complexity of watershed and **landscape-scale features** to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Though a disturbance, the proposed fuels treatments would seek to mimic natural disturbances with which plant communities in the watershed adapted with, and the intent of the treatments is to help restore and maintain some of the landscape features in the watershed to a more natural state.

2. Maintain and restore **spatial and temporal connectivity** within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

No proposed project components would impact spatial or temporal connectivity within and between watersheds at any spatial scale of analysis. Connectivity within the watershed would continue to be disrupted by the reservoirs and interbasin water transfers.

3. Maintain and restore the **physical integrity** of the aquatic system, including shorelines, banks, and bottom configurations.

> No project elements would disturb shorelines, banks, or bottom configurations of the aquatic system. No cutting, piling, or burning is proposed within any channels. Riparian buffers would be retained around all active channels.

4. Maintain and restore **water quality** necessary to support healthy riparian, aquatic and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

> No overstory or riparian species are proposed to be removed, so shade and stream temperatures would not be negatively impacted by the treatments. Vegetative buffers left along active stream channels and around burned debris piles would be sufficient to minimize the potential for ash to migrate off site and into aquatic habitats. As such, this project is not expected to directly reduce water quality in any way at any spatial scale. Indirectly, new openings created as a result of the treatments could be subject to user created OHV trails. This could lead to increased erosion and sediment delivery to streams with hydrological connectivity with any new trails. This could lead to chronic site level inputs of sediment. PDFS have been incorporated into the project to discourage user created trails from becoming established, which coupled with vegetative buffers retained around active channels would reduce this potential risk to the extent possible.

5. Maintain and restore the **sediment regime** under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

> See objective #4. Sediment is not expected to be directly generated by project activities, and ash is not expected to be transported to any aquatic habitat. Indirect inputs resulting from unauthorized user crated trails could potentially occur, though PDFS would, under most circumstances, serve to reduce the potential for this to occur.

6. Maintain and restore **instream flows** sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

> Reducing vegetative density may potentially correspond with decreased evapotranspiration, and hence greater ground water availability at site levels. However, remaining dominant vegetation would remain and would likely utilize any extra water, and hence flows are unlikely to be measurably affected by the fuels treatments.

7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in **meadows and wetlands**.

See objective #6. Though ground water may be increased at the site level, it would be unlikely to translate to increased surface water, as vegetation remaining on site would likely utilize any extra water before it could surface. Meadows and wetlands themselves would not be included in treatment units; there are no hazardous fuels in these areas to treat.

8. Maintain and restore the species composition and structural diversity of **plant communities in riparian areas** and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of **coarse woody debris** sufficient to sustain physical complexity and stability.

Though some vegetation in the outer portions of Riparian Reserves is proposed to be cut, riparian species would not be treated. Buffers left adjacent to active stream channels would ensure that the element of this objective would be maintained in their current states. Thinning in outer portions of the Reserves may benefit riparian areas, as dominant tree species may be released, and thereby allowed to obtain desired characteristics quicker.

9. Maintain and restore **habitat** to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

See previous objectives. Aquatic habitat would not be negatively impacted by fuels treatments, and riparian plant species would not be targeted in the treatments. Hence, habitat that supports populations of native plant, invertebrate, and vertebrate riparian dependent species would be maintained.

F. WILDLIFE

Affected Environment

The habitat proposed for treatment are best classified as a mixed conifer zone, but stands are also characterized by mixed-aged stands of Douglas fir, white fir, incense cedar, grand fir, ponderosa pine, sugar pine, white oak and other species. White fir is out-competing the Douglas fir and pines which are preferred by raptors and other special status species in the analysis area, defined for wildlife as the Section 7 watershed. Section 7 watersheds are used for spotted owl consultation purposes and are similar in size to HUC5 watersheds. The Klamath Section 7 watershed is nearly 400,000 acres (USDI 2010). There are scattered overstory trees older than 200 years (1750 birthdate), but the FOI (Forest Operations Inventory) identifies many patches less than 80. *The Jenny Creek Watershed Analysis mentions the historic planting of Jeffery pine, which is more resistant to pocket gophers than the native Douglas fir, an*d ponderosa pine and lodgepole pine, which are more frost tolerant than Douglas-fir. Johnson and O'Neil et al (2001) describes this habitat type as southwest Oregon mixed conifer-deciduous forest. Fire is an important disturbance mechanism for this habitat type, and most plants are well adapted to regular wildfire. Some may need fire to reproduce. Fire suppression is identified as a concern for this habitat type (Johnson and O'Neill, 2001, USDI 1995b).

The area is under snow much of the winter. Suppression of wildfire has caused the development of understory conifers with higher stem densities than would be expected under regular wildfire regime. The treatment area is dense. It lacks good flying space for owls and large forest-dwelling raptors. Habitat for ground-dwelling birds and mammals is poor because the tight canopy prevents light from supporting important fruits, nuts and herbaceous vegetation. Shrubs in the treatment area are sparse. Typically, the mixed conifer type would be a mosaic of ages and species resulting from repeated wildfires. A stand subject to regular wildfire would be expected to support a diverse shrub layer and patches of ceanothus (USDI 1995b: 19-20). Golden chinquapin, manzanita, elderberry, Oregon grape and service berry would be common. More shade tolerant species include oceanspray, snowberry, mock orange and huckleberry (USDI 1995b). Dryer sites and openings support bluebunch wheatgrass, western needlegrass and California fescue.

Fruits and nuts from shrubs and forbs/grasses are important food sources for birds and mammals, provided they get enough light and moisture to produce fruit. Most of these species in the mixed conifer zone are fire-dependent, and respond well to ground fire. These small birds and mammals are important prey items for the listed and special status species raptors in the area. Most of the treatment area is within 0.5 miles of Howard Prairie Reservoir, a man-made lake. As a dammed reservoir, riparian vegetation around the lake isn't as prominent as it would be around a natural lake. The Reservoir attracts some water-associated wildlife such as sandhill cranes, ducks, and other shorebirds, but these species are unlikely to venture far into the treatment area. The reservoir is used throughout the year, when accessible, for fishing, boating and recreation. The area is heavily roaded.

The Jenny Creek Watershed (USDI 1995b) estimated approximately 255 terrestrial wildlife species likely to occur in the watershed. Johnson and O'Neil (2001: 21) identified 236 species in the Southwest Oregon Mixed-Conifer Deciduous Forest, of which 35 were closely associated and 163 were generally associated. All species associated with the project areas are expected to remain in the treatment area, under any of the alternatives because important habitat components will be retained in all alternatives, and some untreated patches will remain. Therefore, only special status species that may occur in or near the treatment area are noted below in Table 3-1.

Table 3-1. Special Status Species that May Occur in or near the Treatment Area

Species	***Status***	***General Habitat Type***
Northern spotted owl	FT	Douglas fir or mixed conifer forest with complex structure, large overstory trees, large standing and down dead wood, flying space and prey habitat; Generally 60 % canopy cover. Primary prey spp: flying squirrels and woodrats
Pacific fisher	BS FC, WBP	Contiguous forest habitat with small openings to Primary food spp: rabbits, rodents, squirrels, berries.
Bald Eagle	BS FT- Delisted. Continued protection under the Eagle Act and the migratory bird treaty act	Large trees capable of supporting large stick nests within line-of-sight of large bodies of water that produce fish. Primary prey: fish, small birds, carrion, small mammals
Great Gray Owl	S&M	Large trees, mixed with hardwoods, adjacent or interspersed to

Species	***Status***	***General Habitat Type***
		meadows or man-made openings. Primary prey spp: mice and other small rodents
Chase sideband snail (*Monadenia chaceana*)	BS; S&M	Endemic to northern California and southwest Oregon forested and open talus or rocky areas. Vegetation types include dry conifer and mixed conifer/hardwood forest communities as well as oak communities. Areas with frequent fire return intervals where rock crevice refugia are available may have historically favored this species over other, larger forms of Monadenia
Oregon Shoulderband snail (*Helmithoglypta hertleini*)	BS and S&M	Associated with rocks and woody debris in rocky areas within forest habitats, often adjacent to areas with substantial grass or seasonal herbaceous vegetation. Seasonal deep refugia include talus deposits and outcrops, which contain stable interstitial spaces large enough for snails to enter. These seasonal refugia also provide protection from fire and predation during inactive periods include dry conifer and mixed conifer/hardwood forest communities as well as oak communities. Maintaining environmental conditions within refugia in these habitats may be especially critical to survival of local populations. Catastrophic wildfire causes direct mortality in high intensity fires and may result in loss of populations over large areas.
Siskiyou hersperian snail (*Vespericola sierranus*)	BS	Primarily a riparian associate found in perennially moist habitat, including spring seeps and deep leaf litter along streambanks and under debris and rocks. Moist valley, ravine, gorge, or talus sites are preferred, near the lower portions of slopes in areas that are not subject to regular flooding. It may occur in areas with running water or alongside streams and spring pools (Frest and Johannes 1995, Roth 1993]. Removal of forest overstory from logging can dry important subterranean refugia and loss of aestivating individuals
Traveling sideband snail (Monadenia fidelis celeuthia)	BS	Associated with forested and open talus or rocky areas. Vegetation types include dry conifer and mixed conifer/hardwood forest communities as well as oak communities. Mollusks which inhabit rocky habitats also utilize the surrounding forest areas for foraging and dispersal during moist, cool conditions. Seasonal deep refugia include talus deposits and outcrops, which contain stable interstitial spaces large enough for snails to enter. These seasonal refugia also provide protection from fire and predation during inactive periods. Within rocky habitat, the species is also associated with subsurface water, herbaceous vegetation and deciduous leaf litter. ..
Foothill yellow-legged frog	BS	Streams and rivers in woodland, chaparral, and forest. (Stebbins 1985) Found near water, especially near riffles where there are rocks and sunny banks. When frightened, it dives to the bottom and takes refuge among stones, silt, or vegetation. (Stebbins 1985 cited on amphibian website)
Northwestern pond turtle	BS	Found in streams, ponds, lakes, and ephemeral wetlands, the pond turtle spends a large amount of time away from water. Even though pond turtles spend much of their lives in water they require terrestrial habitats for nesting. They also often overwinter on land, disperse via overland routes, and may spend part of the warmest months in aestivation on land (Hays et al 1999).
Fringed myotis	BS	Roosts in trees, snags, buildings, caves, rocks, cliffs and bridges. It likes beetles and moths but will eat spiders and crickets
Pallid bat	BS	Found mostly in arid regions in canyons. eat only insects. Found

Species	*Status*	*General Habitat Type*
		in Southwestern and Eastern Oregon
Johnson's hairstreak butterfly	BS	The larvae of this butterfly feed exclusively on the aerial shoots of dwarf mistletoes (Arceuthobium) (LaBonte et al. 2001). Dwarf mistletoes are highly specialized and adapted parasitic plants of a number of conifers.and may limit the butterflies' occurrence and distribution to trees in stands that are infected with Arceuthobium. Davis et al.: Older coniferous forests, especially those with a heavy component of western hemlock (Tsuga heterophyla) that are infected by dwarf mistletoe (Arceuthobium tsugense) appear to be its key habitat. It also has been documented to use A. abietinum in true firs such as white fir (Abies concolor).
FT: *Federal Threatened* **FT-Delisted**: *No longer listed* **FC**: *Federal candidate* **WBP**: *Warranted for listing but precluded* **S&M**: *Survey and Manage* **BS**: *Bureau Sensitive*		

Northern spotted owls

There are federally-listed northern spotted owl sites east and south west of the reservoir. A portion of the mapped home range, core, and nest patch of one site is in the proposed treatment area. Portions of the project occur in the SE spotted owl core and home range. Both NRF (Nesting Roosting Foraging) and dispersal habitat occur in the treatment area. Northern spotted owl project design features (PDF) will be applied. There is no critical habitat in the treatment area. No treatments will occur in any stand that could be considered older, structurally-complex, and multi-storied.

The U.S. Fish and Wildlife Service listed the spotted owl as threatened in 1990 (http://www.fws.gov/oregonfwo/Species/Data/NorthernSpottedOwl). A 2004 status review re-evaluated the status of spotted owls. *Major threats to Northern Spotted Owls at this time include: the effects of past and current harvest; loss of habitat to fire; barred owls…. Of threats identified at the time of listing, only one (predation linked to fragmentation) does not now appear well supported (Courtney et al.2004). West Nile Virus is a potential threat, but of uncertain magnitude and effect.*

Home ranges in the Klamath Physiographic Province, where this project occurs, have an average radius of 1.3 miles (USDI FWS 2008a). Owls nest in predominately Douglas-fir trees, often nest in mistletoe clumps in our area, and use contiguous, large, structurally-complex stands of forested habitat. They feed on small mammals and birds. Woodrats and flying squirrels constitute the largest mass and numbers of prey species (Forsman et al. 2004). Spotted owls have strong site fidelity, and have been documented to stay in home ranges even if habitat decreases, although they may stop or decrease breeding attempts. In Medford BLM, federally-managed checkerboard ownership challenges the maintenance of owls. Private lands near or adjacent to the project area are managed for private recreation, commercial harvest, or rural agriculture, and may not be conducive to long-term spotted owl maintenance. Spotted owls are thought to respond negatively to noise/disturbance close to their nests during nesting periods. To reduce the chances of disturbing nesting birds, the Level 1 team has developed protection buffers around nest sites to reduce noise/activity during the vulnerable nesting period (see PDFs).

Above-ambient noises further than the distances listed in Table 2-2 (p.11) from spotted owls are expected to have either negligible effects or no effect to spotted owls. The types of reactions that spotted owls could have to noise that the Service considers to have a negligible impact, include flapping of wings, the turning of a head towards the noise, hiding, assuming a defensive stance, etc. (USDI 2003).

The US Fish and Wildlife Service completed the Recovery Plan for the Northern Spotted Owl on May 13, 2008 (USDI FWS 2008a) and it is currently under revision, but overall recovery actions are not expected to change significantly from the 2008 version, although site specific details may vary with the new version. Recovery plans are not regulatory, but are rather advisory for agencies such as BLM to aid us in meeting our requirements under ESA Section 7 (a) (2) to conserve habitat for listed species. The 2008 Recovery Plan identified 32 recovery actions. BLM is working with the Service to implement the Recovery Actions within BLM regulatory authority. In particular, RAs that address Listing Factor A: *The present or threatened destruction, modification or curtailment of the species' habitat or range* (USDI FWS 2008a:19). This project specifically addresses Recovery Action #8*: Manage the Klamath Provinces in Oregon and California to meet spotted owl recovery objectives while creating more fire-resilient and fire-resistant forests.*

Wildlife habitat was typed into habitat categories pertinent to the Northern Spotted Owl (NSO). These habitat types are used throughout this document to describe and quantify habitat conditions across the landscape. These distinct and not over-lapping habitat categories are:

- Non-habitat
- Capable
- Dispersal*
- NRF (Nesting, Roosting and Foraging)*

*Spotted owls also disperse through NRF habitat. All-dispersal is used to describe dispersal plus NRF.

Nesting, Roosting, and Foraging (NRF) Habitat for the northern spotted owl consists of habitat used by owls for nesting, roosting, *and* foraging. NRF habitat also functions as dispersal habitat. Generally, this habitat is multi-storied, at least 80 years old, and has sufficient snags and down wood to provide opportunities for nesting, roosting, and foraging. The canopy closure generally exceeds 60 percent, but canopy closure or age alone does not qualify a stand as NRF. Other attributes include a high incidence of large trees with various deformities (e.g., large cavities, broken tops, mistletoe infestations, and other evidence of decadence); large snags; large accumulations of fallen trees and other woody debris on the ground; and sufficient open space below the canopy for owls to fly (Thomas et al. 1990). NRF habitat in southwest Oregon is typified by mixed-conifer habitat, recurrent fire history, patchy habitat components, and a higher incidence of woodrats, a high quality spotted owl prey species in our area.

Habitat Capable for the northern spotted owl is forest land that is currently not habitat but can become NRF or dispersal in the future, as trees mature and canopy fills in.

Dispersal is a subcategory of "all dispersal" habitat for northern spotted owls. "Dispersal" will be used to describe dispersal-only habitat. Thomas, et al. 1990, defined dispersal habitat as forested habitat more than 40 years old, with canopy closure more than 40 percent, average diameter greater than 11 inches, and flying space for owls in the understory but does not provide the components found in NRF. It provides temporary shelter for owls moving through the area between NRF habitat and some opportunity for owls to find prey, but does not provide all of the requirements to support an owl throughout its life. Dispersal will be used throughout this document to refer to habitat that does not meet the criteria to be NRF habitat, but has adequate cover to facilitate movement between blocks of NRF habitat. Owls also disperse through NRF habitat. The term "all-dispersal" is used when both dispersal and NRF are intended.

Physiographic Province	Section 7 Watershed (used In consultation)	NRF	Dispersal
Western Cascades	Klamath	380	160

Pacific fishers

Pacific fishers, a warranted but precluded candidate species, have been documented in the analysis area and they likely use the treatment area. Pacific fishers were petitioned for listing as endangered or threatened under the Endangered Species Act on three occasions. In 2004 and 2006, the USFWS determined that listing fishers as threatened was warranted, but was precluded by higher priority listing actions (USDI FWS 2004). In their 2006 update on the status of the Pacific fisher, the USFWS defined the reasons for listing as: "*Major threats that fragment or remove key elements of fisher habitat include various forest vegetation management practices such as timber harvest and fuels reduction treatments. Other potential major threats include: Stand-replacing fire, Sudden Oak Death Phytophthora, urban and rural development, recreation development, and highways." The USFWS also states that the three remaining fisher populations "appear to be stable or not rapidly declining based on recent survey and monitoring efforts*." (Id 71 Fed. Reg. 53777 (Sept. 12, 2006)). The species remains a USFWS candidate species (http://www.fws.gov/oregonfwo/Species/Data/Fisher/).

Pacific fishers are omnivorous in eating habits, but prefer small mammals and birds (Powell et al 1994). Males and females meet briefly to breed and then live separately. Females need large snags with suitable sized cavities, or pockets of down wood within which the female can leave her kits to hunt (Aubry and Lewis 2003). She moves her young every few days to other suitable standing or down wood patches across a large home range area (in California) approximately 990 hectares for females and 3,935 hectacres for males (Zielinski et al 2004). There must be structural habitat dispersed throughout her home range area sufficient to allow her to carry her kits safely to each new location, and support adequate prey or vegetative food around that den site to support her kits and her for several days until she moves again. Treatments such as that proposed in the fuels project would maintain large standing and down dead wood for den sites.

There are several active ***bald eagle*** nest sites in or adjacent to the project area, units Section 19 and Section 29.

Western pond turtles spend part of their lives in slow-moving parts of rivers and streams or in ponds, lakes and wetlands, and part of their lives basking, nesting or hibernating on land. They nest in upland sparsely-vegetated areas with southern exposure, and can winter in duff up to one half mile from water (www.dfw.state.or.us/wildlife/living_with/docs/turtles.pdf). Howard Prairie Reservoir is likely near the upper elevation range of western pond turtles, and the project area is likely too dense to provide good nesting habitat. There is slight chance that wintering pond turtles could occasionally occur in forested habitat around the reservoir.

Yellow-legged frogs are stream-breeding frogs, often associated with larger streams with coarse substrates. However, they also have been found in smaller tributaries, and in areas with finer substrates or bedrock (Olson and Davis 2007). Howard Prairie lies within the historic range of yellow-legged frogs. Borisenko and Hayes (1999) failed to detect the species in many northern and southeastern locations of their historic range in Oregon. Threats in Oregon appear to be: (1) stream habitat loss or alteration from water impoundments; (2) introduced exotic species; and (3) stream habitat loss or change.

Bats

There are two special status, and several common bats that could occur in the project area. The special status pallid bat uses day and night roosts in crevices in rocky outcrops and cliffs, caves, mines, trees (*e.g.*, basal hollows of coast redwoods and giant sequoias, bole cavities of oaks, exfoliating ponderosa pine and valley oak bark, deciduous trees in riparian areas, and fruit trees in orchards), and various human structures such as bridges (especially wooden and concrete girder designs), barns, porches, bat boxes, and human-occupied as well as vacant buildings. They forage over open shrub-steppe grasslands, oak savannah grasslands, open ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards. They are communal bats and sensitive to disturbance.
(http://wbwg.org/speciesinfo/species_accounts/species_accounts.html).

The fringed myotis is most common in drier woodlands (oak, pinyon-juniper, ponderosa pine) but is found in a wide variety of habitats including desert scrub, mesic coniferous forest, grassland, and sage-grass steppe. They roost in crevices in buildings, underground mines, rocks, cliff faces, and bridges. Roosting in decadent trees and snags, particularly large ones, is common throughout its range in western U. S. and Canada. *M. thysanodes* roosts have been documented in a large variety of tree species and it is likely that structural characteristics (e.g. height, decay stage) rather than tree species play a greater role in selection of a snag or tree as a roost http://wbwg.org/speciesinfo/species_accounts/species_accounts.html). The closed canopy of the treatment area is poor habitat for these bats, but some snags and cavities in large trees occur.

Survey and Manage Species

Several *great gray owl* sites were found during survey and manage surveys. Fuels in the great gray site will be treated to reduce fuels and create conditions more conducive to prey for great gray owls because great gray owls prefer more open habitat and feed on mice, gophers and other small mammals that prefer more open habitat. Great gray owl seasonal restrictions will limit treatment activities to the non-critical breeding period.

Surveys for *mollusks* are ongoing and will be completed prior to project implementation. Any mollusk sites will be protected as described below to avoid the possibility of loss during fuels treatment, pile burning or broadcast burning.

Bird species of concern in the Mixed Forest/Evergreen Forest

Migratory birds are common in the treatment area. Bird species of concern within this area are those who use more open habitats than occur in the project area, but some of the species that could occur in or adjacent to the treatments are listed below. Species diversity is probably greater due to the presence of the Reservoir. The spotted and great gray owl seasonal restrictions will allow migratory birds to produce young undisturbed in those areas. Untreated habitat in the broader treatment area will also provide refugia for any species that would be displaced or disturbed by the treatment.

Executive Order (EO) 13186 requires "*environmental analysis of Federal actions, required by NEPA or other established environmental review processes, evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern*."

White-headed Woodpecker (pine and fir preferred habitat)

White-headed Woodpecker is restricted to mixed coniferous forests dominated by pines (*Pinus* spp.) in the mountains of far western North America, from south-central British Columbia to southern California. Pine seeds are an important part of its diet through much of the year but especially in fall and winter (BONA). Loss of large-diameter ponderosa pine poses greatest threat to this species in Oregon (RDD). Factors causing loss of habitat quality include logging, planting of even-age stands, fire suppression (which favors replacement of pines by firs), and snag removal (Raphael 1983). Specific snag retention recommendations are 45 suitable large (>58 cm dbh) snags/40 ha to maintain target population of 5 pairs of White-headed Woodpeckers/40 ha.

Wood Ducks use the cavities of hardwood trees near water.

Mature forests are needed for development of trees with suitable cavities (Gilmer et al. 1978). Birds prefer sites close to or over water and near good brood-rearing areas; depending on availability of cavities, will use nest sites within 2 km of water (Bellrose 1976). Most cavities (>60%) suitable for wood ducks develop when branches break and permit subsequent heart rot of the trunk (Hepp et al 1995). Abandoned woodpecker cavities (e.g., pileated woodpecker) are used infrequently. The project area is on the edge of the range of the species in Oregon. Snags, particularly oak in our area, and pileated woodpecker cavities within 2km of water bodies should be retained.

Flammulated owls use long needle pines in open canopy and have been observed in analysis area. They nest in montane forest, usually open conifer forests containing pine, with some brush or saplings (typical of the physiognomy of pre-European settlement ponderosa pine forests). They show a strong preference for yellow pine, i.e. ponderosa pine and Jeffrey pine, throughout their range (McCallum 1994b). Flammulated owls prefer mature growth with open canopy; avoids dense young stands. They are found in cooler, semi-arid climate, with high abundance of nocturnal arthropod prey and some dense foliage for roosting (McCallum 1994a). Flammulated owls are absent from warm and humid pine forests and mesic ponderosa pine/Douglas-fir

(McCallum 1994a, Wright et al. 1997). They are most often found on ridges and upper slopes (Bull et al. 1990, Groves et al. 1997). Flammulated owls nearly always nests in open conifer forest with large old trees, scattered thickets of shrubs/saplings, and clearings (McCallum 1994a) and are closely associated with large, mature trees for nesting (Bull and Anderson 1978).

Management recommendations for flammulated owls summarized in several sources include the following: (1) maintain stands of mature trees at least 0.8 to 4 hectares in size; (2) maintain large snags larger than 30 centimeters dbh (larger than 12 inches) and more than 6 meters (20 feet) in height in adequate numbers, at least 8 snags per 40 hectares (0.8 per acre); (3) leave existing trees and snags with woodpecker cavities undisturbed; (3) preferably leave snags on ridges and upper slopes with east or south aspects and in stands of large trees that contain a high percentage of yellow pine in the overstory; (4) maintain brushy clearings and understory and small grasslands near nest stands for foraging; (5) ensure snag recruitment by retaining large, green tree replacements, especially over-mature trees (can be left in groups to reduce blowdown).; (6) manage for pileated woodpeckers (DRYOCOPUS PILEATUS) and flickers in same habitats; (7) do not apply pesticides in owl habitat; (8) provide public education.

Olive-sided Flycatcher (edge habitat, openings): Nest within the coniferous forest biome, most often associated with forest openings, forest edges near natural openings (e.g., meadows, canyons, rivers) or human-made openings (e.g., harvest units), or open to semiopen forest stands. Olive-sided flycatchers prefer habitat less than 40% canopy cover in a stand of large trees. They would likely occur in non-owl habitat or on the edges of units in the analysis area. Frequently occurs along wooded shores of streams, lakes, rivers, beaver ponds, bogs, and muskegs, where natural edge habitat occurs and standing dead trees often are present (Altman et al 2000). Presence near water may be due to higher insect abundance in these areas. They are reported as a species associated with burned forest; likely because of creation of forest openings, increased edge at interface of live and dead forest, and availability of snags. Because aerial-feeding insectivorous bird species often respond positively to fire (Altman, Bob and Rex Sallabanks. 2000). It has been suggested that aerial insects increase in number after fires, thus providing foraging opportunities for this flycatcher.

Rufous Hummingbird (second growth near scrub): Nest in coniferous forest, second growth, thickets and brushy hillsides, foraging in adjacent scrubby areas and meadows (AOU 1998). Nest in coniferous forest and forage in openings with abundant nectar flowers. They are found in successional communities and forest openings (Calder 1993).

Band tailed pigeons: Important habitat components include closed-canopy forests for nest sites, open-canopy forests for foraging, and presence of mineral springs and licks (Sanders 2010). Mineral springs are preferred by band tailed pigeons, but no mineral springs are known to occur in the treatment area. Close proximity to free water (< 400 meters) is also important (Glover 1953). Foods are principally wild and domestic fruits, grains, and mast throughout the year. Food availability apparently greatly influences breeding and flock movements (Gutierrez 1973), and any management activity that reduces mast production or the availability of fruiting shrubs and other primary foods would be detrimental (Keppie and Braun 2000).

Environmental Effects

Alternative 1: No-Action

Without thinning, wildfire risks remain high. The area has high recreational use, and likelihood of human caused fire is higher in this area than areas with less human activity. Lightning or human-caused fire could lead to the loss of important components in the current stand: large trees, fruiting shrubs, large standing and down dead wood. Trees would continue to develop in a tightly competitive stand. Trees would continue to compete for growing space and nutrients. Crowding can lead to suppression mortality for some trees and reduced grown or increased disease for others. Large trees, desirable to eagles, owls, woodpeckers and fishers, would be slower to develop under a No-Action Alternative. Shrubs and understory vegetation that need light to develop fruit would continue to decline at the expense of small mammals and birds that need this vegetation. Under a No-Action Alternative, there would be little to no risks of potential disturbance to resident wildlife.

Northern spotted owls
Both the NRF and dispersal habitat would remain dense, and would make flying through the canopy difficult for spotted owls that may attempt to fly through the stand. Large trees that could serve as future nest sites would be retained. Prey habitat for arboreal species such as flying squirrels, would likely remain constant. Woodrats, which prefer more open stands, would likely continue decline as the stands develop over time.

Pacific fishers
The No-Action Alternative will retain the large standing and down dead wood important to fishers. Continued suppression mortality could increase the presence of potential den sites in the form of trees killed by suppression mortality, but it is likely that smaller trees too small for fisher dens would become snags first. Prey habitat and fruit on the few understory shrubs would continue to be very shaded, and be unlikely to produce much fruit, which can be an important food source for fishers.

Bald eagles
No disturbance to bald eagles would occur resulting from the No-Action Alternative. It is unlikely that the stand provides much prey habitat for bald eagles, since their primary prey is fish, but incidental capture of small rodents in the project area would likely continue on an opportunistic basis. Large trees that could serve as future nest sites would be retained.

Johnson's hairstreak butterflies could occur in the area, but dwarf mistletoe is not prevalent in the project area. Not treating the area would not affect any Johnson's hairstreak butterflies that might occur in the area.

Western pond turtles
No known western pond turtles occur in the project area, but there is slight possibility that a pond turtle could winter in the duff near the reservoir or one of its tributaries. The No-Action Alternative would have no effect on pond turtles.

Yellow-legged frogs

No known yellow-legged frogs occur in the project area. Limited research suggests the historic range is no longer inhabited. Riparian buffers would likely protect any yellow-legged frogs that might occur in the project area. The No-Action Alternative would have no effect on yellow legged frogs or their habitat.

Bats

Pallid bat and fringed myotis may occur in the project area, although habitat is not optimal because it is too dense. The No-Action Alternative would avoid disturbance of any bats in the treatment area.

Survey and Manage

The No-Action Alternative would avoid any potential disturbance of habitat for mollusks or great gray owls. No mollusks would be impacted by pile burning or understory burning. The risk of wildfire and its consequences would remain high. Not treating the great gray owl sites would maintain current crowded conditions.

Birds of Conservation Concern

The No-Action Alternative would retain any large oak snags or pileated woodpecker cavities that might be nesting habitat for white-headed woodpeckers. The treatment area is likely too dense to be optimal habitat for white-headed woodpeckers, because they prefer more open stands of larger snags and burned trees. Over the long term, without treatment, wildfire could create better habitat for white headed woodpeckers.

No known wood ducks occur in the project area, but their presence is possible in the two treatment units adjacent to the reservoir. Large hardwood snags will be retained under both alternatives. The No-Action Alternative is unlikely to affect wood ducks.

The No-Action Alternative will not benefit flammulated owls. Where fire suppression has led to the accumulation of understory and "ladder" fuels, altering fire regimes and forest succession, taking a course of no management action will likely continue habitat degradation (Erickson and Toweill 1994).

The treatment area probably isn’t optimal for olive sided flycatchers except adjacent to the Howard Prairie Reservoir and in the younger patches. Lack of fire will continue to maintain their habitat in sub-optimal condition.

The treatment area probably isn’t optimal for rufuous sided hummingbirds because flowering shrubs are sparse in the stands scheduled for treatment. Suppression of shrubs and flowering plants is likely to continue without treatment.

The treatment area is not known to have any mineral springs, which are important for breeding band tailed pigeons. Pre-treatment habitat is unlikely to provide optimal habitat for band tailed pigeons because it is too dense for good food production or nesting.

Alternative 2 – Proposed Action

The project area is a small proportion (0.2 percent) of this habitat, as compared to the Section 7 watershed, an area similar to a HUC 5 watershed used for consultation purposes (USDI 2010). The treatment is designed to reduce fuels that could lead to wildfire. Post-treatment habitat conditions would retain the large trees, maintain the shrub component, and retain the standing and large, down, dead wood. Treatment is expected to allow more growing space for the larger Douglas- fir trees and pines and will result in accelerated growth. Short term losses of one reproductive cycle, of understory vegetation would result from the thinning, and small mammals and birds that use understory vegetation for food or cover would be impacted to a slight degree in the treatment area for that season. Thinning will allow more light to hit the forest floor, which will favor grasses and herbs and could stimulate the production of fruit on retained fruiting hardwoods. Understory burning will further stimulate the few shrubs to produce fruits important to the small mammals and birds, after a short term reduction from the burning. Plants would be expected to sprout following light burning shortly after the first rain if temperatures are favorable, or would be expected to respond the next growing season. After a short decline in vegetation, forage conditions for big game would improve with light burning.

Piles of slash that are covered and left to dry out before they are burned can attract rodents. When they are burned the following season, some mortality could occur, but most small mammals would likely flee during the burning. Not all piles typically burn following treatment. Some are too wet to burn completely, and others may get left for other reasons. Remaining piles can serve as habitat for animals temporarily displaced from the fuels reduction. The retention of down wood and large trees could serve to provide shelter for animals who are unable to leave the treatment area. Any site-specific impacts to small animals or birds are expected to be very short term. Any population impacts from the treatment would be expected to be reversed or improved the following spring, when green-up produces more food for ground and shrub dwelling species following the treatment.

There may be short term local disturbance or loss of habitat to small mammals and ground nesting birds, but the scale of the project area, patchiness of the treatment, retention of large standing and down dead wood, and reserve areas buffered out for high priority species, will provide refugia for some of these impacted animals and birds. Untreated areas will provide a source population to re-inhabit the area post-treatment. Project design features, designed to reduce impacts to spotted owls, great gray owls and bald eagles, would also protect small mammals and birds during their important breeding season.

Northern spotted owls

The effects of the project on spotted owls were analyzed in the Summer 2010 NLAA BA (USDI 2010) which concluded the Howard Prairie Fuels Project "may affect and would not likely adversely affect" (NLAA) spotted owls because northern spotted owl NRF and dispersal habitat will be maintained post treatment, and there will be no change to acres of owl habitat post project. Both the pre-treatment NRF and dispersal habitat for spotted owls would be maintained and would retain the characteristics important to spotted owls post-treatment. Flying space, which is an important dispersal condition for spotted owls, would be improved post-treatment. Historic surveys indicate that actual use has been documented to the northeast of the project area in NRF. Treatments are unlikely to displace resident owls based on their traditional use of the

area, but PDF's will further ensure that no disturbance would occur during the critical nesting period. Outside of that timeline, adults would not be confined to a nest site and young would be old enough to safely move away from any noise or disturbance that might cause them discomfort.

Pacific fishers

The treatment could reduce some of the dead wood and tight canopies possibly used by fishers as cover, but will also open the stand to accelerate the development of large diameter trees important for denning habitat, and will allow more light into the understory so that fruiting shrubs are more likely to provide food for fishers and their prey. In both alternatives, the stands will retain contiguous forest canopy which is important to fishers. The more open post-treatment condition and understory burning would be expected to improve fruiting and understory grass development. Improved vigor in understory vegetation would be expected to slightly improve habitat for small rodents such as rabbits, and ground squirrels, which can be important prey sources for fishers.

Bald Eagle

Bald eagles are unlikely to be affected by the proposed action. Both alternatives retain bald eagle nest trees and large trees that could serve as future or alternate nest habitat. PDFs will avoid disturbance during the critical nesting season around active nest sites. Post treatment habitat will be more resistant to losses from wildfire, which should have long term benefits to bald eagles. Once the understory vegetation responds to the increased light and space, small rodents and other potential prey should increase in the post-treatment area. Since bald eagles feed primarily on fish, this increase in prey would be considered incidental. Nest trees and conditions to support favorable nesting/roosting conditions for bald eagles will be maintained.

Dwarf mistletoe is not common in the area, so habitat for ***Johnson's hairstreak butterflies*** is not likely to be impacted. If Johnson's hairstreak are in the project area, any impacts would be insignificant because overstory trees would be retained.

Western pond turtles

Western pond turtles that may overwinter in duff within one half mile of Howard Prairie Reservoir or its tributaries may have a slight chance of being disturbed by fuels reduction, or pile or understory burning. The likelihood of the project impacting wintering pond turtles is slight since their presence is unconfirmed and the project area is thought to be near the edge of their range. Nesting habitat is not present in the treatment area. Treatment would unlikely influence post-project habitat in either a negative or positive way.

Yellow-legged frogs

Yellow-legged frogs are unlikely to remain in the historic habitat because the hydrology has changed with the reservoir. Riparian protection would provide protection to the aquatic habitat should an unknown remnant population remain. Treatment is unlikely to influence post-project habitat in either a negative or positive way.

Bats

Habitat for pallid bats and fringed myotis is not optimum in the project area because it is very dense and because it is adjacent to a heavily-used recreational area around the Howard Prairie Reservoir. It is possible that they occur in low numbers. Fuels treatment would likely cause short-term disturbance to any maternal or wintering sites if they were active during the treatment. If so, some mortality would be expected. Post treatment habitat would remain less than optimum, but would be better over the long term than pre-treatment habitat because large trees and snags would be retained post project, and the post treatment area would be more open to allow better flying and hunting for insects. Any positive or negative impacts from the treatment would be insignificant because the current habitat is suboptimal and would remain suboptimal post project. If bats occur in the vicinity, there are adjacent untreated areas that could provide some refugia from disturbing activities.

Birds of Conservation Concern

The proposed treatments meet all recommendations to benefit ***flammulated owls*** except public education and pesticides (which is not relevant in this proposed action). A more open stand with released pines, retention of large trees, maintenance of at least three large snags per acre, and improved understory shrub development should improve habitat for flammulated owls.
Fuels reduction treatments in NRF or dispersal will retain too much canopy to optimize habitat for olive-sided flycatchers. In areas that are non-owl habitat, a more open canopy and retention of snags would likely improve habitat for olive-sided flycatchers over the pre-treatment conditions, but habitat would continue to remain sub-optimal. Olive-sided Flycatcher abundance was higher in burns (sometimes species is found exclusively in burns) than in adjacent unburned mature forest (Kotliar 2007). Preliminary indications of the importance of postfire habitat to nest success indicate the need to avoid or minimize salvage of burned trees in forest burns. Forest harvest practices that retain snags and live trees (potential nest trees) help provide suitable habitat

Rufus sided hummingbirds would expectedly benefit from fuels reduction because it would open the stand and stimulate additional shrub development. Shrubs are sparse in the pre-treatment stand. It is unlikely that there will be significant improvement in the project area following treatment because the stand will retain a high canopy cover (40% in dispersal habitat and 60% in NRF habitat). These high densities are unlikely to provide optimal habitat for flowering shrubs important to hummingbirds, even after treatment.

Band tailed pigeons would experience reduced habitat for nesting in lower canopies, but this habitat isn't prominent in the treatment area pre-treatment. Over time, important summer grain foods and late season fruiting shrubs would be expected to produce more food for the occasional band tailed pigeon that may occupy the treatment area. Large trees would be retained in the project area under both alternatives and there would be no impact to any currently unknown mineral springs that might occur in the project area.

Fuels reduction will reduce some competition for the larger trees retained in the post-treatment stand. Large snags and down wood would be retained under both alternatives, and the more open habitat post-treatment would be more conducive to ***white-headed woodpeckers***. However, the post-treatment stand would still retain high canopy cover, likely to remain too high for white-headed woodpecker optimal habitat.

Alternative 2 is unlikely to affect any ***wood ducks*** in the treatment area over the short term. Hardwoods large enough to provide wood duck cavities would be retained. Over the long term, the reduction of fuels risks could allow hardwoods to continue to grow and potentially provide important hardwood cavities for wood ducks. Any beneficial or adverse impacts to wood ducks from the treatment would be insignificant because habitat is marginal under both scenarios.

Survey and Manage – Mollusk

Site specific protection and buffering the ***mollusk sites*** would protect any mollusks found during survey and manage surveys. The survey and manage mollusk species occur in low densities and specialized microhabitats that don't occur evenly through the project area. There may be a reduction of duff and cover for mollusks in the treatment area for a season or more. Post treatment habitat would be less likely to be lost to wildfire, which should be a long-term benefit to mollusk habitat. Long or short term beneficial or adverse impacts to mollusk habitat from the treatment would be insignificant.

Survey and Manage - Great Gray Owl

Reducing fuels in the great gray owl site would open the stand and stimulate grasses and understory forbs. Understory burning stimulates grasses and would further improve the habitat for mice, a major prey species of great gray owls in order to improve prey habitat. Seasonal operating restrictions would ensure that treatments near the documented great gray owl site would not cause them disturbance during the sensitive nesting period.

There may be a short-term adverse impact on prey for great gray owls when the understory vegetation is cut or burned, and gophers and mice lose their cover. Some small mammals may be killed during pile burning or under burning. The displaced prey would be easier to hunt, which could have a short term benefit for great gray owls, followed by a short decrease in prey abundance. This short-term impact would be insignificant because of the scale of the project is a small proportion of great gray owl habitat in the analysis area, the timing of the treatment would occur outside the breeding period. The grasses, shrubs and prey would quickly improve to the flush of nutrients and increased light within one or two reproductive seasons following treatment. Long-term effects of fuels reduction would be expected to benefit great gray owls

Cumulative effects

We are aware of two other proposed sales within the Analysis Area that would remove habitat: one in Klamath Falls BLM (Cold Onion) and one in Medford BLM Ashland Resource Area (Swinning). The Medford Summer 2010 LAA BA (USDI 2010) analyzed Medford habitat acres for Swinning in the Klamath Section 7 Watershed. Table 3-2 shows remaining NRF habitat following the removal of the Swinning project acres.

Most ownership (83 percent) in the Klamath Section 7 watershed is private land (Table 2). Private land provides some late seral habitat and much of the early seral habitat in the analysis area. Although no treatments on private are now known, we expect that much if not all of this late seral habitat is likely to change (decrease) over time. There is also forested habitat (NRF and dispersal) on Forest Service and Bureau of Reclamation. We do not know of any projects scheduled in the short term on these lands, but treatments could occur at any time.

The Howard Prairie project will make minimal to no significant habitat changes to species or habitats that may occur in the area and would not result in any significant cumulative effects. Northern spotted owl and fisher habitat will retain the same habitat categories before and after treatment, with slight improvements to habitat following treatment. Habitat will continue to support the same species of plants and wildlife, although minor changes in composition may result.

Table 3-2. Klamath Section 7 Watershed*	***Acres***
Total acres all ownership	396,386
Total acres Non-Medford BLM ownership (83% of total land)	329,880
Total acres Medford BLM	66,506
Non-habitat	32,337
Capable	12,289
Dispersal	3,514
NRF	18,048*
Total NRF on Non-Medford BLM ownership	68,189
Other Federal NRF	28,192
Non-Federal NRF	39,734
Information is not available for California part of Klamath Watershed	

* Acres of NRF reflect habitat of the Swinning project post-harvest.

G. BOTANICAL RESOURCES

Introduction

The effects of fuels reduction on Sensitive Status plants (SSP) is analyzed in this EA for sites occurring within the proposed units. The project botanist considers the effects of the proposed fuels reduction actions on SSP occurring on the BLM-administered lands only, but takes into consideration the location and number of populations outside the units when assessing the cumulative effects on the species across their ranges. The BLM does not conduct surveys on privately-owned lands and the presence of SSP on private lands is not known or considered in this EA.

The analysis area for noxious weeds includes the proposed fuels units and adjacent areas known to contain noxious weed populations which provide a weed source that could invade treated units.

The following assumptions are made:

- There are no legal directives for protecting T&E or Special Status plants on private lands. Although suitable habitat exists on private lands and rare plants may occur there, because they do not receive legal protection, we assume private lands do no contribute suitable habitat or protection for them.
- Short-term effects occur within the first five years of an event. Long-term effects occur more than five years after an event.

Bureau Special Status Plants, Lichens, and Fungi (SSP) include species that are listed as threatened or endangered under the Endangered Species Act (ESA), proposed or candidates for listing, State listed, and Bureau designated Sensitive species. For these species, the BLM implements recovery plans, conservation strategies, and approved project design criteria of biological opinions, and ensures that actions authorized, funded, or carried out by the BLM promotes their conservation and reduces the likelihood and need for their future listing under the ESA.

On July 25, 2007, the Oregon State Office Instruction Memorandum No. OR-2007-072 updated the State Director's Special Status Species List to include species additions and deletions from the application of the most recent scientific data. This list was finalized with the February 7, 2008 Instruction Memorandum No. OR-2008-038.

This project will meet the provisions of the 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (not including subsequent Annual Species Reviews). Details of the project surveys are described below.

Affected Environment

The Howard Prairie Fuels analysis area is entirely outside the ranges of all Federally Endangered species found on the Medford District (*Arabis macdonaldiana*, *Fritillaria gentneri*, *Limnanthes floccosa* ssp. *grandiflora*, and *Lomatium cookii*). Range maps were updated with the Biological Assessment/Letter of Concurrence for the Effects of Proposed FY 2009-2013 Forest Management Activities on Federally Listed Species and Designated Critical Habitat on September 25, 2008 (USDI BLM 2008) (USDI FWS 2008). Any sites of listed, proposed, or candidate species found outside their defined range would have been reported.

Surveys for all species on the Medford SSP list (current at the time of survey) were conducted through 2010. Surveys were conducted using the intuitive controlled survey method. This method includes a complete survey in habitats with the highest potential for locating Sensitive species. Surveys are completed by walking routes that cover a representative cross section (approximately 80%) of all major topographic (slopes, draws, benches, ridges) and special features (wet areas, rock outcrops, ridges, riparian areas, serpentine, etc.) of each unit. In areas of high potential habitat, a more thorough and intensive survey is made. Field work is conducted during the stage of plant phenological development that assures visibility of characteristics necessary for accurate identification of special status plant species. Multiple visits may be required in some habitats for certain species to ensure that the phenological development is such

that accurate identification is possible. In higher elevation areas, vascular plant surveys are conducted from approximately June 15 through October 1. Nonvascular plant surveys may occur in any season. Timing of fieldwork takes into consideration seasonal climate, elevation, aspect, target species and suitable habitat.

Vascular and Non-Vascular Plants

Surveys have documented no occurrences of Bureau Special Status or 2001 Survey and Manage plant species within the Howard Prairie Fuels analysis area that occur within 100 feet of roadsides within the analysis area and/or within 100 meters of proposed units.

Fungi

Of the 20 species of fungi that are on the Medford District Sensitive Species list, 18 are Survey and Manage species whose status determines that pre-disturbance surveys are impractical and not required; one species is a hypogeous (underground) fungus, as are other of the previously referenced fungi, where pre-disturbance surveys would be impractical. Oregon State Office Information Bulletin No. OR-2004-145 reaffirmed this, stating that Bureau policy (BLM Manual Section 6840) would be met by known site protection and large-scale inventory work (strategic surveys) through fiscal year 2004.

It is unknown if undocumented Sensitive fungi sites are present in the fuels reduction units because the BLM has not surveyed them for fungi. Suitable habitat exists for some species in forested units, although because of their rarity across the Northwest Forest Plan area, it is unlikely that populations are present. If present, they could be directly or indirectly affected by actions proposed under Alternative 2. However, the BLM assumes that protecting known sites (current and future) and conducting landscape level strategic surveys will prevent this project and other projects from trending Sensitive species towards further listing.

Surveys have documented one fungi site located 100 meters from proposed units. The species was previously addressed under the Northwest Forest Plan and the provisions for Survey and Manage species within the Howard Prairie Fuels analysis area (Table 3-3).

Table 3-3. Special Status Fungi Located In or Adjacent to Project Roads or Units

Scientific Name	*Lifeform*	*2001 S&M Status**	*2010 Heritage Rank***	*ORBIC List****	*2008 BLM Status*	*Sites*
Boletus pulcherrimus	Fungus	B	G3/S2	1	SEN	3

***Survey and Manage: as determined by the 2001 amendment to the 1994 Northwest Forest Plan Record of Decision for Survey and Manage, Protection Buffers and related mitigation measures.**

A= Rare, and all known sites are managed. Current and future known sites will be managed according to the Management Recommendation for the species. Minimize inadvertent loss of undiscovered sites. Pre-disturbance surveys are practical.

B= Rare, and all known sites are managed. Pre-disturbance surveys are not practical.

C = Uncommon, and not all known sites or populations are likely to be necessary for reasonable assurance of persistence, as indicated by several factors. Pre-disturbance surveys are practical.

D= Uncommon. Manage all known sites until high-priority sites can be determined. Pre-disturbance surveys are not practical or not necessary.

E=Rare, status undetermined. Manage all known sites while category assignment is being determined.

F= Uncommon, or Concern for Persistence Unknown. Management of known sites NOT required because species are uncommon, not rare. Until reassignment of species to a new category or removal from list occurs, inadvertent loss of some sites is not likely to change the level of rarity.

****Heritage Rank: an international system for ranking rare, threatened, and endangered species**

G = Global Rank

S = State Rank
1 = Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation, typically with 5 or fewer occurrence.
2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6-20 occurrences.
3 = Rare, uncommon, or threatened but not immediately imperiled, typically with 21-100 occurrences.
4 = Not rare and apparently secure, but with cause for long-term concern, usually with more than 100 occurrences.
5 = Demonstrably widespread, abundant and secure.
? = Not yet ranked or assigned rank is uncertain.

*****ORBIC List: Oregon Biodiversity Information Center maintains extensive databases of Oregon biodiversity, concentrating on rare and endangered plants, animals, and ecosystems.**

1=taxa which are threatened or endangered throughout their range or which are presumed extinct.
2=taxa which are threatened, endangered, or possibly extirpated from Oregon but are stable or more common elsewhere.
3=taxa for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.
4=taxa which are very rare but are currently secure, as well as taxa which are declining in numbers or habitat but are still too common to be proposed as threatened or endangered.

SEN = Sensitive (USDI Oregon State Director's List)

Boletus pulcherrimus is the red-pored bolete mushroom. It is listed as endemic to the Pacific Northwest, including northern California, but has also been reported from New Mexico. In the range of the Northwest forest Plan (NWFP), there are 23 known sites. Four sites are on the Medford District. NWFP habitat data is available for only the Medford BLM and Winema NF sites. This plant community data shows this species occurs on White fir/Douglas-fir early mature forests, Douglas-fir/White fir/Ponderosa pine young forest, White fir/chinquapin communities, and Shasta red fir/chinquapin communities. Elevation ranges from 4,620' to 5,640'. Habitat data for other NWFP sites is in humus in association with roots of mixed conifers (Grand fir, Douglas-fir) and hardwoods (tanoak) in coastal forests. There is one population occurring within the Howard Prairie Fuels analysis area, representing 100% of the known populations in the Howard Prairie Fuels analysis area.

Environmental Effects

This section discusses the direct and indirect effects of implementing each of the alternatives and the impacts it would have on botanical resources. This section also discusses any cumulative effects considering the range of alternatives plus the effects of other actions that are currently happening or will be happening in the foreseeable future.

Alternative 1: No-Action

Special Status Plants and Fungi

The analysis area includes areas of varying stand density understory density, due to a history of previous land management activity. Stands with a prior harvest history have low- to-moderate shrub cover and tree seedling and sapling cover, resulting in relatively open understories, light ground cover, and filtered light. Under Alternative 1, there would be no increase in fire risk or fire hazard in those areas with previous management activity. Habitat for SSP in these areas would continue to be in good standing for the reasonably foreseeable future.

Without vegetation treatment, known Fungi populations in areas of with more dense vegetation would continue to decline over time due to the slow degradation of suitable habitat through continued increase of low-growing shrub cover, increased seedling and sapling cover, and increased canopy cover. Through fire suppression, the plant communities will continue to become overly dense, decadent thickets with increased competition for resources. Fire risk and

fire hazard would remain higher in those areas with unnaturally high fuel loading and fuels structure. A resulting high-intensity fire in this area would destroy the habitat and directly kill existing SSP populations.

Alternative 2: Proposed Action

The following documents the analysis of effects to botanical resources resulting from the implementation of Alternative 2 (see Chapter 2 for details).

The greatest threats to plant community health resulting from project activity would be soil disturbance that could result in nonnative/noxious weed introduction into areas previously not infested, as well as the resulting accessibility for Off-Highway Vehicles (OHVs) into areas previously considered to be less desirable due to dense vegetation. Resulting soil compaction would also be a mechanism for habitat loss and degradation for nearby Special Status fungi.

Special Status/Survey &Manage Plants and Fungi

Effects on Special Status plants (vascular and nonvascular) are not being analyzed for the purpose of this EA, as there are no occurrences of known sites to set a baseline for change in population vigor and health.

Pre-disturbance surveys for the 20 Sensitive Medford District fungi species (or fungi of related type) are impractical and not required, as determined by the Northwest Forest Plan. Pre-disturbance surveys are impractical because these species are difficult to identify and/or their occurrence is sporadic or unpredictable. All 20 species are associated with a forest component found in the analysis area; i.e., habitat exists in the analysis area to support these species. Most fungi on this list are mycorrhizal (associated with specific host trees) and depend on wind and/or animals to spread the spores. For these 20 fungi, species-specific information on connectivity and habitat requirements, range (including occurrences within the analysis area), and disturbance effects is incomplete. Therefore, there is no information that would lead to a finding that the Proposed Action would have any effect on any of these 20 species.

Activities that remove overstory trees or remove, disturb, or compact the top layer of organic material or mineral soil negatively impact fungi. The main and most extensive part of a fungus consists of a mycelia network that resides in the top few inches of mineral soil. Mycelial networks often connect multiple trees through their root systems.

The objective of fuels reduction is to return fire regimes to more natural and historic conditions. Thinning would only remove understory trees (excluding hardwoods) equal to or less than 7 inches DBH. It would not change the overstory canopy layer or remove late-seral host trees that may have mycorrhizal associations with fungi. Hardwoods will not be removed in fuels reduction prescriptions. Fungi may develop mycorrhizal associations with earlier seral trees, but the majority of associations have likely developed over time with later seral conifers. Thinning to remove hazardous fuels in forest habitats would reduce potential impacts to fungi, if present, in the event of a high intensity wildfire. Reducing fuel load is expected to reduce the risk of a high-intensity stand-replacing wildfires, and in the event of a fire event, promoting the potential for lower-intensity, ground-based fire. Low-intensity and ground-based fires cause less overall damage to soil, duff, and mycelia.

Burning concentrated piles of slash (pile burning) creates an intense burn in localized areas. If rare fungal mycelia are present beneath slash piles, they could be damaged due to burning. The estimated amount of area impacted by burn piles is 3.2% of the total project area. Because they are rare and because the area impacted would be a small percentage of the total landscape, the likelihood of Sensitive fungi being present under one of the burn piles is small. Mycelia form extensive underground mats, and a 6x6 foot pile would not likely cover an entire mycelia community; one pile represents 0.032 acres in area. Damage to the mycelia at one location may break hyphal connections, but would not destroy the entire mycelial mat. Over time, the mycelia would re-establish connections with the fine roots of conifers.

Underburning would carry fire across the landscape and would not create intense localized effects like burn piles would. Underburning conifer stands after removal of hazardous fuels should result in a patchwork, ground-based and low-intensity burn. (Intensity would depend on seasonality, soil and vegetation moisture content, and other environmental conditions.) The risk of damage to any fungi species from underburning would be from more intense burns in patchy areas that resulted in consumption of duff and scorching of soil. Loss of litter and organic matter results in reduced moisture retention capability, loss of nutrient sources and changes in fungal species diversity and abundance (Amaranthus et al. 1996). Burning in late-fall and spring when fungi are fruiting could also result in damage to sporocarps and short-term reduction of reproductive capacity. These effects would be short-term and small scale due to the patchy nature of late-fall-to-spring underburning. Underburning is planned when fuel and soil moistures are high in order to preserve protective duff cover over the majority of area treated and to maintain coarse woody material.

Because fungi evolved with the plant communities in which they occur, they are likely also adapted to a historic fire regime and have strategies to survive wildfire events, such as fruiting outside the window of naturally occurring wildfire events and establishing extensive mycelial mats that increase the odds that hyphae will persist in unburned or lightly-burned areas.

The one known and documented fungi site present in the analysis area occurs 100 meters outside of a unit, a distance great enough to ensure the survival and health of the mycelial mat associated with that site. Thinning, piling and burning activities will all be restricted to within unit boundaries, and this site and associated mycelia are protected by distance from the unit.

Cumulative Effects

Land ownership in the Howard Prairie Fuels project is entirely owned by the BLM and the Bureau of Reclamation (BOR). However, the condition of the local landscape relies heavily on privately-owned land and activities that affect its habitat condition.

Grazing

The Howard Prairie Fuels analysis area was historically grazed as part of the Keene Creek and Deadwood allotments. The Keene Creek allotment was bought out in its entirety in 2009 as part of the Omnibus Public Lands Management Act of 2009, Public Law No. 111-011. The Deadwood allotment is currently an active allotment. Cumulative effects within the Howard Prairie Fuels analysis area due to active grazing within the Deadwood grazing allotment and historic grazing in the Keene Creek allotment will be addressed here due the long history that

grazing has had in the area, and the long-term impacts that can be generally associated with grazing practices, including the introduction and spread of nonnative and noxious weed species.

While soil disturbance does increase the likelihood of movement and introduction of noxious weed and nonnative plant species, the human activity in these areas (privately-owned timber lands, Keno Access Road, Lily Glen, Howard Prairie Lake and its associated recreational areas) presents a more likely mode of transport for these species than the current level of grazing occurring on the Deadwood grazing allotment and the historical grazing in the Keene Creek allotment.

Private Land-Use Operations

Past or proposed timber harvest and other vegetation treatments on private lands are not known. It is assumed that most timber harvest projects and other vegetation treatments on private land will have adverse effects on native plant communities (including SSP) due to timber removal prescriptions, logging methods, and less resource protection measures. Federal laws protecting endangered and special status plans do not apply to private land without a federal nexus.

Past and Proposed Actions

Recent past and proposed federal timber sales and commercial/non-commercial projects in the Howard Prairie Fuels analysis area considered under cumulative effects have mostly been for forest health and fuels reduction. These treatments attempt to remedy the effects of long-term fire suppression and, as such, are generally beneficial to native plant communities (including SSP). If left untreated, the chances for a stand-replacement, catastrophic fire are increased.

The Howard Prairie Fuels analysis area neighbors areas that are proposed under the Swinning Forest Management Project. There are no documented sites of special status species or noxious weeds within the Howard Prairie Fuels Project that would be affected by proposed activities in the Swinning Forest Management Project. With the implementation of designated PDFs in both projects, there would be no measurable effect on botanical resources related to the proximity of these two projects and their potential cumulative effects.

Recreational Operations

This area is used regularly by the public for outdoor recreation, including equestrian events, camping, fishing and hunting. It is an area with relatively high amounts of traffic and use (compared to other areas of the Medford District), and effects of use on the landscape are primarily associated with roads and designated trails.

Areas with mild-to-moderate hillslopes are susceptible to unauthorized recreational uses (i.e., trail building, OHV use) due to fewer natural barriers on the landscape, which can lead to weed and nonnative species infestations and SSP habitat degradation. Areas of new fire line construction are particularly vulnerable to increased OHV use. Implemented PDFs would mitigate for potential use resulting in the creation of new access points.

Fuels activities create more instances of bare soil and/or low vegetation cover, which is ideal habitat for weed introduction and invasion. It is professional judgment that recreational operations in the Howard Prairie Reservoir area, based on scope of area and length of seasonal

use, presents more of a risk for weed invasion than would be created by the completion of the Howard Prairie Fuels project.

H. NOXIOUS WEEDS AND INTRODUCED PLANTS

Affected Environment

Noxious Weeds

Analysis regarding known noxious weed populations within the Howard Prairie Fuels Project has been conducted within the proposed units (i.e. proposed areas of ground disturbance). All references to the "Howard Prairie Fuels analysis area" refers to this area.

Noxious weeds are generally nonnative plants that cause or are likely to cause economic or environmental harm or harm to human health. Introduced plants are species that are nonnative to the ecosystem under consideration. Introduced plants may adversely affect the proper functioning condition of the ecosystem. "Noxious Weed" describes any plant classified by the Oregon State Weed Board that is injurious to public health, agriculture, recreation, wildlife, or any public or private property.

There are is a total of 4 documented noxious weed sites within the Howard Prairie Fuels analysis area (Table 3-4). The species documented is considered to be a "B-Designated Weed", as determined by the Oregon Department of Agriculture.

Table 3-4. Noxious Weed Species and Occurrences in Howard Prairie Fuels analysis area

Scientific Name	*Common Name*	*Documented Occurrences in Analysis Area*	*ODA Designation**
Circium arvense	Canada thistle	4	B
Circium vulgare	Bull thistle	Unknown**	B
Hypericum perforatum	St. John's wort	Unknown**	B

***Oregon Department of Agriculture (ODA) Noxious Weed Control Program: provides a statewide leadership role for coordination and management of state listed noxious weeds.**

A= a weed of known economic importance which occurs in the state in small enough infestations to make eradication or containment possible; or is not known to occur, but its presence in neighboring states make future occurrence in Oregon seem imminent.
B= a weed of economic importance which is regionally abundant, but which may have limited distribution in some counties.
T= a priority noxious weed designated by the Oregon State Weed Board as a target for which the ODA will develop and implement a statewide management plan. "T" designated noxious weeds are species selected from either the "A" or "B" list.

**The exact number of documented occurrences is unknown, due to under-reporting and a lower treatment priority.

Oregon Department of Agriculture List B Noxious Weeds

Canada thistle (*Circium arvense*) is a colony-forming (primarily by asexual reproduction) perennial that is a native of Eurasia. This prickly rose-purple flowered plant can produce up to 1500 wind transported seed per flowering shoot. Seed can remain viable in the soil for 20 years. Vegetative reproduction contributes to local spread and persistence. The large fibrous taproot can send out lateral roots as deep as three feet below the ground, from which shoots sprout up at frequent intervals. It also regenerates from root fragments less than one inch in length. Considered to be an aggressive weed, it thrives in areas with soil disturbance and is difficult to

control. Flowering typically occurs during July and August (Whitson et al. 1999). There are 1,187 documented sites reported on the Medford District, and 4 documented sites within the Howard Prairie Fuels analysis area. All sites occur within 100 feet of roads in the analysis area. Detrimental effects attributed to the establishment of Canada thistle include displacement of native species, decrease of plant diversity, reduced forage, and it serves as an alternate host for insects and pathogenic microorganisms that attack various crops. Successful control methods include biological, chemical, cultural, and some limited success with mechanical methods.

Bull thistle (*Cirsium vulgare*) is a taprooted biennial with spiny stems, leaves, and inflorescences. Each flower head can produce up to 250 seeds. Most seed falls within six feet of the parent plant but is capable of long distance transport by wind and animals. Seed survival is very low, as is seedling and rosette survival. It is estimated to take 200 seeds to produce one flowering plant. Bull thistle seedlings are poor competitors and require bare mineral soil to survive. This weed is a native of Eurasia. There are 1755 sites reported on the Medford District. However, this weed is under-documented within the GeoBOB weed database, as active control methods are not usually employed. Personal knowledge of the Botanists and recent records verify sites within the analysis area. Detrimental effects include displacement of native species, decrease of plant diversity, limits wildlife movement, and reduced forage. Bull thistle is eventually outcompeted by other vegetation for light, moisture, and nutrients.

Common St. Johnswort (*Hypericum perforatum*) is a perennial forb with extensive creeping rhizomes introduced from Eurasia as an ornamental plant. It is both a toxic and invasive weed. It can form dense stands in meadows, pastures, rangelands, disturbed sites, and along roads. It is toxic to livestock but also has human medicinal value. This weed is dramatically under-reported on the Medford District and active control methods, other than the release and monitoring of biological control agents, are not usually employed. Personal knowledge of the Botanists and recent records verify numerous sites within the Howard Prairie Fuels analysis area, on both federal and privately-owned lands. Detrimental effects include displacement of native species, decrease of plant diversity, and reduced forage. Successful control methods include biological and chemical.

Introduced Species

Introduced plants are species that are nonnative to the ecosystem under consideration. Introduced plants may adversely affect the proper functioning condition of the ecosystem. Although not listed on the ODA Noxious Weed list, introduced species pose a threat to natural plant communities in the Howard Prairie Fuels analysis area. Recorded surveys indicate that there are many non-native species located within the analysis area (USDI 2007-2010) (Table 3-5).

Table 3-5. Noxious Weeds and Introduced Plants within Howard Prairie Fuels analysis area

Scientific Name	*Common Name*	*ODA List**	*Frequency%*
Aira caryophylla	silver hairgrass		20%
Alopecurus pratensis	meadow foxtail		20%
Bromus tectorum	cheatgrass		40%
Chemopodium album	lambsquarters		20%
Chichorium intybus	chicory		20%
Circium arvense	Canada thistle	B	20%
Cirsium vulgare	bull thistle	B	40%
Cynosurus echinatus	bristly dogstail grass		40%
Dactylis glomerata	orchardgrass		20%
Holcus lanatus	common velvetgrass		20%
Hypericum perforatum	common St. Johnswort	B	40%
Lactuca serriola	prickly lettuce		20%
Lepidium campestre	poorman's peppergrass		20%
Phleum pretense	timothy		40%
Plantago lanceolata	narrowleaf plantain		20%
Poa pratensis	Kentucky bluegrass		20%
Rumex acetosella	garden sorrel		60%
Rumex crispus	curly dock		20%
Sanguisorba minor muricata	garden burnet		20%
Stellaria media	common chickweed		20%
Taraxacum officianale	common dandelion		40%
Tragopogon dubius	yellow salsify		20%
Trifolium dubium	suckling clover		20%
Trifolium repens	white clover		20%
Verbascum thapsis	common mullein		60%
Vulpia myuros	rat-tail fescue		20%

Environmental Effects

Alternative 1: No-Action

Noxious Weeds and Introduced Plants

Without vegetation treatment, there would be no increase in disturbed ground and no increase in forest and woodlands with lessened canopy cover. Both are conditions that would enhance the

opportunities for weed establishment. Weed populations would be limited to existing weed sites and spread would be limited to adjacent areas. New weed establishments would be limited to existing disturbed areas and areas of open canopy.

Noxious weed inventory and treatment would continue to occur. Treatments are scheduled by priority and occur based on the potential of the weed population to cause economic or environmental harm or harm to human health and as funding is available.

The potential remains for a stand replacement fire that would produce early seral habitat conditions that are favorable for weed and nonnative plant establishment.

Alternative 2: Proposed Action

Noxious Weeds and Introduced Plants

Vegetation treatment would increase the amount of disturbed ground and areas of less canopy cover. Both of these conditions favor noxious weeds and introduced plant establishment.
The creation of fire breaks also increases the risk of spread of weeds into otherwise weed-free areas on the landscape. Constructed fire breaks promote the introduction of nonnative species by acting as corridors or agents for seed dispersal, as well as providing for suitable habitat and reservoirs of propagules for future invasions. The increase of light availability, bare soil and road traffic is correlated to the increase of nonnative species diversity and population numbers (Parendes and Jones 2000; Gelbard and Belnap 2003).

Project Design Features as described in Chapter 2 are incorporated into the Proposed Action to minimize the spread of noxious weeds and nonnative plant species. Noxious weeds would not be spread as a direct result of executing the Proposed Action with the implementation of the Project Design Features. However, weed seed can be transported into the analysis area by human actions not associated with the project and also by wind, water, and animals.

Weed Risk Assessment Field Review and Field Reconnaissance Results

Surveys for all species on the Medford Weed list were conducted in 2010. Surveys were not conducted on private land but general occurrences were noted as casual observations. Noxious weeds are found throughout the analysis area on BLM and adjacent private lands, with populations varying in size and density. Noxious weed populations in the analysis area and on BLM are mostly associated with roads.

Class "A" Weeds
Those noxious weeds that are exotic (not native) to the State or area, and are of limited distribution or are unrecorded in the State or area and pose a serious threat to agricultural crops and rangelands in the State. Class A weeds receive highest priority. Management emphasis is complete control. These weeds approximate the Oregon Department of Agriculture List A weeds. A record check and surveys of areas that may be affected by the proposed project resulted in zero sites.

Class "B" Weeds
Those noxious weeds that are non-native (exotic) plant species that are of limited distribution or unrecorded in a region of the State but are common in other regions of the State and have been identified by the BLM or State as potentially harmful. Class B weeds receive second highest priority. Management emphasis is to control the spread, decrease population size, and eventually eliminate the weed population when cost-effective technology is available. These weeds approximate the Oregon Department of Agriculture List B weeds. A record check and surveys of areas that may be affected by the proposed project resulted in at least 2 sites of 3 species (Table 3-6) below. Bull thistle and common St. Johnswort are underreported on the Medford District.

Class "C" Weeds
Those noxious weed species (exotic or native) or undesirable plants not categorized in the previous categories. This classification receives the lowest priority. Management emphasis is to contain spread to present population size or decrease population to a manageable size. Class C Weed species commonly found on the Medford District BLM primarily include nonnative annual grasses and nonnative buttercup species, and are not typically managed for due to widespread occurrences and unmanageable populations sizes.

The following species are located within the Howard Prairie Fuels analysis area, and fill the following criteria: they are exotic, have a high frequency from recent survey lists, and have the potential to cause ecological damage.

Table 3-6. Weeds Occurrences in Howard Prairie Fuels analysis area

Scientific Name	*Common Name*	*Weed Class*	*# Sites Counted*	*Frequency %*
Circium arvense	Canada thistle	B	4	
Circium vulgare	bull thistle	B	*	
Hypericum perforatum	St. Johnswort	B	*	
Bromus tectorum	cheatgrass	C	*	40.0
Cynosurus echinatus	bristly dogstail	C	*	40.0
Poa pratensis (naturalized)	Kentucky bluegrass	C	*	20.0

***Species are typically underreported and/or not cataloged in the District weed database. Exact population numbers are not available.**

Risk Assessment Factors

The likelihood of noxious weed species spreading into and within the analysis (Table 3-7) area is **low-moderate**; the project includes elements of both low and moderate risk factors. There are small Class B and C weed populations immediately adjacent to and within project roads and units. Project Design Features (PDFs) are included that would prevent the spread of noxious weeds due to direct effects of the proposed project. The 2 sites of Canada thistle have been chemically treated (2010). Weed populations within the affected area would be reduced for five years, per PDF and BLM Manual 9015. Weed spread and new establishments after five years are expected from unrelated seed transport mechanisms and relic populations. The budget to treat and monitor noxious weeds is not fixed for this project. There is no budget to treat Class C

weeds; also, it is not permitted to use herbicides on Class C weeds. If the weeds require repeat treatments, but are not treated due to insufficient budget or workforce, the likelihood of noxious weed species spreading into and within the analysis area would be high.

Table 3-7. Factor 1: Likelihood of Noxious Weed Species Spreading to Analysis Area

Level	*Value*	*Description*
None	0	Noxious weed species not located within or adjacent to the analysis area. Project activity is not likely to result in the establishment of noxious weed species in the analysis area.
Low	1	Noxious weed species present in areas adjacent to but not within the analysis area. Project activities can be implemented and prevent the spread of noxious weeds into the analysis area.
Moderate	5	Noxious weed species located immediately adjacent to or within the analysis area. Project activities are likely to result in some areas becoming infested with noxious weed species even when preventative management actions are followed. Control measures are essential to prevent the spread of Noxious weeds within the analysis area.
High	10	Heavy infestations of Noxious weeds are located within or immediately adjacent to the analysis area. Project activities, even with preventative management actions are likely to result in the establishment and spread of noxious weeds on disturbed sites throughout much of the analysis area.

The consequence of noxious weed establishment in the analysis area (Table 3-8) is **moderate**. The 2 noxious weed populations in the affected areas were small prior to treatment and are associated with roads. No road construction or maintenance is associated with this project, although roadside disturbance is likely with the construction of fire breaks, understory thinning and foot traffic during the burning season. All of these activities can transport weed seed or create areas where possible expansion of infestation could occur. Also, unrelated activities can transport weed seed (e.g., wind, water, wildlife, hiking, OHV, etc.) into the newly disturbed areas. Weed infestations adversely affect a healthy functioning ecosystem.

Table 3-8. Factor 2: Consequence of Noxious Weed Establishment in Analysis Area

Level of Consequence	*Value*	*Description of Possible Effects*
Low to Nonexistent	1	None. No cumulative effects expected.
Moderate	5	Possible adverse effects on site and possible expansion of infestation within analysis area. Cumulative effects on native plant community are likely but limited.
High	10	Obvious adverse effects within the analysis area and probable expansion of noxious weed infestations to areas outside the analysis area. Adverse cumulative effects on native plant community are probable.

Risk Rating

Step 1 - Identify level of likelihood and consequence of adverse effects and assign values according to the following:

None-0 Low-1 Moderate-5 High-10

Step 2 - Multiply the level of Likelihood value (Table 3-7) by the Consequence value (Table 3-8) to determine Value.

Step 3 - Use the value resulting from Step 2 to determine Risk Rating and Action in Table 3-9 below.

Table 3-9. Risk Rating and Action

Value	*Risk Rating*	*Action*
0	None	Proceed as planned.
1-10	Low	Proceed as planned. Initiate control treatment on noxious weed populations that get established in the area.
25	Moderate	Develop preventative management measures for the proposed project to reduce the risk of introduction or spread of noxious weeds into the area. Preventative management measures should include modifying the project to include seeding the area to occupy disturbed sites with desirable species. Monitor area for at least 3 consecutive years and provide for control of newly established populations of noxious weeds and follow-up treatment for previously treated infestations.
50-100	High	Project must be modified to reduce risk level through preventative management measures including seeding with desirable species to occupy disturbed sites and controlling existing infestations of noxious Weeds prior to project activity. Projects must also provide for control of newly established populations of Noxious weeds and follow-up treatment for previously treated infestations.

If weed work is funded, the **weed risk rating under Alternative 2 would be Low to Moderate**.

With suitable weed habitat increasing initially as a consequence of the Proposed Action, total exclusion of new weed establishments is unattainable due to indirect effects. Particularly vulnerable areas would be constructed fire breaks and areas of bare mineral soil related to burning activity. With adequate funding for vegetation inventory and weed treatment, existing noxious weed population sizes are expected to decrease and new establishments are expected to be minimized.

H. RECREATION AND VISUAL RESOURCES

Affected Environment

Recreation

Recreation use across the Medford District BLM is described in the Medford District Proposed Resource Management Plan/Environmental Impact Statement (USDI 1994). BLM lands fall into two recreation management categories, special recreation management areas and extensive recreation management areas. Extensive recreation use areas are all BLM-administered lands

not included in Special Recreation Management Areas (SRMA) identified in the Resource Management Plan (RMP) (USDI 1995a:65) that provide for dispersed recreation opportunities across the Medford District BLM. Special Recreation Management Areas are those areas identified with high concentrations of recreation use and developed facilities.

The proposed thinning project occurs within the Hyatt-Howard SRMA (1995). The Hyatt-Howard SRMA consists of 42,000 acres (17,000 acres managed by the BLM) of federal, state, and private lands in the area of Hyatt and Howard Prairie reservoirs and Dead Indian Plateau (USDI 1995a). The PCNST SRMA is a 100-foot wide corridor (50' either side of the trail) along all public land sections of the PCNST managed by Medford BLM. This project will take place just outside of the PCNST SRMA near Howard Prairie reservoir. Special Recreation Management Areas are those areas identified with high concentrations of recreation use and developed facilities. SRMAs are to be managed to *"realize their potential to provide appropriate/prescribed recreational experience opportunities while protecting sensitive resources, increasing public awareness, reducing conflicts and diversifying the regional economy"* (USDI1995a). The Hyatt-Howard Prairie SRMA was established due to its important recreational value as a result of the areas two reservoirs, trails on the Dead Indian Plateau, and year around recreational use (Hyatt-Howard SRMA Recreation Area Management Plan (1995). The PCNST SRMA was established as a result of the importance of the PCNST as a National Scenic Trail and its popularity for use by hikers and equestrians.

High concentrations of use associated with Howard Prairie Reservoir occur in the proximity of the proposed thinning project. The types of uses in this area include boating on the reservoir and the land based activities of hiking, camping, and general sightseeing. Other types of recreational use that occurs within the area include hunting, equestrian use, mushroom picking, and OHV use. In addition to the PCNST, the Lily Glenn Trail travels through some of the proposed thinning project units. The Lily Glenn Trail is a popular equestrian and hiking trail that travels close to the reservoir.

Visual Resources

"Visual Resources are the land, water, vegetation, structures, and cultural modifications that make up the scenery of BLM-administered land." Medford District BLM-administered lands have been classified under a Visual Resource Management (VRM) Inventory Class system established by the BLM. The criteria used to determine VRM classes were scenery quality ratings, public sensitivity ratings and distance zone-seen area mapping criteria. Approximately 60 percent of the viewsheds in the Medford District RMP planning area have fragmented land ownership patterns with private lands dominating the viewed landscape (USDI 1994: 3-70). The proposed thinning project is within the Hyatt-Howard SRMA which is to be managed as VRM class II.

Class II Objective. The objective to this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Environmental Consequences

Alternative 1 - No-Action

Recreation

Under the No-Action Alternative, recreation opportunities would likely remain unchanged. High concentrations of recreational use at and near Howard Prairie Reservoir would continue unchanged. The use of the PCNST and the Lily Glenn Trail would be unaffected. Visually, the area would also remain the same. The affected areas would remain vulnerable to high intensity wildfire. Should a wildfire occur, impacts that would likely affect recreation opportunities and visually change the characteristic of the landscape would take place.

Visual Resource Management

Under Alternative 1, the No-Action Alternative, the fuels treatment would not occur. If the fuels treatment does not occur, visually the area would remain the same. There would be no changes to the existing landscape. The proposed treatment areas would continue to remain vulnerable to high intensity wildfire. If a wildfire would occur it could have negative visual effects on the landscape.

Alternative 2 - Proposed Action

Recreation

Under Alternative 2, and estimated 795 acres of fuel treatments are proposed in the Hyatt-Howard SRMA and both the PCNST and the Lily Glenn Trail pass through proposed fuel treatment units. Fuels treatment would consist of thinning and hand piling only conifer trees equal to or less than 7 inches dbh. These piles would then be burned when fuel moisture and weather conditions allow for safe burning. No thinning of hardwood trees would occur. Spacing of 25 by 25 foot will be used for conifer leave trees. Follow-up underburning would occur within 1 to 5 years in most fuel treatment units.

Recreational activities within the vicinity of the proposed fuel treatments will receive short term impacts as a result of conducting the fuel treatments due to the sights and sounds associated with the thinning project and follow up underburning itself. This includes actions such as the running of chainsaws, the increased presence of workers associated the project, and the presence of the hand piles. Studies have demonstrated that downed wood from silvicultural treatments is the most influential visual characteristic on the scenic and acceptability judgments of silviculture treatments (Daniel et al. 1977, Ribe 1991, Brown & Daniel 1986). Following the thinning and subsequent burning of the piles there is expected to be no significant impacts from the project on recreational activities within the project area. Thinned trees will be pile burned and visual evidence resulting from the project, after burning occurs, will be minimal. Remaining charred soil and partially burned coarse woody debris, evidence of the project will diminish over time. With the implementation of PDFs, hand piles will not occur on either the Lily Glenn Trail or the PCNST. The PCNST SRMA management plan (1995) requires that a 100 foot (50’ feet either side of the trail) buffer be left where no trees can be cut. The exception to this is made for hazard trees and blow downs lying across the trail. This buffer will likely camouflage any short term visual impacts resulting from the thinning project from the PCNST. This buffer also will most likely ensure that PCNST users will not notice passing from non-thinned to thinned areas

when traveling along the trail. No direct impact to the PCNST tread surface itself will occur as a result of PDFs.

Large amounts of OHV use occurs in the area surrounding Howard Prairie reservoir. Thinning and burning will reduce understory vegetation and create openings that could be utilized as travel routes by OHVs. Construction of containment line for burning could also serve as travel routes for OHVs. PDFs to mitigate the possibility of an indirect effect of this project to increase user created roads and trails through blocking and camouflaging containment lines are in place (see PDFs in Chapter 2). Monitoring of the project area for 2 years will allow for resource damage problems due to OHV use in the treatment areas to be identified. If resource damage as a result of OHV use is identified, measures to eliminate OHV use will be taken (Chapter 2 PDFs).

The thinning of conifer trees equal to or less than 7 inches dbh, pile burning, and burning of understory vegetation will likely not alter recreation patterns and trends in the Hyatt-Howard SRMA. Use of the lands for recreational activities such as hiking, camping, hunting, and mushroom picking will likely continue as they did before the project occurred. By leaving large trees and reducing the density of small (7 inches dbh and smaller) conifers trees, the quality of the recreation experience on recreational activities will not be diminished and may be improved through improving views and easier sight of large trees that recreationist prefer to view (Beckwith et al 2010). Additionally, risk associated with wildfire that could potentially negatively affect recreation resources will also be lowered through completion of this project.

Visual Resource Management

The proposed right-of-way is located on land classified as VRM Class II. The Medford District ROD/RMP objectives for VRM Class II are to retain the existing character of the landscape and the level of change to the landscape should also be low (USDI 1995a: 70). Management activities on VRM Class II lands may be seen but should not attract the attention of the casual observer. The Medford District RMP also states that changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape (USDI 1995a).

In accordance with the Medford District RMP, a visual resources contrast rating system analysis was completed for the proposed Howard Prairie Fuels Thinning Project. Three Known Observation Points (KOPs) within or near the proposed fuels thinning project were used to complete the visual resource rating system analysis. The KOPs were chosen for their proximity to areas that are likely to receive the highest amounts of use in the immediate area of the project. Visual Contrast Rating Worksheets using these KOPs were completed and are on file at the Medford District and available upon request.

The Howard Prairie Fuels Project will likely have little effect visually on the landscape in the project area. After completion of the Visual Contrast Rating Worksheets it was determined that the project would likely not attract the attention of the casual observer in the area of the proposed project. Additionally, the project will likely have no effect on most of the visual elements (form, line, color, and texture) of the landscape and vegetation in the project. A few of the visual elements of the vegetation (form and texture) will have a weak degree of contrast when

compared with the existing landscape when viewed from a nearby road but will not attract the attention of the casual observer (Visual Contrast Rating Worksheets, Appendix A).

I. OTHER EFFECTS

Potential Effects to Public Health and Safety.

No aspects of the project have been identified as having the potential to significantly and adversely impact public health or safety. The implementation of hazardous fuel reduction treatments, as designed under this project, would have a beneficial impact on public health and safety by reducing the threat of large-scale high intensity wildfires in the drainages treated. Prescribed burning operations would follow all requirements of the Oregon Smoke Management Plan and the Department of Environmental Quality Air Quality and Visibility Protection Program.

Administration of Smoke Producing Projects

The operational guidance for the Oregon Smoke Management Program is managed by the Oregon State Forester. The policy of the State Forester is to:

1. Regulate prescribed burning operations on forest land.
2. Achieve strict compliance with the smoke management plan.
3. Minimize emissions from prescribed burning.

For the purpose of maintaining air quality, the State Forester and the Department of Environmental Quality shall approve a plan for the purpose of managing smoke in areas they designate. The authority for the State administration is ORS 477.513(3)(a).

ORS468A.005 through 468A.085 provides the authority to DEQ to establish air quality standards including emission standards for the entire State or an area of the State. Under this authority the State Forester coordinates the administration and operation of the plan. The Forester also issues additional restrictions on prescribed burning in situations where air quality of the entire State or part thereof is, or would likely become adversely affected by smoke.

In compliance with the Oregon Smoke Management Plan, prescribed burning activities on the Medford District require pre-burn registration of all prescribed burn locations with the Oregon State Forester. Registration includes specific location, size of burn, topographic and fuel characteristics. Advisories or restrictions are received from the Forester on a daily basis concerning smoke management and air quality conditions.

Use of Plastic Covering for Burn Piles

The Oregon Department of Forestry Smoke Management Plan addresses the issue of utilizing plastic to cover piles. In section 629-048-0210, Best Burn Practices; Emission Reduction Techniques, it states that “Best burn Practices” involves methods that ensure the most rapid and complete combustion of forest fuels. Covering of handpiles is a “Best Burn Practice”. Also in this section it states “When covers will not be removed and thus will be burned along with the piled forest fuels, the covers must not consist of materials prohibited under OAR 340-264-0060 (3), except that polyethylene sheeting that complies with the following may be used: a) Only polyethylene may be used. All other plastics are prohibited”.

An addendum to the original Wrobel and Reinhart literature review (2003) on the use of polyethylene sheeting to enhance combustion efficiency, discusses the rules affecting polyethylene (PE) burning. Oregon and New Mexico are the only western states that allow insitu burning of PE pile covers. Oregon has addressed the issue based on the findings reported by Wrobel and Reinhart (2003). The Oregon Department of Environmental Quality and the Oregon Department of Forestry developed an MOU for PE that was adopted in 2005. The MOU suggests that the plastic material is removed prior to burning when practicable. Adequate debris/slash is placed over the plastic sheeting to ensure the plastic remains covering the piles until the piles are burned. As stated above this ensures the most rapid and complete combustion of slash debris. Due to the difficulty of removing the plastic cover from below the debris, especially after long-term exposure to the elements, it is operationally and economically impractical to remove the plastic prior to burning. Therefore, the plastic is usually left in place and burned along with the pile. As required, polyethylene sheeting is used to cover piles.

Commenters have suggested that Kraft Paper should be used in place of PE to cover the burn piles. Combustion studies involving lignocellulosic materials suggest that uncoated Kraft Paper may produce some of the same substances as polyethylene (Garcia and others 2003). It also states that from an operational standpoint, Kraft paper is a more expensive, less durable, and less effective means of minimizing moisture intrusion into the pile because of its tendency to degrade more rapidly than PE. In turn, fuel moisture is increased, combustion efficiency is reduced, and more accelerants may be needed for pile ignition.

Additionally, the weight and means of packaging Kraft paper contributes to decreased production and increased per unit cost of covering piles. The use of Kraft paper averages 55 pounds per square bundle compared to 12 pounds per roll for polyethylene use. It takes 3 bundles of Kraft paper (165 pounds) to cover the same amount of piles that one roll of PE (12 pounds) will cover. Kraft paper bundles are 4 by 4 foot square and are awkward to pack into a unit compared to a roll of polyethylene that can be easily packed into the unit. The size and shape of Kraft paper bundles combined with increased weight could also contribute to increased potential for worker injuries (e.g. knee, back, and ankle sprains) during operations.

Cultural Resources

In accordance with the protocol for managing cultural resources on lands administered by the Bureau of Land Management (BLM) and the National Historic Preservation Act of 1966 (specifically section 106), as amended, a literature review and archaeological reconnaissance was conducted for the Howard Prairie Fuels project area. Cultural resources recorded during the survey will be buffered and protected from project activities.

Environmental Justice

This project was reviewed for the potential for disproportionately high or adverse effects on minority or low income populations; no adverse impacts to minority or low income populations would occur. *Executive Order 12898 (Environmental Justice).*

CHAPTER 4 - PUBLIC PARTICIPATION

A letter briefly describing the Proposed Action and inviting comments was mailed to adjacent landowners, interested individuals, organizations, and other agencies on January 19, 2011. A copy of this Environmental Assessment was sent to individuals and the following organizations who responded public outreach for this project.

Organizations and Agencies
Bureau of Reclamation
Confederated Tribes of Grand Ronde
Hannon Library Southern Oregon University
Klamath Siskiyou Wildlands Center
Oregon Wild
Soda Mountain Wilderness Council

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