U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

Environmental Assessment
for
FUEL HAZARD REDUCTION ON THE GRANTS PASS RESOURCE AREA
2010–2015

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BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

EA COVER SHEET

EA# DOI-BLM-OR-M000-2009-0009-EA

ACTION/TITLE: Fuel Hazard Reduction

LOCATION: The Project covers all lands within and adjacent to the Medford District Bureau of Land Management Grants Pass Resource Area

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1.0 Purpose and Need

Background

Bureau of Land Management (BLM) initiated the Programmatic Fuel Hazard Reduction Project in the Grants Pass Resource Area (GPRA) in December 2008 under the 1995 Medford District Resource Management Plan (1995 RMP). A scoping letter was sent to approximately 90 landowners federal, state, and county agencies, and to tribal and private organizations, and individuals that requested information concerning projects of this type. See section 4.1 for further details. This project conforms with, and is consistent with the objectives, land use allocation, and management direction of the 1995 Record of Decision and Resource Management Plan (1995 ROD/RMP). This EA address fuel hazard reduction across the GPRA for a period of five years from the date of the first decision. Decisions will be made as detailed, project-specific plans are developed. Following development of these plans, additional letters will be sent to landowners adjacent to proposed activities, and to individuals and groups who ask to be informed of project decisions. Separate decisions will be made for site-specific projects under this EA.

1.1 Introduction

This project is one of many that implement the Bureau of Land Management's Medford District Record of Decision (ROD) and Resource Management Plan(RMP) (USDI 1995) for the Grants Pass Resource Area. Management direction set forth in the RMP provides direction for resource management on BLM-administered lands according to various land use allocations. The Resource Management Plan was developed, and overall effects of its implementation were analyzed and disclosed in the Final Medford District Proposed Resource Management Plan/Environmental Impact Statement and Record of Decision (EIS 1994 and PRMP/ROD 1995). This Environmental Assessment (EA) analyzes the site-specific effects of implementing the Programmatic Fuel Hazard Reduction Project (from here on referred to as the Programmatic FHRP) to determine whether effects will be within those already analyzed in the RMP.

This chapter of the EA describes the needs, goals and objectives (purpose and need) for the project area. The project area is the area where land management actions are proposed, and represents the area of consideration for assessing current and desired forest, vegetation, fire hazard and risk, and transportation system conditions related to the goals and objectives outlined in BLM's Medford District RMP. This chapter also defines the project area and sets the context for development of the action alternatives and analysis of environmental effects of the alternatives.

This document is designed under the auspices of the National Fire Plan (NFP, 2000), and NFP 10-year Comprehensive Strategy and Implementation Plan (2002), Healthy Forest Initiative (HFI, 2002), and the Healthy Forest Restoration Act of 2003 (HFRA), and 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 manual guidance on the National Environmental Policy Act of 1969 (H-1790-1).

This project would implement fuel hazard reduction on both BLM lands, and on private lands as authorized under the Wyden Amendment (Public Law 109-54, Section 434).

1.2 What is BLM proposing and where?

This section provides a summary of BLM's proposal for landscape management. A more detailed description of alternatives is included in Chapter 2. The general planning area for implementation of this programmatic project is within the lands managed by the BLM in the Grants Pass Resource Area (GPRA). Lands within the Programmatic FHR project area are a "checker board" of federal, private, county and state ownership, totaling approximately 965,785 acres. Of those lands, approximately 240,000 acres are lands under the administration of the BLM. These lands are in a variety of land allocations (e.g., Applegate Adaptive Management Area (AMA), Matrix, Late-Successional Reserve (LSR)) and some are in deferred watersheds. Approximately 113,749 acres are BLM-administered Matrix lands and 111,913 acres are Late-Successional Reserve (LSR) lands. Some of these acres have been analyzed under other existing EAs, and those projects will be implemented under decisions for those documents.

The Programmatic FHRP proposes to thin vegetation within approximately 200 feet of roads located in the GPRA for fuel hazard reduction and development of strategic fuel modification zones (FMZ) along strategic ridges. Fuel hazard reduction may be extended further than 200 feet from roads where it is reasonable to extend to the top of strategic ridge systems. Along with roadside thinning treatments, wildland-urban interface (WUI) areas within the GPRA have been identified in the National Fire Plan as communities at risk for wildland fire. In most cases, dense vegetation found throughout the project area occurs adjacent to residential, local government or other private property boundaries, prompting a request from homeowners and other landowners for the BLM to address the fuel hazard. A number of site-specific fuels reduction plans have been developed over time. This EA will seek to address implementing standard fuel-hazard reduction practices where appropriate, and within identified sideboards and conditions, allowing the BLM GPRA to implement projects more efficiently. Standard practices and sideboards for where and how implementation would occur is detailed in the proposed action section (section 2.2), below.

Fuels hazard treatments would occur in isolated blocks of BLM surrounded by private land, strategic roads and ridges, parcels of BLM lands that may have not been covered in past EAs to tie together treatment areas, as well as private lands using the Wyden amendment or cooperative grants. Up to 1,500 acres per year would be treated, not to exceed 7,000 acres in the 5 years following signing of the first Decision Record for this project.

Two alternatives are considered and analyzed in detail, a No Action alternative and one action alternative.

1.3 Why is BLM proposing the Programmatic Fuel Hazard Reduction Project?

The Programmatic FHRP is designed to comply with the Healthy Forest Restoration Act (Bill H.R. 1904), National Fire Plan (Public Law 106-291), and the Ten-year Comprehensive Strategy Implementation Plan. The need for this project is to reduce fire hazard in forests of the western United States, and to implement the Medford District's 1995 RMP in the GPRA. The primary objective identified for lands in the project area is to reduce the intensity of future wildfires and

to create strategic areas for fire suppression activities. A secondary objective would be designed to move the current conditions found on the Programmatic FHRP area toward the desired forest stand conditions and to attain management objectives identified for lands assigned Matrix, Late-Successional Reserve (LSR) and Riparian Reserve land allocations. Additionally, this project would streamline the NEPA analysis to more efficiently address high fuel hazards, respond to public requests, and implement treatments on private lands under the Wyden Amendment authority.

There is a need to:

1. **Reduce hazardous fuels across the Grants Pass Resource Area; and**
2. **Create strategic areas in BLM managed lands for fire suppression activities**

Fire, both in its historic frequency, and then in its relative absence over the past 100 years, has been the primary natural disturbance process and an essential ecological process that shaped the existing vegetation conditions and seral stage distribution across the project area today. Much of the project area has missed 2-5 fire cycles in the last 100 years (see Section 3, Fire & Fuels, Affected Environment).

As a result of the absence of fire, there is a build-up of fuels and a change to more dangerous fire-prone vegetative conditions, especially in the lower to mid-elevations within the planning area. Shade tolerant and less fire resistant species have become established, replacing more fire adapted species, such as ponderosa pine, which are decreasing due to suppression of fire. The probability of a stand replacement crown fire is much higher now than a hundred years ago due to the increased surface and ladder fuels resulting from missed fire cycles. Both BLM-managed resources and rural residential areas are threatened by an unacceptably high potential for stand replacing wildfires.

The Medford District is directed to suppress all wildland fires until a fire management plan is developed to allow natural fires to burn under specific atmospheric conditions and forest fuel conditions. Much of BLM lands in the GPRA are in “checkerboard” ownership. Because of this ownership pattern, a high proportion of BLM lands is surrounded by private lands, necessitating the need to suppress wildland fires throughout most of the GPRA.

Some parcels of BLM managed lands within the project area have inadequate or no access for wildfire suppression or fuels hazard reduction treatments and maintenance. However, access into these parcels may be granted from surrounding private land owners for hazard reduction activities. Heavy fuel loadings along travel routes, overgrown seasonal roads or areas surrounded by private lands with no easements hinder safe ingress for wildland fire suppression resources to key strategic areas; egress for private citizens along evacuation routes is also hazardous. Hazardous fuels reduction treatments are needed to reduce the intensities of wildfire and improve firefighter safety and access for suppression efforts and to protect watersheds in the GPRA. Implementation under this EA would be coordinated with existing community fire plans and fuels reduction plans to integrate opportunites for landscape-scale treatments across ownerships. Examples of these efforts include roadside treatments in the Illinois Valley; treatment of private lands in the Rogue River Corridor Fuel Hazard Reduction Project (EA #OR110-03-014); and Fuel Modification Zones in the Biscuit Fire to protect watersheds.

There are two primary objectives to meet the needs to reduce hazardous fuels and create strategic areas for fire-suppression activities.

1. Objectives for reducing hazardous fuels across the Grants Pass Resource Area:
Decrease the likelihood of high intensity fire behavior which can damage natural resources and homes, and threaten the safety of individuals and firefighters by:

- Reducing fuel hazards within BLM-administered lands
- Reducing fuel hazards along BLM-administered roads and strategic ridges, creating a network of fuel breaks and/or safe access to areas to fight fires from
- Reducing the risk for the loss of late-successional habitats from stand-replacing fire

Within Late-Successional Reserves and Riparian Reserve:

- Develop or promote late-successional habitats (mature and old-growth forests) through silvicultural prescriptions in stands less than 80 years of age.

2. Objectives for creating strategic areas for fire-suppression activities:

- Create a network of strategic areas with reduced fuels along roads and ridges, fuel modification zones (FMZ), to improve fire suppression capabilities
- Identify private and public road systems that would provide for ingress and egress for wildland fire fighting resources and the public in the event of natural disasters such as wildland fire or floods
- Improve access to provide anchor points, and safe ingress and egress for the public and firefighters along existing roads
- Plan and implement a long-term treatment plan to maintain these roads
- Locate and maintain sites where water is pumped to suppress fires (RMP, p. 90)

Secondary Objectives
Secondary objectives, which would be considered and a benefit of fuel hazard reduction treatments, include attaining healthy and resilient forest stand conditions and to attain management objectives identified for lands assigned Matrix, Late-Successional Reserve (LSR) and Riparian Reserve land allocations. These will be described in further detail in the analysis of effects (Section 3). Additional objectives include: 1) enhancement of local economies; 2) collaboration and relationship building with local communities; and 3) control of noxious weeds.

1. Objectives for enhancement of local economies
A. Remove forest products where feasible to provide material for a variety of uses. Vegetative treatments to reduce hazardous fuels on BLM lands potentially provide forest byproducts, such as small diameter poles, which are typically utilized in the production of wood based products such as flooring, molding, firewood, fencing materials and other specialized wood products. Additionally, the remaining biomass materials produced by the hazardous fuels reduction may be processed as a renewable energy source, or as wood chips for other products (e.g. landscaping materials).

The Programmatic FHRP proposal will make these products available to local area contractors and small business, through the use of creative stewardship contracts and small diameter pole sales. Through these contracts and sales, economic benefits to the small businesses and contractors located within the project area communities would be realized.

B. Educate communities on the prospective business and contracting opportunities regarding fuels reduction byproducts:

- Plan and implement small diameter sales and stewardship contracts
- Initiate collaborative efforts to increase community capacity for production, extraction, and utilization of small diameter and biomass products
- Utilize fuel reduction byproducts in support of local markets, while reducing the number of burn days and particulate emissions

2. Objectives for building collaboration and relationships with the local community

A. Work in partnership with counties, local communities, and individual landowners is important for integrated efforts to reduce hazardous fuels across watersheds.

- Work with these partners to develop treatments and treatment areas to accomplish landscape-scale objectives for fuel hazard reduction.
- Work with private landowners to treat on private lands where it will help protect public lands as per Wyden Amendment guidelines.
- Develop a positive collaborative framework with the community for implementation of this proposed project by providing public informational meetings and informal educational sessions with community members.

B. Develop a monitoring plan in the project area to promote learning and adaptive management to improve future project development and implementation

- Monitoring will focus on select data gaps in forest ecological systems

3. Objectives for control of noxious weeds

Noxious weeds are non-native aggressive plants brought to North America either accidentally or intentionally. These species out-compete our native species for water, nutrients, and light which in turn crowds out and reduces populations of native species. Noxious weeds degrade recreation areas, increase fire risk, reduce forest health, decrease habitat for wildlife, invade croplands/pastures, and decrease availability of livestock forage. Certain species are potentially toxic to humans and other animals. Due to these reasons there is a need to treat noxious weeds along roadways to reduce the spread to other areas within the project area and neighboring lands. Seeds can remain viable for many years and they have extensive root systems which can re-sprout even after the tops of plants have been removed, making it critical to use early detection and rapid response. By detecting noxious weed sites early and rapidly treating them, this decreases the chance for new populations establishing and increases the chance to eradicate noxious weed species from the area. Noxious weeds have no natural predators at the infestation site since their native habitat is outside the U.S. which makes it very difficult to control these species. Noxious weeds are primarily found in disturbed areas often along roads and trails.

A. Reduce, control, contain, or eradicate noxious weed infestations on BLM-administered land using an Integrated Pest Management (IPM) process (RMP, p. 92).
Noxious weed populations will be treated using IPM techniques based on the species, habitat, and environmental factors under the direction of the Medford District Integrated Weed Management Plan (PA-OR110-98-14). Consistent with local and regional management decisions, the goal of IPM will be to maintain or develop ecologically healthy plant communities that are relatively weed resistant, while meeting other land-use objectives such as forage

production, wildlife habitat development, native plant diversity, and recreational land maintenance.

1.4 Decision Factors

This Environmental Assessment will provide the information needed for the authorized officer, the Grants Pass Resource Area Field Manager, to render a decision regarding the selection of a course of action to be implemented for the Programmatic FHRP. The Field Manager must decide whether to implement the Alternative as proposed, select the No Action alternative, or modify the action alternative to best meet objectives of the project.

The decision will also include a determination whether or not the impacts of the proposed action are significant to the human environment. If the impacts are determined to be within those impacts analyzed in the Medford District Resource Management Plan/EIS (USDI 1995), or otherwise determined to not be significant, a Finding of No Significant Impact (FONSI) can be issued and a decision implemented. If we determine in the process of preparing this EA that the significance of impacts are likely greater than those previously analyzed and disclosed in the PRMP/EIS or otherwise determined to be significant, then a project specific EIS will be prepared instead.

1.5 Conformance with Land Use Plans and Other Documents

The actions proposed and analyzed in this EA were developed to be consistent with the management objectives for public lands identified in the following documents:

The proposed action is in conformance with the following plans and decisions:

- *Final Supplemental Environmental Impact Statement and Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (Northwest Forest Plan FSEIS 1994 and ROD 1994);
- *Final-Medford District Proposed Resource Management Plan/Environmental Impact Statement* and *Record of Decision* (EIS 1994 and RMP/ROD 1995);
- *Final Supplemental Environmental Impact Statement: Management of Port-Orford-Cedar in Southwest Oregon* (FSEIS 2004 and ROD 2004);
- *Final SEIS for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (2000), and the *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (2001); and
- *Medford District Integrated Weed Management Plan Environmental Assessment (1998*) and tiered to the *Northwest Area Noxious Weed Control Program* (EIS 1985).

On July 25, 2007, the Under Secretary of the Department of Interior signed a new Survey and Manage Record of Decision that removed the survey and manage requirements from all of the BLM Resource Management Plans (RMPs) within the range of the Northern Spotted Owl. On December 17, 2009, partial summary judgment against this decision was granted. Nonetheless,

for this project the District elected to complete pre-disturbance surveys for Survey and Manage species consistent with the 2001 Survey and Manage Record of Decision.

The ACS Consistency Review found that the project is in compliance with the Aquatic Conservation Strategy as originally developed under the Northwest Forest Plan.

The proposed action is 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 National Historic Preservation Act of 1966.

In addition to the documents cited above, project planning drew from information and recommendations from the following:

1. Effects of Proposed FY 2009-2013 Forest Management Activities on Federally Listed Species and Designated Critical Habitat (TAILS: 13420-2008-I-0136)
2. Visual Resource Contrast Rating BLM Manual Handbook 8431-1
3. BLM Manual 6840 – Special Status Species Management (2001)
4. National Fire Plan (NFP) (2000)
5. National Fire Plan 10-year Comprehensive Strategy and Implementation Plan (2002)
6. Josephine County Integrated Fire Plan (2004)
7. Applegate Fire Plan 2002
8. U.S. Department of Interior, Bureau of Land Management, Western Oregon Districts, Transportation Management Plan (1996, updated 2002)
9. Southwest Oregon Interagency Biomass Utilization Strategy (, January 2008)
10. Applegate Adaptive Management Area (AMA) Guide (USDI/USDA 1998)
11. Illinios Valley Fire Plan 2005
12. Wyden Amendment (Public Law 109-54, Section 434)

The following provides a brief description of the topics covered in a variety of other documents that are relevant to this project. These are not decision documents.

1. Watershed Analysis

Watershed Analysis is a procedure used to characterize conditions, processes, and functions related to human, aquatic, riparian and terrestrial features within a watershed. Watershed analysis is not a decision making process, it is an issue driven process in which resource specialists identify and describe ecological processes of greatest concern and how they are functioning. They establish the context for subsequent planning, project development, regulatory compliance and agency decisions (Federal Guide for Watershed Analysis 1995 p. 1).

2. Applegate Communities Collaborative Fire Protection Strategy (2002 Applegate Fire Plan)

The Applegate Fire Plan is the result of a collaborative effort between local citizens and local and federal agencies to develop a strategy and tool for addressing the high fire danger throughout the Applegate Valley. The main components of the plan include fire protection and suppression, fuel hazard reduction, and emergency communications. The plan is based on a foundation of neighbors cooperating with neighbors.

The Applegate Fire Plan developed recommendations for nineteen strategic planning areas across the Applegate Watershed. The Programmatic FHR project area falls within several Strategic Planning Areas of the Applegate Fire Plan. Recommendations for the Strategic Planning Areas include addressing hazardous fuels on BLM lands between the Communities at Risk boundary to protect the LSR.

3. Josephine County Integrated Fire Plan (JCIFP) 2004
The JCIFP is a multi-jurisdictional plan that addresses wildfire risk and mitigation actions throughout Josephine County. This plan is a result of collaborative efforts between local and state governments, federal agencies, rural fire protection districts and community-based organizations.

The JCIFP wildfire risk assessment analyzes the potential losses to life, property, and natural resources. Objectives of the risk assessment are to identify Communities-at-Risk and the Wildland- Urban Interface (WUI), develop and conduct a wildfire risk assessment, and identify and prioritize hazardous fuel treatment projects and areas. The analysis takes into consideration a combination of factors including risk, hazard, values, protection capability and structural vulnerability. The Programmatic FHR plan will utilize the risk assessment and prioritization process identified in the JCIFP, Illinois Valley Fire Plan, Applegate Fire Plan, or any future CWPP when developing treatment area recommendations.

4. The Wyden Amendment (Public Law 109-54, Section 434)

The Wyden Amendment (Public Law 109-54, Section 434) authorizes the BLM to enter into cooperative agreements to benefit resources within watersheds on BLM lands. Agreements may be with willing Federal, Tribal, State, and local governments, private and nonprofit entities, and landowners to conduct activities on public or private lands for the following purposes:

- Protection, restoration, and enhancement of fish and wildlife habitat and other resources;
- Reduction of risk for natural disaster where public safety is threatened; or
- A combination of both.

This authority was initially provided in FY 1998 and has been extended through the end of FY 2011. Since the authorization does not provide for additional funding, any dollars spent on private land must come from existing appropriations

1.6 Issues and Concerns

A scoping letter was sent to approximately 90 landowners, federal, state and county agencies, and to tribal and private organizations, and individuals that requested information concerning projects of this type. A variety of issues and concerns were raised during project scoping by BLM's interdisciplinary team, and interested individuals and groups outside the BLM. In this EA an issue is something unique to the project area that may need particular consideration and which may contribute to defining a particular action alternative. In some cases, an issue was initially considered by the planning team and then eliminated from further analysis because it was not within the scope of the project or was determined to be irrelevant to making a decision on the project. These are summarized in Appendix C.

In addition to the objectives additional issues pertinent to the analysis are:

- Threatened and Endangered (T&E) species: project activities may remove or degrade habitat for T&E species
- Access for fire suppression
- Smoke impacts to residents from prescribed fire
- Lack of large hardwoods due to past spraying and shading/competition
- Natural surface roads contributing sediment to streams
- Continuation of garbage dumping on BLM lands
- Ground disturbing activities may increase soil erosion and compaction, potentially reducing soil productivity and increasing stream sedimentation.
- Effect to residents from truck traffic and chainsaw noise
- Changes to viewshed as a result of vegetation or road projects
- Removal of forest vegetation may result in increases in off-road OHV use and resultant resource damage.

2.0 Proposed Action for each Alternative

The EA Interdisciplinary Team developed one action alternative to meet the purpose and needs identified in Chapter 1. In addition, a No Action alternative is presented to represent current conditions and trends, and establish a baseline for analysis. The No Action alternative also serves as a reference point in discussing project activity effects. All project activities incorporate Project Design Features (PDFs) designed to reduce or eliminate potential effects from project activities.

Through the scoping process, the public provided comments that were considered by the interdisciplinary team and incorporated into alternative development.

2.1 Alternative 1 – No Action Alternative

The No Action alternative is defined as not implementing any aspect of the action alternative. The No Action alternative also serves as a baseline or reference point for evaluating the environmental effects of the action alternatives. Inclusion of this alternative is done without regard to the decision made in the Medford District RMP and without regard to meeting the purpose and need for the project.

The No Action alternative is not a “static” alternative. Under the No Action alternative, the present environmental conditions and trends will continue. This would include trends such as vegetation succession and consequent terrestrial and aquatic habitat changes, increases in fire hazard, continued road condition or deterioration, and continued or increasing rates of erosion, as well as current road densities and various unauthorized uses (e.g., wood theft, illegal dumping), etc. The effects of other present and reasonably foreseeable future actions that are not dependent on any of the action alternatives are included in the effects analysis for this alternative.

2.2 Alternative 2 – Action Alternative (Proposed Action)

2.2.1. Fuel Hazard Reduction

Fuel treatments proposed in the action alternative reflect our estimation of what will be required on the project area regarding fuel hazard reduction. Both natural and activity fuels would be treated.

Within 5 years of the signing of the first Decision Record for this project, strategic roadsides, ridgeline treatments, and BLM managed parcels encompassing natural fuels in the WUI would be treated under this alternative. Approximately 1,000 to 1, 500 acres per year, not to exceed 7,000 acres within the 5 year time period of the EA would be treated. Treatments are expected to occur across the Resource Area, and no more than 1,700 acres are expected to be treated in any one 5th field watershed. Treatments would include a mix of thinning, slashing, biomass removal, handpiling, handpile burning, and underburning depending on site specific conditions.

Conifer trees less than 12 inch diameter at breast height (DBH) and hardwoods less than 12 inch DBH would be selectively thinned on BLM land. In general, most hardwoods above 6 inches would be retained in order to reduce stump sprouting, but in areas of severe fuel build-up or instances where hardwood removal would better accommodate biomass extraction methods, hardwoods would be cut up to 12 inches. This is expected to occur in limited circumstances.

Biomass may be removed during initial fuel hazard reduction. Ground based extraction and cable based extraction are proposed in all vegetation treatments (i.e. commercial, non-commercial, riparian reserves, and late-successional management areas). Actual acres treated will be determined based on economic, safety and access limitations. The purpose of these prescribed treatments is to reduce hazardous fuels, reduce smoke emissions and utilize the biomass to benefit the local economy. In areas where biomass extraction is not feasible, hand piling and burning would occur. Ground based methods would utilize existing skid trails whenever possible. When this is not possible, the designation of skid trails, spaced approximately 75 feet apart would be required.

Treatment Descriptions

Fuel hazard reduction: Understory vegetation would be thinned using manual and mechanical techniques (slashing, pruning) to the desired tree densities and stocking levels

Oak woodland restoration – In stands where oak have been encroached by conifers, all conifers <12" DBH within 75 ft. radius of larger oak (over 12" DBH) would be removed.

Young Stand Management: Biomass removal would be used if thinned material is accessible and economically viable. Hand piling and burning would be used if biomass removal is not a viable option.

Biomass removal: Biomass is any dead or living vegetation in a fuels unit that is ≤12" in diameter for conifers and ≤12" for hardwoods. For slopes <35%, mechanized low ground pressure machinery would cut, skid, haul or chip biomass. On slopes >35%, biomass would be cable yarded.

Slashing (SL:) Understory vegetation density would be reduced by cutting and spacing of

conifers <12" dbh and hardwoods <12" dbh. Retained vegetation would be spaced 14-45' apart. Within this range, wider spacing would be used for larger leave trees or for species such as pine or oak which thrive in less dense conditions. Vegetation diversity would be obtained by maintaining species occurring at low frequencies in the stand (i.e. Pacific yew, pine, vine maple). Untreated vegetation groups ranging in size from 0.1 to 2 acres would be retained in each treatment unit.

Hand piling and burning (HP): is typically used when underburning is not possible due to heavy fuel loads. Woody material that has been cut 1-6" in diameter and greater than two feet in length would be piled by hand. The piles would be covered with plastic to create a dry ignition point and would be burned during the wet season when the risk of fire spread (scorch or mortality) to nearby residual trees and shrubs is minimized.

Understory Burning (underburning) (UB): is used where the objective is to maintain ≥80% of the overstory. The objective is to reduce dead and down woody material, shrubs and small trees in the understory, and live and dead branches close to the ground. Underburning is conducted throughout the year when fuel and weather conditions permit. Periodic, low intensity underburning following the initial fuel reduction would maintain desired fuel conditions. Maintenance burning throughout the project area would need to be done about every 7-15 years in areas classified as fire regime 1 and every 10-30 years for areas in fire regime 3.

2.2.2 Road Maintenance Associated with Biomass Extraction

Hauling of biomass material would require roads to be up to standard and maintained to handle the expected project traffic. This includes proper construction, maintenance and management of the road system as part of land management projects.

Objectives are to improve road drainage, and maintain existing roads at levels consistent with the planned, long-term use of the roads. The proposed road work is also intended to improve road drainage to reduce chronic erosion and sedimentation.

Selected road surfaces and ditch lines would be bladed. To reduce maintenance generated sediment from entering streams, ditches would not be bladed within 75 feet of live streams, unless necessary to protect culvert/road stability. Other maintenance activities would include cleaning catch basins, brushing near pipe inlets and outlets, and removing vegetation along roadsides to improve site distance.

2.3 Project Design Features

Project design features are included in the proposed action for the purpose of reducing adverse environmental effects that might stem from project implementation. The project design features noted below would be incorporated into each project.

Leave Patches

For treatment units greater than 10 acres, approximately 10 to 20% of each unit would remain untreated to retain areas with pre-treatment stand conditions. These no treatment areas are designed to retain pockets of high vegetative density of varying size and distribution across the treatment units, which provide refugia for plant and animal species that benefit from such conditions (e.g. some species of neotropical migratory birds, rodents, shade-tolerant species of

mosses, lichens and vascular plants). Areas left untreated due to Visual Resource Management (VRM), botany buffers, riparian reserves, cultural sites or other concerns would contribute towards the 10-20% target. The no treatment areas should be ¼ to 1 acre, unless they are linked to other no treatment areas designated for other resource concerns. If possible, these no treatment areas would be distributed randomly throughout the unit. During underburn treatments, fire would be allowed to creep into these no treatment areas, but would not receive direct ignition. Underburn treatments should not result in significant loss of vegetation within these areas. If conditions are such that total vegetative loss would be expected if fire is allowed to burn within these no treatment areas, scratch lines would be built prior to underburning operations in order to exclude fire from burning within these no treatment areas. If cultural sites are incorporated into any no treatment buffers, fire must be excluded from the buffer to protect and maintain the cultural site in its present condition.

Botany

Includes fuels treatment within fuel density reductions in woodlands, brush fields, and meadow edges. If treatments are within an area that was surveyed within ten years, no additional surveys are needed; buffering known sites is required. All special status plant species would be buffered from project activities except as described below (BLM Manual 6840, RMP pg. 51). Burns in areas containing special status plant species would follow prescriptions that would result in cool burns which would minimize potential damage to plant populations. Prescribed fire operations would be done in a manner which strives to reduce or eliminate burning through identified special status plant populations, dependent on the adaptability of each species to fire. If treatments are within an area that was surveyed within ten years, no additional surveys needed; buffering known sites is required.

Special Status Plants (T&E, Sensitive, State Listed, and Survey &Manage)

- For fuels reduction projects, conduct a two year protocol survey for the listed Endangered Gentner's fritillary (*Fritillaria gentneri)* in suitable habitat following the 2009-2013 Programmatic Biological Assessment for Endangered plant species and respective Letter of Concurrence (USFWS 13420-2008-1-0136), (See page 19-21 of the BA for the protocol.) One-year surveys will occur for all other listed and BLM sensitive plant species in suitable habitat within their respective ranges, consistent with protocols in place at the time of implementation. Surveys are currently expected to be valid for 10 years once conducted.
- 2 year surveys are required within suitable habitat for Gentner's fritillary following the survey protocol with the exception that areas to be broadcast burned for habitat enhancement for Gentner's fritillary only require a 1 year survey.
- Buffer sizes for fuels treatments are a minimum of 25 feet from the occurrence boundary (maximum size will be determined on a case by case basis because of differing habitat requirements and existing habitat conditions); however for some species thinning and fuels treatments will be allowed through the sites during dormancy periods for those species that will benefit from the disturbance.
- Hand slashing (Chain saw, brush saw) through buffers is allowed if done during the dormancy period. For Gentner's fritillary, minimum canopy coverage of 40 percent of trees and shrubs is retained. If the canopy is already less than 40 percent, no treatment in the buffer is needed. There is no canopy minimum for Cook's lomatium (*Lomatium cookii*).

- Cut material must be removed and piled outside the buffered occurrence.
- Hand pile and burning: no hand piles in the buffer and piles must be 25ft from the buffer edge.
- Burning of commercial harvest landing slash piles cannot occur within 100 feet of an occurrence.
- Mechanical thinning/brushing treatments (e.g. tracked vehicles): no mechanical equipment in buffers 100-foot buffers required no vehicles or heavy equipment within buffered occurrence (hand treatment allowed within the buffer as previously described).
- Manual slashing (chainsaws) and brushing through buffered occurrences are allowed if during the dormancy period. For *Fritillaria gentneri,* 40 percent combined canopy coverage of trees and shrubs must be retained. If the canopy cover is less than 40 percent, then treatment of the buffer is not needed. There is no canopy minimum for Cook's lomatium.

Noxious Weeds

Noxious weeds would be treated using an integrated pest management approach (RMP p. 92). Management objectives are to contain or eradicate populations of listed noxious weeds. Populations of noxious weeds would be contained using appropriate methods based on species and conditions as directed in the Medford District Integrated Weed Management Plan (PA-OR110-98-14). All treated noxious weed populations would be monitored for treatment effectiveness. All activities would conform to the following restrictions.

- Haul truck turn-arounds would not be constructed in known noxious weed populations (BLM map to be provided).
- Equipment and material would not be stored in known weed populations (BLM map to be provided).
- Skid roads would not be constructed through known weed sites unless the area is treated for noxious weeds prior to road use.
- Roadsides disturbed by project implementation (culvert and road shoulder work) would be re-vegetated after implementation.
- Seed and straw used for restoration, replanting of bare soil, and post treatment throughout the project area would be native species and weed free to prevent the further spread of noxious weeds. All seeding would be contingent on seed availability.
- Project areas would be surveyed for noxious weed populations prior to implementation.
- Noxious weeds within areas of proposed heavy equipment operation including road maintenance and ingress and egress routes would be treated prior to operation with methods analyzed in the Medford District Integrated Weed Management Plan and Environmental Assessment (USDI 1998). Treatments would primarily consist of herbicide application, hand pulling, and mechanical cutting.
- All heavy equipment, including brushing machinery, would be pressure washed to remove all dirt and debris prior to entering BLM lands and when moving from infested to non-infested areas within the project area.

Wildlife

- Retain snags and coarse woody material (CWM) > 12" dbh except for safety or operational reasons except as noted below for spotted owl nest patches.
- Prior to prescribed burning, duff would be pulled away from the base of snags to reduce

the chance of losing them during burning.

- CWM would be retained and protected from disturbance to the greatest extent possible during burning and other project activities.

Northern Spotted Owl (NSO) Seasonal Operating Restrictions

Work activities that produce loud noises above ambient levels will not occur within the specified distances listed below of any known northern spotted owl site during the critical early nesting period, March 1 and June 30, or until two weeks after the fledging period. This seasonal restriction may be waived if protocol surveys have determined the activity center is not occupied, owls are non-nesting, or owls failed in their nesting attempt. The distances listed below may be shortened if significant topographical breaks would muffle sound between the work location and nest sites. The Resource Area biologist has the option to extend the restricted season until September 30 during the year of activity, based on site-specific knowledge (such as a late or 2nd nesting attempt).

- Chainsaws will not be used within 195 feet of spotted owl sites.
- Heavy equipment (including non-blasting quarry operations) will not be used within 105 feet of spotted owl sites.
- Burning will not take place within 0.25 miles of spotted owl sites unless substantial smoke will not drift into the nest patch.

Northern Spotted Owl (NSO) Nest Patch Restrictions

A. Within any known spotted owl nest patch (all BLM lands within 300 meters of known spotted owl nest sites), treatments must conform to the following guidelines:
   1) Limit vegetation removal to materials 8" DBH or less.
   2) Hand-pile cut vegetation only, no use of mechanized equipment to extract materials.
   3) Hand-piles should not be created within the drip line of any NSO nest tree.
   4) No under burning within the nest patch.

B. If the project involves habitat altering activities and is scheduled to occur within a known spotted owl nest patch (area within 300 meters of known spotted owl nest sites), do not conduct project activities between March 1and June 30 unless the Resource Area biologist determines spotted owl young are not present, or until two weeks after the fledging period. The Resource Area biologist has the option to extend the restricted season until September 30 during the year of activity, based on site-specific knowledge (such as a late or 2nd nesting attempt).

Marbled Murrelet Seasonal Operating Restrictions

Work activities that would occur within the marbled murrelet zone (See map in Appendix B) and produce loud noises above ambient levels will not occur within 120 yards of any known marbled murrelet sites or within any un-surveyed suitable habitat between April 1 and August 5. For the period between August 6 and September 15, work activities that would occur within the marbled murrelet zone must be confined to between 2 hours after sunrise to 2 hours before sunset. This seasonal restriction may be waived if protocol surveys have determined the suitable habitat is not occupied. Other seasonal restrictions (Table 1) would be applied as appropriate.

Table 1. Seasonal Restrictions

Location	Restricted Activities	Restricted Dates	Reasons / Comments
Up to a 1/4 mile radius around active spotted owl nest sites.	All chainsaw operations, stewardship harvest activities and prescribed burning	March 1 to June 30 (variable depending on nesting status)	Medford District RMP; Medford BLM FY08 LOC (Tails # 13420-2007-I-0231), Medford BLM FY09 LOC (Tails # 13420-2009-I-0045)*
Up to ¼ mile no line of site and ½ mile line of site around active bald or golden eagle nest sites	All chainsaw operations, stewardship harvest activities and prescribed burning	Variable - January 1 to August 15. Dates and restrictions depend on nest activity.	Medford District RMP; Bald and Golden Eagle Protection Act.
120 yards from occupied marbled murrelet nest sites or unsurveyed suitable habitat	All chainsaw operations, stewardship harvest activities and prescribed burning	April 1 – August 6 - no work w/in 120 yards; August 6 – September 15 work activities must be confined to between 2 hours after sunrise to 2 hours before sunset.	Medford District BLM FY 2006-2008 Biological Assessment and USFWS Biological Opinion (#1-15-06-F-0162).
All treatment units and road	Various activities depending on the species	Variable depending on the species	Restrictions only if special status species are located. (RMP; BLM 6840 Manual)
Entire project area	Fuel hazard reduction	Variable	Time fuel reduction treatments to reduce conditions that contribute to bark beetles in logging slash.

* Additional consultation may be required in subsequent years. Consultation would be completed prior to signing of decisions.

Hauling

The BLM and DEQ have signed a Memorandum of Agreement which holds the BLM responsible to manage agency lands to protect, restore, and maintain water quality. This includes proper maintenance and management of the road system. Hauling of bio mass material would require roads to be up to standard and maintained to handle the expected project traffic.

All roads that are not designated for wet weather haul would have adequate surfacing or may be stabilized in such a way that no maintenance would be necessary to minimize erosion and road damage. Selected erosion prevention and sediment control measures would be implemented prior to the wet season (generally Oct 15th). Adequate surfacing for dry weather haul and all season light vehicular use would be durable rock of sufficient depth or for typical soils in this

watershed a recommended depth of 6 inches of durable rock to prevent road damage, offsite erosion, or stream sedimentation.

Native surface roads and roads with inadequate surfacing for wet season haul may be restricted to the dry season, generally between May 15 and October 15 to minimize erosion and road damage. The Authorized Officer may extend the hauling season if dry weather and dry road surface conditions exist. Adequate surfacing for wet season haul would be durable rock of sufficient depth **or** for typical soils in this watershed a recommended depth of 10 inches of durable rock to prevent road damage, offsite erosion, or stream sedimentation. Durable rock is defined as clean, hard rock without many fines. The rock depth is taken from Oregon Department of Forestry (ODF) Technical Note Number 9.

Hauling of material or biomass removed during operations on all road types may be suspended at any time during and immediately following precipitation events if saturated road surfaces would result in continuous mud splash or tire slide; surface rutting; fines being pumped through road surface from the subgrade; road drainage causes a visible increase in stream turbidities or more than ten percent cumulative increase in natural stream turbidities as measured relative to a control point above the road; or road surface conditions would result in water being redirected into tire tracks or away from designed drainage patterns.

All roads without BST surfacing that would be used for wet weather haul may have a water dip and/or cross drain culvert located within 50 and 100 feet of all streams crossings. Drainage features should be situated as close as possible to the stream crossings (RMP p. 159) and allow between 15-200 feet of ground filtering between the drainage outlet and the high water level of the stream to minimize the amount of sediment entering stream channels. Filtering distance depends, in part, on the slope of the ground below the drain discharge, the road grade and the distance to the next drainage feature up the road.

Cross drain spacing for roads would be done in accordance with the RMP Tables 1-A and 2-A (pg 176-177) to reduce erosion. Where needed, additional cross drains would be added to prevent stream sedimentation along existing haul routes. Selected erosion prevention and sediment control measures must be implemented prior to start of the wet season (generally Oct 15th).

Recreation

The Grants Pass Resource Area has open, limited and closed categories for Off-Highway Vehicle (OHV) use (RMP p.109). If, as a result of increased OHV use due to more open terrain following removal of vegetation, it is determined that resource damage from OHV use is documented, steps will be taken to control the use through additional steps such as signing, barrier installation,, monitoring and, increased law enforcement activity.

To reduce the possibility of damage to resources from unauthorized OHV use, fireline construction would not be done within 100 feet of roadways until project is implemented. Vegetation removal would be minimal for the first 100 feet, routing the fireline around existing vegetation where possible. Upon completion, vegetation would be pulled back over the first 100 feet of fireline.

Cultural Resources

Prior to any project implementation under this FHRP programmatic EA, a cultural resource survey would be completed and site-specific protection measures would be implemented to preserve the integrity of all recorded cultural sites.

Known cultural sites, including historic ditch systems, would be buffered 20 feet out from the site boundary with flagging prior to project implementation. No fire line construction, prescribed burning, hand piling/burning, or skid trails would occur within the flagged boundaries of the recorded cultural resources.

Timber would be felled away from cultural resource site buffers, one site tree length. If any cultural sites, not located during the cultural resource survey, are found during project implementation, activities around the site would halt until a BLM archaeologist reviewed the site and determined appropriate protection measures.

Visual Resources Management
Prior to individual plan implementation a Visual Resource Contrast Rating Analysis would be completed to analyze potential visual impacts of the proposed project and activities. VRM objectives would be met through the following Project Design Features (PDFs).

The VRM classes in the project area (GPRA) are VRM I, VRM II, VRM III and VRM IV. VRM Classes I and II require minimal to low levels of change to the natural landscape characteristics. Class III objectives are to manage lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer. Class IV objectives are to manage lands for high levels of change. Management activities may dominate the view and be the major focus of viewer attention (VRM Manual 8431).

On VRM I and II treatment areas visible from key observation points (KOP):
In areas of VRM Class I and II a site-specific analysis of the area and treatment planned would occur prior to signing a decision.

Along river and road corridors, a 50’ buffer would be maintained so that the changes are not visible to the casual observer.

Treatments within VRM Class I and II would not remove overstory vegetation. During underburn treatments, fire would be allowed to creep into these no treatment areas, but would not receive direct ignition. Underburn treatments should not result in any notable loss of vegetation within these areas.

Use the BLM’s Visual Contrast Rating Worksheet to evaluate the degree of contrast between the proposed activity and the existing landscape to ensure VRM Class I and II consistency (USDI 1986). If treatments cannot be implemented without meeting VRM 1 and II guidelines, those areas would not be treated.

On VRM III and IV treatment areas visible from key observation points (KOP):
Feather edges of treatment areas with untreated areas to blend the vegetation and avoid lines. Retain a mix of tree/shrub sizes and species along edges.

Mimic natural shapes and lines (no straight lines) when determining edge of treatment areas.

Fisheries / Aquatic/ Hydrology
The Medford District Resource Management Plan (RMP) established riparian reserves to maintain and restore riparian functions, provide benefits to riparian dependent and associated species, and provide for greater connectivity within a watershed. The current trend in overly dense small diameter riparian stands does not represent the desired future condition.

Table 2 displays BLM riparian reserve widths for the project area.

Table 2: Riparian Reserve Widths

Stream Type	Riparian Reserve Width
Fish-bearing streams	2 site potential tree heights
Perennial streams & springs and intermittent streams	1 site potential tree height
Unstable or potentially unstable areas	Extent of unstable or potentially unstable area

The project would be No Effect on fisheries with the implementation of the following project design features:

- To maintain stream shade: a) maintain a 50′ no treatment area along all streams, b) maintain canopy closure at a minimum ≥60% within riparian reserves. Where the existing closure is below 60%, fuel treatments would be limited to the understory.
- Prescribed burning could occur in riparian reserves with the following stipulations: a) if hand piles exist within 50′ of a stream, they would not be burned; b) no direct ignition would be done within the 50′ no treatment zone; and c) underburns initiated outside of the 50′ buffer would be allowed to back into this buffer as long as the underburn is of low intensity and the mid-level and upper canopies are not at risk. These limitations are directed particularly at protecting the aquatic ecosystems from runoff and shade reduction.
- On very steep sites susceptible to ravel, fuel reduction treatments would be done manually to ensure duff retention. No more than 30 burn piles per acre would be created.
- Within riparian reserves, trees to be removed from the site would be directionally felled to pre-approved skid trails. No new skid trails or stream crossings would be constructed in riparian reserves. Skid roads would be water barred as appropriate for slope and soil type. Existing skid trails could be used if they are stable and not recovered. These trails would be decompacted and planted according to prescription and covered with mulch or small diameter slash (less than 8″ thick).
- Cable corridors would be located away from draws and would be water barred as needed based on the slope and soil type. All landings, including fill slopes, would be located away from headwalls, draw bottoms and adjacent draw side slopes to avoid potentially unstable areas.
- Yarding corridors would maintain adequate amounts of slash to reduce soil erosion during project activities and would be would be grass seeded after project implementation where necessary to prevent erosion and aid infiltration.

3.0 Affected Environment and Environmental Consequences

Introduction

This section provides the basis for the comparisons of the alternatives and the reasonably foreseeable environmental consequences to the human environment of the alternatives for the proposed action. These consequences can be beneficial, neutral, or detrimental. This analysis considers both the direct effects that are caused by the action and would occur at the same place and time, and the indirect effects that are caused by the action but would occur later in time or offsite (40 CFR 1508.8). The alternatives in this EA are consistent with the management direction of the 1995 RMP.

These effects will be analyzed and described in context by describing and identifying what would take place if no action is taken, considering the present conditions on the land that were produced by past actions, and what effects are and will take place from other present and reasonably foreseeable future actions. This analysis of the effects of taking "no action" then provides the context for analyzing the "incremental effect" of taking action under each of the action alternatives, by then showing how the action alternative will change the conditions on the ground. This is the "incremental impact" that constitutes the "cumulative impact" as defined in CEQ's regulations. (40 CFR § 1508.7) ("the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions…"), and is consistent with the CEQ Memorandum of June 24, 2005 (see below) and 43 CFR 46.115 (effective November 15, 2008). The temporal scale used in this analysis may vary depending on the resource being affected. Generally, the spatial scale used in this analysis will be the Grants Pass Resource Area, however, this scale may vary depending on the resource or species being affected.

As the Council on Environmental Quality (CEQ), in guidance issued on June 24, 2005, points out, the "environmental analysis required under NEPA is forward-looking," and review of past actions is required only "to the extent that this review informs agency decision-making regarding the proposed action." A description of current conditions inherently includes the effects of past actions and serves as a more accurate and useful starting point for a cumulative effects analysis than by "adding up" the effects of individual past actions. "Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." (CEQ Memorandum 'Guidance on the Consideration of Past Actions in Cumulative Effects Analysis' June 24, 2005.)

The CEQ guidance specifies that the "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions." Following review of the guidance and examination of the proposed project, the team found that an exhaustive listing of past projects and speculation on the effects of each would not provide needed data to make an informed decision.

Fuels Treatment Overview

The Grants Pass Resource Area has an active fuels program. Over the past five years, we have completed approximately 11,000 acres of manual treatments, 12,900 acres of hand pile burning, and 3,900 acres of underburning; this is an average of 2,200; 2,580; and 780 acres, respectively, on an annual basis (Table 3). While this is greater than the number of acres expected under this

EA, additional acres would be expected from other projects that have not been completed for treatment of activity fuels; neighborhood treatments (e.g., Rogue River Fuel Hazard Reduction Project); stewardship projects; and other small fuel hazard reduction projects that already have signed decisions. Given that, these numbers can be considered annual averages for assessment of cumulative effects. For any single 5th field watershed project, the maximum that has been completed over that same 5-year period is approximately 1,480 acres of manual treatments, 2,330 acres of hand-pile burning, and 650 acres of underburning. Given historic fuels hazard reduction treatments, for analysis purposes, it is reasonable to consider these numbers as the maximum acres of treatment in any one watershed over this same time period, although it is expected that no more than 1,700 acres would be treated in any 5th field watershed over the span of this project.

Table 3. Fuel Hazard Treatments 2005–2009

Treatment Type	5-year Total	1-year Average	Maximum / watershed
Manual	11,000	2,200	1,480
Hand pile and burn	12,900	2,580	2,330
Underburn	3,900	780	650

While various vegetation treatments, which may have a beneficial or deleterious effects on fuel hazard conditions, are expected to occur in other projects, individual projects completed under this EA will be designed to take effects of neighboring projects into account to enhance area-wide beneficial effects on reduction of hazardous fuels. Under the No Action alternative, fuels reduction treatments are expected to occur on 23% of the landscape over 10 years (Table 3), assuming a similar rate of treatment and under other project specific analysis, watershed by watershed, or project by project. The estimated approximate cumulative acres over the next ten years if a decision is made to implement the proposed action could be greater than past averages. The actual number of acres by watershed is likely to vary based on the percentage of BLM ownership within a watershed, amount of private land cooperation within the project area or on other project-by-project implementation.

3.1 Fuels

3.1.1 Affected Environment

Wildfire History

The project area is within the Klamath Province Region in southwestern Oregon where fire is recognized as a key natural disturbance (Atzet and Wheeler 1982). Fire has played an important role in influencing successional processes and creating diverse forest conditions.

Prior to the 20th century, low severity fires burned regularly in most dry forest ecosystems, with ignitions caused by both lightning and humans. Low severity fire influenced regeneration of fire intolerant species, promoted fire tolerant species such as ponderosa pine and Douglas-fir, maintained an open forest structure, reduced forest biomass, decreased the impacts of insects and diseases, and maintained wildlife habitats for many species that utilize open stand structures

(Graham et al. 2004). Native Americans influenced vegetation patterns for over a thousand years by igniting fires to enhance values that were important to their culture (Pullen 1995). Early settlers used fire to improve grazing and farming and to expose rock and soil for mining. Based on fire scars and vegetative patterns, large, low to moderate severity fires were a common occurrence in the area.

In the early 1900s, suppression of all fires became a goal of land management agencies. This altered the fire return intervals and severity from what would take place under the historic fire regime. Based on calculations using fire return intervals, two to five fire cycles have been missed in the southwest Oregon mixed conifer forests that occur at low elevations (Thomas and Agee 1986). As a result, fuel loading has increased and plant succession shifted to fire-prone vegetative conditions. Fire-tolerant species such as ponderosa pine and oaks have decreased. Many stands, which were once open, are now heavily stocked with conifers and small oaks which have changed the horizontal and vertical stand structure. Surface and ladder fuels have increased, increasing the potential for large scale crown fires which were once historically rare.

In the past 20 years in southwest Oregon we have experienced large fires that burned at higher intensities than would have been the case under historic conditions. Unless the vegetative conditions that have occurred as a result of the fire suppression policies over the past century are altered to be consistent with the natural or historic fire regimes of the area, we expect a continuing trend of increasing numbers of large, high intensity fires. Wildfires in the project area occur predominately from July through September.

Fire Regime Condition Class (FRCC)

Fire regime condition classes offer another approach to evaluating potential fire conditions and are most useful at the watershed and larger scales. Treatment effects are reflected in changes in the acreage in each FRCC. FRCC's are a function of the degree of departure from historical vegetation and disturbance regimes. These departures result in forest component alterations such as species composition, structural stage, stand age, and canopy closure. There are three fire condition classes within the project area:

FRCC 1 - (55,145 acres) Fire regimes are within or near the historic range for the area. The risk of losing key ecosystem components is low. Vegetation species composition and structure are intact and functioning within the historical range for the area.

FRCC 2 – (103,076 acres) Fire regimes have been moderately altered from their historical range (i.e., missed 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.

FRCC 3 – (75,048 acres) Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. This change results in increases to fire size, frequency, severity, and landscape patterns.

3.1.2 Environmental Consequences

Alternative 1 - No Action

Stand Level Effects

Under the No action alternative conditions with a high potential for large, high intensity fires would continue. Fuel hazard would increase as vegetation continues to develop on current

successional trajectories. Surface fuels would increase due to tree mortality in dense stands as higher levels of insect and disease mortality are expected. Canopy Base Height (CBH) would decrease due to understory density increases, increasing the potential for crown fire initiation. Canopy Bulk Density (CBD) would increase, as would the potential for active crown fire events. The shift to more shade tolerant species would continue in dense overstocked stands.

With these conditions, wildland fire fighters and the local public would be at greater risk of loss of life and property. Direct attack capabilities would diminish as fuel hazard increases and deteriorated roads become less accessible. Initial attack success would decline over time resulting in larger fire sizes. Aerial attack effectiveness would decrease with extreme fire behavior and, as upper and mid level canopies close, penetration of aerial applications of water or retardant would reduce. As a result, in the event of a wildfire, many stands would experience stand replacing wildfires.

Project Level Effects
With the no action alternative, except for areas treated under the other projects, the project area would continue on present trajectories of unnaturally heavy fuel loads, over stocked stands, and increased shade tolerant/fire intolerant vegetation. Fire risk would increase proportionately with increases in population, residential development and recreation.

As the number of acres with high fuel hazard increases, the potential for high severity wildland fire increases. Strategies and tactics for fire suppression would shift from direct attack to indirect attack utilizing topographic features such as ridgetops and existing roadways resulting in larger fires. Suppression tactics would include thinning and pruning vegetation along roadways without any ecological consideration for species diversity, stocking levels, or seral stage. Ridgelines are often cleared with tractors or bulldozers with widths ranging from 10’- 40’. Initial attack suppression goals (94% of new fire starts confined to 10 acres or less) would become increasingly difficult to attain due to increased fire line heat and flame length. Therefore, the potential for a fire start to develop into a large fire in these areas would continue to increase.

Alternative 2 - Proposed Action
Fuel hazard reduction treatments would occur on approximately 1,000 - 1,500 acres per year not to exceed 7,000 acres in 5 years. Fire intensities and severities would be greatly reduced in treatment areas in high risk and high hazard areas. Untreated stands would have the same wildfire behavior and intensity as those described in the No Action alternative.

Initial attack effectiveness and public and fire fighter safety would increase throughout the project area. Treated stands would be more resistant to crown fire due to the reduction in the crown base height and crown bulk density, reducing mortality to overstory vegetation. Potential for large scale, high intensity fire would be reduced with the utilization of strategic fuel treatment areas which would create defensible space making fire suppression more successful across the project area.

Surface fuels would be reduced to minimize the potential for high severity, high intensity fire. In areas where surface fuels are untreated there will be an increase in solar radiation on the forest floor which may increase surface temperatures, decrease fine fuel moisture, decrease relative

humidity, and increase surface wind speeds compared to un-thinned stands, increasing fire hazard.

Biomass removal would be utilized wherever feasible and would reduce the need to burn. Some areas would still require burning activities to complete and maintain the treatment areas. Handpiling and burning, and underburning would produce smoke. However, burning would conform to the Oregon Smoke Management Program (OAR 629-048-0001 through 629-048-0500). All burning activities would comply with the national ambient air quality standards for particulates (PM 10 and PM 2.5)

Project Level Effects

Due to urban growth, population increases and recreation and tourism within Josephine County, fire risk is expected to increase. The priority for fuel hazard reduction treatments is to treat fuels in and adjacent to the populated areas, and strategic roads and ridges.

Fire intensities and severities will be greatly reduced in treatment areas near high risk and high hazard areas. Untreated stands would have the same wildfire behavior and intensity as those described in the No Action alternative.

Initial attack effectiveness and public and fire fighter safety will increase throughout the project area. Treated stands would be more resistant to crown fire due to the reduction in the crown base height and crown bulk density, reducing mortality to overstory vegetation. Potential for large scale, high intensity fire will be reduced with the utilization of strategic fuel treatment areas, fire suppression would be more successful across the project area.

Summary and Conclusions

Fuel Reduction and Fire Behavior

The proposed fuel hazard reduction treatments would create defensible areas throughout the project area and return those treated areas of the project to near historical ranges of fuel loadings. This would result in a reduction to fire hazard, fire size and reduced chance of loss of values at risk in the project area. Wildland firefighter and public safety would greatly increase in treated areas and near improved road systems. Direct attack fire suppression strategies and tactics could be used to control fire, resulting in fewer acres burned and less threat to private property.

While the potential for high severity fire is expected to decrease by creating fire-resilient forests, predicting fire behavior in all instances is very difficult. Studies by Pollet and Omi (2002), Moore et al (1955), Van Wagner (1968), Omi and Martinson (2002) provide strong evidence of fuel treatment efficacy. However, even with past and anticipated treatments, the potential for a high severity fire remains high across the watershed due to the level of untreated acres and the unpredictability of human caused fires. It can be expected that extreme fire behavior would be moderated in thinned only stands and overstory mortality can be reduced by as much as 60% as compared to untreated stands.

Burning Polyethylene Plastic Sheeting used to Cover Slash Piles

Oregon Department of Environmental Quality and the Oregon Department of Forestry Memorandum of Understanding for Use of Polyethylene Plastic

The Oregon Department of Environmental Quality and the Oregon Department of Forestry developed an MOU for PE, adopted in 2005. The MOU suggests the plastic material should be

removed prior to burning when practicable. Adequate debris or slash is placed over the plastic sheeting to ensure the plastic remains covering the piles until the piles are burned. Due to the difficulty of removing the plastic cover from below the debris, especially after long-term exposure to the elements, it would be operationally impractical to remove the plastic prior to burning for this proposed action. Therefore, the plastic would be left in place and burned in the pile.

Compliance with the Clean Air Act and the Oregon Department of Forestry Smoke Management Plan

The Oregon Department of Forestry Smoke Management Plan addresses the issue of using plastic to cover piles. OAR 629-048-0210(2), Best Burn Practices; Emission Reduction Techniques, states, ". . . best burn practices involve methods that ensure the most rapid and complete combustion of forest fuels ..." Covering of hand piles is a "Best Burn Practice." OAR 629-048-0210(4) 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." Air quality concerns have led to prohibitions on the open burning of household plastics in many areas of the country. "Inasmuch as regions in Oregon where silvicultural burning occurs are exposed to significant amounts of precipitation, there is an overall emissions reduction benefit from covering silvicultural piles. Polyethylene does not include chlorinated compounds or significant amounts of other chemicals likely to form uniquely toxic emissions, nor have these been demonstrated in the literature" (Wrobel and Reinhart, 2003).

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 has addressed the issue based on the findings reported by Wrobel and Reinhart (2003). "The available literature does not support a contention that burning polyethylene (PE) sheeting would produce unique chemicals or classes of chemicals that are not also found in emissions from burning wood debris" (Wrobel and Reinhart 2003).

Evaluation of Alternative Materials to Cover Slash Piles

Alternative coverings, such as kraft paper, are used in other parts of the country to cover burn piles in place of PE. Combustion studies involving lignocellulosic materials suggest that uncoated kraft paper may produce some of the same substances as polyethylene (Garcia et al. 2003). The study 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. 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-foot 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. Kraft paper has been utilized to cover slash piles on

various projects in southern Oregon. Operational experience utilizing the kraft paper during wet conditions has shown that kraft paper and the piles become saturated, and pile burns have had to be halted since the majority of the piles would not burn, or consumption of the piled material was inadequate to meet the prescribed burn plan objectives.

Weather Conditions during Hand Pile Burning

Pollutant concentrations are reduced by atmospheric mixing, which depends on weather conditions such as temperature, wind speed, amount of sunlight, and the movement of high and low pressure systems and their interaction with the local topography, for example, mountains and valleys. Normally, temperature decreases with altitude. But when a colder layer of air settles under a warm layer, producing a temperature inversion, atmospheric mixing is impeded and pollutants may accumulate near the ground. Inversions can become sustained under a stationary weather system coupled with low wind speeds. The BLM would schedule hand pile burning primarily from October to May during unstable atmospheric conditions (e.g., rain, snow, or storm events) when atmospheric mixing is occurring. Wet season conditions minimize the amount of smoke emissions by burning when duff and dead woody fuel have the highest moisture content, which reduces the amount of material actually burned. All piles would be covered with 4 mil polyethylene plastic sheeting to facilitate rapid ignition and consumption of fuels to minimize residual smoke.

Burning in the spring or after rain events reduces impacts to the soil, consumption of large woody materials and duff layer, and allows for rapid mop-up following ignition. Localized concentrations of smoke may occur in adjacent drainages and low lying areas during prescribed burning operations. Timing of all prescribed burning would be dependent on weather and wind conditions to help reduce the amount of residual smoke to the local communities, and thus impacts on air quality. If residual smoke impacts exceed limits set by the Oregon Smoke Management Plan, additional burning would be suspended until given the notice to proceed by the ODF Forester.

Conclusion

The use of polyethylene plastic sheeting would follow guidance from DEQ and Oregon Department of Forestry Smoke Management Plan. OAR 629-048-0210 (a) “Only polyethylene may be used. All other plastics are prohibited; (b) the size of each polyethylene cover must not exceed 100 square feet. For small piles, covering only an area necessary to achieve rapid ignition and combustion, instead of the entire pile, is encouraged; (c) the thickness of the polyethylene cover must not exceed 4 mil”. On hand pile units, the 4 mil polyethylene sheeting typically covers 90% of the surface of the pile, with a maximum of 100 square feet of coverage. Burning would occur after coordination with ODF on the smoke management forecast and instructions to minimize the likelihood of public health effects and visibility impairment. The literature suggests that the emissions to the atmosphere contributed by the sheet of PE covering are chemically similar to the emissions from the underlying pile of silvicultural debris. For many of these emissions, such as CO, CO_2 and particulate matter, the amount emitted from the woody debris will of course overwhelm the contribution from the PE. The available literature does not support a contention that burning PE sheeting would produce unique chemicals or classes of chemicals that are not also found in emissions from burning wood debris (Worbel & Reinhardt, 2003).

Greenhouse gas emissions:

Greenhouse Gases and Carbon Storage

Context and Background

Current Oregon/Washington BLM policy directs districts to consider, under standard NEPA principles, whether greenhouse gas levels and carbon storage is an issue requiring analysis for a project. The BLM anticipates that the impact of most projects on greenhouse gas levels and carbon storage will be negligible when placed in the appropriate context for analysis. However, because of the relative newness of this issue, and the continuously and rapidly developing science, the BLM is taking a cautious approach, particularly with EAs for projects involving prescribed burning. In line with this cautious approach, greenhouse gas levels and carbon storage has been identified as an issue for the Grants Pass Resource Area Programmatic Fuel Hazard Reduction project. As the BLM analyzes similar projects for greenhouse gas and carbon storage impacts, the agency will accumulate a quantitative dataset that may allow the BLM to establish with better clarity whether greenhouse gases and carbon storage should to continue to be an issue for analysis in individual projects such as this.

The purpose of the this section is to provide a basis for the decision maker to determine whether the proposed action or alternatives are likely to significantly impact the human environment with respect to greenhouse gas levels (i.e., atmospheric carbon levels). Changes in greenhouse gas levels affect global climate. Forster et al. 2007 (pp. 129-234) reviewed scientific information on greenhouse gas emissions and climate change, and concluded that human-caused increases in greenhouse gas emissions are extremely likely to have exerted a substantial warming effect on global climate. Because forests store carbon, they affect the atmospheric concentrations of carbon dioxide, a greenhouse gas. Forest management can change the amount of carbon stored in a forest.

Scientific knowledge on the interrelationship between greenhouse gas levels and climate change is rapidly changing, and substantial uncertainties and several key limitations remain. One limitation is the inability of current science to identify a specific source of greenhouse gas emissions or sequestration, and designate it as the cause of specific climate impacts at a specific location. This limitation was identified by the U.S. Geological Survey in a May 14, 2008 memorandum to the U.S. Fish and Wildlife Service, which summarized the latest science on greenhouse gases. Because specific sources of greenhouse gas emissions or sequestration cannot be designated as the cause of specific climate impacts at a specific location, the appropriate scale for analysis of climate change is global, not local, regional, or continental.

Spatial and Temporal Scale of Analysis

As it is assumed that maintenance underburning would occur on a regular basis (5 to 7 years), greenhouse gas emissions compared to carbon storage from ingrowth in treated areas are expected to fluctuate near equilibrium following initial treatment. In other words, assuming similar levels of treatment on an annual basis, as ingrowth is expected to reach levels needing maintenance underburning in 5 to 7 years, each unit treated would replace, as ingrowth, the same level of carbon that is burned during that 5 to 7 year period. As treatment is temporally separated, and assuming similar levels of treatment each year, carbon storage and carbon emitted during prescribed burning would be maintained at equilibrium. Therefore, only initial treatments are analyzed in this section.

Methodology and Assumptions
Greenhouse gas release due to initial fuels reduction treatments (e.g., slashing, handpile burning, underburning) was calculated using the predicted tons of biomass consumed per acre and estimated emissions of greenhouse gases and other pollutants, such as carbon monoxide and methane, and particulate matter (USDA Forest Service 1996). Calculations are based on an estimated 50 handpiles per acre, and acres used in calculations are based on the maximum treatments proposed in this EA, 1,000 acres of manual fuel hazard reduction and 200 acres of underburning.

Affected Environment
Current information on predicted changes in regional climate are that it has become warmer and wetter with reduced snowpack, and continued change is likely (Climate Consensus Statement 2004). It is likely that climate change is highly sensitive to specific changes in the amount and timing of precipitation, but specific changes in the amount and timing of precipitation are too uncertain to predict at this time. Because of this uncertainty about changes in precipitation, it is not possible to predict changes in vegetation types and condition, wildfire frequency and intensity, streamflow, and wildlife habitat. The analysis in this EA therefore does not attempt to predict changes in the project area due to existing or potential future changes in regional climate.

The following tables (Tables 4 and 5) show the current estimated quantities of carbon in forest ecosystem vegetation[1] at the relevant spatial scales:

Table 4. Estimated Carbon Storage in Forest Ecosystem Vegetation[2]

Total Carbon Storage, Forest Ecosystem Vegetation	Gigatonnes (Gt)6[3]
Worldwide (Matthews et al. 2000, p. 15)	487-956 Gt
United States (US EPA 2009)	27 Gt

Table 5. Estimated Carbon Dioxide Emissions at the Relevant Spatial Scales

Total Carbon Dioxide Emissions	**Gigatonnes (Gt)**
Worldwide (Denman et al. 2007)	25 Gt
United States (US EPA 2009)	6 Gt

The annual accumulation of carbon from forest management in the United States is 0.191 billion metric tons (U.S. EPA 2010; Birdsey et al. 2003)).

[1] Carbon contained in both above ground and below ground parts of trees and forest vegetation, and downed wood, litter and duff. It does not include mineral carbon in soil, nor fossil fuels.
[2] Carbon contained in both above ground and below ground parts of trees and forest vegetation, and downed wood, litter and duff. It does not include mineral carbon in soil, nor fossil fuels.
[3] A Giga-tonne (Gt) is one billion metric tonnes.

Environmental Consequences

Alternative 1 (No Action Alternative)
Under the No Action alternative, continued forest growth would result in an increase in stand volume and a corresponding increase in carbon stored in forests. An increase in carbon storage would continue unless interrupted by a forest disturbance such as wildfire or windthrow (Galik and Jackson, 2009). The level of reversal of carbon storage is dependent on the scale of stochastic events or on other land management actions, which are unknown at this time. Across the Grants Pass Resource Area, without fuel hazard reduction, the risk of stochastic events that would result in carbon storage reversal would continue at current levels.

Alternatives 2 – Proposed Action
Based on past experience on the Grants Pass Resource Area, handpiling activities result in production of an average of approximately 50 piles per acre, and based on average pile size, burning releases approximately 7.5 tons of emissions per acre. Treating 1,000 acres per year would result in 11,250 tons of emissions per year. Underburning activities would occur on up to 200 acres per year, releasing approximately 8 tons of emissions per acre or 1,600 tons on an annual basis (USDA Forest Service1996).

Greenhouse gas emission resulting from the proposed action would total approximately 12,850 tons (11,657 metric tons) of carbon dioxide per year, or 64,250 tons for the five-year period of the life of the decision. Current global emissions of carbon dioxide total 25 billion tons (Denman et al. 2007), and current U.S. emissions of carbon dioxide total 6 billion tons (EPA 2009, p. 2-3).

Summary and Conclusions
Based on handpile and burning 1,500 acres per year, and 200 acres of underburning, greenhouse gas emissions resulting from this project would be negligible. This conclusion is based on past experience on the Resource Area for average number of piles and tons of biomass per acre.

Greenhouse gas emissions from the proposed action would be so small as to be negligible on a U.S or global scale. The proposed action would result in greenhouse gas emissions that would constitute 0.000002159% of current total of the U.S. emissions and 0.000000364% of the current global emissions per year.

3.2 Soils and Hydrology

3.2.1 Affected Environment

Methodology
While the project area is the entire Grants Pass Resource Area, the scale for this effects analysis is the 6th field watershed as projects will generally occur within widely distributed 6th field watersheds, and any effects are expected to be noticeable at that level. The 6th field watershed scale is appropriate because individual projects are expect to generally fall within these boundaries and effects are not expected to occur outside the 6th field watershed.

The Medford District Resource Management Plan (USDI 1995) assessed the effects of projects at the 5th field watershed scale and relies on Best Management Practices (BMP's) to comply with

the Federal Clean Water Act. BMP's are considered the primary mechanisms to achieve Oregon water quality standards (RMP p.151).

Assumptions
For purposes of this analysis, we assume that private lands would remain in an early to mid-seral condition with high densities of roads. We also assume that private lands may use ground-based logging methods on highly erosive soils, resulting in greater risk of erosion.

Introduction
The Grants Pass Resource Area is approximately 965,785 acres, 240,000 acres of which are managed by the BLM, and consists of seventy-four 6th field watersheds. Watershed analyses and Watershed Assessments (USDI and USDA) provide general water resources background information for the Resource Area.

Mining, timber harvest, road construction, agricultural use and residential development have degraded water quality from the reference condition. Residential use will most likely continue to increase and occupy agricultural lands which will in-turn increase water use from the ecosystem. Timber harvest on public lands will follow current forest plans, and road densities will decrease. Timber harvest on many of the private lands will continue to employ clearcut harvest systems, which will continue to degrade water quality. Logging on private timberlands will require high densities of natural surface roads. Water quality can be partially rehabilitated by implementing BMPs and following NWFP management guidelines on public lands.

The ability of BLM to improve hydrologic function and resultant effects on fisheries is limited because the predominant factors contributing to the detrimental conditions in the streams are not subject to BLM's control or even influence.

Geology
The Grants Pass Resource Area lies entirely within the Klamath Mountains Geologic Province (USDA and USDI 1995). The watersheds contain some of the oldest (150-250 million years) and most complex geologic assemblages along the West Coast (ARWC 1994). The Klamath Mountain province is a very old accretion of volcanic, ocean crust and sedimentary rocks that have undergone intense tectonic activity, altering their physical and chemical characteristics. The oldest rocks are to the east, with successively younger rock belts to the west. Older rocks include the metamorphosed volcanic and sedimentary rocks of the Applegate group and associated ultramafic peridotites and serpentine. Younger formations in the watershed include metamorphosed rocks of the Rogue and Galice Formations.

Soils
<u>Erosion Potential</u>
Soils derived from the ultramafic (or serpentine) parent rock (Table 6) on slopes greater than 55% have the most extreme risk of erosion as well as metamorphic rocks on slopes above 55 percent. Most of the ultramafic soils are found in the southwest portion of Resource Area in the Upper Illinois River watershed, with other large areas north of Grants Pass and west of Merlin. Other soils with steep slopes (>35%) are also considered to be high erosion risks.

Table 6. Serpentine Soils within the Grants Pass Resource Area

Soil Unit Name	Parent Material
Cornutt-Dubakella Complex (19E, 20F, 21F)	Cornutt: mixed ultramafic rock and altered sedimentary and extrusive igneous rock. Dubakella: serpentine and peridotite.
Dubakella- Pearsoll Complex (29F)	Dubakella: serpentine and peridotite. Pearsoll: serpentine and peridotite.
Perdin cobbly loam (59F, 60F)	Serpentine and peridotite

Productivity

Soils of particular concern are the serpentine influenced Cornutt-Dubakella. Dubakella, with its clayey subsoil, is susceptible to disturbance / compaction due to high seasonal moisture content just above the subsoil that limits bearing capacity. Because of less dense and slower growing vegetation, the serpentine soils have thin duff and litter layers, which would normally protect the soil from rainfall impact and absorb some of the surface runoff. Therefore, serpentine soils have a greater risk for erosion. Dubakella and Pearsoll soils are also susceptible to slumping when roads are constructed on steep slopes. Combined Cornutt-Dubakella can be susceptible to mass movement, sliding and slumping though slopes are not steep.

The Dubakella and Pearsoll soils, derived from ultramafic rock, are moderately deep and well drained. They have low productivity because many plants cannot grow in serpentine soils. Those plants that can grow on these soils may be stunted and plant distributions are sparse relative to other soil types. The Cornutt series is formed from sedimentary and igneous rock but contains ultramafic material which reduces productivity.

Derived from sedimentary and igneous rock, the Josephine and Speaker soils are deep and well drained, and therefore well suited for productive mixed conifer forests. Vegetation composition on the Josephine and Speaker soils consists mainly of Douglas fir, Ponderosa pine, madrone, shrubs and grasses.

The Josephine, Cornutt-Dubakella, and Pollard soil units may be compacted if wet when heavy equipment is used; designated skid trials are recommended to minimize compaction (USDA 1983). Additionally, the Cornutt-Dubakella soil contains 30% serpentine derived soil, which is susceptible to slumping on slopes greater than 35%.

Surface Water and Peak Flows

The Grants Pass Resource Area has a Mediterranean climate with cool, wet winters and warm dry summers. Precipitation is highly variable with the climate becoming much drier as one proceeds from west to east across the Resource Area. Precipitation ranges from approximately 32 inches in the northeastern portion to 64 inches in the northwestern portion. Above 4,500 feet, snow accumulates for 3 to 4 months a year, usually melting by April or early May. Within the transient snow zone (TSZ) elevation, generally 3000-4500’, rapid snow melt and/or rain on snow events occur frequently. The lack of late season snow pack yields low to intermittent baseflows. In addition, because of the steep topography, water moves very efficiently through the watersheds into the main streams. Table 7 shows the acreage of each precipitation zone in the Grants Pass Resource Area.

Table 7. Percentage of Grants Pass Resource Area within the Transient Snow Zone

Acres by Precipitation Zone			Percent in Transient Snow Zone
Rainfall Zone	Transient Snow Zone	Snow Zone	
619,000*	236,000	33,000	26%

*Rounded to nearest thousand

Surface waters have been fully appropriated in the Resource Area. Exacerbating the effects of surface water diversions on baseflows are groundwater withdrawals for domestic and irrigation use. In these instances, ground water is removed that would have flowed subsurface, discharging into streams.

Although peak flow events are normally considered climatically controlled, watersheds with a considerable amount of area in the TSZ can cause flooding if heavy rain and warm temperatures occur simultaneously after snow has accumulated ("rain on snow" events). Management activities or natural disturbance events may exacerbate these “rain-on-snow” events. Peak flows of record such as the 1964 and 1974 flood events resulted from rain on snow events. The winter of 1995 experienced a 5 to 10 year flood event because of rain falling on a moderate snow pack.

Based on experimental studies at the catchment scale, Grant et al. (2008) indicate that when 29% of an area is harvested in the rain-dominated hydroregion, detectable effects on peak flows in watersheds with roads begin to appear. Grant et al. (2008) point out that this is the theoretical result based on response lines that represent conservative estimates of maximum and mean measured increases in peak flow for a given percentage harvest and can be used to evaluate the potential for hydrologic response to management treatment. Furthermore, the mean line is biased toward higher values, as reported zero values are not included in the calculation. In fact, the first detectable reported value occurs at 40%. The response line for mean reported change crosses the detection limit at 45% harvest. The mean response line suggests a 40% thinning over 100% of the area could be predicted to result in a detectable peak flow increase of approximately 14% in a TSZ watershed and would be under the detection limit in rain-dominated watersheds.

Moore et al. (2005) concluded that peak flow change does not appear to be related in any direct way to the percentage of basin area cut or basal area removed. The magnitude of peak flow increases declined with increasing event magnitude in most cases, with the greatest increases typically associated with autumn rain events on relatively dry catchments. These events resulted in small peak flows with little hydraulic consequence (Moore et al. 2005). Grant et al. (2008) found that zero percent or no significant change in peak flow is reported from 25-100% harvested in both the rain and transient zones. Trees, roots and woody debris on floodplains increase hydraulic resistance and may decrease velocities of both water flows and flood waves (Darby 1999). At the stand level, rain-on-snow processes have been found to vary with both stand age and patch size (Harr and Coffin 1992). Grant et al. (2008) saw less evidence supporting patch age and size contributing to peak flow effects for watersheds in the rain zone. Peak flow effects on channel morphology can be excluded in high-gradient (slopes >0.10) and bedrock reaches, and are likely to be minor in most step-pool systems (Grant et al, 2008).

Stream Channel

The Grants Pass Resource Area consists of steep (45-70%) mountainous slopes surrounding a relatively flat valley bottom. Total stream length in the Resource Area total just under 7,100 miles. Of this, just under half are classified perennial (Table 8). Most of the streams are Rosgen classification A3a+, which indicates that they are steep, narrow, entrenched channels with predominantly cobble substrate. This is the result of rapid flowing water carrying away the gravel, sand, and clay components. Class B1 and B2 streams occur at the toe slopes of the mountains where the stream gradient lowers. In these areas, the channel widens with some smaller floodplain sideslopes but maintains a moderate width/depth ratio. These channels are also moderately entrenched with stable banks. Most BLM streams are located in narrow floodplains or canyons.

Roads, agriculture and development have appreciably altered the watersheds within the GPRA. Loss of floodplains and riparian vegetation in combination with large flood events (1964, 1974, and 1997) led to accelerated erosion. The condition of the riparian zone on federal lands varies from intact late-successional stands in parts of the upper portions of the watershed to narrow bands of hardwoods.

Stream cleaning and timber harvest activities reduced the occurrence of large woody material (LWM) in streambeds and eliminated the potential for future LWM by removing some conifers in the riparian zones. Recruitment of LWM in stream channels in the near future is low. Large woody material provides nutrients to riparian areas and streams, nutrients for terrestrial and aquatic insects, habitat, shade, and food for fish.

Table 8. Stream miles, by type, in the Grants Pass Resource Area

Perennial	Intermittent	Ephemeral	Total
3,277	1,509	2,309	**7,095**

Water Quality

The BLM, in cooperation with the Forest Service, ODEQ, and the Environmental Protection Agency, is implementing the *Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters* (USDA and USDI 1999). Under the Protocol, the BLM will protect and maintain water quality where standards are met or surpassed, and restore water quality limited waterbodies within their jurisdiction to conditions that meet or surpass standards for designated beneficial uses. The BLM will also adhere to the State Anti-degradation Policy (OAR 2005; 340-041-0004) under any proposed actions.

The fish, amphibians, and invertebrates that are native to this watershed require abundant cool, non-polluted water. The domestic and organic agriculture users require abundant non-polluted water, and the conventional agricultural users require abundant water.

The Oregon Department of Environmental Quality (ODEQ) listed several streams , on the water quality limited list from Section 303(d) of the Clean Water Act (Appendix E) for elevated stream temperatures as well as dissolved oxygen, which is related to temperature. Stream temperatures in these watersheds were elevated for following reasons: reduction in stream shade through the removal of riparian vegetation from logging, settlement, and road building; water withdrawal for irrigation and domestic use during the summer low flow period; simplified channels with high

width/depth ratios from the removal of large wood from streams; large areas of stream scoured to bedrock due to the removal of large wood; and past mining in stream channels. These human disturbances, along with natural causes such as climate and geology, have resulted in stream temperatures above the ODEQ summer standard of a maximum of 64°F. Riparian Reserve implementation would maintain or reduce water temperatures of perennial streams (USDI 1994).

3.2.2 Environmental Consequences

Alternative 1: No Action

The existing condition is the result of past actions and natural events that have occurred in the Grants Pass Resource Area. Past actions have resulted in watershed conditions such as elevated stream temperatures, fine sediment above background levels, reduced flow and simplified stream channels. Timber harvest and road building are the main actions that have resulted in these conditions. Other contributors include mining and urban/rural settlements, although the latter tends to occur lower in the watersheds. Urbanization and commercial logging are expected to continue throughout the private and lower portions of the watersheds.

Alternative 1 should not be viewed as a "static" alternative. Under the No Action Alternative, fuel reduction projects would occur, but a programmatic analysis expedites project implementation. Consequently, the amount of acreage that would be treated would be less, and, over much of the Resource Area, current conditions and trends would continue. Many activities and changes to the lands located within the project area will continue to occur throughout the project area even if the No Action Alternative were selected. Under this alternative, there would be no direct effects from ground disturbance on water quality or quantity based on BLM actions. It is understood that the private and non-BLM government agencies would perform actions that would change the landscape.

Fuel treatments would take place as part of other projects but areas that are currently overstocked could result in a high severity burn if a fire occurred. High severity burns damage soils by removing the entire duff layer. Often, the intensity changes the soil structure. Severe fire can cause changes in successional rates, alter species composition, volatilize nutrients, produce rapid or decreased mineralization rates, alter Carbon:Nitrogen ratios, and result in subsequent nutrient losses through accelerated erosion, leaching or denitrification. In addition, changes in soil hydrologic functioning, degradation of soil physical properties, decreases in micro- and macrofauna, and alterations in microbial populations and associated processes can occur (Scott and Van Wyk, 1990; Neary, *et al*, 1999). High intensity fires in the riparian zone would greatly decrease stream shade and large wood recruitment potential. This condition would persist but gradually improve over the ensuing 60+ years.

Alternative 2: Proposed Action

Within 5 years of the signing of the first decision record for this project, strategic roadsides, ridgeline treatments, and BLM managed parcels encompassing natural fuels in the WUI would be treated under this action alternative. The fuel hazard reduction treatments proposed to achieve the project objectives are: selectively thin conifer trees less than 12 inch DBH and hardwoods less than 12" DBH on BLM land. Within the 5 year time period of the EA, approximately 1,000 to 1,500 acres per year, not to exceed 7,000 acres, would be treated. Treatments would include a mix of thinning, slashing, biomass removal, mastication, handpiling and burning, and underburning depending on site specific conditions.

Activities proposed would meet the Clean Water Act by applying BMP's listed in Appendix D of the ROD/RMP (USDI 1995, p.151-178). The following factors would moderate the effects of broadcast burning and underburning in order to stay within the recommended guidelines for light to moderate burns in the 1995 ROD/RMP (p.169):

- Low elevation shrubs and grasses contain relatively small diameter fuels (3 to 6 inches) which equates to shorter fire durations.
- Relatively flat linear topography (0 to 35 percent slopes) means flames are farther from the soil surface than on steep slopes.
- Broadcast burning would occur in the winter or spring, when the soil and duff layer moisture content is typically elevated.
- Strip-head firing[1] and backfiring lighting techniques can reduce fire intensities by burning out areas with higher fuel loadings prior ignition or by strip ignition patterns.
- No broadcast burning would occur on Category 1(highly sensitive) soils (1995 ROD/RMP, p.168)

Tractor and cable yarding are the two treatment methods the BLM is proposing to use in this project. For slopes less than 35%, mechanized, low ground pressure machinery would cut, skid, haul or chip biomass. On slopes over 35%, biomass would be cable yarded. Ground based methods would utilize existing skid trails whenever possible. When this is not possible, we will require the designation of skids trails, spaced approximately 75 feet apart.

Periodic, low intensity underburns following initial fuel reduction would maintain desired fuel conditions. Maintenance burning throughout the project area would need to be done about every 7-15 years in areas classified as fire regime 1 and every 10-30 years for areas in fire regime 3.

Overstory vegetation would not be treated as part of the hazardous fuels reduction project so there would be no effect to stream temperature because canopy closure would be maintained. Maintenance of the riparian vegetation in the 60-foot no-treatment buffers along perennial streams would retain stream shade and, therefore, maintain stream temperatures.

The benefits from the Action Alternative (Table 9) would be reduced high intensity wildfires, development of late-successional stands that, in the riparian areas, would provide for large woody debris and increased stream shading. For soils (Table 10), the reduction in high intensity fire risk would reduce the likelihood that the organic layer would be completely removed and the surface layer would become hydrophobic. The use of large equipment to remove trees on tractor ground could result in isolated patches of compaction but the use of PDFs will ensure that soil compaction will be greatly reduced.

Table 9. Comparison of Effects on Hydrology from All Alternatives

Issue: Hydrologic Condition (including water quality and quantity)	
Alternative 1 (No Action)	**Alternative 2**
There would be reduced fuel treatments and associated roadwork. Therefore, the watershed would maintain the current risk of sedimentation and peak flow increases especially because of a wildfire. Road drainage would not improve; no reduction to the risk of peak flow increases or sedimentation. Peakflows, baseflows, and water yields are all at risk to be affected by a large intense wildfire. These effects could cause reductions in water quality and alter stream channel geometry downstream in the watershed, potentially having long-term effects.	The likelihood of a high intensity wildfire is reduced. If a wildfire did occur, the burn severity on these acres would be reduced which would minimize the impacts to water resources. Increased stand development would allow for future recruitment of large woody debris into streams from surrounding landscape. This would also increase shade from the secondary shade zone outside the riparian area.

Table 10. Comparison of Effects on Soils from All Alternatives

Issue: Soil Condition	
Alternative 1 (No Action)	**Alternative 2**
There would be reduced fuel treatments and associated roadwork. Therefore, the watershed would maintain the current risk of a wildfire. There would be no additional compaction.	Reduced likelihood of a severe fire thus protecting soils from developing water repellency and destruction of the soil's biotic community. Short term soil productivity loss due to consumption of soil duff during handpile and underburning. Isolated pockets of compaction during movement of equipment and mastication.

Road Work

The BLM and DEQ have signed a Memorandum of Agreement, which holds the BLM responsible to protect, restore and maintain water quality. PDF's (see section 2.3) would not permit wet season hauling depending on weather, road surface, drainage and soil moisture. Furthermore, roads that route surface flow to streams will be improved during any maintenance required for hauling of biomass. Ditch maintenance would occur where improperly functioning ditches are currently routing water onto the road. Skid roads would be water barred as needed for slope and soil type and only used during the dry season. Any skid roads in a riparian reserve used over several seasons will be winterized during seasons of non-use.

The proposed road work includes maintenance and renovation necessary for hauling of biomass. We expect a short term input of sediment to stream channels from any road maintenance proposed under the action alternative. Sediment production from forest roads declines substantially with time. A study of 74 road segments with road surfaces graded in western Oregon found 70% recovery by the second year and 90% recovery by the third year (Luce and Black 2001). Road maintenance would reduce sedimentation in the long term, benefiting water quality and reversing increases in overall sedimentation from past activities.

Ditch maintenance would occur where improperly functioning ditches are currently routing water onto the road. Ditch clearing would not occur within 50-100 feet of stream crossings, and in most situations would not occur between the last relief culvert and stream crossings. Maintaining distance between ditch clearings and the crossing reduces potential delivery of sediment to the channel system because the armoring layer is not broken and vegetation in the ditch acts as a filter. The recovery from ditch blading occurs rapidly during the first three years in an exponential pattern (Luce and Black, 2001). The short term inputs from maintenance may create isolated pockets of fine sediment deposition immediately below culverts (5-100 feet). During high flows, the introduced sediment will become an immeasurable fraction of the system sediment load; it would not be detectable at downstream locations. A long term reduction in sedimentation and improved flow routing would be expected following road drainage improvement and decommissioning planned in the project.

Temporary spurs, skid trail crossings and road maintenance would incrementally add fine sediment to the channel network. However, during typical winter peak flows, which initiate suspended and bedload sediment transport, the activity generated sediment would be inconsequential. The estimated erosion rate under the California Forest Practice Rules was about one-tenth of that estimated for an adjacent tributary of Redwood Creek as a result of timber operations utilized before 1976 (Best et al. 1995). The BLM's PDFs are similar to California's rules. Periodic grading is important for maintaining the roadbed and preventing the formation of ruts, which can increase the road erosion rate by concentrating overland flow. Grading breaks up the armor layer and increases the loose sediment availability on the road, temporarily increasing the erosion rate. However, Megahan (1974) found that the decline in sediment yield after grading follows an exponential decay curve similar to that which occurs after road construction so that yields in the second and third years are typically many times lower than in the first year. All temporary spur roads would be constructed and obliterated in the dry season. Temporary roads would be winterized by installing water bars or water dips, seeding, mulching and surfacing the road. Roads would be replanted after obliteration.

Based on experimental studies at the catchment scale, Grant et al. (2008) indicate that when 29% of an area is harvested in the rain-dominated hydroregion, detectable effects on peak flows in watersheds with roads begin to appear. The type and extent of vegetation management that will occur as a result of this EA will be limited to small diameter and understory removal. This will not create large openings, and probably not even small openings except for any areas that would be oak woodland or meadow restorations, thus will not be adding to the percent harvested in a watershed. Consequently, we do not expect detectable increases in peak flows.

Fuels Treatments

Fuels treatments are proposed for the riparian reserves of both perennial and intermittent streams. Prescriptions in the riparian are designed to be consistent with objectives for ecosystem function,

including no reduction in streamside shade or large instream wood recruitment as only smaller diameter trees would be cut. Activity and natural fuels would be treated to reduce the fuel hazard and risk of severe wildfire. Fuel treatments include handpiling / burning, slashing, and underburning. Hand piles would not be burned within 50' of stream channels. Mechanical treatments and prescribed burning in riparian reserves would occur outside of no treatment zones.

Over time, the riparian reserve treatments would eventually result in late-successional forest conditions with increased structural diversity, canopy, and large woody debris recruitment, and improved stream complexity and water quality. This would occur at a faster rate than under the No Action alternative.

Small woody material would be consumed during prescribed burning, but LWM would remain largely intact. The low intensity prescribed fires have a very low risk of mortality to large overstory trees or the consumption of snags. Therefore, future recruitment of LWM and streamside shade would not be reduced due to prescribed fire in the riparian reserve. Although these piles burn down to mineral soil, sediment would not migrate beyond the unburned litter around the pile. Following underburning, the potential for sediment and ash transport is low because of the unburned strip of vegetation and organics along streams and the mosaic pattern of unburned vegetation outside the no treatment zone; therefore, no sediment routing mechanisms would be created. The potential for sediment transport resulting from these burns would coincide with intense rainfall and high winter flows and would not be distinguishable from baseline sediment loads.

While turbidity may increase under certain conditions in the first year following activity, there would be no alterations to channel form (width to depth ratios, pool reduction, embeddedness) or to channel processes (floodplain connectivity, stream flow velocity, pool and bar formations). Erosion rarely occurs uniformly in a forested watershed because surface erosion depends primarily on extent and continuity of bare areas; soil loss is usually slight. Longer term sedimentation is not expected due to site rehabilitation (i.e.: skid trail decommissioning, ditch cleaning, etc.) and ceasing of log truck traffic immediately following treatments. The channels would maintain themselves regardless of activity. There would be no alteration to sedimentation processes, which would create chronic adverse water quality or channel conditions.

Tractor and cable yarding are the two treatment methods the BLM is proposing to use in this project. Generally, tractor causes the most ground disturbance, followed by cable. Increased erosion and subsequent sedimentation is possible with ground-disturbing activities such as tractor yarding. Tractor yarding causes ground disturbance by removing vegetation and duff, thereby exposing soils to rainfall and subsequent erosion. Tractor yarding also physically displaces soils, resulting in potential erosion and subsequent off-site sedimentation. A buffer width of 100-200 feet is sufficient to prevent most sediment from reaching streams (A.C. Kindig and Cedarock 2003). For treatments that remove POC, there will be no stream buffer, but the diameter limit and the yarding PDF's will limit potential sediment sources.

Cable yarding corridors, if sufficiently compacted (≥25 cm depth) may route surface water and sediment into streams. The susceptibility of soil to compaction depends strongly on the soil moisture content, soil organic matter content, soil type, number of passes, the load applied, and the characteristics of the equipment applying the load. Most of these factors are dynamic and

depend on the operation making it difficult to evaluate the contribution of each factor (Williamson & Neilson, 2000). Even if the soils were compacted, high levels of residual slash left on the yarding corridors would reduce runoff by deflecting and redistributing overland flow laterally to areas where it would infiltrate into the soil. Limbs, tops, and brush would be scattered on the site and yarding corridors would be grass seeded where necessary to prevent erosion and aid infiltration. Yarding equipment would be restricted to existing roads to reduce soil compaction and yarding and hauling would be restricted to periods of low precipitation and soil moisture.

Implementation of any alternative would not reduce streamside shade within any stream reach and the project would not reduce large wood recruitment potential because standard stream buffers and reserves would be utilized. Since there would be no reduction in streamside shade, the project would not cause an increase in water temperature, thus complying with the state of Oregon's anti-degradation policy for the water bodies in the project planning area listed as water-quality limited for stream temperature. Tree growth rates would increase in response to density reduction decreasing the time required to achieve stand structure with potential to deliver large instream wood. Potential erosion from riparian disturbances would be minimized, short term, and not result in stream channel modification.

At the 6th field watershed level, there is a low risk of changes in peak flow due to harvest in the TSZ because the project is thinning only and there would be no openings created. Research (Beschta et al. 2000; Harr et al. 1979; Harr et al. 1975; Jones 2000, Thomas and Megahan 1998, Ziemer 1981) has found that consistent detectable changes to stream flow from timber harvest occurred only when greater than 25% of the watershed was in clear-cut condition. We expect thinning to have a much reduced influence on the streamflow regime compared to clearcutting. Rapid expansion of root systems and crowns of trees left after partial cutting or thinning would be expected to quickly reduce any changes in streamflow (Rothacher 1971).

Summary and Conclusions

Hazardous fuels treatments would be spread across the landscape of thirteen fifth field watersheds and treatments would be completed over a 5-year time period. Distributing hazardous fuels treatments over time and space would minimize cumulative effects by allowing vegetation to recover in one area while treatment occurs in another.

Burn piles typically average 50 piles per acre with the average pile size being approximately 36 square feet, which equals approximately 4 percent of the total of all burn pile unit acres. Due to the wide distribution and small size of the burn piles relative to the total amount of acres in the Resource Area, the BLM expects cumulative effects on soil erosion at the sixth field watershed or larger scale would be undetectable; a maximum of 1,700 acres are expected to be treated in any one 5th field watershed during the 5-year span of this project. Spatial and temporal isolation would allow for more biological interaction between the small islands of impacted soil and the surrounding matrix of undisturbed areas. This helps to promote and accelerate recovery in soil productivity when compared to one large burn area of the same size.

3.3 Fisheries / Aquatic resources

3.3.1 Affected Environment

Species found in the Grants Pass Resource Area include Chinook salmon, coho salmon, steelhead trout, resident rainbow trout, resident cutthroat trout, Pacific lamprey and sculpin. The Southern Oregon / Northern California Coasts (SONCC) coho salmon (*Oncorynchus kisutch)* ESU (Evolutionarily Significant Unit) was federally listed as threatened on May 6, 1997 (Fed. Reg./Vol. 62, No. 87). The Southern OR / Northern CA Coastal Chinook (*Oncorynchus tshawytscha)* ESU and the Klamath Mountains Province steelhead (*Oncorynchus mykiss)* ESU are BLM Strategic species. Strategic species are not considered special status species for management purposes and do not require management or mitigation (IM OR-2007-072).

Watershed analyses identify streams in the GPRA as limited in factors for salmon and trout production and survival including: inadequate amounts of Large Woody Material (LWM), inadequate pool depth, inadequate pool frequency (% occurrence of the total stream area), inadequate summer water flow, high water temperature, and too much fine sediment in the gravel of riffles. Data compiled by Rogue Basin Coordinating Council (2006), identified the majority of streams in the Rogue Basin limited in watershed health for temperature, sediment, channel modification and LWD.

Stream habitats and riparian areas have been degraded by road construction, timber harvest, urbanization, agricultural activities, mining, flood control, “stream cleaning”, and construction of dams (Hicks et al. 1991; FEMAT 1993, Conservation Biology Institute (2001)). Road construction has increased the drainage network of watersheds, created fish passage barriers at road-stream crossings, and increased delivery of fine sediments. Timber harvest has removed shade-providing trees, decreased recruitment of large woody debris, and increased delivery of fine sediments to streams. Mining of gravel and precious metals removed natural stream substrates, created tailing piles in riparian areas, and altered stream channels. Flood control projects straightened stream channels. Stream cleaning severely degraded steam channels by removing habitat elements such as boulders and large woody debris and increasing stream width-to-depth ratios. Construction of dams has blocked fish passage, altered natural hydrologic cycles, and interrupted bedload movement.

3.3.2 Environmental Consequences

The following analysis considers the likelihood that the No Action and the proposed action would affect fisheries and aquatic resources, and then assesses the potential magnitude, duration, and nature of effects. The proposed actions are evaluated on how they would change fish habitat, and for this reason, the fisheries analysis is linked closely to the soil and water effects analysis, which details the impacts on stream conditions. The effects on habitat are in turn used to evaluate the potential of the proposed actions to affect fish populations through production and survival.

Alternative 1: No Action

Current conditions and trends of channel processes and water quality, and therefore fish habitat, would continue. Currently, fish-bearing streams in the project area have poor quality rearing habitat limiting salmonid growth and survival, as stated above in the description of the affected environment.

Programmatic road maintenance would continue to reduce sediment sources. However, proposed road improvements to alleviate chronic sediment sources would not occur.

Alternative 1 would have no direct effect on summer stream temperatures. However, there would be an increased risk under this alternative of having a high severity wildfire in the riparian zone. A high severity wildfire would indirectly affect stream temperatures by reducing the amount of stream shade in large areas.

The loss of future LWM recruitment potential from a high severity wildfire in the riparian area would result in decreased pool frequency and depth, decreased stream complexity, and decreased salmonid growth and survival through reduced rearing habitat quality. Fish-bearing streams with inadequate levels of instream wood would continue to have low pool frequency and depth, little stream complexity, high stream velocities, and excessive bank erosion.

Alternative 2: Proposed Action

Road Work

The proposed road work includes maintenance associated with fuel hazard reduction treatments, and at levels requisite with level of biomass extraction and hauling. Road maintenance would reduce chronic sources of sediment through improved road drainage. Road maintenance has the potential to cause small inputs of fine sediments to streams immediately downstream of culverts, but the size and effects on fish would be so greatly reduced by implementation of PDFs (wet season restrictions, erosion prevention and sediment control measures) that these actions are not likely to alter fish habitat. Fish habitat would not be altered because the amount of sediment delivery would be so small it would not increase stream gravel embeddedness or deterioration in pool formation or quality.

Through PDFs and practices which minimize potential sediment routing to streams, activity-generated sediment in fish habitat would be undetectable. Salmonid survival and production would not be negatively affected because, as stated in the Soil and Water section, there would be no alterations to channel form (width to depth ratios, pool reduction, embeddedness) or channel processes (floodplain connectivity, stream flow velocity, pool and bar formations). There would be no alteration to sedimentation processes which would create chronic adverse water quality or channel conditions. Since there would be no negative effects of the channel conditions and processes, salmonid life stages (spawning, incubation, rearing) which depend on them would not be negatively affected.

Fuel Treatments

The riparian areas (outside of the 50’ no treatment buffer) of both perennial and intermittent streams are proposed for treatment. Fuel treatment prescriptions in the riparian are designed to be consistent with objectives for ecosystem function.

Riparian treatments would result in late-successional forest conditions at a faster rate than under the No Action alternative. Late successional forest conditions provide increased structural diversity, canopy, and large woody debris recruitment, and improved stream complexity and water quality. Salmonid production would increase as channel function improves, resulting in increased adult holding areas and improved gravel retention. Improved rearing habitat resulting from increased stream complexity would increase juvenile survival.

The hydrologic analysis did not identify any impacts to channels resulting from fuel treatments either within or outside of riparian areas.

PDFs would minimize the potential to negatively affect fish and aquatic habitat. Tractors and mastication machines would only operate in riparian areas that have slopes <35% and logs would be lined to existing skid trails in riparian reserves, which would be decompacted following use. Cable yarding would not be expected to result in erosive runoff because of PDFs to apply slash and grass seed to corridors. PDFs reduce treatments in the riparian to maintain canopy cover at 60%. Fifty foot no treatment buffers would maintain vegetation in the primary shade zone of perennial streams. Only small diameter (<12") trees would be cut in riparian reserves. There would be no reduction in streamside shade or large instream wood recruitment because the larger trees that provide shaded canopy and the best recruits for future large wood would be left in place. The use of these PDFs in treatments conducted in riparian areas would protect water quality by maintaining the shade necessary to avoid raising water temperatures in the stream segments passing through BLM lands, and by avoiding the creation of new sediment sources.

Activity and natural fuels treatments including handpiling / burning, slashing, and underburning, would be treated in the riparian of perennial and intermittent streams in order to reduce the fuel hazard and risk of severe wildfire as described in the No Action alternative. Mechanical treatments and prescribed burning in riparian areas would occur outside of no treatment zones.

Small woody material would be consumed during prescribed burning, but LWM would remain largely intact. The low intensity prescribed fires have a very low risk of mortality to large overstory trees or the consumption of snags. Therefore, future recruitment of LWM and streamside shade would not be reduced due to prescribed fire in the riparian. Hand piles would not be burned within 50 feet of stream channels. Although these piles burn down to mineral soil, sediment would not migrate beyond the unburned litter around the pile. Following underburning, potential for sediment and ash transport to fish habitat is low because of the unburned strip of vegetation and organics along streams and the mosaic pattern of unburned vegetation outside the no treatment zone. The potential for sediment transport resulting from these burns would coincide with intense rainfall and high winter flows and would not be distinguishable from baseline sediment loads. There would be no changes to the channel environment that would adversely affect fish or fish habitat.

Individual fish behavior would not be affected directly by the patchy low-intensity fires caused by controlled burning. Studies (Rinne 1996 and Gresswell 1999) have found that even in the event of extensive high severity wildfires, local extirpation of fishes is patchy and recolonization is rapid. In addition, severe effects to streams and aquatic communities were not observed immediately after fire, but rather after subsequent precipitation events washed exposed fine sediments into streams. The low-intensity of the fire and the small scale of treatments would minimize any changes in abundance of macroinvertebrates and would not cause a measurable change in survival.

Summary and Conclusions

The potential effects described above are negligible in this alternative because of the dispersed nature of the treatments (≤1,700 acres per 5th field watershed), and efforts to eliminate sediment delivery mechanisms and disturbance through PDFs (wet season restrictions, erosion prevention and sediment control measures). Riparian functions of streamshade and large wood recruitment

would be maintained and/or improved. There would be no increase in peak flows, no increase in erosion due to compaction, and no alterations in channel form or processes. Therefore, there would be no measurable changes to aquatic habitat at the 5th or 6th field watershed scales.

Private lands are assumed to continue to be harvested on a rotation schedule in accordance with ODF guidelines. Proposed hazardous fuels treatments would be spread across the landscape of thirteen fifth field watersheds and treatments would be completed over a 5-year time period. Due to the wide distribution and small size of the proposed treatment acres relative to the total amount of acres, the proposed actions would not result in negative cumulative effects to soil and water (See Section 3.4). Therefore, no cumulative effects to fish and aquatic habitats would be expected to result from the proposed action at the 5th or 6th field watershed scales.

In conclusion, based on this analysis of potential impacts, fuel hazard reduction including biomass removal would not be likely to disrupt normal behavior patterns such as migration, spawning, egg incubation, rearing and feeding. Habitat would not be degraded. The habitat would be expected to improve as late-successional forest develops in the riparian areas at a faster pace than would occur under the No Action Alternative. Additional LWM recruitment potential would result in increased pool frequency and depth, increased stream complexity, and increased salmonid growth and survival through better rearing habitat quality.

Aquatic Conservation Strategy (ACS)

The Aquatic Conservation Strategy developed and identified nine objectives to maintain and restore the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy is designed to protect salmon and steelhead habitat on federal lands managed by the BLM within the range of Pacific Ocean anadromy. The components of the ACS are *riparian reserves, key watersheds, watershed analysis, and watershed restoration* (1995 RMP p. 22).

Riparian Reserves

Riparian reserve widths conform to the interim widths prescribed in the Northwest Forest Plan (USDI, 1994. p. C-20). Fish bearing streams would have a riparian reserve width of 2 site potential tree heights, perennial and intermittent streams and springs would have riparian reserve widths of 1 site potential tree height. A 50 foot no treatment buffer would be applied to all streams and springs.

Riparian reserve treatments were proposed to achieve objectives as stated in the EA and RMP: "to maintain and restore riparian functions, provide benefits to riparian dependent and associated species, and provide for greater connectivity within a watershed. The current trend in overly dense small diameter riparian stands does not represent the desired future condition." (EA p. 18). Beneficial effects are addressed in the fisheries effects section (EA pp. 38-42).

Key Watersheds

There are five Tier 1 Key Watersheds in the Grants Pass Resource Area: Cave/Grayback Creeks, Indigo Creek, Silver Creek, Taylor Creek and Upper Sucker Creek. Projects may be within a key watershed (RMP p. 23). Key watersheds were designed to serve as refugia for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. Key watersheds include areas of high quality habitat and areas of degraded habitat. Those of low

quality habitat have high potential for restoration (RMP p. 22). Riparian reserve treatments were proposed to maintain and restore riparian function (EA p. 18)

Watershed Analysis
The actions proposed are consistent with recommendations made in Watershed Analyses including reducing fuel hazards and reaching late-successional forest conditions within the riparian at a faster rate than No Action.

Watershed Restoration
Riparian reserve treatments are proposed in areas where there is a build-up of fuels and a change to more dangerous fire-prone vegetative conditions. Shade tolerant and less fire resistant species have become established, replacing more fire adapted species, such as ponderosa pine, which are decreasing due to suppression of fire. The probability of a stand replacement crown fire is much higher now than a hundred years ago due to the increased surface and ladder fuels resulting from missed fire cycles (EA p. 3). Treatment would maintain or restore the species composition and structural diversity of plant communities, supporting riparian-dependent species. Anticipated instream benefits would restore channel complexity, promote long-term ecological integrity in the watershed and conserve the genetic integrity of native species. The physical integrity of the aquatic system is expected to improve with increased channel roughness and reduced water velocities (EA pp. 38-42).

The ACS was used as a guide to develop and refine treatments in the riparian reserves and in the watersheds. The ability of treatments to meet and promote the ACS objectives below is used to evaluate the project actions.

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.

The project would maintain and restore components of the watershed. No detectable cumulative effects were identified in the analysis of impacts to soil and water. Therefore, no cumulative effects to fish and aquatic habitats would be expected to result from the proposed action in this alternative at the project area, 6th or 5th field watershed scales (EA pp. 40-42).

The proposed actions would not likely disrupt normal behavior patterns such as migration, spawning, egg incubation, rearing and feeding. Habitat would not be degraded. The habitat would be expected to improve as late-successional forest develops in the riparian reserves (EA pp. 40-42).

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.

The project would not affect the watershed connections. The proposed road improvements would provide a benefit through reduction of sediment delivery and would

not be likely to degrade habitat or to negatively affect salmonids' life history requirements such as migration, spawning, egg incubation, rearing and feeding (EA pp. 40-42).

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

It is anticipated that the short term beneficial effects from road maintenance will maintain downstream salmon survival and production. Long term beneficial effects from road activities include sediment reduction, improving road conditions for peak runoff flows, and better water drainage. There would be no increase in peak flows, no increase in erosion due to compaction, and no alterations in channel form or processes (EA pp. 40-42).

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.

Water quality will be maintained as would the biological, physical, and chemical integrity of the system. Riparian functions of streamshade and large wood recruitment would be maintained and/or improved. (EA pp. 40-42).

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.

Objective 5 would continue to be met as sedimentation would be highly localized and short term in duration. Sediment would be maintained within a range that would be expected to occur in the natural sediment regime. There are no expected changes to the timing, volume, rate, and/or character of sediment input, storage, and transport at the local or watershed scale. Improved roads would decrease fine sediment input to the system. (EA pp. 35-38).

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

There is a low risk of changes in peak flow due to harvest in the TSZ because the project is thinning only and there would be no openings created (p. 38).

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

As there are no anticipated changes to water flow, channel structure or conditions, and reduction of sedimentation, the project would have little or no effect on timing,

variability or duration of floodplain inundation or water table levels at both the project and watershed scale (EA p. 37).

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.

Riparian reserve treatments are proposed in areas where there is a build-up of fuels and a change to more dangerous fire-prone vegetative conditions. (EA p. 3). Over time, the riparian reserve treatments would eventually result in late-successional forest conditions with increased structural diversity, canopy, and large woody debris recruitment, and improved stream complexity and water quality (EA p. 37).

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

Riparian reserve treatments are proposed in areas where there is a build-up of fuels and a change to more dangerous fire-prone vegetative conditions (EA p. 3). Over time, the riparian reserve treatments would eventually result in late-successional forest conditions with increased structural diversity, canopy, and large woody debris recruitment (EA p. 37).

3.4 Roads and Transportation Systems Management

3.4.1 Affected Environment

The Grants Pass Resource Area is approximately 965,785 acres and consists of seventy-four 6th field watersheds. Watershed analyses and Watershed Assessments (USDI and USDA) provide general water resources background information for the Resource Area. Road density and types of roads are variable across the watersheds.

Most BLM roads in the GPRA were constructed for mining and timber activities and improved for timber management objectives. From the 1960s through the 1980s, roads were mostly maintained in conjunction with timber haul. Beginning in the 1990s, however, reduced timber hauling and funding for road maintenance has caused some road maintenance activities to be deferred.

Road conditions vary depending on road surface type, use, location, weather, maintenance cycle, and soil type. Some roads are maintained on a regular basis for emergency use, others are allowed to naturally revegetate.

3.4.2 Environmental Consequences

Alternative 1: No Action

The No Action alternative would have no effect on road density. The No Action alternative would continue to leave BLM roads without repairs until cyclic maintenance can be

accomplished. Erosion and sedimentation on those roads would continue as time goes on emergency access will be deteriorated.

Alternative 2: Proposed Action

Road Density

Road renovation throughout the Grants Pass Resource Area BLM system roads would not increase the existing road density.

Road Improvements and Deferred Road Maintenance

Renovation of roads for necessary for implementation of this project would improve existing roads, facilitating drainage and reducing risk of sediment transfer. Roads will receive some maintenance, commensurate with level of use for project activities, thus reducing deferred road maintenance and also improving driver site-distance. Road renovation and improvements would have minimal short term erosion and sedimentation, but in the long term would decrease the amount of erosion and sedimentation from current road conditions improving access for emergencies

3.5 Wildlife

3.5.1 Affected Environment

Only federally listed and Bureau Sensitive species known or suspected to be present within the planning area and impacted by the proposed actions are addressed in this EA. Appendix B provides additional information on special status species known or suspected to occur within the GPRA.

Threatened and Endangered Species

The GPRA is within the range of various Listed or Candidate Species. However, only the following Listed or Candidate T&E terrestrial wildlife species may potentially be impacted by the proposed action: northern spotted owl, marbled murrelet and fisher.

Northern Spotted Owls

Spotted owls are closely associated with old forests for nesting, foraging, and roosting throughout most of their range (Forsman et al. 1984; Carey et al. 1990; and Solis and Gutierrez 1990). Suitable spotted owl nesting, roosting, and foraging habitat (NRF), habitat is characterized by forested stands with older forest structure, multiple canopy layers, and a canopy closure of 60 percent or greater. The best quality NRF habitat has large old trees with cavities, broken tops or mistletoe platforms, large branches, large dead standing and fallen decayed trees, and multiple canopies of shade tolerant hardwoods and conifers that support prey base. NRF habitat also functions as dispersal habitat. “Dispersal-only” habitat for spotted owls is defined as stands that have a canopy closure of 40 percent or greater, and are open enough for flight and predator avoidance. Unsuitable habitat does not currently meet the NRF or dispersal-only habitat criteria. Spotted owl NRF and dispersal-only habitat, as well as unsuitable habitat exists in a mosaic pattern across the GPRA. As of August, 2008 (D. Assali, 08/08), GIS modeling depicts 51 percent of all GPRA BLM ownership is NRF habitat, and 14 percent is dispersal-only habitat. Since NRF also functions as dispersal, 65 percent of all the GPRA BLM lands support dispersal (USDI 2008).

Spotted owls subsist on a variety of mammals, birds, reptiles, and insects, with small mammals such as the flying squirrel, red tree voles and dusky-footed woodrats making up the majority of the food items throughout the range of the species (Solis and Guitiérrez 1982, Forsman et al. 1984, Barrows 1985). Spotted owl diets have been shown to vary regionally, annually, seasonally, and locally, which is likely in response to prey fluctuations and availability (Courtney et al. 2004). In southwest Oregon and across the GPRA, spotted owls prey primarily on dusky-footed woodrats and flying squirrels (comprising an average of 48.5% and 30.2% of all prey biomass respectively) (Forsman et al. 2004).

The GPRA has identified approximately 130 owl sites within the GPRA from historic information, protocol surveys, incidental observations, or owl estimation models. Very limited surveys have been done on the GPRA in the past 15 years, since pre-project protocol owl surveys are not required (USDI 2008).

The final rule for Revised Designation of Critical Habitat for the northern spotted owl was published by the US Fish and Wildlife Service (the Service) in the Federal Register and became effective on September 12, 2008. Critical Habitat includes the primary constituent elements that support nesting, roosting, foraging, and dispersal. Designated critical habitat also includes forest land that is currently unsuitable, but has the capability of becoming NRF habitat in the future. There are 188,716 acres of spotted owl CHU within the GPRA (USDI 2008). Any treatments in CHU will be compliant with any restrictions under the CHU designation and with USFWS consultation.

Marbled Murrelet

Marbled murrelet suitable habitat includes the conifer-dominated stands generally 80 years old or more with trees averaging ≥18 inches in diameter at breast height (DBH). Potential marbled murrelet nest trees occur within 50 miles (81 kilometers) of the coast (USDI 1997) and below 2,925 feet in elevation (Burger 2002). Murrelets nest in one of four tree species: western hemlock, Douglas-fir, Sitka spruce, or western red cedar (Nelson and Wilson 2002). Nest trees are ≥19.1 inches DBH and greater than 107 feet in height, have at least one platform 5.9 inches or more in diameter, contain nesting substrate (e.g., moss, epiphytes, duff) on that platform, and have an access route through the canopy that a murrelet could use to approach and land on the platform (Burger 2002; Nelson and Wilson 2002). Nest trees have a tree branch or foliage, either on the tree with potential structure or on a surrounding tree, which provides protective cover over the platform (Nelson and Wilson 2002). Marbled murrelets use large riparian areas for travel and they fly up rivers from the sea to the forest sites where they nest (Richardson 2004). Even though a small portion of the GPRA is within the potential range of the marbled murrelet, there have not been any observations of marbled murrelets or murrelet nests within the GPRA.

Critical Habitat for the marbled murrelet was designated by the USFWS on May 24, 1996 (61 FR 26256), and includes the primary constituent elements that support nesting, roosting, and other normal behaviors that are essential to the conservation of the marbled murrelet. The Service published the proposed revised Critical Habitat for marbled murrelets on July 31, 2008. (Federal Register Vol. 73, No. 148, July 31, 2008, 44678-44701). There are approximately 6,020 acres of marbled murrelet CHU within the GPRA.

Fisher

The Pacific fisher was 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 (Federal Register Vol. 69, No. 68, April 8, 2004, 18769-18792). 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" (Federal Register Vol. 71, No. 176, Sept. 12, 2006, 53777). 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.) The species remains a USFWS candidate species (USDI, USFWS 2004, 2006).

Fishers are closely associated with low to mid elevation (generally <4,000 feet) forests with a coniferous component, large snags, or decadent live trees and logs for denning and resting, and complex physical structure near the forest floor to support adequate prey populations (Aubry and Lewis 2003). Powell and Zielinski (1994) and Zielinski et al. (2004) suggest that habitat suitable for denning and resting sites may be more limiting for fishers than foraging habitat. Suitable fisher denning and resting sites include the following key habitat requirements: high canopy cover, multi-storied stands, large snags, and large down trees on the forest floor. Several studies have shown that fishers use riparian areas (Jones 1991; Aubry and Houston 1992; Seglund 1995; Dark 1997; Zielinski *et al.* 1997). According to Seglund (1995), riparian areas are important to fishers because they provide important habitat elements, such as broken tops, snags, and coarse woody debris (Federal Register Vol. 69, No. 68, April 8, 2004, 18769-18792).

Suitable fisher denning and resting habitat exists on BLM lands within the GPRA. Suitable spotted owl NRF habitat described above also adequately describes suitable fisher denning and resting sites as they have similar key habitat requirements (high canopy cover, multi-storied stands, large snags, and large down trees on the forest floor). Based on the current GPRA spotted owl NRF baseline analysis, approximately 51 percent of the GPRA could be considered suitable fisher denning and resting habitat. However, all of these acres may not provide optimal fisher habitat because past harvest practices and land ownership patterns have fragmented this habitat within the GPRA. BLM checkerboard ownership may be one of the primary factors limiting the ability of BLM lands to provide optimal habitat for fishers (USDA and USDI 1994). Forest carnivore surveys using bait stations with motion and infrared detection cameras have been conducted in several locations throughout the GPRA; however, fishers have only been detected in the Southern portion of the GPRA, in the vicinity of Williams and near the top of the Deer Creek drainage.

Bureau Sensitive

The BLM lands throughout the GPRA provide habitat for a variety of BLM sensitive birds, reptiles, amphibians and mammals. Bureau sensitive species known to occur on GPRA lands include: Bald eagle, Foothill yellow-legged frog, Northwestern pond turtle and a variety of bat species. However, only those species that may be affected by the proposed action are addressed

here. Appendix A displays the current bureau sensitive species and their specific habitat requirements.

Land Birds (Neotropical Migrants and Year-Round residents)
All neotropical migrants go to Mexico, Central and South America each year. They are addressed here due to widespread concern regarding downward population trends, and habitat declines. The USFWS in the Migratory Bird Program Strategic Plan 2004-2014 (USDI 2008) includes a list of "Western BLM Bird Species of Conservation Concern" (Migratory Birds of Concern) and "Game Birds below Desired Condition" and are suggested birds to include in NEPA analysis. Medford BLM biologists conferred with local bird groups and knowledgeable individuals to identify which birds on the list in our region (Bird Conservation Region 5, USFWS Region 1) are present within the Medford Districts BLM lands. Thirteen of the birds on this list are known to occur within the GPRA BLM lands:

- Band-tailed pigeon
- Flammulated owl
- Grasshopper sparrow
- Lewis' woodpecker
- Mallard
- Mourning dove
- Olive-sided flycatcher
- Peregrine falcon
- Prairie falcon
- Red-naped sapsucker
- Rufous hummingbird
- White-headed woodpecker
- Williamson's sapsucker

3.5.2 Environmental Consequences

The following discussion describes the typical effects anticipated from project activities. As described in the proposed actions, a site specific analysis would occur at each project site to determine if activities are consistent with the anticipated effects identified below. Only federally listed and Bureau Sensitive species known or suspected to be present within the project area and impacted by the proposed actions are addressed in this EA. Impacts to wildlife from the proposed actions are measured by changes to stand structure in different habitat types.

Consultation for individual project units will be conducted prior to project implementation. The treatments discussed in the proposed action would only be applied to areas that have had ESA consultation completed and will conform to all the necessary seasonal or other operating restrictions typical of such consultations. The Project Design Features included in this document and ESA consultation Project Design Criteria that would cover future projects implemented under this analysis would ensure that project activities will not adversely affect listed species and their habitat. Key project criteria to ensure minimal to no effects include:

1. Actions would not remove or reduce function of suitable T&E species habitat
2. Actions would not remove spotted owl, marbled murrelet, or bald eagle nest trees

3. Site-specific actions would be reviewed by a Resource Area biologist to ensure consistency with the parameters of this EA.
4. Site-specific actions would be reviewed and modified as necessary for listed species as per future ESA consultation requirements.

Threatened & Endangered
Northern Spotted Owl

Alternative 1: No Action
Under Alternative 1, management activities would not alter the various habitat types that occur throughout the project area and habitat would continue to develop along current successional pathways. As described more fully in the fuels discussion in section 3.6, under the No Action Alternative, the density of ladder fuels, stand level fuel loads, and canopy bulk density would continue to increase across the majority of the GPRA. As this trend continues, the potential severity and size of fires would correspondingly increase across much of the project area. The loss of habitat from wildfire would remain the most immediate hazard to spotted owl habitat across the GPRA under the No Action Alternative.

Alternative 2: Proposed Action
The fuel hazard reduction treatments as proposed in chapter 2 would not alter the overstory forest structure or remove key habitat components related to spotted owl habitat. In very dense stands, these treatments reduce understory density and improve flight paths within stands, in turn, increasing the accessibility of owls to the forest floor and prey abundance or availability (Sakai and Noon 1993, 1997). In some instances, mechanical fuels treatments can reduce the habitat quality for owls because these treatments simplify the forest structure, which can in turn have negative effects to prey species. Conversely, results from other studies on small mammals and fuel reduction treatments have demonstrated that the total amount of small mammal biomass increases as a result of mechanical fuel reduction treatments (Converse et al. 2006). The Project Design Features in chapter 2 incorporate the inclusion of untreated patches throughout larger treatment areas. This provision, along with the spatial and temporal staggering of treatments across the landscape should ameliorate the potential negative effects of these fuels treatments on prey species at the landscape level.

Underburning treatments have the greatest potential to impact spotted owl prey because these treatments can fully or partially consume the snags or CWM that many prey species are associated with during underburn operations (Stephens and Moghaddas, 2005). However, these effects to prey species are expected to be highly limited and localized because very few acres would be underburned during a given year (<300 acres/watershed), and generally, not all the existing snags or CWM within an underburn are lost during underburn treatments. In addition, while some prey species may be adversely affected from mechanical and underburn treatments, a good proportion of the prey are primarily arboreal in habit, and will remain largely unaffected by these treatments.

The treatments proposed under alternative 2 would have minimal impacts on spotted owls within the project area for the following reasons:
1. Treatments will not remove or reduce the function of suitable spotted owl habitat
2. The PDF's (Section 2.3) will preclude project activities from disturbing any breeding spotted owls

3. The PDF's (Section 2.3) will preclude project activities from having widespread impacts to spotted owl prey species

Additionally, since no known nest trees or suitable nest trees would be removed, no direct effects to individuals are expected. Treatments in suitable NSO habitat may impact foraging by changing habitat for spotted owl prey species (USDI 2006). Residual trees, snags, and down wood retained in the thinned stands would provide some cover for prey species over time and would help minimize treatment impacts to some prey species, such as dusky-footed woodrats.

Summary and Conclusions
Consistent with the USFWS findings these activities would not likely jeopardize the continued existence of the northern spotted owl. Since the proposed action would not remove suitable habitat, even when combined with future foreseeable projects, the projects would not preclude spotted owls from dispersing through or nesting within the GPRA.

Marbled Murrelet

Alternative 1: No Action
Under Alternative 1, management activities would not alter the various habitat types that occur throughout the project area and habitat would continue to develop along current successional pathways. As described more fully in the fuels discussion in section 3.1 under the No Action Alternative, the density of ladder fuels, stand level fuel loads, and canopy bulk density would continue to increase across the majority of the GPRA. As this trend continues, the potential severity and size of fires would correspondingly increases across much of the project area. The loss of habitat from wildfire would remain the most immediate hazard to marbled murrelet habitat across the GPRA under the No Action Alternative.

Alternative 2: Proposed Action
No project activities would modify or remove key habitat elements for marbled murrelet. Key habitat elements include large trees with multi-canopies and moderate canopy cover. Large trees with platforms would be retained for nesting. Therefore, there would be no effects to habitat. Additionally, no direct impacts to marbled murrelets are expected because there is a low likelihood of murrelets occurring within the project area.

Similar to NSOs, noise and visual disturbance during the breeding season would adversely affect nesting birds. While effects to murrelets from noise, human intrusion and smoke from proposed activities are not well documented, observations have documented flushing of birds and missed feeding opportunities (USDI 2007). However, these effects are not anticipated with the implementation of seasonal restrictions and disturbance distance buffers as described under the Project Design Features in Chapter 2. As stated above, the proposed actions were consulted at the programmatic level. Appropriate consultation will be completed before decisions are made; actions would be in compliance and consistent with any required consultation.

Summary and Conclusions
Consistent with the USFWS findings these activities would not likely jeopardize the continued existence of marbled murrelets within the GPRA. Since the proposed action would not remove

suitable habitat, even when combined with future foreseeable projects, the projects would not preclude marbled murrelets from nesting within the GPRA.

Fisher

Alternative 1: No Action

Under Alternative 1, management activities would not alter the various habitat types that occur throughout the project area and habitat would continue to develop along current successional pathways. As described more fully in the fuels discussion in section 3.6, under the No Action Alternative, the density of ladder fuels, stand level fuel loads, and canopy bulk density would continue to increase across the majority of the GPRA. As this trend continues, the potential severity and size of fires would correspondingly increases across much of the project area. The loss of habitat from wildfire would remain the most immediate hazard to fisher habitat across the Resource Area under the No Action Alternative.

Alternative 2: Proposed Action

The mechanical fuel hazard reduction treatments as proposed in chapter 2 do not typically alter the overstory forest structure or remove key habitat components related to fisher habitat. In some instances, mechanical fuels treatments can reduce the habitat quality by simplifying the forest structure. The Project Design Features in chapter 2 include incorporation of untreated patches throughout larger treatment areas. This provision, along with the spatial and temporal staggering of treatments across the landscape would ameliorate the potential negative effects of these fuels treatments on prey species at the landscape level.

Underburning treatments have the greatest potential to impact fisher habitat because these underburning treatments can partially or fully consume the snags or CWM that fishers often utilize for denning or rest sites (Stephens and Moghaddas, 2005). However the potential loss of these snags or CWM is expected to be highly limited and localized because very few acres would be underburned during a given year (<300 acres/watershed), and not all the existing snags or CWM within an underburn is lost during underburn treatments (Pers. Observation, 2009; Pers. Comm. Allen Mitchell, 2009).

Project activity disturbance effects to fishers are not well known. Fishers may avoid roaded areas (Harris and Ogan 1997) and humans (Douglas and Strickland 1987; Powell 1993). Disturbance from project activities would be temporally and geographically limited and would occupy a geographic area smaller than the average fisher home range. Telemetry studies have determined that fishers are wide-ranging animals (Zielinski et al. 2004). Seasonal restrictions listed as Project Design Features for other resources would benefit fishers by restricting project activities until young are approximately six weeks old, approximately the age when fisher move young from natal dens and become more mobile. Because fishers have large home ranges they would be able to move away from the action area while the disturbance is occurring, without impacting their ability to forage and disperse within their home range.

Summary and Conclusions

The action alternatives would not contribute to the need to federally list the fisher as threatened or endangered because suitable habitat would not be removed. Even when combined future foreseeable projects, the proposed actions would not preclude fishers from dispersing through or

reproducing within the GPRA. The proposed projects would not affect persistence of fishers in the watersheds where the projects occur.

Bureau Sensitive Species

Alternative 1: No Action
Management activities would not remove or alter bureau sensitive species habitat within the project area and habitat would continue to develop along current successional pathways. The development of key late-seral and old-growth forest stand conditions would be the same as described above for the northern spotted owl. Particularly to sensitive species, the greatest risk of No Action is the potential wildfire related loss of large live remnant conifers, large snags and large woody material, which are important habitat features for a variety of species. Additional effects to bats would include reduced access to snags due to cluttered flight paths in densely stocked stands, which causes echolocation interference (pers. comm. J. Hayes 2003). Under Alternative 1, no disturbance to bureau sensitive species would occur from equipment noise associated with typical fuels reduction treatments.

Alternative 2: Proposed Action
A small percentage of bureau sensitive species habitats may be affected or altered by fuels reduction treatments across the GPRA. However, the effects of these treatments would generally be negligible due to the limited impact the proposed fuels treatments would have on bureau sensitive species habitat, and the large amounts of suitable habitat that would remain untreated across the project area. The proposed actions may disrupt some individuals of sensitive species due to disturbance. However, disturbance from project activities would be temporally and geographically limited and most species would be able to move away from the action area while the disturbance is occurring, without impacting their ability to forage and disperse within their home range.

Bald Eagles
The proposed actions would not result in the removal of potential bald eagle nest trees, roost trees, or suitable habitat as no trees greater than 12" DBH would be removed under the proposed action. The fuels treatments are designed to reduce fuel loads and ladder fuels, working to create more fire resilient forest stands, and thus protecting existing bald eagle nesting and roosting habitat. These treatments have the additional secondary benefits of reducing competition amongst the residual trees in the treated stands; allowing for increased health and vigor, and resistance to insects, disease and drought stress; therefore, allowing some trees to grow faster and larger or remain as habitat on the landscape for longer duration than if left untreated.

There is a potential that equipment and chainsaw activity associated with the proposed activities could cause disturbance effects to bald eagles. However, since the Project Design Features included in chapter 2 would be followed around any known sites, no eagles would be negatively impacted from project implementation.

Bats
Fuels reduction treatments may benefit bat species by reducing echolocation interference and cluttered flight paths, and improve access to snags (pers. comm. J. Hayes 2003).

Summary and Conclusions
The proposed actions along with other future foreseeable projects that are expected to occur across the project area are not expected to affect the long term population viability of any bureau sensitive species known to be in the project area or lead to the need to list these species as T&E. Activities and disturbance from project activities would be temporally and geographically limited, precluding major effects to species habitats or disturbance during breeding seasons.

Land Birds (Neotropical Migrants and Year-Round residents)
Alternative 1: No Action
Under the No Action alternative, management activities would not remove or alter any bird species habitat within the project area and habitat would continue to develop along current successional pathways. The development of key late-seral and old-growth forest stand conditions would be the same as described above for the northern spotted owl. Birds that favor dense conditions may benefit from the No Action alternative because the dense understory would continue to build across much of the project area.

Alternative 2: Proposed Action
A small percentage of the overall neotropical bird habitat may be altered within the project area through fuel reduction treatments. However, this loss would be negligible due to the large amounts of suitable habitat to be retained on adjacent land and the loss of site specific habitat would be fairly short-term (5-15 years). Additionally, existing large diameter snags and down wood found in older seral stands would be retained in the project area, and would continue to provide nesting, roosting, or foraging opportunities for species dependent on these key habitat structures. The proposed treatments largely affect the understory component of the forest, and would have minimal to no effect on most bird species. In some instances, mechanical fuels treatments can reduce the habitat quality for birds because these treatments simplify the forest structure. Conversely, results from other studies on small mammals and fuel reduction treatments have demonstrated that the total amount of small mammal biomass increases as a result of mechanical fuel reduction treatments (Converse et al. 2006). The Project Design Features in chapter 2 incorporate the inclusion of untreated patches throughout larger treatment areas. This provision, along with the spatial and temporal staggering of treatments across the landscape should ameliorate the potential negative effects of these fuels treatments on bird species at the landscape level.

Some individual birds may be displaced during project activities. However, untreated areas adjacent to the treatment areas would provide refuge and nesting habitat, minimizing short term loss of habitat. Additionally, implementation of the leave patch PDF will further alleviate the treatment effects by providing untreated pockets throughout treatment areas. Activities occurring during active nesting periods could cause some nests to fail. However, the failure of a nest during one nesting season would not be expected to reduce the persistence of any bird species in the GPRA because sufficient habitat of all types would be retained throughout the planning area to support the wide diversity of bird species in the area. Additionally, even though BLM does not know the precise number of individual birds within the GPRA, the potential failure or loss of some nests would not be measurable at the regional scale because of the small scope of the project in relationship to the regional scale. Partners in Flight support the ecoregional scale, as appropriate, for analyzing bird populations: (http://www.partnersinflight.org/description.cfm).

Summary and Conclusions
The proposed actions along with other future foreseeable projects that are expected to occur across the project area are not expected to affect the long term population viability of any bird species known to be in the area or lead to the need to list these species as Threatened & Endangered. Treatments are limited, and separated spatially and temporally, precluding major effects to species habitats or disturbance during breeding seasons.

3.6 Botany

3.6.1 Affected Environment

The vegetation of southwestern Oregon and adjacent northern California is one of the most biologically diverse areas in the United States. Floristically, the region combines elements of the northern California Klamath Mountains, the southern Oregon Cascades, and the western Oregon Coast Range, and has a large number of endemic species.

Within the BLM Manual 6840 and the RMP, BLM policy directs management to conserve federally listed and sensitive species, to initiate proactive measures that reduce or eliminate threats, manage sensitive species by determining distributions and abundance, maintain or restore populations and habitat, follow recovery plans, and implement conservation plans and agreements to meet policy (BLM Manual 6840, RMP). Surveys of suitable habitat will be conducted for listed and sensitive species prior to project specific decisions. Mitigation measures will be put in place, if necessary to reduce significant adverse effects to the species.

Methods to reduce effects may include full protection (installing variable radius no disturbance buffers), changing the timing (treatments in the spring or fall), changing the intensity of disturbance (e.g., retaining certain level of canopy, or leaving shrubs over the population), or even the duration (e.g., only allow a quick burn over the top of a sensitive plant population).

Within the Medford District there are 97 plants on the federally listed and BLM sensitive list; two federally listed plants; 76 known sensitive vascular plants; 10 lichens, mosses and liverworts and 9 fungi. The district also has a list of 46 plant species that occur on adjacent federal and non-federal lands that are suspected to occur but have never been documented. If populations of suspected sensitive plants are documented in surveys, they will be managed like known species. Appendix C provides the list of known federally listed and sensitive plants within the Medford District, the associated habitat and status.

<u>ENDANGERED PLANTS</u>
There are 2 plants listed as Endangered by the US Fish and Wildlife service that are known to occur on the Medford BLM within the Grants Pass Resource Area, Gentner's fritillary (*Fritillaria gentneri*) and Cook's desert parsley (*Lomatium cookii*). One federal candidate species also exists on BLM lands in the subbasin, Siskiyou Mariposa-Lily (*Calochortus persistens*). This species is known from adjacent Siskiyou County in Northern California and is disjunct here. Two other species are suspected to occur on BLM lands, Large flowered wooly meadowfoam, (*Limnanthes floccosa* spp*. grandiflora*) and McDonald's rockcress *(Arabis macdonaldiana*). McDonald's rockcress is found in rocky serpentine outcrops, and large flowered wooly meadow foam is a wetland species, (vernal pools). Neither species has been found on BLM lands in the subbasin.

Gentner's fritillary (*Fritillaria gentneri*)
Gentner's fritillary is a long lived perennial lily endemic to the Rogue River basin in Jackson and Josephine County, and in the upper drainages of the Klamath basin in the Cascade-Siskiyou National Monument, Jackson County, Oregon. In 1980, it was identified as a candidate species for federal listing as a Category 2 species. It was listed as Federally Endangered on December 10, 1999 (USDI, FWS, 1999) however, critical habitat was not designated. A final recovery plan was published in 2003 (USDI, 2003).

Gentner's fritillary is known from a wide variety of habitats and soil types across its range. The recovery plan identifies over 25 soil types and about 16 different plant communities that this species can occupy. This species prefers situations where it can receive at least partial light (Brock and Callagan 2002). It is rarely found under a dense conifer canopy; although it has been found in riparian habitats and ecotones with a high cover of mixed conifer and deciduous trees. It is most often found in forest ecotones or transitional areas, especially along upper slopes, ridgelines or aspect changes. It has been found growing on the edges of grasslands and chaparral, and in partially-open, mixed evergreen forest and oak woodland openings. It appears to have a moisture requirement in that it has not been found in fully exposed rocky, skeletal soil types (e.g. open grasslands), but prefers a level of soil moisture that is also capable of supporting trees and shrubs.

There are 146 known sites on BLM, which make up about 75% of all known sites. Estimates of the total flowering individuals population are likely less than 3,000 plants, with an average of 22 flowering plants per site. The median number of flowering individuals at a site is one; most populations are very small. Reproduction is mostly asexual by bulblets breaking off a mother bulb. Recent fertility studies by the Oregon Department of Agriculture, have found that Gentner's fritillary is not sterile, and produces capsules and seed best when pollen from another population is used. This suggests that a genetic self-incompatibility exists, and as most populations or patches are clonal, or very closely related, within population sexual reproduction is non-existent or very low. Intra-population fruit mature in controlled setting, for *Gentneri* x *Gentneri* crosses has been found to be 2.3 percent with poor seed viability, while inter-population fruit set of *Gentneri x Gentneri* crosses were 48.9%, with good seed viability (Amsberry and Meinke, 2007).

Cook's desert parsley (*Lomatium cookii*)
This member of the carrot family was listed as a candidate for listing in 1990, and the State of Oregon listed it as State Endangered in 1995. In May 2000, it was proposed for listing (Federal Register 65:30941-30951, May 15, 2000). The comment period was re-opened in January of 2002, and it was listed as Federally Endangered in November of 2002 (Federal Register 67:68004-68015, November 7, 2002). A recovery plan and critical habitat unit designation is currently in process (Personal communication Sam Friedman, USFWS, 2009).

The distribution of plant populations is disjunct. It was originally discovered in 1981 in the Agate Desert, Jackson County, Oregon, on the edge of vernal pools, and subsequently described by J. Kagan in 1986. At this site just north of the Medford airport, 13 occurrences exist within the historical flood plain of the Rogue River on non-federal land on the edge of vernal pool complexes. Additional populations were found in 1988 about 40-air miles to the southwest in the Illinois River valley in seasonally wet grassy meadows; shallow sloped meadows along creeks; and in and adjacent to oak woodlands and serpentine influenced meadow and shrub

habitats. Thirty-three (33) occurrences are now known in the Illinois River valley, mostly on federal lands. The most northerly occurrence in the Illinois valley is near Selma. The largest is at French Flat ACEC which is estimated to have 146,356 plants (Kaye and Thorpe, 2007). The smallest documented location is 1 plant. The median population size is 250 plants, and the total amount of occupied habitat is about 50 acres.

No populations have ever been found between the Illinois Valley and Medford Agate desert populations. Most of the habitat between these populations is on non-federal lands, and have been heavily modified by rural development. Little likelihood exists that undiscovered populations occur between the Agate Desert and the Illinois Valley occurrences; these two major populations segments are disjunct and are assumed to not be interbreeding.

The habitats of the species are slightly different between the Agate Desert and Illinois valley sites. In the Agate Desert, its habitat is along the margins and bottoms of vernal pools. These pools, within swale and mound topography, form during the winter rains in shallow clayey-gravelly soils over an impervious hardpan. The Illinois Valley habitats are mostly alluvial silts and clays within serpentine soils and riparian flats / meadows. The soils consist of flood plain bench deposits that also have a clay hardpan 60-90 cm below the soil surface. This creates seasonally wet areas similar to vernal pools in the Agate desert that lack the swale and mound topography (*i.e.*, no pools). The Illinois Valley sites are alluvial in nature within serpentine substrates and are within the serpentine valley bottom communities. The meadows are dominated by California oat-grass and occur within Oregon white oak-ponderosa pine/Jeffery pine savanna. An open shrub layer comprised of wedge-leaf ceanothus and white-leaf manzanita is interspersed with native and introduced grasses and herbs. One known site occurs in Oregon white oak dominated grassland on a shallow slope (not a meadow). Populations of *Lomatium cookii* do occur in the proposed area.

SENSITIVE PLANTS

The Oregon and Washington Special Status Species policy details the need to conserve listed species and the ecosystems on which they depend on BLM administered lands. Policy directs the BLM to conserve by use of all methods and procedures which are necessary to improve the condition of Special Status Species and their habitats to a point where their Special Status recognition is no longer warranted. Policy objectives also state that actions authorized or approved by the BLM do not contribute to the need to list species under the Endangered Species Act (ESA). Special Status Species are designated by the State Director in coordination with federal and state agencies (The Manual, Policy, and IM-OR- 2003-054). On July 26, 2007 a new Special Status Species list went into effect (IM No. OR-2007-072). This new list has two categories, Sensitive and Strategic. The former categories of Bureau Assessment and Bureau Tracking no longer exist. Sensitive Species require a pre-project clearance and management to prevent them from trending toward federal listing. There is no pre-project clearance or management required for the Strategic Species at the BLM District level, thus Strategic Species will not be analyzed in this document. Ninety seven sensitive plant species are known to occur on the Medford district. Of these ninety seven species fifty six are documented in the Grants Pass Resource Area. These species are listed and in bold in Appendix B. All ninety seven species on the list are surveyed for with a more direct focus on listed species known or suspected to occur in the GPRA.

SURVEY AND MANAGE

Surveys will be conducted prior to project implementation. The surveys will be consistent with the 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, as incorporated into the Medford District Resource Management Plan. Surveys will be conducted for Survey and Manage (S&M) category A and C species. Survey and Manage species with ranges in the Medford District BLM that are in categories B, D, E, or F, do not require pre-disturbance surveys (USDI, USDA 2001, Standards and Guidelines, pp. 7-14). Survey and Mange species with a category listing of A, B, and E are listed as "manage known sites". Categories C and D are listed as "manage high priority sites".

3.6.2 Environmental Consequences

Alternative 1: No Action

The No Action alternative would have effects on species requiring open habitat conditions. Species requiring openings, which are found in the project area, would continue to decline due to shrub/conifer encroachment and crowded conditions. Natural openings in the forest such as, grasslands, meadows, oak woodlands, chaparral, and serpentine areas are declining due to encroachment by fire intolerant species. If this trend continues to occur, species requiring these types of habitats will also decline, potentially leading to listing under the ESA.

Fire has played an extremely important role in influencing the plant communities of southwestern Oregon. The mixed evergreen forests and shrublands typically found in Josephine County and in this project area have been created and perpetuated in the past by fire. This regime has been disrupted by fire control activities (Franklin and Dyrness 1988). Suppression of fire in the watershed is a limiting factor that has brought on a decline of habitat for species requiring high canopy such as the *Cypripedium* species. These plants are adapted to low intensity fires that reduce competition in the herbaceous vegetation layer. The rhizomatous roots of the species are deep enough in the ground to survive low intensity fires. However, it has been found that they will not survive high intensity fires (Lichthardt 2001). Without treatment, a build-up of fuels would continue to occur within the plant populations or suitable habitat. This build-up would create conditions making high intensity wildfires more likely, which could result in extensive damage to habitat. Studies suggest that the most detrimental long term effect to *Cypripedium fasciculatum* from fire is the loss of appropriate habitat (Lichthardt 2001). Although, there is no way to know when wildland fires will actually occur on the project area, we do know that at some point there will be a fire ignition, and without fuel reduction, when it does occur, it would likely cause severe effects on species in the project area.

Currently fuels reduction is occurring on BLM lands within the resource area from other projects. Some fuels reduction is also occurring on private, state, and county lands as well. Lands that are not being treated tend to be dense with trees and shrubs competing for nutrients and light.

Noxious weeds can out-compete native, rare, and listed plants, reduce habitat for native insects and animals, and threaten biological diversity. They can alter soil fertility, dry up water supplies, poison animals, decrease agriculture production, increase fire danger, infest rivers, and reduce recreational value. Vehicles, wildlife, recreational activities, and livestock are primary methods for transporting and creating new populations of noxious weeds. Road maintenance, new and

temporary road construction, tractor harvest, trails and landing construction occurring throughout the GPRA and adjacent private lands present a potential risk for seed dispersal of noxious weeds.

Disturbance can provide suitable habitat for noxious weeds. Additional human disturbance and traffic would increase the potential for spreading noxious weeds, but regardless of human activity, spread of these weeds would continue through natural forces, such as, outcompeting and displacing native and rare species. It is unlikely that the BLM can stop the spread of noxious weeds to and from non-federal lands; but will reduce the risk or rate of spread and control of known populations in accord with the direction of the Medford District Integrated Weed Management Plan (PA-OR110-98-14).

Alternative 2: Proposed Action

A. Listed and Sensitive Species

Species Requiring Shade

Certain plant species, such as *Cypripedium fasciculatum,* require a sufficient amount of down logs, snags, duff layer, and canopy cover to maintain soil moisture and mycorrhizal associates.

Treatments that reduce shrub and canopy cover to 50% may degrade occupied habitat for some botanical species requiring high canopy cover such as *Cypripedium fasciculatum* if canopy openings reduces or dries moist microsites. However, this short term degradation would occur in limited areas, and within several years would begin to recover outside buffers in areas in which shrub and canopy cover would increase. These treatments would not lead to the listing of any botanical species, given the small scale of treatment, short duration of effects, protection buffers, and presence of habitat for these species found throughout the resource area, the district, and the Pacific Northwest. Species needing denser canopy cover, would be maintained and benefit from differing vegetation treatment proposals because a minimum of 60% canopy cover would be maintained in various areas of the project area. Additionally, vegetation density, inside and outside the project area, and in untreated areas would maintain current canopy cover and slowly increase over time, improving habitat conditions for species requiring high canopy cover.

Species Requiring Open Areas

Fuels treatments reduce competing vegetation and opens the canopy and therefore should improve habitat for those plant species requiring openings. Species requiring openings for habitat such as, *Lotus stipularis* has been shown to thrive in areas that have been logged (Mullens 2000). Treatment will also increase habitat for known species in the project area and species not currently found in the area requiring these same habitat types.

Fuel reduction and Riparian Thinning: Fuels treatments, including thinning and burning, could result in trampling, or burning of Threatened and Endangered (T&E) or Bureau Sensitive plant species resulting in temporary or permanent harm to individual plants. Pile burning of slash, broadcast understory, or "maintenance" burning within plant communities can affect occurrences and habitats of listed and Bureau Special Status plant species, especially the Federally Endangered *Fritillaria gentneri*. Spring and early summer burning could directly kill growing *Fritillaria gentneri*, but could also create new habitat that could become occupied later by that species and other listed species. Project design features specifically designed for habitat enhancement burning during the dormant period would reduce or eliminate any effects that could occur. Certain species, such as *Fritillaria gentneri,* are likely adapted to fire in the summer and early fall when they are dormant and underground. Burning occupied habitat during the dormant

period is likely a beneficial effect for certain plant species. The use of drip torch oil to ignite fire in occupied habitat is unlikely to hurt the plants as the oil burns off (Martin, 2008) and ignition sites would not be started on plant sites. Burn piles can sometimes occupy as much as 10% of an acre, depending on the plant community and the fuel loads. The burning of piles of slash can burn listed and sensitive plant species if the piles are within close proximity or on top of plant sites. The radiant heat can penetrate the soil and kill the roots and bulbs, depending on the size of pile, and the duration of the event; however, because known sites would be buffered using the project design features, documented sites will be protected.

Fire can be used to promote, enhance, or maintain these habitats and create suitable habitat. Special Status species, such as the listed *Fritillaria gentneri*, are likely adapted to fire in the summer and early fall when it is dormant underground. Light intensity burning of occupied habitat during the dormant period would likely have a beneficial effect on listed plant species. Fuels reduction projects can also have a long term beneficial effect by creating more open habitat that is suitable for plants like *Fritillaria gentneri*, *Lomatium cookii*, and other listed and sensitive plant species. Species requiring canopy openings are found throughout the GPRA. Natural openings in the forest, such as grasslands, meadows, oak woodlands, chaparral, and serpentine areas, are declining because of encroachment by fire intolerant species. If this trend continues to occur, species requiring these types of habitats will also decline, potentially leading to listing. These species populations and habitat would benefit from treatment creating openings and providing more habitat.

Areas with listed and sensitive plants that have had fuels treatment are likely to burn with less intensity during wildfire in the future, increasing the probability of survival. This could help with recovery of the species, which would be a beneficial effect for the species. Riparian thinning would reduce canopy cover, altering habitat for botanical species. Proposed riparian thinning would not reduce canopy cover below 60%. The modification of plant habitat from partial thinning of the canopy, increasing the light regime and available precipitation, can have a beneficial effect for listed and sensitive species. These project activities likely mimic the role that wildfire historically played in these habitats by periodically opening the canopy. Based on existing data from known populations, it appears that partial light (40 - 60 percent canopy cover) is optimum for species like *Fritillaria gentneri*. Given the proposed canopy retention of 60%, the canopy modifications from riparian thinning and watershed restoration projects are not likely to adversely affect any listed plants. However, reducing the canopy cover to 60% can reduce relative humidity, reduce soil moisture, increase temperatures and increase light exposure. This change in environmental conditions would create conditions not optimal to species like *Cypripedium faciculatum.* Fuels treatments of 12 inch diameter or less will move the habitat into a later seral state, creating optimal conditions for species needing shade which will have a long term benefit for habitat conditions.

On July 28, 2009 the U.S. Fish and Wildlife Service proposed to designate critical habitat for two plant species, *Lomatium cookii* and *Limnanthes floccosa* ssp. *grandiflora* (Federal register, Vol 74, No. 143, July 2009, pp. 37314-37392). There are several designated critical habitat units within the resource area. If it is determined that fuels reduction would occur within critical habitat, burning would be prescribed to benefit the species and provide a better substrate for seeds and seedlings. Due to the fire suppression that has occurred for the past fifty years or

more, meadows found within the resource area have been slowly declining. Encroachment of shrubs and trees into meadows decreases habitat for *Lomatium cookii*.

The proposed action will not adversely modify critical habitat designated for *Lomatium cookii*.

Populations of Gentner's fritillary do occur in the proposed area. Due to project design features the populations will be protected or enhanced from the proposed action.

B. Noxious Weeds

The risk of introducing and/or spreading invasive plant species for any ground disturbing activity within the GPRA is analyzed and determined for every action by district policy. If it is determined that a project has a moderate to high risk of introducing invasive plant species, control measures must be identified prior to project implementation.

Ground disturbing activities from fuels projects and heavy equipment operation can facilitate the introduction and spread of Oregon State Listed noxious weed species (Table 9).

Table 9. Noxious Weeds Survey Findings

Species	Common Name	Species Code	Designation
Centaurea debeauxii	Meadow Knapweed	CEDE5	B
Centaurea solstitialis	Yellow Starthistle	CESO3	B
Centaurea stoebe (maculosa)	Spotted Knapweed	CEST8	B
Chondrilla juncea	Rush Skeletonweed	CHJU	B
Cirsium arvense	CanadaThistle	CIAR4	B
Cirsium vulgare	Bull Thistle	CIVU	B
Cytisus scoparius	Scotch Broom	CYSC4	B
Fallopia japonica (polygonum)	Japanese Knotweed	POCU6	B
Genista monspessulana	French Broom	GEMO2	B
Hedera helix(hibernica)	English Ivy	HEHE	B
Hypericum perforatum	St. Johnswort	HYPE	B
Isatis tinctoria	Dyers Woad	ISTI	B
Lathyrus latifolius	Perennial Peavine	LALA4	B
Lythrum salicaria	Purple Loosestrife	LYSA2	B
Rubus discolor	Himalayan Blackberry	RUAR9	B
Senecio jacobaea	Tansy Ragwort	SEJA	B
Spartium junceum	Spanish Broom	SPJU2	B
Tribulus terrestris	Puncturevine	TRTE	B

Noxious weeds can compete with listed plants for light, space, water, and nutrients. Similarly, road edge disturbance can facilitate the introduction and spread of noxious weeds that can compete with listed plants. Any noxious weeds occurring within the critical habitat will be

treated prior to implementation to reduce or eliminate any effects to listed species. Project design features will reduce noxious weed populations.

Summary and Conclusions

As human populations and development increase in this region, available habitat for native botanical species would decrease. Management and treatment activities would continue to occur on private lands where there are no laws or regulations to govern management of listed species. Plant species on federal lands would continue to be protected and conserved following policy and management guidelines. Populations on non-federal lands would most likely remain undetected and unprotected because there are no laws governing rare plants on non-federal lands. Because habitat and populations for botanical species found throughout the GPRA, and in southern Oregon on federal land are protected, impacts associated with this project would not lead to the listing of any plant species.

Indirect effects from habitat disturbance can have adverse, neutral, or beneficial effects to plants, depending on the type, intensity, duration, and the timing of disturbance. The PDF's, such as buffers, reduce or eliminate adverse effects in all cases. The long-term effects of habitat modification are not well known, as few studies have occurred for these species, however, much of the information uses best professional judgment, or is based on ecological patterns seen in related species and on the ground.

This project would incorporate surveys, PDF's, and buffers for the protection of listed and sensitive botanical species and habitat from project activities. These protection measures are also utilized for other projects throughout the GPRA. Due to these protection measures, listed and sensitive species are protected from potential impacts and project activities; therefore, they will not trend towards extinction or extirpation. The developed PDF's in most cases negate or reduce direct effects to insignificant levels for listed plant species. Given the project design features and minimization or elimination of effects no cumulative effects are anticipated to listed or sensitive plant species.

Similarly, PDFs for washing equipment and seeding with native material are standard for all BLM activities to prevent noxious weed spread, thus proposed foreseeable activities on BLM land would not affect noxious weeds. It is assumed that private lands would be entered on a 60 to 80-year rotational basis for timber harvest, providing opportunities for weed spread and establishment. Foreseeable activities that have the potential to spread weeds, such as motor vehicle traffic, development, recreational use including OHVs, and road construction are expected to continue or increase. These types of activities could result in new disturbed sites available for noxious weed establishment. The possibility of introduction of noxious weeds is similar for both the action and No Action alternatives.

Given unpredictable vectors for weed spread, such as vehicle usage by private parties, wildlife behavior, and wind currents, it is not possible to quantify with any degree of confidence the rate of weed spread in the future, or even the degree by which that potential would be increased by the proposed actions. However, the proposed action, inclusive of PDFs, would minimize the spread of noxious weeds, and treatments would reduce existing weed populations. The BLM is working to increase communication and treatment opportunities with other land owners, agencies, and organizations through Cooperative Weed Management Areas with the hope of

increasing the effectiveness of treatments and a cumulative decrease in the spread of noxious weeds.

3.7 Cultural Resources

3.7.1 Affected Environment

The Grants Pass Resource Area is situated in a region with a rich history. Archeological evidence indicates that human occupation of southwest Oregon dates back more than 10,000 years. The native inhabitants of the area were Takelma and Athapascan, and are generalized as hunters and gatherers. Takelma people occupied most of the Rogue and Illinois Valleys and the Athapascans occupied lands from the coast to the Applegate River and Galice Creek.

The first known whites to enter the Rogue Valley belonged to a party of Hudson's Bay Company trappers from Fort Vancouver who passed through the area in early 1827. Other trappers and explorers made periodic visits to the area up to the time of the discovery of gold.

Gold mining was originally the mainstay of the economy in southern Oregon. It was the momentum that started settlements, built roads and schools, promoted local government, and established law and order (Libbey 1964). The first gold discovery in Josephine County was along the Illinois River at the mouth of Josephine Creek in 1851 (Kramer 1999). By 1911, most of the principal placer deposits in the county had been found and worked. Prior to 1853 most food items were brought into the Illinois mining regions from Crescent City, California or the Willamette Valley. By 1854, farmers from the Rogue Valley were shipping food surpluses to Yreka and Crescent City in California. In only a few years most of the fertile bottom lands in the Rogue and Illinois Valleys was claimed and a thriving farm community was already well-established (McKinley and Frank 1996:34, 35). Most of the acreage was taken up under the Donation Land Claim (DLC) Act of 1850.

The development of the timber resources for commercial purposes in southwestern Oregon began in the 1850s. In August of 1851 the first exports of forest products (cedar shingles) occurred. In the Illinois Valley, whipsawing occupied many on a full time basis with the rapid expansion created by the large influx of miners into the area. Logging in southern Oregon was not a large part of the local economy until World War II. Prior to this time logging was comprised mostly of small family owned logging operations producing wood products for the local use and mining operations. With the end of World War II a building boom occurred. This boom coupled with improved logging technology and better roads created the impetus for the logging industry to expand (Draper 1998:21).

The first form of transportation within the project area was trails that developed into roads during expansion of the area. By 1858 the route from Crescent City, California to Kerby, Oregon and on to Jacksonville, Oregon had become a wagon road (USDI 1995:16). In the late 1860s, the Oregon and California Railroad Company began construction of a rail line connecting Oregon to California but owing to financial problems the line was not completed until 1887 by Southern Pacific. The completion of this line led to the establishment of numerous stations throughout the Rogue River and Illinois Valley and associated communities from which timber products and agricultural goods were shipped (Draper 1998:21).

Currently, there are 506 cultural sites recorded in the Grants Pass Resource Area. These sites are pre-historic and historic sites.

3.7.2 Environmental Consequences

Alternative 1: No Action

Fuel hazard reduction activities would continue at their current rate across the Resource Area. Environmental conditions and trends would continue. Fuels build-up would continue to increase in untreated areas, and could result in a catastrophic fire which could threaten or destroy cultural resources. Vegetation would continue to encroach on cultural resources and could result in the damage and/or destruction of those resources through root disturbance, bioturbation and wind throw.

Wildland fire and suppression efforts can have direct impacts to cultural resources. The direct effects of fire depend primarily on burn severity that is in turn dependent upon available fuels, terrain, and weather conditions. Direct impacts to stone artifacts include thermal fracturing and spalling, and destabilization of surface structures by either burning of organic material embedded within the structure or by fire weakened trees and limbs falling on structures. Other impacts include the alteration of shell midden deposits and pollen remains within habitation complexes. Rock art sites including petroglyphs and pictographs are susceptible to fire effects by sooting, discoloration, or in more severe burns cracking and spalling. Historic structures (wooden structures, fence lines, trail signage, etc.) are particularly vulnerable to fire effects regardless of burn severity. Impacts to glass, ceramics, and metal objects result from direct exposure to fire.

Operational impacts which can directly impact a site include suppression techniques such as construction of hand line or machine line, explosive line construction, bucket drops, the use of fire retardants, and mop-up rehabilitation efforts. Direct impacts can also occur as a result of landscape modification for spike camps (designated camp and staging areas for firefighting personnel) and associated facilities, equipment staging areas, landing zones, and safety zones. Black lining, or creating a back fire to consume available fuels in front of the fire's path, and hose lays may also affect cultural resources within the fire environment. Fire rehabilitation activities which are ground-disturbing, such as out-planting to restore vegetation communities may also impact sites.

Indirect impacts are negative effects that occur in post-fire environments and include increased surface runoff and erosion, increased tree mortality, and carbon contamination. Increased surface visibility of archeological remains and surface artifacts may contribute to increased site disturbance and looting activity within the fire area.

Alternative 2: Proposed Action

Indirect impacts to cultural sites can occur from fuel reduction activities. They include the potential of fire weakened trees and limbs falling on the sites, low severity underburns creeping into the site and roots burning out and creating erosion and sediment issues within the site.

With the reduction of vegetation created by proposed management activities, potential indirect impacts on cultural resources may include sites becoming more susceptible to vandalism and

looting because of increased visibility and access. Following the Protocol agreement between BLM and the State Historic Preservation Office (SHPO), recorded sites within the project area will be protected, using project design features including: flagging placed 20 feet beyond the known site boundary; no fire line construction, prescribed burning, or hand piling/burning would occur within the flagged boundaries of the recorded cultural resources; timber would be felled away from flagged cultural site perimeters; and if unrecorded cultural sites are found during project implementation, a cultural resource specialist would be informed and provide appropriate protection measures (see PDFs, Section 2.3). The cultural program utilizes post-project monitoring of cultural sites in areas where projects have been completed. This monitoring has shown the methods used to protect cultural resources to be effective. The vegetation management around these sites will afford additional protection of wooden features and artifacts associated with historic sites, reducing the risk from possible catastrophic fire. Due to inclusion and implementation of the project design features there would be no direct effects to cultural resources because the sites would be buffered and no activities would occur within the protected area.

Summary and Conclusions

Management direction includes protecting and managing the integrity of all historic / prehistoric sites identified in the cultural survey for this and other projects. The risk of loss of cultural sites from a wildland fire is far greater than the accidental loss from activities being proposed under the Fuels Programmatic. Activities from the proposed action that might damage cultural resources include controlled burning, fuel hazard reduction, and illegal Off Highway Vehicle (OHV) use. Currently OHV use occurs within the Grants Pass Resource Area. Fuels work on BLM would reduce understory vegetation, creating potential illegal / unauthorized uses (i.e. increased OHV use off designated roads and trails). Cultural sites have the potential to be impacted by illegal / unauthorized OHV use. Damage to cultural resources by OHV use is uncertain and depends on user responsibility and the degree to which they would actually access thinned stands.

However, all identified cultural sites would be buffered with flagging from project activities for this and other projects, and PDFs will be implemented to minimize effects from potential OHV use and other ground disturbing activities; therefore, no cumulative impacts on cultural resources are anticipated. Monitoring of cultural sites during and after project implementation has shown these methods adequately protect the cultural sites from ground disturbance during project implementation.

3.8 Recreation

3.8.1 Affected Environment

The Grants Pass Resource Area manages a variety of developed and dispersed recreation sites including the Wild and Scenic Rogue River Corridor, Cathedral Hills and Eight Dollar Mountain to name a few. The Rogue River Corridor provides opportunities for rafting, kayaking, fishing, boating, camping and hiking. The river corridor receives the greatest concentration of recreation use in the Grants Pass Resource Area and offers opportunities for both dispersed camping and camping at developed sites. A backcountry byway also provides visitors with the opportunity to view sections of the Wild and Scenic Rogue River with stopping points such as the Hellgate Overlook and the Smullin Visitor Center at Rand.

Outside of the Rogue River corridor, there are numerous developed trail heads and trails for hiking, biking, and horseback riding. Cathedral Hills, located in the urban growth area of Grants Pass, has become extremely popular with mountain biking, hiking, and horseback riding enthusiasts. Additional developed trails are found south of Grants Pass along Layton Ditch, to Kerby Peak and Grayback Mountain. In the Illinois Valley, Lake Selmac and Eight Dollar Mountain also provide hiking, biking, and horseback riding opportunities. Off highway vehicle (OHV) use is most significant in the Quartz Creek area with plans underway to develop the site with staging areas and a designated trail system.

Despite the developed sites previously mentioned, most of the recreation that occurs in the Grants Pass Resource Area would be classified as dispersed recreation. Opportunities for hiking, biking, camping, hunting, and horseback riding are available throughout the resource area.

3.8.2 Environmental Consequences

Alternative 1 – No Action
Under the no action alternative, within the project area, dispersed recreation would continue under the current conditions. Ongoing projects including the development of the Bolt Mountain and Beacon Hill trail systems will progress as funding sources become available, and other recreation projects will continue to be developed to meet the needs of the public in the future.

Alternative 2 – Proposed Action
Fuels reduction projects on BLM lands would reduce understory vegetation, creating the potential for increased dispersed recreation in the project area. In the short term, hand piles from fuels reduction work may be visible from trails. Opening up the understory may invite people to travel off designated trails, and create new trails. There would likely be an increase of user-created OHV routes, especially at low elevations and in the rural interface. These trails are often along skid roads and firelines, which can be steep and may lead to an increase in water runoff, erosion, and sedimentation. Project design features identified previously (Section 2.3), such as blocking firelines and skid roads, would reduce the effects of increased user-created trail construction and use. Leaving a buffer along existing trails of more lightly treated vegetation would reduce the chances of travel off designated trails and would provide a visually pleasing canopy.

Summary and Conclusions
No action would result in a build-up of dead standing trees, dead and down woody material, and higher accumulations of fuels. Without proposed treatments the higher fuel loads could increase the chance for large wildfires. This could pose a risk to recreation infrastructure such as trails, trailheads, campgrounds, and associated facilities.

Effects of this project could include an increase in user created OHV trails through thinned areas. However, the reduction in fuel loads and associated decreased chances for large-scale wildfires and disease spread would help protect recreation facilities and the aesthetic forested experience sought by many recreationists.

3.9 Visual Resource Management

Introduction

The VRM inventory classes in the project area are VRM I, VRM II, VRM III and VRM IV. BLM Handbook H-8410-1 Visual Resource Inventory, describes the following Classes: Class I objectives are to preserve the existing character of the landscape. The level of change should be very low and must not attract attention. Class II objectives are to preserve the existing character of the landscape and the level of change should be low. Class III objectives are to manage lands for moderate levels of change to the characteristic landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. Class IV objectives are to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements that are currently present on the landscape.

3.9.1 Affected Environment

The existing character of the landscape is discontinuous due to variations in natural features such as different vegetation types, with both vertical dominance as well as more rounded forms, and different types and levels of canopy cover, and various colors of land and vegetation (seasonally and year-round). In addition, there are discontinuous landscape patterns from private and state lands. Human alterations within the project area are scattered throughout the project area (e.g., clearings, structures/buildings, fences, power lines, and roads).

Although visuals vary widely across the Resource Area, typically, vegetation in the project area varies from the open areas and fields in the valley to young, mid and older forest stands on the slopes and ridges. The lowest slopes are often blocked by foreground vegetation on the valley floor. The middle ridges and background ridgelines are more visible due to the flat topography of the valley floor. The vegetative character is a blend of medium to dark green colors and light to medium browns, with light, medium and coarse textures of varying forms, combining mixed conifers, hardwoods and brush fields. The conifer stands, with their medium to coarse texture of vegetation, characterizes the general landscape of higher ridges; pockets of openings, brush fields and younger stands occur and reflect the existing landscape throughout the planning area that surrounds the valley.

Key Observation Points

Key Observation Points would be established prior to individual plan implementation. These sites would be chosen based on the following indicators, as recommended in the BLM's VRM Manual 8431: angle of observation, number of viewers, length of time the project is in view, and relative size of the project area. The angle of observation would be straight ahead, or looking left or right from the commonly traveled routes. Number of viewers would be considered high (e.g.., state highway, interstate), medium (e.g.. county road) and low (e.g., private or BLM road). Length of time project is in view would be determined by the speed at which a vehicle is traveling on the road, and the view of the area from the vehicle. Relative size of the project

would be determined by each individual plan. Other indicators weighed in determining KOPs include season of use, and light conditions. A Visual Resource Contrast Rating Analysis would be completed to analyze potential visual impacts of the proposed project and activities. VRM objectives would be met through the following Project Design Features (Section 2.3).

3.9.2 Environmental Consequences

Alternative 1: No Action

Under the No Action Alternative, natural vegetative succession would continue and the existing scenic characteristics would remain relatively unchanged. No action would result in continued tree mortality and build-up of dead standing trees, dead and down woody material, high accumulations of fuels – brush, low-limbed trees and dense tree canopies. Visibility through the forest would continue to be limited by the dense vegetation, and opacity of the forest would continue to be dark and dense. Without proposed treatments there would be more fuel (from denser stands and dead or dying trees) increasing the chance for large, stand-replacing wildfires. In places where these units are in view from Key Observation Points, a stand-replacing wildfire would dominate the view. Under the No Action alternative, insect/disease spread could also adversely affect the forest and would appear as pockets of dead or dying trees and an increase in grays and browns

Under the No Action alternative, visual resource characteristics (form, line, color, and texture) of existing vegetative character could change dramatically with a wildfire, depending on fire location, intensity, timing and suppression/containment response. The least scenic effect would be a small, low-intensity fire that was contained quickly. Under this scenario, the fire would leave patches of blackened, standing dead trees, plus orange/red scorched and dead vegetation among a forest of living, green trees and shrubs. Conversely, the greatest scenic effect would be a very large fire where large areas would be consumed, leaving blackened standing trees, and blackened mountainsides of trees and brush, with some patches of unburned green vegetation. The changes in form, line, color and texture would be obvious in the short and long term, lasting up to 20- or 25-years. The variety of visual hues, such as dark greens and browns would dramatically change to blacks, grays, orange/reds and whites. In addition, landscape character would drastically change from medium-coarse texture to smooth textured mountainsides with sparse or no vegetation. This change would create a long-term, adverse visual impact to the overall scenic quality of the landscape.

Alternative 2: Proposed Action

Effects of the proposed action on visual resources include short term increases in browns and light greens along roads and ridges where treatment is proposed. The texture of the vegetation would become slightly rougher as smaller diameter trees are removed. Vertical lines would be slightly more pronounced in the foreground views, as individual trees may stand out more. The level of change would create openings in an existing dense, coarse-textured stand with full canopy closure. In the short term, the activity would cause a moderate contrast and draw attention to the landform until vegetation fills in the openings over several years. The vegetation's blend of medium to dark green colors would remain unchanged. Treatments would meet VRM I and II objectives through the use of leave patches, understory and hand pile burning. Treatments would meet VRM III and IV objectives by blending and feathering with the

characteristic variable landscape. Treatments on the ridges would blend with existing vegetation, which is generally vertically dominated with some skyline visible through ridgeline vegetation.

Project design features such as feathering, irregular shapes, avoiding straight lines and screening would also aid in meeting VRM objectives.

Summary and Conclusions
Effects of this project, combined with other project across the resource area on visuals would be neutral to positive, as fuel reduction would decrease chances for large-scale wildfires and disease spread, which could negatively impact the visuals. The prescriptions would blend with the characteristic landscape and include project design features such as feathering and screening, so that treatments are not noticed by the casual observer.

4.0 Public and Agencies Contacted

4.1 Public Involvement

The BLM extended an invitation to the local and regional communities and other state and federal agencies, private organizations and individuals to develop issues and resources important to local, state, national, and international economies.

Public scoping for the Fuels Reduction Programmatic Environmental assessment was initiated in December 2008, when BLM sent scoping letters to landowners and others who have asked to be kept informed about upcoming BLM projects. The letter described the intent and purpose for the project, treatment options and acres, the needs of the landscape and contact information to submit comments or questions. In addition, phone calls and comment letters provided public input for BLM consideration.

Letters and phone calls solicited the following input:

- Prioritize treating high risk areas starting in the community zone
- Ensure fuel reduction treatments are effective
- Prioritize treatments along major roads
- Disclose effects of yarding

4.2 Agencies Consulted

The following agencies were contacted during the planning process: Josephine County, USDA Forest Service, US Fish and Wildlife Service, National Marine Fisheries Service, and Oregon Department of Fish and Wildlife. In addition, BLM mailed letters to the Confederate tribes of Siletz and Grand Ronde as well as the Cow Creek Band of Umpqua Tribe.

4.3 Availability of Document and Comment Procedures

Copies of the EA will be available for public review in the Grants Pass Interagency Office, 2164 NE Spalding Ave. Grants Pass, OR 97526. A formal 30-day public comment period will be initiated by a notice in the Daily Courier. If you would like a copy of the EA, please stop by the office or contact Jon Larson, project lead, at (541) 471-6644. Written comments should be addressed to Abbie Jossie, Field Manager, Grants Pass Resource Area, 2164 NE Spalding Ave. Grants Pass, OR 97526. E-mailed comments may be sent to: *Medford_mail@blm.gov.*

Appendix A. Literature Cited

A.C. Kendig and Co. and Cedarock Consultants, Inc. 2003. Best Available Science Literature Review and Stream Buffer recommendations. City of Renton. Project No. 182. Renton, WA. http://www.ci.renton.wa.us/ednsp/images/caostrea.pdf

Altman. 2000. Conservation Strategy for Landbirds in Lowlands and Valleys of Western Oregon and Washington. Oregon-Washington Partners in Flight.

Amaranthus, Michael P., Debbie Page-Dumroese, Al Harvey, Efren Cazares, and Larry F. Bednar, 1996. Soil Compaction and Organic Matter Affect Conifer Seedling Nonmycorrhizal and Ectomycorrhizal Root Tip Abundance and Diversity. US Forest Service Pacific Northwest Research Station, PNW-RP-494.

Amaranthus, Michael P and David E. Steinfeld, September, 1997. Soil compaction after Yarding of Small-Diameter Douglas fir with a Small Tractor in Southwest Oregon. Pacific Northwest Research Station, USDA-Forest Service. PNW-RP-504.

Amsberry K and R Meinke. 2007. Continuing investigations of hybridization and fertility of *Fritilaria gentneri* through cytological evaluations and pollen viability analysis. ODA Oregon Department of Agriculture.

Aubry, K. B. and Houston, D. B. (1992). Distribution and status of the Fisher (Martes Pennanti) in Washington. Northwestern Naturalist 73(3): 69-79.

Aubry, K.B. and J.C. Lewis. 2003. Extirpation and reintroduction of fishers (*Martes pennanti*) in Oregon: implications for their conservation in the Pacific states. Biological Conservation 114 (1):79-90.

Bêche, Leah H, Scott L. Stephens and Vincent H. Resh, 2005. Effects of prescribed fire on a Sierra Nevada (California, USA) stream and its riparian zone. Forest Ecology and Management, vol 218 (2005) pp37-59.

Beschta, R.L., M.R. Pyles, A.E. Skaugset, and C.G. Surfleet. 2000. Peakflow responses to forest practices in the western Cascades of Oregon, USA. Journal of Hydrology 233:102-120.

Best, D.W.; Kelsey, H.M.; Hagans, D.K.; Alpert, M. 1995. Role of fluvial hillslope erosion and road construction in the sediment budget of Garrett Creek, Humboldt County, California. In: Nolan, K.M.; Kelsey, H.M.; Marron, D.C., eds. Geomorphic processes and aquatic habitat in the Redwood Creek Basin, northwestern California. Professional Paper 1454. Washington, DC: U.S. Geological Survey; M1-M9.

BJ Hicks, JD Hall, PA Bisson, JR Sedell - 1991. Responses of Salmonids to Habitat Changes. American Fisheries Society Special Publication 19, 483-518....

Brown, G.W. 1985. 2nd Edition. Forestry and water quality. Oregon State University Bookstore Corvallis 142p

Brush, L.M. and Wolman, M.G. 1960. Knickpoint behaviour in noncohesive material: A laboratory study. Bulletin of the Geological Society of America, 71: 59-73

Bunnell, F.L., L.L. Kremsater, and R.W. Wells. 1997. Likely consequences of forest management on terrestrial, forestdwelling vertebrates in Oregon. Report M7 of the Centre for Applied Conserv. Biol. Univ. Of British Columbia. 130 pp.

Burger, A.E. 2002. "Conservation assessment of marbled murrelets in British Columbia, a review of biology, populations, habitat associations and conservation." Technical Report Series Number 387. Canadian Wildlife Service, Pacific and Yukon Region, British Columbia. 168pp.

Carey, A.B., J.A. Reid, and S.P. Horton. 1990. Spotted owl home range and habitat use in southern Oregon coast ranges. Journal of Wildlife Management 54:11-17.

Chan, I.A., 1998. Aquatic macroinvertebrates of small streams in the Mineral King region of Sequoia National Park: baseline communities and response to prescribed fire. M.S. thesis, University of California, Davis, CA, USA, 109 pp.

Conservation Biology Institute (2001). Conservation Planning for Aquatic Biological Integrity in the Klamath-Siskiyou Ecoregion Using Multiple Spatial Scales. Corvallis, OR.

Dark, S. J. (1997). A landscape-scale analysis of mammalian carnivore distribution and habitat use by fisher. Arcata, California, USA: Humboldt State University.

Department of Environmental Quality (2004). Applegate SubBasin Total Maximum Daily Load. Medford, OR.

Department of Environmental Quality (2008). Rogue Basin Total Maximum Daily Load. Medford, OR.

Douglas, C.W. and M.A. Strickland. 1987. Fisher. *In* Wild furbearer management and conservation in North America. M. Novak, J.A. Baker, M.E. Obbard, Eds. Toronto, Ontario: Ontario Ministry of Natural Resources. Pp. 511-529.

Draper, John A. Ph.D.1998 Results of an Archaeological Survey of the Cen Oak, Merlin Bummer, Deer Mom, and Wild Wonder Timber Sale Units, Curry, Jackson and Josephine Counties, Oregon. Medford, Oregon: USDI Bureau of Land Management, Medford District.

Dwire, K.A. and J.B. Kauffman, 2003, Fire and riparian ecosystems in landscapes of the western USA. Forest Ecology and Management 178 (1-2): 61-74.

Forsman, E.D., E.C. Meslow, and H.M. Wight. 1984. Biology and Management of the northern spotted owl in Oregon. Wildlife Monographs No. 87: 1-64.

Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland, 2007: Changes in Atmospheric Constituents and in Radiative Forcing. *In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Gardner, T.W., Experimental study of knickpoint and longitudinal profile evolution in cohesive, homogenous material, Geol. Soc. Am. Bull., 94, 664-672, 1983.

Gucinski, Hermann; Furniss, Michael J.; Ziemer, Robert R.; Brookes, Martha H. 2001. Forest Roads: A Synthesis of Scientific Information. Gen. Tech. Rep. PNWGTR- 509. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Harris, J. E., and C. V. Ogan. Eds. Mesocarnivores of Northern California: Biology, Management and Survey Techniques, Workshop Manual. August 12-15, 1997. Humboldt State University. Arcata, CA. The Wildlife Society, California North Coast Chapter. Arcata, Ca. 127 p.

Jackson County (2002). Jackson County Water Resources Study. Jackson County, OR.

Jones, J. L. (1991). Habitat use of fisher in north central Idaho. 147. Moscow, Idaho, USA: University of Idaho.

Kramer, George 1999 Mining in Southwestern Oregon: A Historic Context Statement. Eugene, OR: USDI Bureau of Land Management/USFS Rogue River National Forest.

Libbey, F.W. 1964. Lest We Forget. *In* Sourdough Gazette l (2):7 (Summer).

Luce, Charles H and Thomas A Black, 1999. Sediment Production from Forest Roads in Western Oregon. Water Resources Research, vol 35 (8), pp2561-2570.

Luce, C. H., Black, T. A., 2001, Spatial and Temporal Patterns in Erosion from Forest Roads. In: Wigmosta, M. W. and Burges, S. J., editors, Influence of Urban and Forest Land Uses on the Hydrologic-Geomorphic Responses of Watersheds. American Geophysical Union, Washington, DC.

Management Guidance. Instruction Memorandum No. 2008-050, December 18, 2007.

McKinley, George and Doug Frank 1996 Stories on the Land: An Environmental History of the Applegate and Upper Illinois Valleys. Medford, OR: USDI Bureau of Land Management.

Megahan, W.F, 1974. Erosion Over Time on Severely Disturbed Granitic Soils: A Model. Research Paper INT-156, United States Department of Agriculture, Forest Service, Ogden, Utah, 14 pp.

Millar, Robert G., and MichaelC. Quick. 1998. Stable width and depth of gravel-bed rivers with cohesive banks. Journal of Hydraulic Engineering 124(10):1005–1013.

Moore, R.D. and S.M. Wondzell. 2005. Physical hydrology and the effects of forest harvesting in the Pacific Northwest: a review. Journal of the American Water Resources Association, pp. 763-784, August 2005.

Neary, Daniel G., Carole C. Klopatek, Leonard F. DeBano and Peter F. Ffolliott, 1999. Fire effects on belowground sustainability: a review and synthesis. Forest Ecology and Management, Vol 122 (1-2) pg 51-71.

Nelson, S.K. and A.K. Wilson. 2002. "Marbled murrelet characteristics on state lands in western Oregon." Oregon Cooperative Fish and Wildlife Research Unit, Oregon State University, Department of Fisheries and Wildlife, Corvallis, OR. 151 pp.

Oregon Dept of Environmental Quality, 1999. TMDL Assessment Report: Riparian Shade, Williams Creek.

Personal Communication. 2003. John Hayes. Program Coordinator and Wildlife Ecologist for the Cooperative Forest Ecosystem Research Program, Corvallis, OR, and serves as a Department of Forest Science professor at Oregon State University, Corvallis, OR. Forest Management and Bat Conservation Workshop, Eugene, OR. August 26-27, 2003.

Powell, R. A. and Zielinski, W. J. (1994). Fisher. In The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine: 38-73. Fort Collins, Colorado, USA: USDA Forest Service, Rocky Mountain Forest and Range Experimental Station.

Powell, R.A. 1993. The Fisher: Life History, Ecology and Behavior. 2nd ed. Minneapolis, MN. University of Minnesota Press. 237 p.

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

Richardson J.S. 2004. Meeting the Conflicting Objectives of Stream Conservation and Land Use Through Riparian Management: Another Balancing Act. Pages 1-6 in G.J. Scrimgeour, G.Eisler, B. McCulloch. U.Silins and M. Monita. Editors. Forest Land-Fish Conference II- Ecosystem Stewardship through Collaboration. Proc. Forest-Land-Fish Conf. II, April 26-28, 2004. Edmonton, Alberta.

Rieman, B. E., R. E. Gresswell, M. K. Young and C. H. Luce, 2003, Introduction to the effects of wildland fire on aquatic ecosystems in the western USA. Forest Ecology and Management 178:1-3.

Rothacher, J. 1971. Regimes of streamflow and their modification by logging. In: Proceedings of a symposium: forest land uses and stream environment, J. T. Krygier and J. D. Hall (Editors). October 19-21, 1970 Oregon State University, Corvallis, Oregon. Forest Extension, Oregon State University, Corvallis, Oregon, pp. 40-54.

Scott, D. F. and D. B. Van Wyk, December 1990, The effects of wildfire on soil wettability and hydrological behaviour of an afforested catchment. Journal of Hydrology, Volume 121, Issues 1-4, 15 Pages 239-256.

Seglund, A. E. (1995). The use of rest sites by the Pacific fisher. 66. Arcata, California, USA: Humboldt State University.

Sensenig, Thomas S. 2002. Development, Fire History and Current and Past Growth, of Old Growth and Young Growth Forest Stands in the Cascade, Siskiyou and Mid-Coast Mountains of Southwestern Oregon.

Solis, D.M. and R.J. Gutierrez. 1990. Summer habitat ecology of northern spotted owls in Northwest California. Condor 92:739-748.

Stearns-Smith, Stephen C. and Hann, David, W. 1986. Forest Soil Associations of Southwest Oregon. Corvallis, OR. Oregon State University Forest Research Lab.

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

Swanston, D.N., 1974 Slope stability problems associated with timber harvesting in mountainous regions of the western United States. USDA Gen. Tech. Report. PNW-21. Portland, OR, USA.

Switalski, TA, JA Bissonette, TH DeLuca, CH Luce, and MA Madej, 2004. Benefits and impacts of road removal. Frontiers in Ecology and the Environment 2(1): 21-28.

USDA 1993. Forest Ecosystem Management: An Ecological, Economic, and Social Assessment. Us Governement Printing Office: 1993-793-071.

USDA, Forest Service and USDI, Bureau of Land Management. 1994. Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl. Appendix J2 Results of Additional Species Analysis. Portland, Oregon.

USDI, BLM. Record of Decision for Density Management and Conversion Treatments and Attaining Riparian Reserve Function: Management Direction Concerning Silvicultural Activities Inside the Riparian Reserves. Coos Bay Dist. Office, North Bend, OR

USDI 2008. Medford BLM District Analysis and 2008 Biological Assessment of Forest Habitat.

USDI Bureau of Land Management, Washington Office. 2008. Migratory Bird Treaty Act – Interim

USDI Fish and Wildlife Service. 1996. Washington, D.C. 61 Federal Register Vol. 61 (102) 26256-26320.

USDI Fish and Wildlife Service. 1997. *Recovery plan for the threatened marbled murrelet (Brachyramphus marmoratus) in Washington, Oregon, and California* US Fish and Wildlife Service, Region 1, Portland, Oregon.

USDI Fish and Wildlife Service. 2002. Birds of Conservation Concern 2002. Division of Migratory Bird Management, Arlington, VA. http://migratory birds.fw.gov/reports/bcc2002.pdf

USDI Bureau of Land Management 1995 Watershed Analysis for the Kerby Watershed. Medford, Oregon: USDI Bureau of Land Management, Medford District.

USDI, Bureau of Land Management. 2008. Informational Memorandum OR-2008-038. Final State Director's Special Status Species List.

USDI, Bureau of Land Management, Medford District Office. 1995. Medford District Record of Decision and Resource Management Plan. Government Printing Office. Medford, OR.

USDI, US Fish and Wildlife Service. 2004. Washington, DC. Federal Register April 8, 2004 Vol. 69 (68) 18769-18792.

USDI, US Fish and Wildlife Service. 2008. Washington, DC. Federal Register July 31, 2008 Vol. 73 (148) 44678-44701.

USDI, US Fish and Wildlife Service. 2008. Washington, DC. Federal Register August 13, 2008 Vol. 73 (157) 47325-47374.

USDI, US Fish and Wildlife Service. 2006. Washington, DC. Federal Register. Sept 12, 2006 Vol. 71 (176) 53777

Watershed Professionals Network (WPN). 1999. Oregon Watershed Assessment Manual. June 1999. Prepared for the Governor's Watershed Enhancement Board. Salem Oregon.

Wemple, B. C., F. J. Swanson, J. A. Jones. 2001. Forest roads and geomorphic process interactions, CascadeRange, Oregon. Earth Surface Processes and Landforms 26, pp. 191-204. John Wiley & Sons, Ltd. 2001.

Williamson, JR and WA Neilson, 2000. The influence of forest site on rate and extent of soil compaction and profile disturbance of skid trails during ground-based harvesting. Canadian Journal of Forest Research Vol. 30:1196-1205

Zielinski, W. J. and Gill, C. (1997). A sensitive measure of forest ecosystem health. US FOR SERV FOR RES WEST: 17-24.

Zielinski, W. J., R. L. Truex, G.A. Schmidt, F.V. Schlexer, K. N. Schmidt, and R.H. Barrett. 2004. Home Range Characteristics of Fishers in California. Journal of Mammalogy. 85(4): 649-657.

Ziemer, Robert R. 1981. Storm flow response to road building and partial cutting in small streams of northern California. Water Resources Research 17: 907-917.

USDA Forest Service. 1996. PNW-GTR-364 February 1996 Colin C. Hardy, Gurdelines for Estimating Volume, Biomass, and Smoke Production for Piled Slash.

Environmental Protection Agency. 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2007. U.S. EPA, Washington, D.C.

Scientific Consensus Statement. 2004. Scientific Consensus Statement signed at a symposium on, "Impacts of Climate Change on the Pacific Northwest" by 50 Ph.D.-level scientists with expertise on the impacts of climate change in the Pacific Northwest.

U.S. EPA. 2010. DRAFT Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008.

Galik, CS and RB Jackson. 2009. Risks to forest carbon offset projects in a changing climate. Forest Ecology and Management, 257, 2209-2216.

USDI, Bureau of Land Management, VRM Manual 8410-1.

USDI, Bureau of Land Management. 1980, Visual Resource Program, U.S. Government Printing Office, Washington, D.C.

Appendix B: Medford District Wildlife Special Status Species

On February 6, 2008 a new Special Status Species list went into affect (IM No. OR-2008-038). This new list has two categories, Sensitive and Strategic. According to BLM Special Status Species Management (6840), only Sensitive species are required to be addressed in NEPA documents. All Sensitive species were considered and evaluated for this project, and only those that could be impacted by the proposed actions are discussed in more detail in the EA.

The USFWS in the Migratory Bird Program Strategic Plan 2004-2014 (USDI 2008) includes a list of "Western BLM Bird Species of Conservation Concern" (Migratory Birds of Concern) and "Game Birds below Desired Condition" and are suggested birds to include in NEPA analysis. Medford BLM biologists conferred with local bird groups and knowledgeable individuals to identify which birds on the list in our region (Bird Conservation Region 5, USFWS Region 1) are present within Medford BLM lands.

The table below lists the Bureau Sensitive species, Birds of Conservation Concern, and Game Birds below Desired Conditions that are documented or Suspected on lands within the Medford District.

Medford District Special Status Species			
Species	**Status**	**Presence**	**Habitat information/ Basic Conclusions**
Birds			
Bald eagle	BS	D	Late successional stands with large trees near large bodies of water. See Wildlife Effects Section in EA.
Band-tailed pigeon	GBBDC	D	Typically nest in closed canopy conifer or mixed hardwood and conifer forests and use open canopy forests for foraging. Often found near mineral springs and mineral sites. No detectable effects from proposed actions. No detectable effects from proposed actions.
Lewis' woodpecker	BS, BOCC	D	Habitat preference is hardwood oak stands with scattered pine near grassland shrub communities. No anticipated effects.
Flammulated owl	BOCC	D	Habitat is a mosaic of open forests containing mature or old-growth ponderosa pine mixed with other tree species. No anticipated effects.
Grasshopper sparrow	BOCC	D	In Oregon, their distribution is restricted to grasslands. No anticipated effects.
Mallard	GBBDC	D	Wetlands and large riparian areas. No detectable effects from the proposed actions.
Marbled murrelet	FT	S	Late successional stands within 50 miles of the coast. No Effect.
Mourning dove	GBBDC	D	Doves are adapted to a wide variety of habitats ranging from open forests and clear-cuts to urban and agricultural areas. They are not found in densely forested sites and alpine areas. No

Medford District Special Status Species			
Species	**Status**	**Presence**	**Habitat information/ Basic Conclusions**
			anticipated effects.
Northern spotted owl	FT	D	Old growth coniferous forest is preferred nesting, roosting and foraging habitat or areas with some old growth characteristics with multi-layered, closed canopies with large diameter trees with an abundance of dead and down woody material. See Wildlife Effects Section in EA.
Olive-sided flycatcher	BOCC	D	Mixed conifer, hardwood conifer, douglas fir, true fir, and lodgepole pine forests; more abundant in landscapes containing fragmented late-seral forests with high contrasted edges than in less fragmented landscapes. No anticipated effects.
Peregrine falcon	BOCC, BS	D	Nests on cliffs. No Effect.
Prairie falcon	BOCC	D	Open habitat in mountainous regions with low, sparse vegetation. No Effect.
Purple martin	BS	S	In Oregon they nest in snags in forest clearcuts and burns, nest boxes along rivers, and crevices beneath bridges. Purple martins forage diurnally over open areas such as rivers, lakes, marshes, fields, and high above the forest canopy. Possible migrant in Josephine County. No detectable effects from proposed actions.
Red-naped sapsucker	BOCC	S	Riparian habitats within pine forests, less frequently found in mixed conifer forests. Casual in all seasons west of the Cascades. No Effect.
Rufous hummingbird	BOCC	D	Forest edges near riparian thickets, meadows, and other openings. No detectable effects from proposed actions.
Streak horned lark	BS	D	Mainly occurs in open fields with short herb-dominated ground cover with patches of bare grounds. Rare or possible migrant on Medford BLM. No Effects.
Tricolored blackbird	BS	D	Tri-colored blackbirds are found in the lowland interior valleys of southern Oregon, near freshwater marshes and crop lands. Oregon breeding colonies occur in hardstem bulrush, cattail, nettles, willows, and Himalayan blackberry. No detectable effects from proposed actions.
White-headed woodpecker	BS	D	Occur in open ponderosa pine or mixed conifer forests dominated by ponderosa pine. No Effect.
White-tailed kite	BS	D	The kite is a resident in the Rogue, Illinois, and Applegate valleys. They nest in trees in and around open fields and agricultural areas. No anticipated effects.
Williamson's sapsucker	BOCC	S	In Oregon, Williamson's sapsuckers are most often found in ponderosa pine forests during the breeding season. No Effect.
Wood duck	GBBDC	D	Timbered wetlands or riparian zones of rivers, streams, marshes, sloughs, and lakes. They require cavities in trees for nesting. No detectable effects from proposed actions.

Medford District Special Status Species			
Species	**Status**	**Presence**	**Habitat information/ Basic Conclusions**
Amphibian			
Black salamander	BS	D	Forests, open woodlands, moist talus, and streamside areas with down logs and rock debris. See Wildlife Effects Section in EA regarding effects to salamanders.
Foothill yellow-legged Frog	BS	D	Permanent streams with rocky, gravelly bottoms. See Wildlife Effects Section in EA.
Oregon spotted frog	BS	D	Permanent water bodies including ponds and slow streams; most often in sedge, rush and grass communities. No detectable effects from proposed actions.
Siskiyou Mt. salamander	BS	D	Habitat is deep talus, especially on forested, north-facing slopes and woody debris near talus slopes during rainy periods. See Wildlife Effects Section in EA regarding effects to salamanders.
Reptiles			
Northwestern pond turtle	BS	D	Live in most types of freshwater environments with abundant aquatic vegetation, basking spots, and terrestrial surroundings for nesting and over-wintering. No detectable effects from proposed actions.
Mammals			
Fisher	FC	D	Primarily mature and old growth forests with high canopy cover, but have also been located foraging in mixed conifer/hardwood forests. Use large living trees, snags and fallen logs for denning. See Wildlife Effects Section in EA.
Fringed myotis	BS	D	Fringed myotis is a crevice dweller which may be found in caves, mines, buildings, rock crevices, large old growth trees and snags. They have been captured in openings and in mature/old growth and mid-seral stage forest habitats. See Wildlife Effects Section in EA.
Pacific pallid bat	BS	D	This bat is a crevice dweller. Rock crevices, snags, large trees and human structures are used as day roosting sites See Wildlife Effects Section in EA.
Townsend's big-eared bat	BS	D	Roost in mines, caves, tree cavities and attics of buildings. See Wildlife Effects Section in EA.
Invertebrates			
Chase sideband snail	BS	D	Found in moist coniferous forests. See Wildlife Effects Section in EA regarding effects to mollusks.
Coronis fritillary	BS	S	Found in forests and meadows. Their host plant is the violet. No detectable effects from proposed action.
Evening fieldslug	BS	S	May be associated with a variety of low vegetation, litter, and debris. Rocks also may be used. Little is known about this species and its habitat. See Wildlife Effects Section in EA regarding

Medford District Special Status Species			
Species	**Status**	**Presence**	**Habitat information/ Basic Conclusions**
			effects to mollusks.
Franklin's bumblebee	BS	S	Found in herbaceous grasslands between 1400-4000 ft. in elevation. Their range is restricted to southwestern Jackson County, Oregon, and perhaps the southeastern corner of Josephine Co., and part of northern California. No detectable effects from proposed actions.
Johnson's hairstreak	BS	D	Mature to old growth forests; feed on dwarf mistletoes growing on conifers. No detectable effects from proposed action.
Mardon skipper butterfly	FC	D	In general habitat consists of alpine, grassland/herbaceous, conifer woodland. It is known to occur in the Siskiyou Mountains of Oregon with an isolated remnant population on a serpentine grassland in Del Norte county, California. No detectable effects from proposed actions.
Nerite peblesnail	BS	D	A freshwater snail found only in Jackson County. No detectable effects from proposed actions.
Oregon shoulderband snail	BS	D	Found in rocky areas including talus deposits, as well as rock fissures or large woody debris sites. See Wildlife Effects Section in EA regarding effects to mollusks.
Scale lanx snail	BS	S	A freshwater snail that likely inhabits clean undisturbed springs, ponds or lakes. Only other known locations are around Klamath Lake mostly in very large limnocrenes. No Effect
Siskiyou hesperian snail	BS	D	Riparian and other perennially moist habitats, in deep leaf litter and under debris and rocks. May occur along running water, such as small-order streams, or around permanent ponds and springs. Vegetation at sites includes Rorippa and skunk cabbage. See Wildlife Effects Section in EA regarding effects to mollusks.
Siskiyou short horned grasshopper	BS	D	This species occurs in Grassland/herbaceous habitats and is associated with elderberry plants. Only in the Siskiyou Mountains of Jackson County. No anticipated effects from the proposed action.
Travelling sideband snail	BS	D	Dry basal talus and rock outcrops, with oak and maple overstory component; also along spring run in rocks and moist vegetation and moss, within mixed conifer-hardwood forest; also very moist, silty alluvial bench adjacent to creek in mixed conifer-hardwood forests. See Wildlife Effects Section in EA regarding effects to mollusks.
Vernal pool fairy shrimp	FC	D	Habitat for vernal pool fairy shrimp is vernal pools, small shallow pools that fill with water during the wet winter and early spring months and are dry during the remainder of the year. Only in the Butte Falls RA. No anticipated effects from the proposed action.

Status: lists the Oregon BLM

FT - USFW Threatened - likely to become endangered species within the foreseeable future

FC - USFW Candidate - proposed and being reviewed for listing as threatened or endangered

BS - Bureau Sensitive (BLM) - Generally these species are restricted in range and have natural or human caused threats to their survival.

Presence: **D = Documented occurrence** = A species located on land administered by the BLM or the Forest Service based on historic or current known sites of a species reported by a credible source for which BLM and the Forest Service has knowledge of written, mapped or specimen documentation of the occurrence.

S = Suspected occurrence = Species is not documented on land administered by the BLM or the Forest Service, but may occur on the unit because: 1) BLM District or National Forest is considered to be within the species' range ***and*** 2) appropriate habitat is present ***or*** 3) known occurrence of the species (historic or current) in vicinity such that the species could occur on BLM or FS land.

Appendix C: Medford District Federally Listed and Sensitive Plants

Species on this list are subject to change as plant species populations recover (taken off the list) or decline (species added to the list) over the coming years.

VASCULAR PLANTS		
Species	**Habitat**	**Status**
Fritillaria gentneri (Gentner's Fritillary)	Open low-elevation sites in mixed oak-madrone woodlands, ponderosa pine woodlands, open Douglas-fir forests, chaparral, and grasslands 1,000-5,000 ft. Often found in eco-tones between forested sites and more open habitats, including the edges of riparian zones	Federally Endangered
Lomatium cookii (Cook's Lomatium)	Vernal pool/patterned ground areas on mounds and moist sites in meadows.	Federally Endangered
Adiantum jordanii (California Maiden-hair)	Moist woods or shaded hillsides, seeps, riparian, and serpentine rock outcrops. Found on damp banks at the base of rocks or trees, 800-1,100 ft.	Bureau Sensitive
Arabis modesta (Rogue Canyon Rockcress)	Rocky walls and bluffs 500-1,500 ft. Damp shaded banks or slopes.	Bureau Sensitive
Arctostaphylos hispidula (Hairy Manzanita)	Dry rocky ridges and gravelly soils that receive direct sun with shrub communities or sparse forests.	Bureau Sensitive
Astragalus californicus (California Milk-vetch)	Dry open areas in shrubland and woodlands, 900-4,000 ft.	Bureau Sensitive
Astragalus gambelianus (Gambel Milkvetch)	Open grassy areas in shrubland.	Bureau Sensitive
Bensoniella oregana (Bensonia)	Deep soils in moist meadows, forest openings, and along streamsides, 3,000-5,000 ft. Upper slope sites and ridge saddles with northerly aspects.	Bureau Sensitive
Callitriche marginata (Winged Water-starwort)	Often in vernal pools or submersed.	Bureau Sensitive
Calochortus greenei (Greene's Mariposa Lily)	Clay soils of chaparral areas around dry thickets and on rocky slopes and bluffs 2,400-6,500 ft. Margins of white oak and white fir stands.	Bureau Sensitive
Calochortus howellii (Howell's Mariposa Lily)	Dry, open slopes. Rocky, serpentine soils, in Jeffrey pine forests.	Bureau Sensitive
Calochortus monophyllus (One-leaved Mariposa Lily)	Wooded slopes, clay-loam soils 1,200-3,600 ft.	Bureau Sensitive
Calochortus nitidus (Broad-fruit Mariposa Lily)	Grassy hillsides and meadows.	Bureau Sensitive

Calochortus persistens (Siskiyou Mariposa Lily)	Open rocky areas above 3,000 ft.	Federal candidate for listing
Camassia howellii (Howell's Camas)	Dry open slopes in serpentine soils.	Bureau Sensitive
Camissonia graciliflora (Slender Flowered Evening Primrose)	Open or shrubby slopes, grasslands, oak woodlands, less than 4,500 ft.	Bureau Sensitive
Carex capitata (Capitate Sedge)	Generally wet meadows, bogs at high elevations.	Bureau Sensitive
Carex comosa (Bristly Sedge)	Swamps and marshes and other wet areas, sea level to 1,200 ft.	Bureau Sensitive
Carex gynodynama (Hairy Sedge)	Moist meadows, open forests, or seeps.	Bureau Sensitive
Carex klamathensis (Klamath Sedge)	Serpentine wetland areas that dry out in mid-late summer 1,300-1,800 ft.	Bureau Sensitive
Carex scabriuscula (Siskiyou Sedge)	Vernally or perennially wet serpentine above 2,800 ft. in the coast range and 5,000 ft. in the inland ranges. Generally in open, sunny sites with little cover.	Bureau Sensitive
Carex serratodens (Saw-tooth Sedge)	Moist meadows and rocky places near streams and seepages, frequently on, but not limited to serpentine soils, below 6,000 ft.	Bureau Sensitive
Cheilanthes covillei (Coville's Lipfern)	Rock crevices, base of rocks, rocky slopes, and sun to shade.	Bureau Sensitive
Cheilanthes inertexta (Coastal lipfern)	Rock crevices, foothills to mid-montane.	Bureau Sensitive
Chlorogalum angustifolium (Narrow Leaved Amole)	Open, dry places, heavy soil in meadows, and woodlands below 1,500 ft.	Bureau Sensitive
Cimicifuga elata var. *elata* (Tall Bugbane)	White and Doug fir forests. It has been found near springs, drainages, and in clearcuts. North-northeast facing slopes, 4,300-5,400 ft.	Bureau Sensitive
Cryptantha milo-bakeri (Milo Baker's Cryptantha)	Rocky or gravelly slopes, generally coniferous forests.	Bureau Sensitive
Cupressus bakeri (Baker's Cypress)	Dry forested, brushy, or open slopes. Usually rocky ground or serpentine soils 3,800-6,000 ft.	Bureau Sensitive
Cypripedium fasciculatum (Clustered ladyslipper)	Moist microsites in mixed evergreen forests	Bureau Sensitive
Delphinium nudicaule (Red Larkspur)	Open areas on rocky slopes, among shrubs and woods.	Bureau Sensitive
Dicentra pauciflora (Few-flowered Bleedingheart)	Rocky places at higher elevations.	Bureau Sensitive
Epilobium oreganum (Oregon Willow Herb)	Wet boggy sites often serpentine at lower elevations.	Bureau Sensitive

Erythronium howellii (Howell's Adder's Tongue)	Usually in or near serpentine in ecotonal areas. Found in the shade of trees and shrubs on forest edges.	Bureau Sensitive
Eschscholzia caespitosa (Gold Poppy)	Dry flats and brushy slopes below 3,500 ft.	Bureau Sensitive
Eucephalus vialis (Wayside Aster)	Coniferous forests, usually on drier upland sites dominated by Douglas-fir and mixed hardwoods, serpentine slopes, and edges between meadows and forest 500-5,100 ft.	Bureau Sensitive
Frasera umpquaensis (Umqua Swertia)	Open woods or at edges of meadows. In mid to upper elevation true fir dominated forests or mixed conifer forests (4,000-6,000 ft.), generally in partial shade or openings.	Bureau Sensitive
Gentiana setigera (*Waldo* Gentian)	Wet meadows and bogs on serpentine soils at lower elevations.	Bureau Sensitive
Hackelia bella (Beautiful Stickseed)	Stream banks, roadsides, open slopes, forest openings 3,000-6,000 ft.	Bureau Sensitive
Hastingsia bracteosa var. *atropurpurea* (Purple Flowered Rush Lily)	Wet meadows on serpentine soil.	Bureau Sensitive
Hastingsia bracteosa var. *bracteosa* (Large Flowered Rush Lily)	Wet meadows on serpentine soil.	Bureau Sensitive
Horkelia tridentata ssp. *Tridentata* (Three-toothed Horkelia)	Dry open coniferous forest on granitic or igneous soils 1,000-8,000 ft.	Bureau Sensitive
Iliamna latibracteata (California Globe Mallow)	Moist sites, streamsides in coniferous forests. Often on shady disturbed ground 200-6,000 ft.	Bureau Sensitive
Lewisia leeana (Quill-leaf Lewisia)	Rocky or gravelly ridges or benches at higher elevations, often on serpentine soils.	Bureau Sensitive
Limnanthes floccosa ssp. *bellingeriana* (Bellinger's Meadow Foam)	Full sun in vernally wet meadows or vernal pools, generally found on basalt scablands at 1,000-4,000 ft.	Bureau Sensitive
Limnanthes floccosa ssp. *pumila* (Dwarf Meadow Foam)	Edges of deep vernal pools which dry up by mid-summer.	Bureau Sensitive
Limnanthes gracilis ssp. *gracilis* (Slender Meadow Foam)	Wet ground, on serpentine soils.	Bureau Sensitive
Lotus stipularis (Stipuled trefoil)	Open forests, stream beds, ditches, chaparral, and logged areas below 4,000 ft	Bureau Sensitive
Meconella oregana (White Fairy Poppy)	Vernally moist openings/prairies on sandy, gravelly, or serpentine soils.	Bureau Sensitive
Microseris howelli (Howell's Microseris)	Dry, rocky areas on serpentine soil.	Bureau Sensitive
Mimulus bolanderi (Bolander's Monkeyflower)	Openings, in chaparral and disturbed areas, especially burned areas 1,000-2,500 ft.	Bureau Sensitive

Mimulus congdonii (Congdon's Monkeyflower)	Oregon white oak-wedgeleaf ceanothus-whiteleaf Manzanita chaparral 1,000-3,000 ft.	Bureau Sensitive
Monardella purpurea (Siskiyou Mondardella)	Rocky, open slopes, chaparral, woodlands, and montane forest on serpentine soils (or related bedrock) 1,400-4,000 ft.	Bureau Sensitive
Navarretia leucocephala ssp. *leucocephala* (White- flowered Navarretia)	Vernal pools.	Bureau Sensitive
Nemacladus capillaries (Slender Nemacladus)	Dry slopes, burned areas 1,200-6,500 ft.	Bureau Sensitive
Pellaea andromedifolia (Coffee Fern)	Rocky or dry areas, rock crevices and under boulders, 100-6,000 ft.	Bureau Sensitive
Pellaea mucronata ssp. *mucronata* (Bird's Foot Fern)	Rocky or dry areas all elevations.	Bureau Sensitive
Perideridia erythrorhiza (Red-rooted (Red-rooted Yampah)	Vernally moist depressions in heavy, poorly drained soils. Oak or pine woodlands at lower to mid elevations up to 5,000 ft. Also found in serpentine soils.	Bureau Sensitive
Plagiobothrys austiniae (Austin's Plagiobothrys)	Vernally wet areas, wet sites, and along roads and trail edges.	Bureau Sensitive
Plagiobothrys figuratus ssp. *corallicarpus* (Coral Seeded Allocarya)	Rocky, open grassland meadows assoc. with vernal pools (wet in spring/dry in summer).	Bureau Sensitive
Plagiobothrys greenei (Greene's Popcorn Flower)	Vernally wet areas, and along trails and old roads.	Bureau Sensitive
Poa rhizomata (Timber Bluegrass)	Dry douglas-fir/ponderosa pine forest.	Bureau Sensitive
Rafinesquia claifornica (California Chicory)	Shrubby slopes and open woods (common after fires).	Bureau Sensitive
Ranunculus austrooreganus (Southern Oregon Buttercup)	On damp or dry grassy loam slopes, often among scattered oak 1,500-2,000 ft.	Bureau Sensitive
Rhamnus ilicifolia (Redberry)	Chaparral and oak woodlands below 5,000 ft.	Bureau Sensitive
Ribes divaricatum var. *pubiflorum* (Straggly Gooseberry)	Forest edges and streamside.	Bureau Sensitive
Saxifragopsis fragarioides (Joint-leaved Saxifrage)	Rocky crevices 4,500-9,000 ft.	Bureau Sensitive
Scirpus pendulus (Drooping Bulrush)	Marshes, wet meadows, river terraces, ditches. Sea level to 3,000 ft.	Bureau Sensitive
Sedum moranii (Rogue River Stonecrop)	Rock outcrops in lower canyons. Found on greenstone outcrops on west or southwest slopes.	Bureau Sensitive

Sidalcea hickmanii ssp. *nov* (Hickman's Checkerbloom)	Dry chaparral on ridgelines. Responds well to fire.	Bureau Sensitive
Silene hookeri ssp. *bolanderi* (Bolander's Catchfly)	Oak woodland, rocky knolls and slopes, often on serpentine below 5,000 ft.	Bureau Sensitive
Solanum parishii *(Parish's Horse Nettle)*	Buckbrush chaparral, oak/pine woodlands, meadows and brush land in dry Douglas fir or Oregon oak communities.	Bureau Sensitive
Sophora leachiana (Western Sophora)	Open, sunny, south or west facing slopes, within mixed evergreen-oak woodlands. Sometimes riparian. Requires disturbance occasionally found in clear cuts.	Bureau Sensitive
Streptanthus glandulosus (Common Jewel Flower)	Rocky serpentine in open coniferous and hardwood forests.	Bureau Sensitive
Streptanthus howellii (Howell's Streptanthus)	Dry, rocky, serpentine slopes in open conifer/hardwood forests from 1,000-4,500 ft.	Bureau Sensitive
Utricularia minor (Lesser Bladderwort)	In pond and bogs in shallow, standing, or slow moving water.	Bureau Sensitive
Viola primulifolia ssp. *occidentalis* (Western Bog Violet)	Serpentine wetlands.	Bureau Sensitive
Wolffia borealis Dotted water-meal	Fresh water areas.	Bureau Sensitive
*Zigadensus fontanus (*Small flowered death camas)	Vernally moist or marshy areas, open hillsides, often on serpentine; < 500 m.	Bureau Sensitive
NON-VASCULAR PLANTS		
Species	**Habitat**	**Protection Status**
Chaenotheca subroscida (Needle Lichen)	Found on conifer bark at lower - mid elevations in old growth stands.	Bureau Sensitive
Leptogium cyanescens (Dark Blue Skin Lichen)	Found on bark at the base of trees, rotten logs, and on rocks. Found in mixed conifer stands, mature big leaf maple, and Douglas fir stands 1,400-4,600 ft.	Bureau Sensitive
Peltigera *pacifica* (Pacific Felt Lichen)	Found on rotten logs and humus, occasionally on lower boles of trees in closed canopy old growth stands.	Bureau Sensitive
Porella bolanderi (Liverwort)	Found on bark and rock in drier somewhat exposed rock.	Bureau Sensitive
Bryum calobryoides (Bryum Moss)	Cliffs, rock, and soil covering rock at higher elevations.	Bureau Sensitive
Codriophorus depressus (Depressed Codriophorus Moss)	Granitic rock or soil over rock in moist high elevation areas.	Bureau Sensitive
Ephemerum crassinervium (Ephemerum Moss)	Meadows and rocky moist areas in partial shade at low elevations.	Bureau Sensitive
Meesia uliginosa (Meesia Moss)	Exposed wetlands at various elevations.	Bureau Sensitive

Tayloria serrata (Dung Moss)	Found on dung and other nitrogen enriched substrates.	Bureau Sensitive
Tortula mucronifolia (Mucronleaf Tortula Moss)	Found on rock at high elevations.	Bureau Sensitive
FUNGI		
Species	**Habitat**	**Protection Status**
Boletus pulcherrimus	Found in humus in association with the roots of mixed conifers and hardwoods. Fruiting July-December.	Bureau Sensitive
Gomphus kauffmanii	Partially hidden in deep humus under *Pinus* and *Abies spp*. Fruits in Autumn.	Bureau Sensitive
Leucogaster citrinus	Found in association with the roots of *Abies lasiocarpa*, *Pinus contorta*, *Pseudotsuga menziesii*, and *Tsuga heterophylla* 800-6,000 ft. Fruiting August-November.	Bureau Sensitive
Phaeocollybia californica	Found in association with the roots of *Abies lasiocarpa*, *Picea stitchensis*, *Pseudotsuga menziesii*, and *Tsuga heterophylla*. Fruiting March, May, October and November.	Bureau Sensitive
Phaeocollybia olivacea	Scattered in mixed forests containing Fagaceae and Pinaceae in coastal lowlands. Fruits in Autumn.	Bureau Sensitive
Phaeocollybia pseudofestiva	Scattered under mature mixed conifers and hardwoods. Fruits October-December.	Bureau Sensitive
Ramaria largentii	Fruits in humus or soil and matures above surface of the ground. Fruits in October.	Bureau Sensitive
Rhizopogon ellipsosporus	Found in association with the roots of *Pseudotsuga menziesii*, and scattered *Pinus lambertiana*. Fruits inOctober.	Bureau Sensitive
Sowerbyella rhenana	Fruits in the duff of moist, relatively undisturbed, older conifer forests. Fruits October-December.	Bureau Sensitive

Appendix D: Issues and Concerns Considered, but Not Analyzed in Detail

BLM identified a number of issues through internal scoping, interdisciplinary team process, and public input (see Chapter 4). The following issues were considered during project development and analysis but not analyzed in the EA.

Reduce road density by decommissioning and building no new roads
Roads will not be decommissioned as part of this project and no new road construction is proposed. Road maintenance and renovation will occur which will reduce sediment inputs into streams

Large diameter trees in the LSR and the Riparian Reserves should not be logged in order to facilitate yarding activities.
Large trees will not be logged in order to facilitate yarding activities.

Harvest activities and proposed yarding activities within the Riparian Reserve and LSRs.
No commercial timber harvest is proposed. Biomass produced and removed will be a byproduct of fuel hazard reduction activities. The Decision Recprd prepared for each project will disclose the locations of activities.

Ensure fuel reduction treatments are effective.
The purpose of the prescribed treatments in the proposed action is to reduce hazardous fuels, reduce smoke emissions and utilize the biomass to benefit the local economy. Trees greater than 12 inch DBH will be retained and in general oaks greater than 6 inches will be retained to prevent sprouting. Slash created by fuels treatment would be burned. For treatment units greater than 10 acres, approximately 10 to 20% of each unit would remain untreated to retain areas with pre-treatment stand conditions. Fuels hazard treatments would occur in isolated blocks of BLM surrounded by private land, strategic roads and ridges, as well as pieces of BLM lands that may have not been covered in past EAs to tie together treatment areas. Periodic, low intensity underburning following the initial fuel reduction would maintain desired fuel conditions. Maintenance burning throughout the project area would need to be done about every 7-15 years in areas classified as fire regime 1 and every 10-30 years for other fire regimes. A monitoring plan is proposed in the project area to promote learning and adaptive management to improve future project development and implementation.

Special status species surveys
Special status species surveys will be completed prior to project implementation and PDFs will be adhered to, to ensure proper protection of plant and animal populations.

Appendix E. Oregon DEQ Stream Listing, Parameters and Status

Name LLID River Mile	Parameter	Season	Criteria	Status	Assessment: Year Action	[Data Source] Supporting Data
Applegate Watershed 4th Field HUC, #17100309						
E Fork Williams Cr 1232742/422112 0 to 2.4	Temperature	Summer	Rearing: 17.8 C	Attaining	1998 Added to database	BLM (above Glade Fork): 7-day moving average of daily maximums of 62.9 with 2 days exceeding temperature standard.
	Dissolved Oxygen	Summer	Cold water: Not less than 8.0 mg/l or 90% of saturation	303(d)	2002 Added to database	Applegate Watershed Council: 3/9 samples.
Williams Creek 1232401/422976 0 to 7.1	Dissolved Oxygen	Summer	Cold water: Not less than 8.0 mg/l	303(d)	2002 Added to database	Applegate Watershed Council: RM 0.2: 5/9 samples ; RM 2.0: 5/8 samples ; RM 4.8: 3/8 samples
West Fork Williams Creek 1232742/422111 0 to 3	Dissolved Oxygen	Summer	Cold water: Not less than 8.0 mg/l	303(d)	2002 Added to database	Applegate Watershed Council: RM 0.0: 2/10 samples
Middle Rogue Watershed 4th Field HUC, # 17100308						
Savage Creek 1232199/424196 0 to 4.8	Temperature	Summer	Rearing: 17.8 C	303(d)	1998 Added to database	Previous Data: 1997 data shows exceedance of criteria, 73.1
Illinois Watershed 4th Field HUC, #17100311						

Name LLID River Mile	Parameter	Season	Criteria	Status	Assessment: Year Action	[Data Source] Supporting Data
Althouse Creek 1236145421293 0 to 18	Temperature	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18.0° C 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	[DEQ] 2004 Data: RM 0.1: From 6/19 to 8/18/2000, 61 days with 7-day-ave max > 18° C.
Anderson Creek 1236128/422916 0 to 3.2	Temperature	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18.0° C 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	[DEQ] 2004 Data: RM 0.1: From 7/17to 9/25/2000, 24 days with 7-day-ave max > 18° C.
Deer Creek 1236880/422694 0 to 17	Temperature	October 15 - May 15	Salmon and steelhead spawning: 13.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	DEQ] RM 0.2: From 10/15 to 11/2/2000, 5 days with 7-day-ave max > 13° C.
	Temperature	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 5.8: From 7/17to 9/25/2000, 70 days with 7-day-ave max > 18° C. RM 9: From 7/2to 8/19/2000, 36 days with 7-day-ave max > 18° C. RM 2.8: From 7/1 to 8/20/2000, 51 days with 7-day-ave max > 18° C. RM 0.2: From 7/1 to 10/14/2000, 90 days with 7-day-ave max > 18° C. RM 13.7: From 7/2to 8/19/2000, 18 days with 7-day-ave max > 18° C. RM 3.8: From 7/2 to 8/19/2000, 45 days with 7-day-ave max > 18° C.

Name LLID River Mile	Parameter	Season	Criteria	Status	Assessment: Year Action	[Data Source] Supporting Data
East Fork Illinois River 1236586/4215980 to 14.4	Temperature	October 15 - May 15	Salmon and steelhead spawning: 13.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 0.1: From 10/15 to 11/2/2000, 19 days with 7-day-ave max > 13° C.
	Temperature	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 0.1: From 6/18 to 10/14/2000, 112 days with 7-day-ave max > 18° C. RM 0.1: From 7/16 to 9/22/2000, 69 days with 77-day-ave max > 18° C. RM 4.2: From 6/19 to 8/18/2000, 26 days with 7-day-ave max > 18° C. RM 8.3: From 6/18 to 8/18/2000, 62 days with 7-day-ave max > 18° C. RM 14.4: From 6/18 to 10/14/2000, 41 days with 7-day-ave max > 18° C.
Illinois River 12406624254950 to 56.1	Temperature	October 15 - May 15	Salmon and steelhead spawning: 13.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 0.2: From 10/15 to 10/30/2000, 10 days with 7-day-average maximum > 13 degrees Celsius. [DEQ] LASAR 23395 River Mile 32.2: From 10/15/2000 to 11/2/2000, 9 days with 7-day-ave max > 13° C.

Name LLID River Mile	Parameter	Season	Criteria	Status	Assessment: Year Action	[Data Source] Supporting Data
	Temperature	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 32.2: From 6/24 to 10/14/2000, 103 days with 7-day-ave max > 18° C. RM 0.2: From 7/23 to 10/9/2003, 148 days with 7-day-ave max > 18° C. RM 48.3: From 7/1 to 8/19/2000, 50 days with 7-day-ave max > 18° C. RM 48.3: From 7/1 to 8/19/2000, 50 days with 7-day-ave max > 18° C. RM 46.1: From 7/1 to 8/20/2000, 51 days with 7-day-ave max > 18° C. RM 3.7: From 7/24 to 8/25/2000, 33 days with 7-day-ave max > 18° C. RM 38.8: From 6/24 to 8/20/2000, 52 days with 7-day-ave max > 18° C. RM 3.7: From 7/24 to 8/25/2000, 33 days with 7-day-ave max > 18° C.
McMullin Creek 1235926/4227530 to 6.6	Temperature	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 0.9: From 7/17 to 9/25/2000, 25 days with 7-day-ave max > 18° C.
Rough & Ready Creek 1236743/4208690 to 6.1	Temperature	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 0.1: From 6/23 to 8/17/2000, 56 days with 7-day-ave max > 18° C.
West Fork Illinois River 1236586/4215970 to 14.7	Temperature	October 15 - May 15	Salmon and steelhead spawning: 13.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 0.1: From 10/15 to 11/2/2000, 14 days with -day-ave max > 13° C.

Name LLID River Mile	Parameter	Season	Criteria	Status	Assessment: Year Action	[Data Source] Supporting Data
	Temperature	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 6.7: From 6/23 to 9/23/2000, 49 days with 7-day-ave max > 18° C. RM 0.1: From 7/16 to 10/14/2000, 45 days with 7-day-ave max > 18° C. RM 13.1: From 6/20 to 8/17/2000, 59 days with 7-day-ave max > 18° C. RM 13: From 7/15 to 9/23/2000, 66 days with 7-day-ave max > 18° C. RM 6.6: From 7/15 to 9/23/2000, 71 days with 7-day-ave max > 18° C.
	Temperature	Year Around (Non-spawning)	Core cold water habitat: 16.0 degrees Celsius 7-day-average maximum	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 14.8: From 6/23 to 10/14/2000, 103 days with 7-day-ave max > 16° C. RM 14.7: From 6/23 to 8/17/2000, 56 days with 7-day-ave max > 16° C.
Lower Rogue Watershed 4th Field HUC, #17100310						
Big Boulder Creek 1231696/4270520 to 1.8	Temperature	Summer	Rearing: 17.8 C	303(d)	1998 Added to database	BLM (Near confluence with Grave Creek): 7 day moving average of daily maximums of 68.0 with 28 days above temperature standard (64) in 1995.
Grave Creek 1235849/4264840 to 37.6	Temperature	October 15 - May 15	Salmon and steelhead spawning: 13.0° 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 0.4: From 10/15 to 10/30/2000, 5 days with 7-day-ave max > 13° C. RM 10: From 10/15 to 10/30/2000, 4 days with 7-day-ave max > 13° C. RM 10: From 10/15 to 10/30/2000, 5 days with 7-day-ave max > 13° C.

Name LLID River Mile	Parameter	Season	Criteria	Status	Assessment: Year Action	[Data Source] Supporting Data
	Temperature	Year Around (Non-spawning)	Core cold water habitat: 16.0 degrees Celsius 7-day-average maximum	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 10: From 9/16 to 10/14/2000, 7 days with 7-day-ave max > 18° C. RM 12.8: From 6/17 to 9/1/2000, 74 days with -day-ave max > 18° C. RM 21.7: From 6/17 to 9/1/2000, 75 days with -day-ave max > 18° C. RM 1.4: From 6/17 to 9/8/2000, 84 days with -day-ave max > 18° C. RM1.4: From 6/17 to 9/8/2000, 43 days with -day-ave max > 18° C. RM 6: From 6/17 to 8/30/2000, 75 days with -day-ave max > 18° C. RM 8.1: From 6/17 to 9/8/2000, 84 days with -day-ave max > 18° C. RM 8: From 6/17 to 9/8/2000, 12 days with -day-ave max > 18° C. RM 10: From 6/19 to 10/14/2000, 67 days with -day-ave max > 18° C. RM 25.4: From 6/17 to 9/1/2000, 74 days with -day-ave max > 18° C. RM 29.5: From 6/17 to 9/1/2000, 76 days with -day-ave max > 18° C. RM 32.9: From 6/17 to 9/1/2000, 12 days with -day-ave max > 18° C. RM 16.1: From 6/17 to 9/1/2000, 77 days with -day-ave max > 18° C. RM 0.4: From 6/17 to 10/14/2000, 98 days with 7-day-ave max > 18° C.
Hog Creek 1235003/4253920 to 5.2	Temperature	Summer	Rearing: 17.8 C	303(d)	1998 Added to database	BLM (Near mouth): 7 day moving average of daily maximums of 66.1 with 22 days above temperature standard (64) in 1995.
Jumpoff Joe Creek 1234983/4252910 to 21.3	Temperature	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18.0° C 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [DEQ] RM 1.2: From 6/11/1999 to 9/4/2003, 231 days with 7-day-ave max > 18° C. RM 14: From 6/10 to 9/20/2001, 33 days with 7-day-ave max > 18° C.

Name LLID River Mile	Parameter	Season	Criteria	Status	Assessment: Year Action	[Data Source] Supporting Data
Louse Creek 1234275/4251970 to 12.3	Temperature	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18.0° C 7-day-ave max	Cat 5: Water quality limited, 303(d) list, TMDL needed	2004 Added to database	2004 Data: [BLM] RM 6.5: From 8/24/1997 to 9/25/2000, 77 days with 7-day-ave max > 18° C.
Pickett Creek 1234884/4249910 to 3.9	Temperature	Summer	Rearing: 17.8 C	303(d)	1998 Added to database	ODFW (2 Sites: At Riverbanks and RM 3.5): 7 day moving average of daily maximums of 72.1 and 67.8 with 59 and 26 days above temperature standard (64) in 1993 and 1994 respectively.
Quartz Creek 1234444/4251780 to 7.3	Temperature	Summer	Rearing: 17.8 C	303(d)	1998 Added to database	ODFW Data (2 Sites): Above mouth: 7 day moving average of daily maximums 1994, 77.6 and 1996, 76.2°F. and RM 4.5 1994, 67.5 and 1997, 62.9. Three of four exceed temperature standard (64).