

Environmental Assessment
for
AQUATIC AND RIPARIAN HABITAT ENHANCEMENT
EA# DOI-BLM-OR-M000-2009-0004-EA

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

April 2009

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

EA COVER SHEET

EA# DOI-BLM-OR-M000-2009-0004-EA

ACTION/TITLE: Aquatic Habitat Enhancement

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

FOR FURTHER INFORMATION CONTACT: Tim Reuwsaat
3040 Biddle Rd
Medford, OR 97504

Interdisciplinary Preparers	Title	Resource Values
Lisa Brennan	Cultural Specialist	Cultural Resources
Mike DeBlasi	Hydrologist	Soils/hydrology/riparian
Tim Gonzales	Fire Mitigation & Education Specialist	Fire and Fuels
Sharon Frazey	Fisheries Biologist	Fisheries
Mike Mathews	Environmental Coordinator	Project Lead, NEPA, hydrology/riparian
Robin Snider	Wildlife Biologist	Wildlife
Robin Taylor	Botanist	Plants/Noxious Weeds
Dustin Wharton	Engineer	Roads

Table of Contents

Contents

1.0 Purpose and Need	1
1.1 Purpose	2
1.2 Need	2
1.3 Project Location	3
1.4 Issues	3
2.0 Alternatives	4
2.1 Alternative One - No Action	4
2.2 Alternative Two - Proposed Action	4
A. Riparian Vegetation Projects	5
B. Stream Enhancement Projects	6
C. Road and Culvert Projects	8
2.3 Project Design Features.....	10
3.0 Affected Environment and Environmental Consequences	12
3.1 Affected Environment	12
3.1.1 Fish Species and Habitat.....	13
3.1.2 Roads.....	15
3.1.3 Riparian Habitat and Conditions.....	16
3.1.4 Wildlife	17
3.1.5 Botany	21
3.2 Environmental Consequences	24
3.2.1 Soil, Water and Fish.....	24
3.2.2 Botany	35
3.2.3 Wildlife	39
4.0 Public and Agencies Contacted	46
Literature Cited.....	47
Appendix A: Medford District Wildlife Special Status Species.....	51
Appendix B. Documented federally listed and sensitive plants within the Medford District of the BLM.....	55

1.0 Purpose and Need

Introduction

The Bureau of Land Management (BLM), Medford District, plays a key role in aquatic and riparian enhancement activities presently underway in the Rogue, Umpqua and Klamath River Basins. Because of the interspersed, checkerboard ownership pattern of the revested Oregon & California Railroad lands, the District works closely with public and private partners to plan aquatic and riparian enhancement projects that benefit resources across ownership boundaries.

This Programmatic Aquatic Habitat Enhancement Environmental Assessment (EA) addresses a suite of activities to maintain and restore watershed conditions, establishes the scope and sideboards of the activities, and provides an analysis of the environmental consequences of the typical projects. All proposed activities are consistent with actions identified by National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service (USFWS) in the Biological Opinion for Programmatic Consultation on Fish Habitat Restoration Activities in Oregon and Washington, CY2007-CY2012. The USFWS, NMFS and BLM identified these programmatic activities because they have predictable effects to species and habitat regardless of their location of treatment. Restoration activities that did not have predictable effects (*e.g.*, channel reconstruction projects) or which had uncertainty were not included.

The EA does not include site specific projects. Rather the EA identifies a suite, or types of actions that would benefit aquatic resources. As this EA does not specifically identify each project, future site specific projects would be evaluated for consistency with the effects disclosed in this programmatic EA. If site project effects are not addressed by this programmatic EA then they would require a separate National Environmental Policy Act (NEPA) analysis and documentation.

This EA tiers to the following NEPA and land use planning documents:

- *Revision of the Resource Management Plan for the Western Oregon Bureau of Land Management (FEIS 2008 and ROD 2008)*
- *Final Supplemental Environmental Impact Statement: Management of Port-Orford-Cedar in Southwest Oregon (FSEIS 2004 and ROD 2004);*
- *Medford District Integrated Weed Management Plan Environmental Assessment (1998) and tiered to the Northwest Area Noxious Weed Control Program (EIS 1985).*

This EA also conforms to the following documents:

- National Marine Fisheries Service (NMFS) Endangered Species Act – Section 7 Programmatic Consultation Biological and Conference Opinion (BO # 2008/03506)
- USFWS - Section 7 Programmatic Consultation Biological and Conference Opinion (BO#2007-F-0055)
- USFWS – Plant Letter of Concurrence (LOC# 13420-2008-1-0136)

1.1 Purpose

The purpose of the aquatic and riparian enhancement activities proposed in this EA is to maintain or aid recovery of aquatic habitat, riparian habitat, and water quality where a tangible benefit would accrue to resources on public lands. The purpose of the proposed activities is to focus on:

- Controlling and preventing road-related runoff and sediment production through road improvements, and renovation including culvert replacement/removal, and road decommissioning;
- Improving the condition of riparian vegetation stands through silvicultural and fuel treatments, including treatments to expedite large conifer development;
- Increasing instream habitat and channel stability and complexity, including activities designed to provide unobstructed access to aquatic species.

Further, the Aquatic Habitat Enhancement Programmatic EA seeks to establish a process that facilitates partnership development, leverages funding, and improves watershed condition through reducing duplication of NEPA documentation for similar projects with similar effects.

1.2 Need

Watershed enhancement projects are needed to maintain or restore aquatic habitat. As shown by watershed analyses and monitoring, various streams and watersheds across the Medford District require restoration activities to either achieve or to maintain aquatic health. Current conditions in the watershed provide specific information indicating the need for improving aquatic habitat, which includes:

- Control and prevention of road related runoff and sediment production.
- Maintenance and enhancement of the species composition and structural diversity of plant communities adjacent to streams and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, and reduced rates of sedimentation
- Rehabilitation of streams and other waters to enhance natural populations of anadromous and resident fish. Possible rehabilitation measures would include, but not be limited to, fish passage improvements, instream structures using boulders and log placement to create spawning and rearing habitat, placement of fine and coarse materials for over-wintering habitat.

The proposed actions also respond to financial opportunities available for conducting enhancement and rehabilitation projects, both on and off Federal lands. Funds for such work are presently available through Title II of the Secure Rural Schools and Community Self-Determination Act (a.k.a. County Payments Act), various grants, annual appropriations and other funding sources. The Wyden Amendment (1998) also gives Federal agencies the authority to spend Federal funds on non-federal lands when there would be a tangible benefit to resources on Federal land. Whether from these or other sources, the BLM expects that there will be continued funding for restoration efforts.

The development of community partnerships is always a preferred method needed to achieve large-scale restoration objectives and is encouraged by the BLM National Strategic Plan which provides direction to “restore and maintain the health of the land and promote collaborative management through restoration activities.” (USDI, BLM 1997).

1.3 Project Location

The planning area includes all lands within the Bureau of Land Management, Medford District (Map 1). The vast majority of projects would occur within the riparian reserve land use allocation on public lands. Private lands that contribute to the health of public lands, typically adjacent to BLM, are also included within the planning area scope.

1.4 Issues

An interdisciplinary (ID) team of resource specialists reviewed the proposal and all pertinent information, including public input received, and identified relevant issues to be addressed during environmental analysis. The following issues served as a basis for the development and comparison of alternatives and to provide information on the decision factors identified in Section 1.5, “Decision to be Made,” below.

- How would enhancement efforts affect habitat for Threatened, endangered, and sensitive plant and animal species?
- How would proposed actions change the rate or distribution of noxious weeds?
- The proposed actions include heavy equipment operation in and adjacent to streams. How would equipment operation affect soil productivity and erosion?
- How would heavy equipment operation affect stream water quality and channel conditions?
- How would riparian vegetation treatments affect stream shade?

1.4.1 Issues Considered but Eliminated from Detailed Analysis

Cultural Resources

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

Identified cultural sites would be buffered and avoided to prevent degradation. Therefore, no effects are anticipated to cultural resources.

Fuel Hazard – The project team did not identify any actions that would increase fuel hazards. Vegetation management actions in riparian areas are intended reduce fuel loading and fire hazard. Therefore, fuel hazard was not an issue needing further analysis or one that would drive alternative development.

1.5 Decision to be Made

The information and analysis provided in this EA will assist the Medford District Manager in deciding between the proposed action and the no action alternative. NEPA regulations require that prior to making this decision the authorized officer (the Medford District Manager) must first make a finding of whether the proposed action analyzed in the EA has a significant impact. In making that determination, the District Manager will consider both the context of the action and the intensity of the impacts, including the 10 factors outlined in 40 CFR 1508.27(b). If the District Manager determines the proposed action will not likely result in significant effects then the BLM will issue a “Finding of No Significant Impact” (FONSI).

In deciding between the proposed action and the no action alternative, the District Manager will consider the extent to which the alternatives:

- Restore and maintain aquatic ecosystems
- Facilitates funding and partnership development
- Generate effects leading to degradation of habitat for threatened, endangered, and sensitive species.

2.0 Alternatives

This chapter describes basic features of the alternatives analyzed in this document.

2.1 Alternative One - No Action

Under this alternative, the Medford District Office would not pursue any of the programmatic enhancement actions proposed in this analysis. There would be no process in place to facilitate and expedite implementation of riparian or aquatic enhancement. NEPA documentation of enhancement projects would continue to rely on individual environmental assessments for each project.

2.2 Alternative Two - Proposed Action

Under this alternative, a range of watershed enhancement actions would be undertaken, grouped into the categories described below — riparian, instream habitat, and roads and culverts. All proposed projects would be consistent with actions identified by National Marine Fisheries Service (NMFS) (Fisheries BO 2008/03506) and the United States Fish and Wildlife Service (USFWS)(Wildlife BO #13420-2007-F-0055 and Plant LOC 13420-2008-1-0136) for Programmatic Consultation on Fish Habitat Restoration Activities in Oregon and Washington.

The activities identified in this programmatic alternative as well as those in the programmatic consultation were selected because they have predictable effects to species and habitat regardless of location. Restoration activities that do not have predictable effects (*e.g.*, channel reconstruction projects) or which have uncertainty are not included in the proposed action.

This alternative addresses a suite of activities intended to restore watershed conditions. Site specific projects identified in the future would be assessed for consistency with the scope and effects addressed in this EA. To ensure consistency and to examine site specific conditions and effects, the BLM would determine NEPA adequacy prior to any project implementation. The determination would examine the project location and the proposed activities and identify applicable project design criteria. Projects found to be consistent with the scope and effects found in this programmatic alternative would be implemented; those that do not would be modified to be consistent with the alternative, or would require a separate NEPA analysis.

Best Management Practices and Project Design Features would be selected and implemented in conjunction with actions to avoid or mitigate identified impacts to the environment. 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 associated with each project. However, only those that are appropriate to the location and activity would be selected.

In addition, instream projects may require obtaining a removal and fill permit from the Army Corps of Engineers and Division of State lands. These permits would be obtained as necessary prior to project implementation.

A. Riparian Vegetation Projects

Objective

The riparian vegetation treatments seek to improve health and vigor of stands and to increase riparian function to support aquatic species. Specifically, the objectives include increasing structural and species diversity that provide long-term benefits of stream shading, large wood recruitment, organic litter, and root strength for stream bank stability. Improved riparian conditions are intended to increase aquatic habitat for adult holding, spawning and juvenile rearing.

Proposed Actions:

Silvicultural treatments in Riparian areas would include:

- Thinning to reduce stand density
- Fuel reduction activities including: Handpile and Burning, underburning
- Girdling to create small snags and coarse down wood
- Thinning of alder dominated stands to release conifers and longer-lived hardwood species.
- Tree Planting
- Fencing

Riparian Reserve Thinning

Thinning would occur in stands determined to be exhibiting signs of suppression through measures of high density, poor crown ratios, and poor conifer seedling regeneration. Treatment locations include riparian areas and adjacent stands. Stagnant stands produce poor growth rates per stem; are susceptible to crown fire because of the density; and are susceptible to insect and disease infestation from poor health (e.g. poor root structure, canopy development and bole strength). Stands with a high potential to respond to thinning through either increased growth rates or conifer establishment in hardwood dominated stands.

Thinning would consist of cutting suppressed overstocked trees with low vigor and poor crown ratio. Thinning would be accomplished by cutting smaller diameter trees (<12" diameter at breast height) and retaining 50-60% canopy cover. Cut vegetation would either be lined to existing roads and skid roads for removal or treated as described below for fuel reduction. No new roads or skid roads would be constructed.

To ensure protection of water quality a no thinning buffer of 60' and 35' would be applied along each side of perennial/fish bearing and intermittent streams, respectively. These buffer widths may be expanded where established in a Water Quality Management Plans (WQRP).

Fuel Reduction

Understory vegetation (<12") would be thinned using manual techniques. Actions would include selectively slashing hardwoods, conifers, and shrubs. Species diversity would be maintained by retaining a mix of on-site species. Slash would then be handpiled and burned (HP/B). To remove residual fuels, a light underburn may be implemented on select units within the 1-2 years following handpile burning. Underburns would be ignited outside the 60- and 35 foot buffer adjacent to creeks but would be allowed to back into the buffered zone.

B. Stream Enhancement Projects

Objective

Stream projects aim to improve aquatic habitat through increased habitat complexity. Through increasing channel complexity and stability, the projects seek to increase spawning gravel retention and form pool habitat for adult holding and juvenile rearing. Project activities are also intended to improve hydrologic function of floodplains and stabilize channel banks.

Actions:

Instream Structure

Actions include placement of log structures and boulders to create instream and off-channel habitat that would benefit fish and other aquatic fauna. Logs and boulders or a combination would be placed instream through cable yarding systems, felling trees from adjacent riparian areas, and/or with heavy equipment.

The Oregon Department of Fish and Wildlife' *Guide to Placing Large Wood in Streams* (1995) and *Habitat Restoration Guide* (1999) would guide project designs and construction.

Construction would involve use of heavy equipment, such as excavators, backhoes, front-end loaders, dump trucks, and bulldozers.

Large wood may be secured through entanglement in riparian vegetation or keyed into the banks as necessary to protect downstream infrastructure (bridges, culverts etc). Existing access to creeks would be preferred but removal of brush and understory vegetation for vehicle and equipment access may occur.

The projects would target streams that provide habitat for anadromous fish, but implementation of projects in streams occupied by native, resident fish species would not be precluded. High priority areas would also be identified through one or all of the following:

- Watershed analysis
- Aquatic habitat survey findings
- Oregon Department of Environmental Quality's list of water quality limited streams
- Professional knowledge of fish populations and habitat conditions.
- Sufficient availability of large trees near the riparian corridor to complete the project without degrading wildlife habitat or water quality.

Foster et al. (2001) recommend one large piece of instream wood per 100 meters, equal to 48 per mile, as the desired condition. A large piece is defined as greater than 60 cm diameter and greater than or equal to 10 meters in length. NMFS Fisheries considers 80 large pieces per mile as properly functioning (USDC NMFS 1996). For purpose of this analysis 80 large trees per mile would be the maximum number placed instream.

Whole trees from the adjacent riparian area or off-site would be used for instream large wood. The action would remove single trees or groups (<5), selected within the first two line of trees adjacent to existing openings such as roads, young stands, and clear cuts. Trees would be felled onto existing roads/skid roads or lined to existing roads. Trees selected from the riparian area would not remove primary shade to the creek. Further, trees would be selected from fully stocked riparian stands.

Small diversion dams used for irrigation may also be removed to restore aquatic connectivity. This action, as defined in the NMFS biological opinion covering restoration projects, includes the removal of diversion structures that are less than six feet high, or that impound less than 15 acre-feet of water. Construction would involve use of heavy equipment, such as excavators, backhoes, front-end loaders, dump trucks, and bulldozers. Sediment retained behind these dams may be removed and placed in a stable off-site location prior to structure removal.

Unstable banks delivering fine sediment or that threaten infrastructure may be stabilized using boulders, large wood, or erosion control fabric. These structures would be designed to also enhance fish habitat through instream cover and velocity breaks. Similarly, the proposed action includes stabilizations of gullies and headcuts to reduce erosion.

Reconnecting side channels or floodplain areas offers another opportunity to reduce bank shear stress and may be implemented to improve floodplain function and off channel habitat. Actions to restore side channel and floodplains could include the removal of sediment plugs which block water movement through side channels and alcoves. Further, side channel and alcove include large wood and/or boulder placement and riparian planting. Construction would involve the use of heavy equipment, such as excavators, spiders, backhoes, and dump trucks.

During the 1980s and early 1990s, many habitat-forming structures such as log weirs, boulder weirs, and gabions were placed in streams to create pool habitat. Many of these structures, also known as legacy structures, were placed perpendicular to stream flow or placed in a manner that interfered with natural stream function, creating undesirable habitat conditions. The alternative proposes to remove these structures to restore natural stream function.

C. Road and Culvert Projects

Objective

Road improvements aim to reduce existing erosion from road surfaces, cut banks and fill slopes, and reduce probability of failure via improvement of road surface stability and drainage. Culvert removal or replacement seeks to reduce sediment production and increase aquatic and hydrologic connectivity.

The objectives of decommissioning include: improve water quality by reducing short and long term road related sediment; restore hydrological processes modified by water routing and compaction; reduce road maintenance cost; and reduce impacts to aquatic and wildlife resources.

Project locations would include roads delivering chronic sediment to streams or locations that have road or culvert failure potential. Other priority areas for road and culvert improvements or decommissioning include watersheds with high habitat potential or water quality restoration plans (i.e. Total Maximum Daily Load, Water Quality Restoration Plans).

Actions:

Road projects identified and selected for implementation would meet at least one of the following criteria:

- A recommendation in watershed analysis or water quality restoration plan
- Protection/improvement of instream beneficial uses (anadromous/resident fish, water supply etc.)
- BLM or public identified the road as a chronic sediment source or areas with potential for road failure

Construction would involve use of heavy equipment, such as excavators, backhoes, front-end loaders, dump trucks, and bulldozers.

Road surface improvement

Specific road improvements would depend on the site conditions. Typical road surface improvements would include placing rock aggregate that is resistant to erosion on natural surfaced roads, or additional aggregate surfacing on rock roads. In many cases, road blading would precede aggregate placement. Project related exposed cut banks and fill slopes would be seeded and mulched. Energy dissipaters may be installed as necessary at the outfall of cross-drain culverts to prevent erosion of fill slopes.

Drainage improvements would be designed to disperse runoff across the landscape, reducing both concentrated water and entrained sediment. This could be accomplished by: reshaping road crowns; installing additional cross-drain structures (i.e. water dips, relief culverts, water bars); repair/replace existing culverts; cleaning and regrading ditches; and out-sloping road surfaces.

Road Decommissioning

Subject to the agreement of the O&C counties and private parties holding access rights under reciprocal rights-of-way agreements, selected roads would be decommissioned. Selected roads would either be closed for the long term (>five years) or decommissioned permanently.

For long-term closure, roads would be closed to vehicular use, but would be retained for potential future use. They would be placed in an “erosion-resistant” condition by providing ample cross-drainage, eliminating diversion potential at stream crossings, and stabilizing or removing fill materials.

Permanent or full decommissioning could include: removal of all cross-drain and stream-crossing culverts; partial or full recontouring; pull-back of fill material at stream crossings; removal of unstable fills; sub-soiling of the road bed; seeding and mulching of disturbed areas; placement of erosion control material; and reestablishment of native vegetation and trees.

Culvert Replacement

Stream-crossing culverts that restrict aquatic connectivity of resident and anadromous fish and other aquatic fauna would be replaced or upgraded. Improperly functioning culverts crossing intermittent or ephemeral drainages would also be included.

Criteria used to select culverts for replacement would include:

- The existing culvert blocks access to habitat of anadromous and resident fish species.
- The culvert is aged and/or at a risk of failure.
- The culvert is improperly functioning leading to flow interruption and road runoff, creating a threat to public safety, increased sedimentation, and infrastructure loss.

Existing culverts would be replaced with pre-cast concrete spans, bottomless pipes, arch or round culverts set at or below the level of the stream bed. Where necessary to prevent channel down-cutting or provide a gradient sufficient to insure fish passage, grade control structures such as weirs may be incorporated into the project designs.

Alternatives Considered but Eliminated

Projects such as mining reclamation and channel reconstruction were considered, but were eliminated from the proposal and analysis. The scope and extent of mining reclamation and channel reconstruction can vary widely, introducing uncertainty regarding environmental effects for which a programmatic assessment is not suited.

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 associated with each project.

Fish, Water Quality and Wildlife

- Project design features incorporate, as appropriate, the project design criteria identified in the USFWS(BO#13420-2207-F-0055 and LOC#13420-2008-1-0136) and NMFS(BO # 2008/03506) Biological Opinions/LOCs covering restoration projects.
- Project design features incorporate, as appropriate, Best Management Practices identified in the Medford District Resource Management Plan.

Port-Orford-Cedar (POC)

- Port-Orford-cedar in the planning area would be managed according to the May 2004 BLM POC-FSEIS/ROD. Mitigation measures would be implemented if uninfected POC are in, near, or downstream of the activities (USDA-USDI 2003). Prior to entering a POC area or leaving a *Phytophthora lateralis* (PL) area, all heavy equipment would be washed according to Management Guidelines in the Port-Orford Rangewide Assessment (USDA-USDI 2003)

Botany

Special Status Plants

- For Riparian thinning and fuels reduction projects, conduct a two year protocol survey for the listed endangered Gentner's fritillary 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 actions, prior to project implementation for all other listed and BLM sensitive plant species in suitable habitat within their respective ranges. Surveys are valid for 10 years.
- A minimum 25' radius buffer would be established around all identified listed plant species.
- Thinning through the buffer is allowed if during the dormancy season and if a combined canopy of trees and shrubs of no less than 40% will be maintained. Broadcast burning also is allowed through buffered listed plant sites during the dormancy period.
- Generally BLM sensitive plant species locations will also be buffered (actual size 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 for those species that will benefit from the disturbance.

- Cut material (slash) must be piled outside the buffers for listed and sensitive species. Piles will not be placed or burned within occupied habitat, and must be placed a minimum of 25 feet from the buffer or population boundary edge.
- For road improvement and maintenance on open roads, blading, rocking, ditching, culvert replacement, and brushing, the BLM must conserve and manage (e.g. buffers) any known listed or sensitive plant occurrences within the road prism; no surveys are required,
- Road decommissioning within the existing road prism, conserve and manage (e.g. buffer) any known listed or sensitive plant occurrences, no surveys are required. For road obliteration that disturbs intact native vegetation outside the road prism, one year surveys are required; buffer any listed or sensitive plant occurrences.
- Culvert replacement within areas where the footprint of disturbance is not new (e.g. the road prism), then no surveys are required. If intact native habitat is being disturbed by culvert replacement, then one year surveys are needed for listed and sensitive plants; protect known occurrences.

Noxious Weeds

- 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.
- Roads to be decommissioned or culverts replaced would be treated for noxious weeds prior to decommissioning and revegetated, as necessary.
- 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 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.

Cultural

Known cultural sites would be buffered with flagging for protection prior to project implementation. The flagging would be placed twenty-five feet from the site perimeter. No disturbance would occur in the buffered areas.

Any archaeological or historical artifacts or remains discovered during operations would be left intact and undisturbed; all work in the area would stop and the BLM area archaeologist would be notified immediately.

3.0 Affected Environment and Environmental Consequences

Introduction

This chapter of the EA presents the affected environment, including existing conditions and future anticipated conditions if the no-action alternative is selected, and the anticipated effects to the environment if the proposed activities are implemented. Given the landscape variability, the following discussions describe conditions across the landscape and acknowledge that site specific conditions vary. Further, given the large geographic scale, data presented represents readily available data. The IDT team determined the available data sufficient to present existing conditions across the landscape. Further detailed data would be incorporated as site specific projects are identified.

The Environmental effects portion of this chapter considers the anticipated direct, indirect, and cumulative impacts. Because specific actions in specific locations are not identified, the effects determinations represent the typical effects associated with the activity. As site specific projects are planned, they will be individually evaluated to determine if the typical effects described in this EA adequately analyze the site specific project effects. In addressing cumulative effects of proposed activities the assessment assumes compliance with USFWS and NMFS's guidelines included in the BO regarding number and type of actions within a watershed.

Specifically, USFWS and NMFS, in their Biological Opinions (NMFS p. 6; USFWS p. 9), identified Group 1 projects, those with direct channel disturbances such as bank stabilization, log and boulder placement, irrigation dam removal etc. be limited to 10 projects within a 5th field watershed. The agencies did not place a limit on Group 2 projects, those without direct channel disturbance, such as road work and riparian planting/thinning. Both NMFS and USFWS, given the number of projects limitation, concluded that these actions would not generate cumulative effects.

3.1 Affected Environment

Medford District watersheds, located in the Klamath-Siskiyou and Cascade Ranges in southwestern Oregon, drain into the Rogue, Umpqua and Klamath River basins.

Rugged terrain, complex geology, and strong moisture gradients create a complex mixture of valleys, foothills, and mountains. Major mountain ranges border the region on the east, south, and west. Elevations typically range from 150 meters to more than 2400 m within the region; Soils are very diverse, with more than 50 series identified (Stearns-Smith and Hann 1986).

The near-Mediterranean climate is characterized by winter rains and dry, hot summers; the land within the Medford District has a range of hydrologic patterns within a relatively small geographic area. Peak flows vary by year and are dependent on annual rainfall, which ranges from an average annual precipitation of 150" in the northwest portion of the Grants Pass Resource Area to below 20" near Ashland. Large peak flows of record such as 1955, 1964, 1974, 1997 result from rain on snow events. Summer low flows are much lower than average

winter flows largely due to precipitation patterns in the Pacific Northwest; a majority of precipitation occurs between November and March.

This physiographic diversity created a diversity of habitats and species distributions. Habitats are varied and range from wet coastal temperate rainforests to inland forests dominated by Douglas fir, Ponderosa Pine, and Sugar Pine mixed with hardwoods. Drier oak forests and savannas lie in the lower elevation areas.

Rivers and streams of Southern Oregon support a distinctive fish fauna, including anadromous and resident species. Water courses throughout the Medford District also support a variety of beneficial uses including water supply, recreation, boating, aesthetics, navigation and hydroelectric power.

3.1.1 Fish Species and Habitat

Of the approximately 3,910 miles of streams within the Medford District planning area, 529 miles support fish. Of those 529 miles, 264 miles support a combination of anadromous fish and resident trout (RMP/EIS 1994). Salmonid species found in the Medford District include Chinook salmon, Coho salmon, steelhead trout, resident rainbow trout, and resident cutthroat trout. Table 1 displays listed species and the resource area they occupy.

Table 1. 2007 Special Status Species (SSS) present in Medford District.

Scientific Name	Common Name	ESU	Species Status	Resource Area
<i>Oncorynchus kisutch</i>	Coho salmon	S.Oregon/N.California Coast	Federally Threatened	Grants Pass, Butte Falls, Ashland, Glendale
<i>Oncorynchus kisutch</i>	Coho salmon	Oregon Coast	Federally Threatened	Glendale
<i>Oncorynchus mykiss</i>	Steelhead trout	Klamath Mountains Province	BLM Strategic	Grants Pass, Butte Falls, Ashland, Glendale
<i>Oncorynchus mykiss</i>	Steelhead trout	Oregon Coast	BLM Strategic	Glendale
<i>Oncorynchus mykiss</i>	Redband trout	Jenny Creek	BLM Strategic	Ashland
<i>Oncorynchus tshawytscha</i>	Chinook salmon	S.Oregon/N.California Coast	BLM Strategic	Grants Pass, Butte Falls, Ashland, Glendale
<i>Catostomus rimiculus</i>	Jenny Creek sucker	All	BLM Strategic	Ashland
<i>Oregonichthys kalawatseti</i>	Umpqua chub	All	BLM Sensitive	Glendale

The Southern OR/Northern CA (SONC) Coho ESU (Evolutionarily Significant Unit), which was listed as threatened on May 6, 1997 (Fed. Reg./Vol. 62, No. 87). The Oregon Coast Coho (OCC) ESU was listed as threatened on February 11, 2008 (Fed. Reg./Vol. 73, No. 28).

Habitat

Table 2 displays aquatic habitat indicators and conditions across the Rogue Basin within the Medford District, incorporating both federal and private lands. The data, compiled by Rogue Basin Coordinating Council (2006), represents ODFW and forest service stream surveys, watershed analyses, watershed council monitoring results, and professional judgment.

Table 2. Habitat Indicators and Stream Habitat Conditions

Indicator	Rating ¹	% of streams	Criteria
Temperature	Adequate	8	42-65°F
	Moderate	5	65-70°F
	Limiting	87	>70°F
Chemistry	Adequate	66	Meets DEQ Standards
	Moderate	13	Marginally Meets DEQ Standards
	Limiting	21	Does not meet DEQ Standards
Sediment	Adequate	27	<5% Fine Sediment
	Moderate	29	6-15% Fine Sediment
	Limiting	44	>15% Fine Sediment
Instream large wood	Adequate	18	>20 Pieces/100 meters
	Moderate	11	10-20 Pieces/100 meters
	Limiting	71	<10 Pieces/100 meters
Spawning gravel	Adequate	74	>35% of Area
	Moderate	18	15-35% of Area
	Limiting	8	<15% of Area
Pool/riffle ratio	Adequate	58	>35/65
	Moderate	16	20/80-35/65
	Limiting	26	<20/80
Stream complexity	Adequate	48	Mixture of habitat providing variety of stream velocities
	Moderate	11	Between the above and below definitions
	Limiting	40	Uniform habitat and flow velocity
Aquatic barriers	Adequate	37	No barriers
	Moderate	35	Restricted passage part of the year
	Limiting	27	Block migration
Channel Modification	Adequate	27	Natural Channel
	Moderate	23	Some modification, simplifying channel structure
	Limiting	50	Stream channelized

¹Limiting: the watershed health factor is unhealthy and a significant amount of restoration activities are needed to improve watershed conditions.

- Moderate: the watershed health factor is less than desired and moderate to significant levels of restoration activities are needed to improve existing conditions.

- Adequate: the watershed health factor is functional and minimal restoration activities are needed to maintain existing condition.

The data indicate that water temperature, stream complexity and migration barriers limit fish distribution and productivity. While water quantity is not displayed, studies (Jackson County Water Resources (2002), DEQ (2008)) have documented water quantity as a limiting factor to aquatic health.

Stream habitats and riparian areas degradation have been linked to 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 stream 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.

3.1.2 Roads

Research indicates that roads are a major contributor to fine sediment input into streams. These sources derive from both annual chronic delivery as well as from failures during flooding events. Roads compact soil and have the potential to route surface water and sediment to streams, particularly at stream-road crossings. However, many roads are often isolated by grasses, brush, trees and down logs, greatly reducing surface flow routing. Additional compaction created through management history is highly variable due to recovery since implementation, local equipment techniques, slopes, and soils. Soil compaction also reduces soil pore space, reducing plant growth and productivity.

There are approximately 4,455 miles of BLM-administered roads in the planning area (Table 3). Historically, roads were constructed, improved, and maintained to support timber management activities. In addition to timber management, roads now provide access for removal of other forest products, recreational use, mineral exploration and development, and access to rural homes. Each year, approximately 1,250 miles of road are maintained by BLM and another 300 miles are maintained by purchasers of timber sales.

Currently, 415 miles of road are closed to public use year around; another 365 miles are closed seasonally (winter and early spring). Closed roads usually include short, dead-end roads and local roads constructed for individual timber sales, and represent approximately 20 percent of the BLM-administered transportation network. The roads are normally gated or barricaded and

closed to reduce maintenance costs or to protect other resource values such as wildlife. Many other roads are closed by natural vegetation regrowth.

Existing roads occupy approximately 24,000 acres of BLM-administered land in the planning area. Easements and/or reciprocal right-of-way agreements provide physical access to approximately 90 percent of BLM-administered land in the planning area for management activities. An integral part of the transportation system is the 72 bridges and 97 major culverts located at road crossings of larger streams.

Table 3. Road Inventory¹(miles)

Surface	Arterial ²	Collector ³	Local ⁴
Natural	1	31	1,075
Pit Run	28	105	626
Grid Rolled	1	19	342
Screened Base	0	0	17
Aggregate base	18	146	626
Aggregate surface	89	366	626
Bituminous surface	203	83	53
Total	340	750	3,365
		Grand Total	4,455

1. Source: Medford District Resource Management Plan (1994 EIS). Includes BLM-controlled roads and privately controlled roads with improvements.
2. Arterial roads provide service to large land areas and usually connect with public highways or other arterial roads to form an integrated network of primary travel routes.
3. Collector roads may be operated for either constant or intermittent service, depending on land use and resource management objectives.
4. Local roads connect terminal facilities of: trailheads, landings, viewpoints, wayside stops, parking spurs, or comfort stations to collector or arterial roads or public highways.

In addition, Jackson and Josephine County support approximately 6,000 miles (Josephine and Jackson county GIS databases) of road comprised of city, county, and state roads. Conditions and uses for roads vary across the county. It is assumed that numerous smaller roads cross forest land in both counties that are not captured in the county’s GIS databases. Douglas and Klamath County roads also lie within the planning area.

3.1.3 Riparian Habitat and Conditions

Riparian areas are the vegetated areas immediately adjacent to rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs, and wet meadows. The vegetation and microclimate conditions in riparian areas are a function of the combined presence and influence of perennial or intermittent water, water tables, and soils moisture content.

Riparian areas in the planning area occur throughout drainage systems, from the smallest intermittent headwater streams to the largest rivers such as the Rogue, Illinois, and Applegate. Riparian areas are not limited to an arbitrary, uniform distance from a water body but vary in

width and shape. The size and extent of riparian areas depend on topography, soils, rainfall, water quality and quantity, stream conditions, and width of floodplains.

Riparian areas provide streambank stability, filter overland flow, store water, and insulate streams from summer and winter extremes. Standing riparian vegetation helps regulate water temperature through shading. Also, they are the source of coarse woody debris which dissipates flood energy and creates aquatic habitat. For terrestrial species riparian vegetation supports nesting, roosting, cover habitat, and food sources (Brown 1985).

In western Oregon, riparian habitat with mature trees greater than 21 inches in diameter provides the greatest plant and structural diversity, a high level of animal diversity, and a high level of woody debris (Brown 1985). Mature riparian zones contribute to a high level of aquatic diversity and provide corridors for wildlife species.

In determining condition class, the method used average tree size derived from the timber inventory database. From the records, approximately 18 percent of riparian areas are in minimal condition, 30 percent are in fair condition, and 52 percent are in good or optimal condition (RMP EIS 1994) (see Table 4).

Table 4. Riparian Stand Conditions

Riparian Habitat Conditions ¹			
Minimal	Fair	Good/Optimal	Total
12,345	21,187	35,823	69,355

¹. Minimal – 0-11 inches tree diameter

Fair – 11-21 inches tree diameter

Good/optimal – 21 inches and larger tree diameter

Typically, riparian conditions rate higher in the smaller, higher elevation streams and decrease along larger, lower gradient rivers. Riparian shade provided to larger tributary streams and mainstem rivers, occurring predominately within private lands, averages 55-65% of potential (DEQ 2008, 2007, 2004). DEQ identified low stream flow and lack of riparian shade has elevated summer water temperatures, limiting aquatic beneficial uses. Currently, DEQ lists 2,300 miles of stream within the planning area as limited due to water temperatures; 440 miles occur within BLM managed lands.

3.1.4 Wildlife

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 A provides additional information on special status species known or suspected to occur within the Medford District.

T&E

The Medford District is within the range of various Listed or Candidate Species. However, only the following Listed or Candidate T&E terrestrial wildlife species could be impacted by the

proposed action: northern spotted owl, marbled murrelet, and fisher. All 3 of these species are known to use riparian areas.

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 Medford District. As of August, 2008 (D. Assali, 08/08), Medford GIS confirms 44 percent of all Medford District BLM ownership is NRF habitat, and 15 percent dispersal habitat. Since NRF also functions as dispersal, 59 percent of all Medford BLM lands support dispersal (USDI 2008).

Northern spotted owls are known to use riparian areas, either as roost locations during hot summer months or for foraging. Northern spotted owls generally nest in the lower third of slopes, therefore some nests could be adjacent to proposed riparian treatment locations. The Medford BLM has identified approximately 595 owl sites in within the district from historic information, protocol surveys, incidental observations, or owl estimation models. Very limited surveys have been done on the Medford district 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 Medford District (USDI 2008).

Marbled Murrelet

Marbled murrelet suitable habitat includes the conifer-dominated stands generally 80 years old or more with trees averaging 18 inches dbh or more. 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 or more dbh and more than 107 feet in height, have at least one platform 5.9 inches (15 centimeters) 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). The tree has 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 habitat exists within the Medford District, there are no known marbled murrelet nests or observations.

Critical Habitat for the marbled murrelet was designated by the Service 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 10,052 acres of marbled murrelet CHU within the Medford District (Glendale and Grants Pass Resource Areas).

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 Medford District. Suitable spotted owl NRF habitat described above can 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 Medford District spotted owl NRF baseline analysis, approximately 44% of the Medford District 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 project. 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 all resource areas in the Medford District; however, fishers have only been detected in the Ashland, Butte Falls, and Grants Pass Resource Areas.

Bureau Sensitive

Riparian areas throughout the Medford District along streams, rivers and wetlands provide habitat for a variety of BLM sensitive birds, reptiles, amphibians and mammals. Bureau sensitive species known to inhabit or use riparian areas include: Bald eagle, Foothill yellow-legged frog, Northwestern pond turtle, Siskiyou Mountain Salamander, Oregon Spotted frog, terrestrial snails, and a variety of bat species. Large green trees, snags, coarse woody debris, and talus are often associated in riparian areas and provide key habitat features for these Bureau sensitive species. Riparian habitats also provide a key role in maintaining linkages or wildlife movement corridors between low and high elevation habitats. Appendix A displays bureau sensitive species and their specific habitat requirements.

Land Birds (Neotropical Migrants and Year-Round residents)

A number of bird species utilize riparian habitat through the year or seasonally. Many of these species are generalists that also occur as breeders in other habitat types. However, others are obligate or near obligate to riparian habitat. Most species are primarily insectivores that take advantage of the high insect productivity that occurs in riparian habitats. Other riparian associated bird species are tied to unique features such as nesting cavities provided by snags, nectar of flowering plants in the understory, fruit from berry producing plants in the understory and subcanopy, or a dense, diverse shrub layer. Riparian areas also provide movement corridors for some species. Many species of birds follow drainages during migration (Altman 2000).

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 Medford BLM lands. Fourteen of the birds on these lists are known to occur on the Medford District BLM:

- 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

3.1.5 Botany

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.

The BLM policy is to conserve federally listed and sensitive species, to initiate proactive measures that reduce or eliminate threats, to determine the distribution, abundance, and condition of sensitive species, and to consider site specific methods in implementation planning to conserve species (BLM Manual 6840). The objective of the Medford RMP is to conserve listed and sensitive species, and it directs the BLM to a) managed listed species following recovery plans, b), manage sensitive plants and fungi to maintain or restore populations and habitat consistent with conservation needs, and c) implement conservation plans and agreements. To meet policy and the RMP, the BLM surveys an area where actions could affect identified populations of listed and sensitive populations and then mitigates, if necessary, the proposed action to reduce significant adverse effects to the species.

Surveys of suitable habitat are conducted for the listed and sensitive plants prior to project initiation. 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. leaving certain canopy requirements, 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; 2 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 never documented. If populations of suspected sensitive plants are documented in surveys, they will be managed just like known species. Appendix B provides the list of known federally listed and sensitive plants within the Medford District, the associated habitat and status.

ENDANGERED PLANTS

There are 2 plants listed as endangered by the US Fish and Wildlife service that are known to occur on the Medford BLM in riparian zones, Gentner's fritillary (*Fritillaria gentneri*) and Cook's desert parsley (*Lomatium cookii*). One federal candidate species also exists on BLM lands in the subbasin, (*Calochortus persistens*). This species is known from adjacent Siskiyou County in Northern California and is disjunct here. However this species is known from rocky-ridgelines well away from the Riparian zones and will not be affected by the proposed action. 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 ever been found on BLM lands in the subbasin.

Gentner's fritillary (*Fritillaria gentneri*)

This lily is a long lived perennial 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). 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 (USDI, 2003) 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 has been found growing on the edges of grasslands and chaparral, and in partially open mixed evergreen forest and oak woodland openings. It is most often found in forest ecotones or transitional areas, especially along upper slopes, ridgelines or aspect changes. 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 3000 plants, with an average of 22 flowering plants per site. The median number of flowering individuals at a site is 1; 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 set 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.

Populations of Gentner's fritillary could occur in areas affected by the proposed action.

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), and the comment period was re-opened in January of 2002. 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 due out this spring (Personal communication Sam Friedman, USFWS, 2009).

The distribution of the plant 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, 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 either along the Rogue River or in alluvial areas along the lower Applegate River. 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 not 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, but lacks 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 could occur in areas affected by the proposed action.

SENSITIVE PLANTS

In order to analyze effects for the proposed action, rather than address every plant species one by one, it is useful to place species into one or more plant habitat guilds. For the proposed action, only 38 of the 97 sensitive plant species are known to occur on the district that can be found in riparian zones and riparian forests. Only these species are analyzed in this EA as species found in the uplands are unlikely to be significantly affected by the proposed action. In appendix B, these riparian species are **bolded** for the reader to see. All other sensitive plants found in other habitats not affected by the proposed action are not analyzed any further as impacts from the proposed action are unlikely to occur.

3.2 Environmental Consequences

3.2.1 Soil, Water and Fish

Alternative 1—No Action

Current and future restorative actions underway on private and federal land are increasing instream structure and reducing surface erosion from roads. In some riparian areas on private lands, through watershed council efforts, replacing blackberries with conifers and hardwoods is expected to increase over the next several decades. Further, fish access continues to improve as state and federal agencies replace fish passage barriers and Oregon Department of Fish and Wildlife work with land owners to install and maintain fish screens at diversion ditches.

On federal land, a long term improvement in water quality and aquatic habitat is expected as a result of implementation of riparian management areas and Best Management Practices (BMPs). Active and passive riparian restoration on federal lands will create an upward trend in stream shade and large wood recruitment potential as riparian stands mature. While an improving trend is expected, the time for riparian vegetation to mature and input wood into streams may require 40-100 years.

Currently, each action requires individual EAs. Under the no action alternative individual EAs would continue to be required for each project, delaying or preventing project implementation. Thus, the number and extent of enhancement activities would be reduced compared to the action alternative. It is anticipated that through increased planning efficiencies, partnerships and funding opportunities would also increase. Partnerships are particularly important for watershed improvements on the Medford District due to the checkerboard ownership pattern. Therefore under the no-action, there would be reduced opportunities to enhance production and survival of aquatic species.

Alternative 2

Alternative 2 proposes three categories of projects: Riparian vegetation treatments, Instream enhancement, and road improvements to protect/improve water quality and aquatic habitat conditions. This section identifies the physical effects to soil, streambanks, water quality, and stream channels from implementation. Following the description of effects to the environment or habitat, effects to aquatic species are identified.

A Species Effects analysis considers how the actions proposed would affect fisheries and aquatic resources, assessing the potential magnitude, duration, and nature of the effects. The 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. The effects on habitat are in turn used to evaluate the potential of the proposed actions to affect fish populations through production and survival. The majority of the analysis focuses on salmonids. However, because salmonid

production and survival is based on habitat condition, other fish species would be affected similarly.

Riparian Projects

1. Soils and Water Effects

Riparian Vegetation Thinning: This alternative proposes to carry out non-commercial thinning, to enhance plant species composition and structure. Thinning dense conifer or alder stands would promote the development of large trees. This activity would be implemented to reduce small tree density for fuels hazard reduction and to facilitate growth of large diameter conifers.

A “No activity buffer” of either 60- and 35 feet on perennial and intermittent channels respectively, or in accordance with established WQRPs would be established; thinning in the riparian areas outside the buffer would not reduce canopy closure below 50-60%. Project design features (PDFs) also include no new road construction; only existing roads and skid roads would be used.

Short-term effects may include minor reductions in riparian canopy cover. However, the “no activity” stream buffers would maintain primary shade to the creek. Riparian thinning in the outer riparian zone would reduce canopy cover to 50-60%, increasing to 60-70% within 10 years due to regrowth.

Due to maintenance of primary stream shade and light thinning of the understory, riparian thinning would not affect stream temperatures (USFS, BLM *Sufficiency Analysis for Stream Temperature 2004*). In the long term, increased stream shade and large wood debris recruitment potential would result in increased stand health and vigor and development of large tree structure.

In stands dominated by a single species, diversity is expected to increase as increased light and growing space would facilitate hardwood and shade intolerant species development. The gaps between the crowns would allow indirect sunlight to penetrate the thinned stand similar to natural disturbances, leading to opportunities for hardwoods and shade intolerant species to establish.

Single tree selection for instream large wood would remove canopy cover at localized sites. Trees would only be removed in a fully stocked stands and would not change the stands canopy cover. Further, NMFS PDFs require the retention of full canopy between trees selected for removal, thereby, preventing gaps in the canopy cover. The individual tree crowns removed may provide shade to the creek for a portion of the day. However, this level of canopy cover removal, isolated to single trees in fully stocked stands, would maintain stream temperatures and protect water quality.

To avoid potential detrimental compaction and erosion, riparian thinning would use existing roads and skid trails; no new roads would be constructed. Rather, vegetation would be lined to an existing skid trail or road. To prevent a build-up of ground fuels, thinning may include whole

tree falling and yarding. Soil disturbance would be expected in areas where trees are lined to the road. Compaction, however, would seldom occur due to dry season operation and no heavy equipment off of existing roads.

Disturbed soils would rarely move off site as soil infiltration would be retained and areas of disturbance would be isolated and surrounded by undisturbed soil and vegetation. Riparian thinning activity would not create a soil or water routing mechanism to the channel network. Further, on most sites woody and plant material would either remain or be placed in the lined corridor. Therefore, neither soil productivity nor water quality would be affected by riparian thinning activities.

Riparian Vegetation Treatment (controlled burning): Controlled burning would be planned and implemented to result in low intensity burns as defined in the National Fire Plan (2002).

The primary beneficial effect of reducing fuel loads in riparian areas is the reduced risk of high intensity wildfire. Riparian areas frequently differ from adjacent uplands in vegetative composition and structure, microclimate and fuel characteristics (Dwire and Kauffman 2003).

Although fire can have a wide range of effects on aquatic ecosystems ranging from minor to severe (Reiman *et al.* 2003), prescribed burns would occur in the spring and fall when fuel moisture and relative humidity are high. Under these conditions, burns in riparian areas tend to occur in a mosaic pattern, leaving considerable unburned area and resulting in low tree mortality. Effects from low to moderate intensity prescribed fire in riparian areas would maintain stream shade and large wood recruitment. In some cases, large woody debris levels would increase due to prescribed fire (Chan 1998).

In a recent study on controlled burns conducted in the Sierra Nevada Mountains of California, Bêche *et al.* (2005) concluded that low to moderate intensity prescribed fire actively ignited in the riparian area had minimal effects on a small stream and its riparian zone during the first year post-fire. The controlled burn left a mosaic pattern of intensity and fuel consumption with the highest burn severity in areas of large debris accumulations. There was no measurable decrease in riparian canopy cover, no increase in fine sediment, and little to no macroinvertebrate response. Similarly in Southwest Oregon inputs of fine sediment to streams are unlikely due to the surrounding vegetation, stream buffers and maintenance of soil porosity and infiltration.

Pile burning, in all alternatives for treatment of activity fuels and fuel treatments, would leave bare soil areas on less than 10% of the treated area. Bare soil conditions would be discontinuous, with the surrounding unburned ground preventing concentrated runoff. This disturbance would be localized and thus, have no effect on off-site conditions. Therefore, very low, immeasurable rates of erosion would occur as a result of this treatment. It is expected that one year after treatment grasses, forbes, understory plants, and forest litter would return.

Riparian Vegetation Planting. This Alternative proposes to plant naturally occurring riparian vegetation, which may occur as a stand-alone action or as an action to stabilize disturbed areas.

Riparian planting is utilized to increase shade, hiding cover, future potential woody debris, streambank stability, and species diversity. Planting riparian vegetation decreases areas of bare soil and provides a sediment filtering buffer. As plantings and riparian vegetation matures, width-to-depth ratios of disturbed channels and fine sediment delivery would decrease. In the case of conifers, which need at least 80 years to mature, the results of planting would not be evident for several decades.

Site preparation and planting is not expected to result in stream sedimentation or erosion. Riparian fencing may require vegetation removal along the fence line. No overstory trees would be removed and no roads would be created. Therefore, fencing would not affect water quality, channel substrate or bank conditions. In areas previously disturbed, fencing would exclude the disturbance (dispersed camping, OHV's, livestock), resulting in an increase in diversity and abundance of riparian vegetation and a decrease in sediment.

2. Effects to Species and Habitat

Increased riparian vegetation structural and habitat heterogeneity would increase future potential large wood. Increased large wood would increase shade, hiding cover, pool and gravel bar formation, and stabilized banks; thus, improve habitat for fish. Associated with an improvement of aquatic habitat, survival of yearling and other juveniles is expected to increase by providing appropriate substrate for fry and cover from predators and high flows. Beneficial effects also include enhanced vigor through improved conditions for forage species and improved reproductive success for adult salmonids because of increased pools, spawning substrate, cover and holding areas. Retention of stream shade would not increase stream temperatures protecting water quality.

Effects from low to moderate intensity prescribed burns would be much less severe than the effects of intense wildfires, and expected benefits would result in improved riparian vegetation and eventually stream habitat. Individual fish behavior would not be affected directly by the patchy low-intensity fires caused by controlled burning. The low-intensity of the fire would minimize any changes in abundance of macroinvertebrates and would not cause a measurable change in survival.

Stream Enhancement Projects

1. Soils and Hydrology Effects

EFFECTS COMMON TO ALL STREAM ENHANCEMENT PROJECTS

Instream enhancement activities would require the use of heavy equipment, including but not limited to excavators, dump trucks, and bulldozers, within stream channels and riparian areas. Due to instream and near stream equipment operation, stream enhancement projects may have short-term adverse effects including disturbance to riparian vegetation, exposure of bare soil, stream turbidity, fine sediment input, channel bed disturbance and increased risk of chemical contamination from fuel and lubricants. These effects can be minimized through successful application of PDF's and BMP's as described below.

Chemical spills: When heavy equipment is operating in or near the stream, there is always the potential for fuel or other contaminant spills. PDFs (outlined in the NMFS BO and BMPs from the 2008 RMP) would include measures to prevent or reduce impacts from potential spills (fuel, hydraulic fluid, etc). Namely, hydraulic fluid and fuel lines on heavy equipment would be in proper working condition in order to minimize potential for leakage into streams. Further, no re-fueling of heavy equipment would occur within 150 feet of streams. Equipment would be properly maintained and cleaned of excessive fluid accumulation. Therefore, chemical spill risk is reduced to the lowest degree possible.

Soil and erosion: Access to construction sites may require removal of riparian vegetation and the creation of temporary access routes. In addition, access to stream channels may disturb bank vegetation and topsoil. The combination of disturbed soil and proximity to streams increases the potential for sediment delivery to streams.

Bank disturbance such as creating anchor points for instream structures, removal of diversion dams and legacy habitat structures, and channel access could release sediment directly into the channel environment. In-channel equipment operation would disturb the channel bed, releasing fine sediments. Release of fine sediments from riparian areas, streambanks, and channel substrate into streams would cause elevated turbidity and increased fine sediment.

However, these impacts can be minimized by the application of site specific PDFs and BMPs. Removal of riparian vegetation would be minimized, limited to the work area, and ground cover replaced by the application of native mulch, weed free straw, or erosion blankets. Additionally, straw wattles or other perimeter control BMP's would be applied as necessary. It is expected that where disturbance occurs, vegetation would reestablish within two years. Similarly, bank disturbances would be limited to the site of equipment activity; bank conditions up and downstream of the activity would remain stable.

Plantings, mulch or organic debris, and other sediment trapping material (e.g. straw bales) would be placed on ingress and egress access routes, staging areas, and other disturbed areas prior to the onset of winter rains, thus preventing/minimizing sediment input. Furthermore, actions would occur during low flow or dry conditions when the probability of soil detachment and transport are low. Given the limited area and duration of disturbance, seasonal restrictions, and application of other PDF's and BMP's, instream turbidity and sediment delivery would be minimized.

Sediment depositions and turbidity would be short term. Project duration, in almost all cases would be less than 2 weeks. Inputs of fine sediment would typically be limited to the time of activity. It is expected that any introduced fine sediment would become entrained in the first high flow of the season and would become a small, immeasurable percentage of the stream channels sediment load. After which, sediment would not affect downstream gravels or pool volume. Similarly, any increases in turbidity would cease upon completion of instream equipment operation. Expected long term benefits of improved channel complexity, aquatic connectivity, and bank stabilization to aquatic habitat and species would far outweigh potential short term adverse effects.

Large Wood and Boulder Installation. Large wood and boulder complexes would be designed to reduce and deflect flow velocity. In moderate gradient reaches (2-4%) large wood is the dominate mechanism responsible for velocity breaks and pool formation. As flows diverge, velocity decreases, leading to deposition and sorting of stream sediment. Flow convergence focuses flow velocity, creating scour and pool formation. Large wood and boulders placement in moderate gradient reaches would improve and promote course sediment deposition, decrease flow velocities, and increase low flow pool volume.

Flow in a meandering stream follows a highly sinuous line and has lower gradients, hence less stream power, which reduces the sediment transport capacity. Complexity in meandering streams is enhanced by the amount of obstructions within the channel. In general, large woody debris tends to increase the sediment storage capacity of a reach. Large wood also sorts sediment sizes through velocity breaks; stabilizes gravel bars; induces local bed and bank scour, and increases pool formation and channel complexity favorable to aquatic species.,

Head-cut Stabilization. Headcuts are abrupt changes in bed surface elevation at the head of channel networks where intense, localized erosion takes place (Brush and Wolman, 1960; Gardner, 1983). In upland concentrated flows, the migration of headcuts is commonly associated with significant increases in sediment yield and lower water tables in low gradient channels and meadows. It can take decades for channels to re-establish their gradient and former elevation. Stabilization of headcuts greatly reduces erosion potential, meadow degradation, and slows channel incision compared to untreated or existing conditions.

Headcut stabilization may require excavation within active stream channels. It is expected that localized sediment levels would increase during excavation and the first high flow. However, sediment transport would be minimized as instream work would be completed during low flow conditions. There would be short-term increases in sediment, but sediment yield would be much lower over the long term (>2yrs) as the headcuts stabilize and meadows recover.

Bank stabilization. While streambank erosion is a natural process, landscape changes have decreased bank stability and accelerated rates of bank migration. Bioengineering uses boulders, large wood, and plant materials (e.g., dormant cuttings of willows and other plants that root easily) in a structural way to reinforce and stabilize eroding streambanks. Streambanks covered with well-rooted woody vegetation have an average critical sheer stress resistance three times that of poorly vegetated streambanks (Millar and Quick 1998).

Long-term beneficial effects of stabilizing eroding streambanks include reductions in fine sediment inputs. Through placement of wood and vegetation, bioengineering methods would also increase aquatic habitat complexity, providing cover and velocity refugia during high flow events.

Restore Floodplain/Side Channel Connection. Reconnecting floodplains and side channels includes removing accumulated sediment or other obstructions that restrict flow access, and using boulders and large wood for flow deflection. Boulders and large wood would also be placed in the side channel to increase complexity and habitat structure.

In unconfined river reaches, side channel habitat and connectivity is dynamic, changing with river migration and sediment transport and deposition. Floodplains and side channels dramatically reduce the flow energy within the active channel by functioning as an energy dissipater for the stream during high flow periods. Furthermore, during high flows, when the large majority of sediment transport occurs, vegetated floodplains tend to efficiently trap and store fine sediments. This channel-floodplain interaction develops the conditions for a healthy riparian/floodplain plant community, builds banks, shapes channel geometry, and attenuates flows.

Functioning side channels have inlet and outlet connections to the main channel and often flow during bankfull or greater flood events. Functioning alcoves provide back-water channels that typically contain water during both low and high flows. This provides important rearing habitat and refugia for fish and other aquatic species.

Removing obstructions to side channels would directly increase connectivity, thus increasing flow frequency through the channel. Wood and boulder deflection in the mainstem, similarly, may increase flow frequency in side channels. These channel obstructions create a back water effect, deflecting a greater percentage of flow toward the side channel.

In the both the long and short term, reestablishment of side channel and floodplain connectivity would decrease mainstem flow velocities, reducing bank erosion potential. Increased storage of fine sediment in the floodplain reduces in-channel fine sediment and provides deposition for vegetation establishment. Further, reconnection of side channel and alcove habitat increases refugia for juvenile fish during high flows.

Irrigation Diversion and Legacy Structure Removal

This action includes the removal of diversion structures that are less than six feet high, or that impound less than 15 acre-feet of water. Additionally, existing instream habitat structures that were constructed to improve fish habitat but were installed in a manner that was, and continues to be, inappropriate for the given stream type would be removed. These legacy structures and diversion structures can increase width/depth ratios due to aggradations. In some cases, the jump height over the structures interferes with aquatic species migration.

In addition to the effects identified above, sediment retained behind irrigation diversion dams and legacy structures would release downstream. This could be minimized by the application of site specific PDF's and BMP's such as partial or complete removal of stored material prior to removal. Any released sediment represents redistribution of existing in-channel sediment. The sediment, rather than being stored behind the structure, would be transported to downstream reaches. The stored material would likely contain elevated levels of fine sediment which would also increase turbidity. However, sediment has also been shown to provide needed substrate and nutrients for development of healthy floodplain riparian vegetation.

Given the isolated source (immediately behind the dam), release of sediment would occur within one to two years following removal, depending on the magnitude and frequency of high flows. Peak flows at or greater than the 2-year return interval may transport all material downstream the

first year or within hours. With lower peak flows, mobilization and transport may take an additional high water event or two years. Similar to the time required to mobilize the stored sediment, the distribution and resident time of the sediment in downstream habitat units would likely be short term (1 to 2 years) depending on flow magnitude, channel structure and stream gradient.

Regardless of the transport rate, the released sediment represents a small percentage of the suspended and bedload of the channel network. Therefore, following the initial release and transport, long term effects to downstream channel conditions are not expected. The release of any material would be a one-time source and any adverse effects would likely be offset by the anticipated long term benefits, including permanent removal of the mechanisms responsible for adverse channel adjustments, restricted access and degraded habitat conditions.

2. Species and Habitat Effects

In and near- stream enhancement activities: Beneficial effects result from the addition of habitat features such as large wood and boulders by increasing hiding cover, aiding in the formation of pools, and retain spawning substrates. Increased retention of spawning gravel would increase the total amount of spawning habitat available to adult salmonids. Pools, large wood, and boulders also provide eddies and areas of slower water velocity, which in turn provides improved feeding efficiency. Bank stabilization utilizing bioengineering methods such as placement of large woody debris and riparian plantings would increase aquatic habitat through overhead cover for fish and reduce sediment inputs.

Immediate beneficial effects of floodplain connectivity include periodic delivery of water, nutrients, sediment to floodplains, flood attenuation, and reduced stream energy. Ultimately, floodplain reconnection would result in more functional fish habitat. Streams with overhead cover and undercut banks provide protection for juvenile fish. Low width-to-depth ratios provide cool and deep refugia for migrating juveniles. Healthy riparian plant communities provide primary and secondary productivity that drive the food base that juvenile salmonids consume when rearing and migrating to the ocean. Reconnection of side channels would provide important refuge habitat and improve spatial structure.

Seasonal restrictions imposed by instream work windows would prevent heavy equipment effects to salmonids and critical habitat such as smothering or crushing eggs. The instream restrictions would also reduce potential increases in turbidity or disruption in over-wintering behavior.

Instream construction activities may increase fine sediment up to a few hundred feet below construction sites, but is expected to be short term (during project work and the first high flow). Minor reductions in macroinvertebrate forage may occur but would not have observable detrimental effects on salmonid survival and production.

Instream structure removal: Removal of poorly constructed legacy structures and small diversion dams would directly benefit aquatic species by removing migration barriers, thus increasing

available habitat. Localized habitat is also expected to increase by re-establishing favorable channel geometry. In the long term, spawning habitat and fish distribution would increase. Increasing access to all habitat types is likely to increase fish populations.

In the short term, sediment released behind diversion dams and legacy structures could increase fine sediment in downstream gravels, depending on the duration and flow magnitude the first year following activity. High flows are likely to mobilize the stored sediment and become a very small percentage of the streams sediment load. In this scenario, given the small volume compared to the channels total sediment load, it is unlikely that downstream deposition would be noticeable. In years with below average runoff, sedimentation may be observable for 1 year following activity. It is not anticipated that these effects would extend beyond one year. In either case, given the short duration and limited extent, when compared with increased access to upstream habitat, short term spawning and rearing success would be similar or greater than existing conditions.

Chemical Contamination: Operation of heavy equipment requires the use of fuel and lubricants, which if spilled into the channel or the adjacent riparian zone can injure or kill aquatic organisms. Petroleum-based contaminants (such as fuel, oil, and some hydraulic fluids) contain polycyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can cause acute and chronic sub-lethal effects on aquatic organisms (Neff 1985). Development and implementation of the required pollution and erosion control plan would reduce contaminants from entering stream channels and limit any potential adverse effects of a toxic material spill.

Road and Culvert Projects

1. Soils and Hydrology

Roads identified as unnecessary and/or roads causing or having the potential to cause (high risk) adverse impacts to streams or watershed function would be identified for drainage improvement or decommissioning. Stream crossing replacements would focus on culverts that are at risk of failure, are not properly designed for the stream or are a passage barrier.

Roads and associated ditch systems increase watershed drainage networks, intercept overland flow, and alter timing of peak flows (Wemple et al. 1996). During precipitation events, fine sediments from roads can be delivered into streams. Roads constructed in close proximity to streams constrain the stream channel and may eliminate the stream's access to its floodplain. Deteriorating or undersized culverts reduce water conveyance, leading to potential road fill failure or stream diversion. In these cases, large volumes of sediment can be introduced into the channel environment.

Road decommissioning and road upgrades may result in short-term, construction-related increases in sediment. In particular, road decommissioning, including culvert removal, and culvert replacement pose a risk of introducing sediment into streams. This can be minimized or avoided through the application of PDF's and BMP's. Bare soil conditions would be mulched and/or planted. As appropriate silt fences, straw bales, straw wattles, or other sediment

containment structures would be installed. Collectively, the ground cover and perimeter containment BMP's prevent, and capture soil erosion; thereby, greatly reducing or eliminating sedimentation. For in-channel construction such as culvert replacement or removal, the site would be isolated with coffer dams upstream and downstream. These practices effectively prevent turbidity and sediment transport as flowing water is routed around the site and downstream structures (e.g. straw bales) capture any mobilized sediment.

The goal is to achieve zero discharge of sediment; however, not all sediment in all cases would be prevented from entering the stream channel. Any sediment input would likely be minimal, immeasurable and generally be limited to the first storms, or runoff, following activity. This effect would decline with time (<2 years) as the surface stabilizes and revegetation occurs. Similarly, there is also potential for short term increases in turbidity, limited to time of operation if occurring in a flowing stream or the first rainstorms of the season. Following the first high flow of the year sediment may be entrained in the water column, becoming a fraction of the channel's sediment load. In most cases, based on past actions, there would be no effects to channel conditions or water quality.

In the long term, road improvements reduce both chronic and episodic erosion and sedimentation. Drainage improvements such as out-sloping the road surface and installing rolling dips reduce or eliminate chronic sources of road erosion and fine sediment delivery. Road closures, particularly during the wet season, prevent road rutting known to deliver sediment to streams. Stream crossing upgrades can provide for aquatic passage and reduce the risk of catastrophic failure and associated impacts on aquatic ecosystems. Decommissioning reduces both chronic sediment sources and eliminates or reduces the potential for episodic sedimentation. The proposed road activities would decrease watershed drainage networks, and eliminate channel obstructions.

The project also proposes road maintenance associated with road drainage upgrades. Associated with road maintenance is road side ditch clearing. Luce and Black (1999) found no significant increase in erosion when only the road tread was treated; however statistically significant increases in erosion occurred when road ditches were bladed. Sediment delivery to streams from road-ditch renovation would primarily occur at road-stream crossings in years one and two following activity. Luce and Black (2001) observed an 87% decrease in erosion and sediment transport in year one and two following road maintenance activities. While activity generated sediment would increase, road conditions would improve due to drainage improvements, leading to an overall immediate reduction in erosion.

2. Species and Habitat Effects

In the long term, the proposed road activities would decrease watershed drainage networks, eliminate stream-road crossings, reduce soil compaction, and substantially remove both chronic and episodic sources of sediment. These beneficial impacts to the landscape would reduce scour-related mortality of eggs and alevins, reduce involuntary downstream movement of juveniles during freshets, and increase substrate interstitial spaces used for refuge by fry. Also decreases in sediment/ turbidity have proven to be correlated with increased survival and growth of aquatic organisms.

Decommissioning roads in riparian areas would decrease delivery of fine sediment to streams. Eliminating sediment sources would help to increase the diversity and density of aquatic macroinvertebrates, maintain or increase the amount of interstitial cover available, reduce or eliminate suffocation of fry and entombment, and improve feeding abilities through increased light penetration.

Culvert replacements, which restrict passage, would increase population range extension. Fish populations that are well distributed spatially are at a lower risk of detrimental effects from stochastic events. In addition to improved spatial structure, the additional available spawning and rearing habitat would result in increased population abundance and productivity.

Where necessary, fish relocation during culvert replacement in flowing streams may result in increased stress and possible mortality for a small number of fish. The stress of relocation would last only a few hours and would only occur once. Road work would have short-term increase in erosion and sediment deposits. Erosion and sediment would be minimized by project design and would be small in scale and short in duration. Therefore, there would not be any observable detrimental effects to survival.

Cumulative Effects

The NMFS and USFWS Biological Opinions include a limit to the number of projects that may occur within a 5th field watershed to avoid potential cumulative effects generated by implementation of multiple projects. Specifically, a limit of 10 group 1 activities is authorized in a fifth field watershed per year. Type 1 activities include instream actions such as wood and boulder placement, irrigation dam removal, bank stabilization. This threshold was selected to ensure that short-term adverse effects associated with beneficial actions would not collectively compromise watershed function or integrity. Neither NMFS nor USFWS limit the number of low impact activities such as road improvements, riparian thinning and fuel reduction, and riparian fencing. With these limitations and the beneficial nature of projects the project team concurred with the opinions that no adverse cumulative effects are expected.

Likewise interactions with other land management activities occurring on private and public land are not expected to generate cumulative adverse impacts. All actions are designed to maintain or restore aquatic habitat conditions. While potential short term impacts are identified, all actions were determined to provide both short and long term benefits to aquatic habitat and species.

However, there may be local situations where potential short term activity impacts, which cannot be avoided or mitigated by project design features, may add long term effects to existing adverse conditions. These instances could include streams listed by DEQ for sediment or where road building and logging are expected to deliver levels of sediment sufficient to alter spawning and rearing habitat. In these instances where project design features or mitigation is not sufficient to limit project effects to the short term, projects would not be implemented under this programmatic EA.

This assessment acknowledges that potential cumulative benefits may occur if associated with other federal or private enhancement activities such as migration barrier removal and increased channel complexity through wood and boulder placement. Cumulative benefits would greatly improve aquatic conditions and potential for increase species populations and distribution. These effects are consistent with the purpose and objectives of this EA.

3.2.2 Botany

Alternative 1—No Action

The no action alternative would have effects that may occur to 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.

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 another 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 higher 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.

Noxious weeds can out-compete native plants, 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 Medford District 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. It is unlikely that the

BLM will stop the spread of noxious weeds to and from non-federal lands; it could only reduce the risk or rate of spread and control of known populations.

Alternative 2

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 (*Cypripedium fasciculatum*) if canopy opening reduces or dries moist microsites. However, this short term degradation would only occur in limited areas, and within several years, would begin to recover outside buffers in areas in which shrub and canopy cover increases. 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 adjacent to the project area, within the watershed, and throughout 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 higher canopy cover.

Species Requiring Open Areas

Canopy thinning reduces 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. Habitat for species requiring a more open habitat would decrease over time with shrub/conifer encroachment and crowded conditions outside of these treatment strips. These crowded conditions can lead to a decline in populations of species that require openings for survival due to competition for space, light, water, and nutrients.

Direct Effects

Instream Restoration and Road Work: Heavy equipment operation for stream channel ingress and egress routes for instream structure placement, bank stability, instream dam removal, and lining trees may compact and displace soil. Impacts from equipment operation to Threatened and Endangered (T&E) and Bureau Sensitive plants could include damage to plant tissue, destruction of plants, and habitat loss through physical ground disturbance in suitable habitat. This is especially true for nonvascular species growing on rocks in streams that could be damaged by heavy equipment during instream structure placement.

Road maintenance, reconstruction, obliteration, and culvert replacement within the road prism is unlikely to directly affect Threatened and Endangered (T&E) and Bureau Sensitive plants, as the footprint of the disturbance is not new and road edge habitat is generally not suitable.

Single tree and group (<5) selection may occur during these activities. Equipment operation off the road prism, similar to heavy equipment operation for instream restoration, could include damage to plant tissue, destruction of plants, and habitat loss through physical ground disturbance in suitable habitat.

Fuel reduction and Riparian Thinning: Fuels treatments including thinning and burning could trample, or burn 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* (Gentner’s fritillary). Spring and early summer burning could directly kill growing Gentner’s fritillary plants, but could also create new habitat that could become occupied later by that species and other listed species. Certain species, such as *Fritillaria gentneri*, are likely adapted to fire in the summer and early fall when it is 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 bake 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.

Indirect Effects

Fire can be used to promote, enhance, or maintain these habitats and create suitable habitat. Special Status species, such as the listed Gentner’s fritillary, are likely adapted to fire in the summer and early fall when it is dormant underground. Light intensity of burning occupied habitat during the dormant period is likely a beneficial effect for listed plant species. Fuels reduction projects can also have a long term beneficial effect by creating more open habitat that is more suitable for plants like Gentner’s fritillary, *Lomatium cookii* (Cook’s lomatium), and other listed and sensitive plant species. Species requiring canopy openings are found throughout the Medford District. 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. These species populations and habitat would benefit from treatment creating openings and providing more habitats.

Previously treated 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, and potentially helping with recovery which would be a beneficial effect for the species. On the other hand, herbivorous browsing of Gentner’s fritillary by deer in treated areas has been observed presumably because they are more exposed and visible.

Riparian thinning would reduce canopy cover, altering habitat for botanical species. Proposed riparian thinning would reduce canopy cover to 50-60%. 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 species and sensitive. These 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 Gentner's fritillary. Given the proposed canopy retention of 50-60%, the canopy modifications from riparian thinning and watershed restoration projects are not likely to adversely affect any listed plants. Although, reducing the canopy cover to 50-60% can reduce relative humidity, reduce soil moisture, increase temperatures and increase light exposure. This change in environmental conditions would be a negative effect to species like *Cypripedium fasciculatum* and other species needing increased canopy cover.

B. Noxious Weeds

Ground disturbing activities from thinning, fuels projects, and heavy equipment operation can facilitate the introduction and spread of Oregon State Listed noxious weed species such as Yellow starthistle, French broom, Spanish broom, Meadow knapweed, Spotted knapweed, Scotch broom, Dyer's woad, Himalayan blackberry, Rush skeleton weed, Tansy ragwort, Puncture vine, Japanese knotweed, Purple loosestrife, Reed canary grass, and Canada thistle. Noxious weeds can have an indirect effect by competing 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. Indirect effects could occur to plants growing next to roads from competition from noxious weeds coming in along roads. The PDFs of washing of BLM, Forest Service, and contractor equipment and vehicles and treating known population prior to project activity can reduce the spread of noxious weeds.

Cumulative Effects

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 district, and in southern Oregon on federal land, 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 of disturbance, the intensity, duration, and the timing. The PDF's 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. Much of the information is anecdotal in nature, 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 Medford District. 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 direct and indirect 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, 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. This possibility of introduction of new 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.

3.2.3 Wildlife

The proposed actions only included projects identified and analyzed in the USFWS biological opinion (BO# 13420-2007-F-0055). The BO identifies project design criteria to ensure that covered actions will not adversely affect listed species and their habitat. Key project criteria to ensure minimal to no effects include:

1. Actions will not remove or reduce function of suitable T&E species habitat
2. No removal of spotted owl, marbled murrelet, or bald eagle nest trees
3. A biologist input on site specific projects, including nest surveys if suitable habitat is present
4. Apply and modify as necessary disturbance and disruption distances for listed species as per Table 7 BO#13420-2007-F-0055.

The following discussion describes the typical effects anticipated from project activities. As described in proposed actions a site specific analysis would occur at each project site to

determine if activities are consistent with the anticipated effects identified. 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.

T&E

Northern Spotted Owl

Alternative 1 -No Action

Under Alternative 1, management activities would not alter suitable habitat within the project area and habitat would continue to develop along current successional pathways. The development of large tree structure comparable to that of remnant trees used by spotted owls is not likely to occur in riparian areas proposed for thinning. This is because current stand conditions are too dense and trees are not developing the diameter to height ratio required to develop this structure. This ratio was historically created through frequent fire events that reduced stem densities and competition that created open grown conditions. Current stand conditions would likely develop into less complex stand structures and species compositions than that of old growth stands (Sensenig 2002). As a result, these dense riparian areas would be at greater risk for loss through stand replacing fires. Wildfire would remain the most immediate hazard to spotted owl habitat within riparian areas under the No Action Alternative.

Alternative 2

Proposed instream habitat actions and road improvements, such as LWD, Boulder, and Gravel placement, and culvert repairs would not affect suitable spotted owl habitat. Riparian thinning, single tree removal for instream log material and heavy equipment access through riparian areas for culvert replacement, dam removal, and habitat placement would remove some riparian vegetation. However, light thinning or single tree removal, such as proposed for riparian areas would still maintain spotted owl NRF or dispersal habitat and would not remove or downgrade northern spotted owl habitat. 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 harvest impacts to some prey species, such as dusky-footed woodrats.

Riparian thinning may benefit spotted owl dispersal by reducing fire hazard within riparian areas and improving late seral conditions across the landscape. Further, riparian planting and thinnings may add habitat complexity by increasing species diversity as well as promote/maintain late-seral trees. Even though riparian thinning may affect spotted owl habitat, the scope would be relatively small at the project level compared to the amount of suitable NRF and dispersal habitat existing across the landscape.

There is a potential that heavy equipment and chainsaw activity associated with the proposed activities could cause disturbance effects to spotted owls. However, since PDFs would be

followed around known sites, the expected disturbance effects to nesting spotted owls are limited and would only be expected when projects are in or adjacent to unsurveyed suitable habitat. These activities may cause flushing of individuals, missed feeding attempts, or premature fledging. As stated above, the proposed actions were consulted at the programmatic level. The Medford EA would not go beyond the proposed actions consulted on in the BO. However, if we exceed this amount, new consultation would occur.

Cumulative effects

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 future foreseeable projects, the projects would not preclude spotted owls from dispersing through or nesting within the Medford District.

Marbled Murrelet

Alternative 1 -No Action

Under Alternative 1, management activities would not remove or alter suitable 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 in riparian areas proposed for thinning would be the same as described above for the northern spotted owl. Particularly to marbled murrelets, the greatest risk of no action is the potential wildfire related loss of large live remnant conifers within riparian areas important for marbled murrelet nesting habitat.

Alternative 2

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 stated above, the proposed actions were consulted at the programmatic level. The Medford EA would not go beyond the proposed actions consulted on in the BO. However, if we exceed this amount, new consultation would occur.

Cumulative Effects

Consistent with the USFWS findings these activities would not likely jeopardize the continued existence marbled murrelets within the Medford District. Since the proposed action would not remove suitable habitat, even when combined future foreseeable projects, the projects would not preclude marbled murrelets from nesting within the Medford District.

Fisher

Alternative 1 -No Action

Under Alternative 1, management activities would not remove or alter suitable 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 in riparian areas proposed for thinning would be the same as described above for the northern spotted owl. Particularly to fishers, the greatest risk of no action is the potential wildfire related loss of large live remnant conifers as well as snags and down wood within riparian areas important to fisher natal and denning habitat.

Alternative 2

Proposed actions, such as LWD, Boulder, and gravel placement, and culvert repairs would not affect suitable fisher habitat. Riparian thinning, single tree removal for instream log material and heavy equipment access through riparian areas for culvert replacement, dam removal, and habitat placement would remove riparian vegetation. However, light thinning, such as proposed for riparian areas would not remove fisher habitat. Riparian thinning treatments with at least 40% canopy retention would have short term negative effects to fisher prey species due to the reduced vegetation. These effects are relatively short term, as understory vegetation typically returns within 5 years and 60% canopy closure returns within 10-15 years. Untreated areas within the project area would continue to provide forage habitat while canopy cover in the treated stands increases. Additionally, all treatments would retain large snags and coarse woody debris (CWD) to provide future habitat for fishers, and reduce potential impacts.

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. Fishers have large home ranges and 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.

Cumulative Effects

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 Medford District. 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 as well as snags and down wood within riparian areas important habitat to a variety of species. Additional effects to bats would include reduced access to snags in dense stands due to cluttered flight paths in dense riparian areas, which causes echolocation interference (pers. comm. J. Hayes 2003). Under Alternative 1, no disturbance to bureau sensitive species would occur from equipment and associated noise.

Alternative 2

A small percentage of bureau sensitive species habitat may be removed within the project area through riparian thinning, single tree removal for instream log material and heavy equipment access through riparian areas for culvert replacement, dam removal, and habitat placement. However, this loss would be negligible due to the large amounts of suitable habitat to be retained on adjacent land. 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. Heavy machinery access to proposed stream projects may directly affect individuals of sensitive species when the ingress/egress routes are routed through occupied habitat. However, the number of access points would be minimized and would affect only a small area of suitable habitat.

Bald Eagles

The proposed actions are unlikely to result in removal of potential bald eagle nest trees, roost trees, or suitable habitat because much of the work would occur near or along roadways, away from typical nesting locations. Trees removed for single tree selection or thinning within riparian areas would not be nest trees or lead to reduced function of habitat. Aquatic enhancement activities are expected to improve riparian habitat, potentially benefiting bald eagles, including increased fish runs and food supply. Additionally, many of the vegetation treatments would be designed to promote or maintain late-seral trees, which could, overtime provide additional habitat.

There is a potential that heavy equipment and chainsaw activity associated with the proposed activities could cause disturbance effects to bald eagles. However, since PDFs would be followed around known sites, the expected disturbance effects to nesting bald eagles would be limited to projects adjacent to unknown sites or projects where PDFs could not be followed. Disturbance may cause flushing of individuals, missed feeding attempts, or premature fledging. As stated above, the proposed actions were consulted at the programmatic level. The Medford EA would not go beyond the proposed actions consulted on in the BO. However, if we exceed this amount, new consultation would occur.

Bats

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

Foothill Yellow-Legged Frog

Culvert installation, road decommissioning, and road renovation may have an adverse short term impact on foothill yellow-legged frog habitat. Foothill yellow-legged frogs are adversely affected by high water temperatures and excessive sedimentation. They require clean, silt free, gravelly substrate. However, sediment delivery to streams due to project activities would be highly localized, immeasurable, and of short duration. Additionally, PDFs that minimize sedimentation (e.g., filter fabric, seasonal restrictions) would minimize these impacts. Long term benefits from this project would include sediment reduction and improve stream connection, allowing for easier movement within the stream system.

Salamanders and Mollusks

Indirect effects, such as changes to habitat are not expected due to retention of canopy closure, which would prevent warming or drying of micro sites. Further, project design criteria include retention of down coarse wood debris and snags, although limited removal may occur for safety or where unavoidable.

Sensitive salamanders and mollusks may be harmed if located within heavy equipment ingress/egress routes to project sites. Similarly, individuals may be affected if, during thinning operations, logs are dragged over inhabited locations. However, these instances would be rare as project activities are very limited spatially, occurring in isolated patches across the landscape. Additionally, when feasible at the project level, steps would be taken to avoid key habitat features (talus, coarse woody debris, hardwood patches, etc.).

Therefore, while there may be isolated instances of direct effects to immobile species, such as salamanders and mollusks, the occurrence would be minimal across the Medford District and would not affect species population persistence.

Cumulative Effects

The proposed actions are not expected to affect long term population viability of any species known to be in the area or lead to the need to list sensitive wildlife species as T&E. Actions would not change the function of habitats at the stand level. Most actions would avoid disturbance species by establishing seasonal restrictions and disruption distance.

Cumulatively, continued replacement of culverts with updated “fish and amphibian friendly” designs would aid in widespread dispersal and improved conditions for amphibians and other riparian species. The project will not exacerbate the effects of actions on private and other non-federal lands. Riparian habitat is expected to continue to improve on federal lands (BLM and Forest Service) and likely remain in its current state on non-federal lands.

Land Birds (Neotropical Migrants and Year-Round residents)

Alternative 1 -No Action

Management activities would not remove or alter riparian habitat within the project area used by a number of bird species. Riparian 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 these dense riparian understories would continue to build within the project area.

Alternative 2

A small percentage of neotropical bird habitat may be removed within the project area through riparian thinning, single tree removal for instream log material and heavy equipment access through riparian areas for culvert replacement, dam removal, and habitat placement. 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 short-term until the disturbed area is revegetated. 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. Green-tree retention may also help maintain connectivity of habitats for some species between treated and untreated stands (Bunnell et al. 1997).

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. Activities occurring during active nesting periods could cause some nests to fail. However, seasonal restrictions/Project Design Features for other species would also protect most nests from disturbance during project activities. Thinning occurring during the critical nesting periods for most species may 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 Medford District 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 on the district, 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>).

Cumulative Effects

The proposed actions are not expected to affect long term population viability of any bird species known to be in the area or lead to the need to these species as T&E. Actions would not change the function of habitats at the stand level. Riparian habitat is expected to continue to improve on federal lands (BLM and Forest Service) and likely remain in its current state on non-federal lands.

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 Medford District Aquatic Enhancement Environmental assessment was initiated in June 2008, when BLM mailed 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:

- Maximize road decommissioning
- Encourage fish passage improvements
- Include monitoring of riparian thinning
- Introduction of noxious weeds
- Noted an abundance of trash on public lands
- Enthusiastic support for restoration
- Encourage Partnerships

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 Medford Interagency Office, 3040 Biddle Rd, Medford OR 97504. A formal public comment period will be initiated by a notice in the Medford Mail Tribune. If you would like a copy of the EA, please stop by the office or contact Jim McConnell, District NEPA lead, at (541) 618-2402. Written comments should be addressed to Bureau of Land Management, 3040 Biddle Rd, Medford OR 97504. E-mailed comments may be sent to: *Medford_mail@blm.gov*.

Literature Cited

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

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

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 behavior 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, forest dwelling 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 (2007). Bear Creek Watershed 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.

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.

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

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.

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, Charles H and Thomas A Black, 2001. Spatial and Temporal Patterns in Erosion from Forest Roads. *In* Influence of Urban and Forest Land Uses on the Hydrologic-Geomorphologic Responses of Watersheds. *Water Resources Monographs*, American Geophysical Union, Washington, D.C. pp165-178

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

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

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.

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.

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.

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

USDA 1993. *Forest Ecosystem Management: An Ecological, Economic, and Social Assessment*. Us Government 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 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://migratorybirds.fws.gov/reports/bcc2002.pdf>

USDI Fish and Wildlife Service. 2007. *Biological Opinion and Letter of Concurrence USDA Forest Service, USDI Bureau of Land Management and the Coquille Indian Tribe for Programmatic Aquatic Habitat Restoration Activities in Oregon and Washington that Affect ESA-listed Fish, Wildlife, and Plant Species and their Critical Habitats (Tails # 13420-2007-F-0055)*.

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.

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.

Appendix A: 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 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.

Medford District Special Status Species			
SPECIES	STATUS	Presence	Habitat information/ Basic Conclusions
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.
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.

Medford District Special Status Species			
SPECIES	STATUS	Presence	Habitat information/ Basic Conclusions
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 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 B. Documented federally listed and sensitive plants within the Medford District of the BLM

Bolded names are riparian species potentially to be affected by the proposed action

VASCULAR PLANTS		
Species	Habitat	Status
<i>Fritillaria gentneri</i> (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
<i>Lomatium cookii</i> (Cook's Lomatium)	Vernal pool/patterned ground areas on mounds and moist sites in meadows.	Federally Endangered
<i>Adiantum jordanii</i> (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
<i>Arabis modesta</i> (Rogue Canyon Rockcress)	Rocky walls and bluffs 500-1,500 ft. Damp shaded banks or slopes.	Bureau Sensitive
<i>Arctostaphylos hispidula</i> (Hairy Manzanita)	Dry rocky ridges and gravelly soils that receive direct sun with shrub communities or sparse forests.	Bureau Sensitive
<i>Astragalus californicus</i> (California Milk-vetch)	Dry open areas in shrubland and woodlands, 900-4,000 ft.	Bureau Sensitive
<i>Astragalus gambelianus</i> (Gambel Milkvetch)	Open grassy areas in shrubland.	Bureau Sensitive
<i>Bensoniella oregana</i> (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
<i>Callitriche marginata</i> (Winged Water-starwort)	Often in vernal pools or submersed.	Bureau Sensitive
<i>Calochortus greenei</i> (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
<i>Calochortus howellii</i> (Howell's Mariposa Lily)	Dry, open slopes. Rocky, serpentine soils, in Jeffrey pine forests.	Bureau Sensitive
<i>Calochortus monophyllus</i> (One-leaved Mariposa Lily)	Wooded slopes, clay-loam soils 1,200-3,600 ft.	Bureau Sensitive

<i>Calochortus nitidus</i> (Broad-fruit Mariposa Lily)	Grassy hillsides and meadows.	Bureau Sensitive
<i>Calochortus persistens</i> (Siskiyou Mariposa Lily)	Open rocky areas above 3,000 ft.	Federal candidate for listing
<i>Camassia howellii</i> (Howell's Camas)	Dry open slopes in serpentine soils.	Bureau Sensitive
<i>Camissonia graciliflora</i> (Slender Flowered Evening Primrose)	Open or shrubby slopes, grasslands, oak woodlands, less than 4,500 ft.	Bureau Sensitive
<i>Carex capitata</i> (Capitate Sedge)	Generally wet meadows, bogs at high elevations.	Bureau Sensitive
<i>Carex comosa</i> (Bristly Sedge)	Swamps and marshes and other wet areas, sea level to 1,200 ft.	Bureau Sensitive
<i>Carex gynodynamis</i> (Hairy Sedge)	Moist meadows, open forests, or seeps.	Bureau Sensitive
<i>Carex klamathensis</i> (Klamath Sedge)	Serpentine wetland areas that dry out in mid-late summer 1,300-1,800 ft.	Bureau Sensitive
<i>Carex scabriuscula</i> (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
<i>Carex serratodens</i> (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
<i>Cheilanthes covillei</i> (Coville's Lipfern)	Rock crevices, base of rocks, rocky slopes, and sun to shade.	Bureau Sensitive
<i>Cheilanthes inertexta</i> (Coastal lipfern)	Rock crevices, foothills to mid-montane.	Bureau Sensitive
<i>Chlorogalum angustifolium</i> (Narrow Leaved Amole)	Open, dry places, heavy soil in meadows, and woodlands below 1,500 ft.	Bureau Sensitive
<i>Cimicifuga elata</i> var. <i>elata</i> (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
<i>Cryptantha milo-bakeri</i> (Milo Baker's Cryptantha)	Rocky or gravelly slopes, generally coniferous forests.	Bureau Sensitive
<i>Cupressus bakeri</i> (Baker's Cypress)	Dry forested, brushy, or open slopes. Usually rocky ground or serpentine soils 3,800-6,000 ft.	Bureau Sensitive
<i>Cypripedium fasciculatum</i> (Clustered ladyslipper)	Moist microsites in mixed evergreen forests	Bureau Sensitive
<i>Delphinium nudicaule</i> (Red Larkspur)	Open areas on rocky slopes, among shrubs and woods.	Bureau Sensitive
<i>Dicentra pauciflora</i> (Few-flowered Bleedingheart)	Rocky places at higher elevations.	Bureau Sensitive
<i>Epilobium oregonum</i> (Oregon Willow Herb)	Wet boggy sites often serpentine at lower elevations.	Bureau Sensitive
<i>Erythronium howellii</i> (Howell's Adder's Tongue)	Usually in or near serpentine in ecotonal areas. Found in shade of trees and shrubs on forest edge.	Bureau Sensitive

<i>Eschscholzia caespitosa</i> (Gold Poppy)	Dry flats and brushy slopes below 3,500 ft.	Bureau Sensitive
<i>Eucephalus vialis</i> (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
<i>Frasera umpquaensis</i> (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
<i>Hackelia bella</i> (Beautiful Stickseed)	Stream banks, roadsides, open slopes, forest openings 3,000-6,000 ft.	Bureau Sensitive
<i>Hastingsia bracteosa</i> var. <i>atropurpurea</i> (Purple Flowered Rush Lily)	Wet meadows on serpentine soil.	Bureau Sensitive
<i>Hastingsia bracteosa</i> var. <i>bracteosa</i> (Large Flowered Rush Lily)	Wet meadows on serpentine soil.	Bureau Sensitive
<i>Horkelia tridentata</i> ssp. <i>tridentata</i> (Three-toothed Horkelia)	Dry open coniferous forest on granitic or igneous soils 1,000-8,000 ft.	Bureau Sensitive
<i>Iliamna latibracteata</i> (California Globe Mallow)	Moist sites, streamsides in coniferous forests. Often on shady disturbed ground 200-6,000 ft.	Bureau Sensitive
<i>Lewisia leeana</i> (Quill-leaf Lewisia)	Rocky or gravelly ridges or benches at higher elevations, often on serpentine soils.	Bureau Sensitive
<i>Limnanthes floccosa</i> ssp. <i>bellingiana</i> (Bellinger's Meadow Foam)	Full sun in vernal wet meadows or vernal pools, generally found on basalt scablands at 1,000-4,000 ft.	Bureau Sensitive
<i>Limnanthes floccosa</i> ssp. <i>pumila</i> (Dwarf Meadow Foam)	Edges of deep vernal pools which dry up by mid-summer.	Bureau Sensitive
<i>Limnanthes gracilis</i> ssp. <i>gracilis</i> (Slender Meadow Foam)	Wet ground, on serpentine soils.	Bureau Sensitive
<i>Lotus stipularis</i> (Stipuled trefoil)	Open forests, stream beds, ditches, chaparral, and logged areas below 4,000 ft	Bureau Sensitive
<i>Meconella oregana</i> (White Fairy Poppy)	Vernally moist openings/prairies on sandy, gravelly, or serpentine soils.	Bureau Sensitive
<i>Microseris howelli</i> (Howell's Microseris)	Dry, rocky areas on serpentine soil.	Bureau Sensitive
<i>Mimulus bolanderi</i> (Bolander's Monkeyflower)	Openings, in chaparral and disturbed areas, especially burned areas 1,000-2,500 ft.	Bureau Sensitive
<i>Mimulus congdonii</i> (Congdon's Monkeyflower)	Oregon white oak-wedgeleaf ceanothus-whiteleaf Manzanita	Bureau Sensitive

	chaparral 1,000-3,000 ft.	
<i>Monardella purpurea</i> (Siskiyou Mondardella)	Rocky, open slopes, chaparral, woodlands, and montane forest on serpentine soils (or related bedrock) 1,400-4,000 ft.	Bureau Sensitive
<i>Navarretia leucocephala</i> ssp. <i>leucocephala</i> (White- flowered Navarretia)	Vernal pools.	Bureau Sensitive
<i>Nemacladus capillaries</i> (Slender Nemacladus)	Dry slopes, burned areas 1,200-6,500 ft.	Bureau Sensitive
<i>Pellaea andromedifolia</i> (Coffee Fern)	Rocky or dry areas, rock crevices and under boulders, 100-6,000 ft.	Bureau Sensitive
<i>Pellaea mucronata</i> ssp. <i>mucronata</i> (Bird's Foot Fern)	Rocky or dry areas all elevations.	Bureau Sensitive
<i>Perideridia erythrorhiza</i> (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
<i>Plagiobothrys austinae</i> (Austin's Plagiobothrys)	Vernally wet areas, wet sites, and along roads and trail edges.	Bureau Sensitive
<i>Plagiobothrys figuratus</i> ssp. <i>corallicarpus</i> (Coral Seeded Allocarya)	Rocky, open grassland meadows assoc. with vernal pools (wet in spring/dry in summer).	Bureau Sensitive
<i>Plagiobothrys greenei</i> (Greene's Popcorn Flower)	Vernally wet areas, and along trails and old roads.	Bureau Sensitive
<i>Poa rhizomata</i> (Timber Bluegrass)	Dry douglas-fir/ponderosa pine forest.	Bureau Sensitive
<i>Rafinesquia claiornica</i> (California Chicory)	Shrubby slopes and open woods (common after fires).	Bureau Sensitive
<i>Ranunculus austrooreganus</i> (Southern Oregon Buttercup)	On damp or dry grassy loam slopes, often among scattered oak 1,500-2,000 ft.	Bureau Sensitive
<i>Rhamnus ilicifolia</i> (Redberry)	Chaparral and oak woodlands below 5,000 ft.	Bureau Sensitive
<i>Ribes divaricatum</i> var. <i>pubiflorum</i> (Straggly Gooseberry)	Forest edges and streamside.	Bureau Sensitive
<i>Saxifragopsis fragarioides</i> (Joint-leaved Saxifrage)	Rocky crevices 4,500-9,000 ft.	Bureau Sensitive
<i>Scirpus pendulus</i> (Drooping Bulrush)	Marshes, wet meadows, river terraces, ditches. Sea level to 3,000 ft.	Bureau Sensitive
<i>Sedum moranii</i> (Rogue River Stonecrop)	Rock outcrops in lower canyons. Found on greenstone outcrops on west or southwest slopes.	Bureau Sensitive
<i>Sidalcea hickmanii</i> ssp. <i>nov</i> (Hickman's Checkerbloom)	Dry chaparral on ridgelines. Responds well to fire.	Bureau Sensitive
<i>Silene hookeri</i> ssp. <i>bolanderi</i> (Bolander's Catchfly)	Oak woodland, rocky knolls and slopes, often on serpentine below 5,000 ft.	Bureau Sensitive
<i>Solanum parishii</i> (Parish's Horse Nettle)	Buckbrush chaparral, oak/pine woodlands, meadows and brush land in dry Douglas fir or Oregon oak communities.	Bureau Sensitive

<i>Sophora leachiana</i> (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
<i>Streptanthus glandulosus</i> (Common Jewel Flower)	Rocky serpentine in open coniferous and hardwood forests.	Bureau Sensitive
<i>Streptanthus howellii</i> (Howell's Streptanthus)	Dry, rocky, serpentine slopes in open conifer/hardwood forests from 1,000-4,500 ft.	Bureau Sensitive
<i>Utricularia minor</i> (Lesser Bladderwort)	In pond and bogs in shallow, standing, or slow moving water.	Bureau Sensitive
<i>Viola primulifolia</i> ssp. <i>occidentalis</i> (Western Bog Violet)	Serpentine wetlands.	Bureau Sensitive
<i>Wolffia borealis</i> Dotted water-meal	Fresh water areas.	Bureau Sensitive
<i>Zigadensus fontanus</i> (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
<i>Chaenotheca subroscida</i> (Needle Lichen)	Found on conifer bark at lower - mid elevations in old growth stands.	Bureau Sensitive
<i>Leptogium cyanescens</i> (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
<i>Peltigera pacifica</i> (Pacific Felt Lichen)	Found on rotten logs and humus, occasionally on lower boles of trees in closed canopy old growth stands.	Bureau Sensitive
<i>Porella bolanderi</i> (Liverwort)	Found on bark and rock in drier somewhat exposed rock.	Bureau Sensitive
<i>Bryum calobryoides</i> (Bryum Moss)	Cliffs, rock, and soil covering rock at higher elevations.	Bureau Sensitive
<i>Codriophorus depressus</i> (Depressed Codriophorus Moss)	Granitic rock or soil over rock in moist high elevation areas.	Bureau Sensitive
<i>Ephemerum crassinervium</i> (Ephemerum Moss)	Meadows and rocky moist areas in partial shade at low elevations.	Bureau Sensitive
<i>Meesia uliginosa</i> (Meesia Moss)	Exposed wetlands at various elevations.	Bureau Sensitive
<i>Tayloria serrata</i> (Dung Moss)	Found on dung and other nitrogen enriched substrates.	Bureau Sensitive
<i>Tortula mucronifolia</i> (Mucronleaf Tortula Moss)	Found on rock at high elevations.	Bureau Sensitive
FUNGI		
Species	Habitat	Protection Status
<i>Boletus pulcherrimus</i>	Found in humus in association	Bureau Sensitive

	with the roots of mixed conifers and hardwoods. Fruiting July-December.	
<i>Gomphus kauffmanii</i>	Partially hidden in deep humus under <i>Pinus</i> and <i>Abies spp.</i> Fruits in Autumn.	Bureau Sensitive
<i>Leucogaster citrinus</i>	Found in association with the roots of <i>Abies lasiocarpa</i> , <i>Pinus contorta</i> , <i>Pseudotsuga menziesii</i> , and <i>Tsuga heterophylla</i> 800-6,000 ft. Fruiting August-November.	Bureau Sensitive
<i>Phaeocollybia californica</i>	Found in association with the roots of <i>Abies lasiocarpa</i> , <i>Picea stichensis</i> , <i>Pseudotsuga menziesii</i> , and <i>Tsuga heterophylla</i> . Fruiting March, May, October and November.	Bureau Sensitive
<i>Phaeocollybia olivacea</i>	Scattered in mixed forests containing Fagaceae and Pinaceae in coastal lowlands. Fruits in Autumn.	Bureau Sensitive
<i>Phaeocollybia pseudofestiva</i>	Scattered under mature mixed conifers and hardwoods. Fruits October-December.	Bureau Sensitive
<i>Ramaria largentii</i>	Fruits in humus or soil and matures above surface of the ground. Fruits in October.	Bureau Sensitive
<i>Rhizopogon ellipsosporus</i>	Found in association with the roots of <i>Pseudotsuga menziesii</i> , and scattered <i>Pinus lambertiana</i> . Fruits in October.	Bureau Sensitive
<i>Sowerbyella rhenana</i>	Fruits in the duff of moist, relatively undisturbed, older conifer forests. Fruits October-December.	Bureau Sensitive