# Bieber Salt
# Forest Management Project
# Environmental Assessment

## DOI-BLM-OR-M050-2016-0007-EA

BLM

Butte Falls Resource Area

May 2016

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

**BLM/OR/WA/PL-15/036+1792**

Dear Reader:

The Butte Falls Resource Area, Medford District Bureau of Land Management (BLM) has completed the environmental analysis for the proposed Bieber Salt Forest Management Project. This document, the Bieber Salt Forest Management Project Environmental Assessment (EA), provides a description of the project and Project Area, background information, and the possible effects of implementing the project.

The EA analyzed the following activities proposed on **BLM-administered lands** located north east of the city of Medford, Oregon in the Little Butte Creek 5th field watershed:

- Forest Management
  - Timber harvest—431 acres
- Timber Yarding
  - Ground-based—335 acres
  - Skyline-cable—96 acres
- Transportation Management
  - Temporary route construction and decommissioning—0.06 mile
  - Road Renovation—32.63 miles
  - Roadside vegetation maintenance—3.62 miles
  - Partial road decommissioning—1.78 miles
  - Pre-designated skid trails—0.63 miles
  - New landings—3 sites
- Treatment of Forest Management Activity Slash
  - Lop and Scatter
  - Hand pile and hand pile burn
  - Biomass removal
- Water source restoration—7 sites

The 30-day comment period for this EA will begin when the legal notice is published in the *Medford Mail Tribune* newspaper on June 2, 2016. Any comments you may have regarding this project must be received by July 5, 2016 to be considered in final decisions for this proposal.

Please send your comments to Bureau of Land Management, Attention: Stephanie Kelleher, 3040 Biddle Road, Medford, OR 97504, or e-mail your comments to BLM_OR_MD_Mail@blm.gov (Attention: Stephanie Kelleher). Questions on the proposed project should be directed to Stephanie Kelleher at 541-618-2205 or Nick McDaniel at 541-618-2356.

Please note that all written submissions from private individuals in response to this notice, including your name, address, telephone number, email address, or other personal identifying information may be made available for public inspection and disclosure, unless you specifically request confidentiality. If you wish to withhold your personal identifying information from public review or disclosure, you must state this at the beginning of your written comment and provide justification for doing so. We will honor such requests to the extent allowed by law, but you should be aware that release of that information may be required under certain circumstances. All submissions from organizations or businesses and from individuals identifying themselves as representatives or officials of organization or business will be made available for public inspection and disclosure in their entirety.

Thank you for your continued interest in the Bieber Salt Forest Management Project. Your input plays an important role in our land management decisions.

Teresa J. Trulock
Field Manager
Butte Falls Resource Area

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# CHAPTER 1 - PURPOSE AND NEED

## 1.1 INTRODUCTION

This environmental assessment (EA) documents the environmental analysis the BLM conducted to estimate the potential site-specific effects on the human environment that may result from implementation of this project. The EA will provide the BLM's Authorized Officer (Butte Falls Resource Area Field Manager) with current information to aid in the decision-making process. It will also determine if there are significant impacts not already analyzed in the environmental impact statement (EIS) for the Medford District's 1995 Resource Management Plan (RMP) and whether a supplement to that EIS is needed or if a Finding of No Significant Impact is appropriate. This EA complies with the Council on Environmental Quality's (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA; 40 CFR Parts 1500-1508) and the Department of the Interior's regulations on Implementation of the National Environmental Policy Act of 1969 (43 CFR part 46).

## 1.2 WHAT IS THE BLM PROPOSING?

The Bureau of Land Management (BLM), Butte Falls Resource Area is proposing forest management actions, including timber harvest, on approximately 431 acres of forest lands in the Bieber Salt Project Area. Silviculture prescriptions include density management, selective thinning, and understory reduction. The prescriptions are tailored to various site conditions (e.g. elevation, aspect, soil conditions, stand health) found throughout the Project Area. Fuel loads resulting from harvest would be reduced by lopping and scattering, piling and burning, underburning, or biomass removal. Forest management would be accomplished through a combination of commercial timber sale contract(s) and service contracts.

Transportation management activities proposed include temporary route construction (0.06 miles), timber haul (32.63 miles), road renovation along haul routes, roadside vegetation maintenance (3.62 miles), partial road decommissioning (1.78 miles), full road decommissioning (0.19 miles), and pre-designated skid trails (0.63 miles) and landing construction (3 sites).

Water source restoration is also proposed at seven sites located throughout the Project Area.

A more detailed description of BLM's Proposed Action and other alternatives considered is included in Chapter 2, Alternatives.

## 1.3 WHERE IS THE PROJECT LOCATED?

The Bieber Salt Forest Management Project is located in southwest Oregon northeast of Medford in the Salt Creek and Lower North Fork Little Butte Creek sub-watersheds in the Little Butte Creek 5$^{th}$ field watershed (Map 1). The 25,630-acre Project Area includes BLM (9,130 acres), private (15,450 acres), and Forest Service (1,050 acres) lands.

All BLM-administered lands in the Project Area are designated as Matrix land use allocation. Matrix is one of seven land use allocations designated in the Northwest Forest Plan (NWFP) (USDA and USDI 1994) and the Medford District Resource Management Plan (RMP) (USDI 1995). It is the Federal land in which most timber harvest and silviculture activities are anticipated to occur. Matrix is divided into the northern and southern general forest management areas and connectivity/diversity blocks.

About 42% of the Project Area (10,692 acres) is within the South Fork/North Fork Little Butte Creek Tier 1 Key Watershed. Key watersheds were identified in the NWFP and the Medford District RMP (USDI 1995, pp. 22-23) and are intended to contribute directly to the conservation of at-risk anadromous salmonids and resident fish species. They also have a high potential of being restored as part of a watershed restoration program.

Within the Project Area, about 996 acres (4%) are located in the Ginger Springs Municipal Watershed.

Approximately 49% of federal land (3,970 acres of BLM and 1,050 acres of Forest Service) within the Project Area is designated as northern spotted owl critical habitat.

The Bieber Salt project proposals only apply to public lands within the Project Area managed by the Butte Falls Resource Area, Medford District Bureau of Land Management (BLM).

The Public Land Survey System (PLSS) description of the Bieber Salt Project Area is as follows:

- T. 35 S., R. 02 E., Sections 27, 29, 32, 33, and 35;
- T. 36 S., R. 01 E., Sections 12 and 13;
- T. 36 S., R. 02 E., Sections 1-7, 9, 11, 12, 13, 14, 15, 22-26; and
- T. 36 S., R. 03 E., Sections 6, 7, 18-20, 29, 31, and 32, Willamette Meridian; Jackson County, Oregon.

## 1.4 WHY IS THE BLM PROPOSING THIS PROJECT?

The Bieber Salt Forest Management Project is designed to implement specific Management Objectives consistent with the BLM's 1995 Medford District Resource Management Plan (RMP) in the Bieber Salt Project Area. Specifically, this forest management proposal is designed to meet the following objectives:

- Manage forest stands to promote tree survival and growth and to improve stand vigor, resiliency, and stability necessary to meet land use allocation objectives (USDI 1995, pp. 62, 72);
- Protect and conserve federally listed and proposed species, and manage their habitats to contribute toward their recovery in compliance with the Endangered Species Act (ESA), approved recovery plans, and Bureau Special Status Species policies (USDI 1995, pp. 17-18, 50-51);
- Produce a sustained yield of products to support local and regional economic activity (USDI 1995, pp. 38, 72, 73, and 81);
- Reduce the risk of wildfire that may result from the fuels (e.g. limbs, branches, twigs) produced during harvest activities (USDI 1995, p. 91);
- Manage water drafting sites (sites where water is pumped to suppress fires) to minimize adverse effects on riparian habitat and water quality consistent with Aquatic Conservation Strategy and Riparian Reserve objectives (USDI 1995, pp. 30, 90); and
- Maintain a transportation system within the Project Area that serves resource management needs in an environmentally sound manner (USDI 1995, pp. 84-86).

### 1.4.1 Need for the Bieber Salt Project

The following discussion provides more detail concerning the need for forest and road management based on the 1995 RMP direction that applies to the Timber Management (Matrix) land allocation, current forest, road, and water drafting site conditions, and their desired future conditions.

**There is a need to promote tree survival and growth and to improve the vigor, resiliency, and stability of forest stands in the Bieber Salt Project Area.**

Forest stands selected for treatment in the Bieber Salt Project Area are overstocked and are experiencing declining growth rates due to high levels of density-related competition. As trees compete for limited water, nutrients, and growing space they become stressed and more susceptible to mortality from insects, forest pathogens, and drought. Forest thinning treatments are needed to reduce stand densities to natural carrying capacities and create favorable conditions to improve individual tree health (vigor) for desirable species and to promote the growth and establishment of tree species that are well adapted or most resilient to environmental conditions and natural disturbance regimes (USDI 1995, pp. 62 and 186).

Forest thinning treatments are needed to accelerate the development of forest stand conditions that meet long-term management objectives for northern spotted owl (NSO) habitat and shift stand trajectories to encourage key habitat components for the future. Desired future conditions for NSO habitat include encouraging tree growth; promoting species diversity; increasing heterogeneity; enhancing and creating horizontal and vertical structure; and reducing the risk of habitat loss from wildfire, disease, and insects (USDI FWS 2011, p. III-33 to III-34).

A summary of silvicultural prescriptions by forest stand type (i.e. Douglas-fir, mixed conifer, and white fir) and treatment objective are included in Chapter 2, Section 2.3.1.

**There is a need to protect and conserve federally listed and proposed species, and manage their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, the Medford District Resource Management Plan (USDI 1995, pp. 50-51), and Bureau Special Status Species policies.**

The Endangered Species Act (ESA) directs the Secretary and all Federal agencies to use their authorities to carry out programs for the conservation and recovery of listed species. One of the purposes of the ESA is the preservation of ecosystems upon which endangered and threatened species depend and would minimize the need to list species under the ESA. Lands administered under the Oregon and California Railroad and Coos Bay Wagon Road Grant Lands Act of 1937 (O&C Lands Act) must be managed in accordance with other environmental laws, such as the Endangered Species Act (ESA) and the Clean Water Act. Some provisions of these laws take precedence over the O&C Act. For instance, the ESA requires that the Secretary [of the Interior] ensure that management of O&C lands will not likely result in jeopardy to listed species or destruction or adverse modification of critical habitat (USDI 1995, p. 17-18).

**There is a need to produce a sustained yield of products to support local and regional economic activity.**

The management of the O&C lands in the Project Area is governed by a variety of statutes, including the O&C Lands Act. The O&C Lands Act requires the Secretary to manage O&C lands for permanent forest

production; however, such management must also be in accord with sustained-yield principles (USDI 1995, p. 17).

Matrix lands within the Bieber Salt Project Area are intended to achieve sustainable timber production and other forest commodities, provide jobs and contribute to local and regional community stability through both growth and harvest, while also promoting the development of fire-resilient forests (USDI 1995, pp. 38, 81). Timber products produced from this area would be sold in support of the District's Allowable Sale Quantity (ASQ) declared in the 1995 RMP (USDI 1995, pp. 17, 72-73).

**There is a need to reduce the potential risk of wildfire that may result from the fuels (e.g. limbs, branches, twigs) produced during harvest activities.**

Forest management activities produce fuels that could remain a fire hazard for 10 to 20 years, if left untreated, until natural decomposition occurs. The ROD/RMP direction is to reduce activity-based fuel hazards (USDI 1995, p. 91).

**There is a need to manage water drafting sites (sites where water is pumped to suppress fires) to minimize adverse effects on riparian habitat and water quality consistent with Aquatic Conservation Strategy and Riparian Reserve objectives.**

Water sources at seven sites are in need of repair to ensure water availability for fire engines and water tenders for fire suppression and by wildlife for drinking water, habitat, and foraging opportunities. The RMP direction (USDI 1995, p. 90) is to locate and manage water drafting sites to minimize adverse effects on riparian habitat and water quality and to supply water for various resource programs while protecting water quality and riparian vegetation (ibid., p. 165).

**Within the Bieber Salt Project Area, there is a need to develop and maintain a transportation system that serves the needs of users in an environmentally sound manner.**

Roads throughout the Bieber Salt Project Area are in need of maintenance to restore, repair, or improve road surfaces, culverts, and roadside drainage ditches in order to reduce road related erosion and sedimentation to stream courses. Some roads have been identified that are no longer serving resource program needs.

BLM roads in the Project Area have not been maintained in recent years which have resulted in large vegetation and trees growing along roads that prevent road maintenance equipment from maintaining and improving the drainage patterns along BLM roads. Removing the vegetation would improve and maintain drainage patterns.

Proposed transportation management activities are designed to improve road access to areas in need of forest management, reduce road densities in areas where the road system no longer serves resource program needs, and to maintain roads to reduce road-related erosion and sedimentation to stream courses.

## 1.5 DECISION FRAMEWORK

This Environmental Assessment (EA) will provide the information needed for the responsible official, the Butte Falls Resource Area Field Manager, to select a course of action to be implemented for the Bieber Salt Forest Management Project. The Butte Falls Resource Area Field Manager must decide

whether to implement the Action Alternative, part of the Action Alternative, or select the No Action Alternative.

In choosing an alternative that best meets the project purpose and needs, the Field Manager will consider the extent to which each alternative responds to the decision factors listed below. The forthcoming Decision Record will document the authorized officer's rationale for selecting a course of action based on the effects documented in the EA, and the extent to which each alternative:

1. Reduces competition-related mortality and the potential for wildfire risk due to activity fuels created by the project, and increases tree vigor and growth, and stand resiliency;
2. Provides for the establishment and growth of conifer species while retaining structural and habitat components, such as large trees, snags, and coarse woody debris;
3. Maintains or improves existing suitable northern spotted owl habitat within the provincial home range (1.2 mile radius) of known active northern spotted owl sites and substantially all of the older and more structurally complex, multi-layered conifer forests;
4. Captures opportunities to implement improvements in the transportation system to protect water quality;
5. Contributes to the District's Allowable Sale Quantity as directed by the Medford District RMP; and
6. Reduces the short-term and long-term costs of managing BLM-administered lands in the Project Area.

The decision will also include a determination whether or not the impacts of the actions are significant to the human environment. If the impacts are determined to be within the range analyzed in the Medford District Resource Management Plan Final Environmental Impact Statement (FEIS) (USDI 1994) and the Northwest Forest Plan Supplemental Final EIS (USDA and USDI 1994), or otherwise determined to be insignificant, a Finding of No Significant Impact (FONSI) can be issued and the decision implemented. If this EA determines that the significance of impacts are unknown or greater than those previously analyzed and disclosed in the RMP/FEIS and the Northwest Forest Plan, then a project-specific EIS must be prepared.

## 1.6 LAND USE CONFORMANCE AND LEGAL REQUIREMENTS

### 1.6.1 Conformance with Land Use Plans

The Butte Falls Resource Area of the Medford District BLM designed this project to be in conformance with the objectives, land use allocations, and management direction in the *Medford District Record of Decision and Resource Management Plan* (ROD/RMP) (USDI 1995). The 1995 Medford District RMP incorporated the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl* (USDA and USDI 1994).

The Bieber Salt Forest Management Project is consistent with the Medford District RMP as amended by the 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (2001 ROD); the *BLM Vegetation Treatments Using Herbicides Final Programmatic EIS Record of Decision* (USDI 2007); Record of Decision (BLM): Vegetation Treatments Using Herbicides on BLM Lands in Oregon (USDI

2010); *Medford District Integrated Weed Management Plan Environmental Assessment* (USDI 1998) and tiered to the *Northwest Area Noxious Weed Control Program* (EIS, USDI 1985).

This project utilizes the December 2003 Survey and Manage species list. This list incorporates species changes and removals made as a result of the 2001, 2002, and 2003 Annual Species Reviews (ASRs) with the exception of the red tree vole. For the red tree vole, the Ninth Circuit Court of Appeals vacated the category changes and removal of the red tree vole in the mesic zone, and returned the red tree vole to its status as existed in the 2001 ROD Standards and Guidelines, which make the species Category C throughout its range.

### 1.6.2 Special Status Species

The Bieber Salt Forest Management Project is consistent with BLM Manual 6840 (USDI 2008), the purpose of which is to provide policy and guidance for the conservation of BLM Special Status Species and the ecosystems upon which they depend on BLM-administered lands. BLM Special Status Species include those species listed or proposed for listing under the Endangered Species Act (ESA), as well as those designated as Bureau Sensitive by the State Director. The objectives of the BLM Special Status policy are:

- To conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species; and
- To initiate proactive conservation[1] measures that reduce, or eliminate, threats to Bureau Sensitive species to minimize the likelihood of and need for listing of these species under the ESA (USDI 2008, Section .02).

### 1.6.3 Statutes and Regulations

The Proposed Action is designed to be in conformance with the direction given for the management of public lands in the Medford District and the following:

- **Oregon and California Lands Act of 1937 (O&C Act)**. Requires the BLM to manage O&C lands for permanent forest production. Timber shall be sold, cut, and removed in accordance with sustained-yield principles for the purpose of providing for a permanent source of timber supply, protecting watersheds, regulating stream flow, contributing to the economic stability of local communities and industries, and providing recreational facilities.

- **Federal Land Policy and Management Act of 1976 (FLPMA)**. Defines BLM's organization and provides the basic policy guidance for BLM's management of public lands.

- **National Environmental Policy Act of 1969 (NEPA)**. Requires the preparation of environmental impact statements for major federal actions which may have a significant effect on the environment.

- **Endangered Species Act of 1973 (ESA)**. Directs Federal agencies to ensure their actions do not jeopardize species listed as "threatened and endangered" or adversely modify designated critical habitat for these listed species.

1 Conservation: as applied to Bureau Sensitive species, is the use of programs, plans, and management practices to reduce or eliminate threats affecting the status of the species, or improve the condition of the species' habitat on BLM-administered lands (USDI 2008, Glossary p. 2).

- **Clean Air Act of 1990 (CAA)**. Provides the principal framework for national, state, and local efforts to protect air quality.

- **National Historic Preservation Act of 1966 as amended (NHPA).** Requires federal agencies to take into account the effect of their federal or federally-licensed undertakings on historic properties, whether those properties are federally owned or not.

- **Archaeological Resources Protection Act of 1979 (ARPA)**. Protects archaeological resources and sites on federally-administered lands. Imposes criminal and civil penalties for removing archaeological items from federal lands without a permit.

- **Safe Drinking Water Act (SDWA) of 1974 (as amended in 1986 and 1996)**. Protects public health by regulating the nation's public drinking water supply.

- **Clean Water Act of 1987 (CWA)**. Establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water.

## 1.7 RELEVANT ASSESSMENTS AND PLANS

The following documents contain information related to existing conditions and management practices in the Bieber Salt Project Area. These documents are incorporated by reference into the project documentation.

#### Little Butte Creek Watershed Analysis (1997)

Watershed Analysis (WA) is a procedure used to characterize conditions, processes and functions related to human, aquatic, riparian and terrestrial features within a watershed. Watershed Analysis is issue driven. Analysis teams of resource specialists identify and describe ecological processes of greatest concern in a particular "fifth-field" watershed (also referred to as Fifth-Field Hydrologic Unit Codes, or HUC5s), and recommend restoration activities and conditions under which other management activities should occur. Watershed Analysis is not a decision-making process. The resulting WA is not a decision document under NEPA, and there is no action that is proposed for implementation with the completion of the analysis. Rather, Watershed Analyses provides information and non-binding recommendations for agencies to establish the context for subsequent planning, project development, regulatory compliance and agency decisions (REO 1995, p. 1).

The Bieber Salt Project Area falls within the Little Butte Creek Watershed Analysis Area. The Watershed Analysis focused on the use of existing information available at the time the analysis was conducted, and provides baseline information. Additional information, determined to be necessary for completing an analysis of the Bieber Salt Forest Management Project, has been collected and is considered, along with existing information provided by the 1997 *Little Butte Creek Watershed Analysis.* Management Objectives and Recommendations provided by the 1997 Watershed Analysis were also considered and addressed as they applied to the Bieber Salt Project proposal.

#### Ginger Springs Watershed Analysis and Management Plan (1998)

The Ginger Springs Municipal Watershed is a geologically derived watershed that supplies water for the community of Butte Falls. The Medford District ROD/RMP directed a watershed plan should be prepared for this "community water system" for the city of Butte Falls (USDI 1995, 42). The Butte Falls Resource Area prepared *A Watershed Analysis and Management Plan for BLM Lands within the Ginger Springs Recharge Area* in September 1998. This watershed plan provides management

recommendations for the BLM-administered lands within the municipal watershed. These recommendations are *not* management decisions and the impacts of these recommendations were not assessed. BLM management decisions for the municipal watershed must be analyzed in project-specific NEPA analyses.

#### Revised Recovery Plan for the Northern Spotted Owl (2011)

In June 2011, the USFWS (U.S. Fish and Wildlife Service) finalized the *Revised Recovery Plan for the Northern Spotted Owl*, which contains 33 Recovery Actions. Recovery Actions are recommendations to guide activities needed to accomplish the recovery objectives and ultimately lead to delisting of the species. Specifically, Recovery Action 32 (RA 32) in the Recovery Plan recommends "maintaining and restoring the older and more structurally complex multi-layered conifer forests (USDI FWS 2011, III-67)." The intent of RA 32 is to maintain substantially all of the older and more structurally complex multi-layered conifer forests on federal lands in order not to further exacerbate the competitive interactions between spotted owls and barred owls.

Also included in the Revised Recovery Plan is Recovery Action 10 (RA 10) which recommends "Conserving spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population (USDI FWS 2011, III-43)." Within the administrative units of the Rogue River-Siskiyou National Forest (FS) and the Medford District Bureau of Land Management (BLM), an interagency, interdisciplinary team was created to develop interim guidance for incorporating Recovery Action 10 (RA 10) when planning and implementing management activities on federal lands in southwest Oregon (USDA, USDI, and USDI FWS 2013). As part of the proposal development process for the Bieber Salt Project, a core team of specialists worked to incorporate this interim guidance. Refer to Chapter 2, Section 2.2, Development of the Project, for more details.

The Bieber Salt Project defers proposed treatment in RA 32 stands identified by interagency survey guidance (USDA and USDI 2010), follows principles in the SW Oregon Recovery Action 10 Guidance Document (USDA, USDI, and USDI FWS 2013), and is consistent with consultation requirements with the U.S. Fish and Wildlife Service; therefore, the Bieber Salt Project is consistent with the *Revised Recovery Plan for the Northern Spotted Owl* (USDI FWS 2011).

#### U.S. Department of Interior, Bureau of Land Management, Western Oregon Districts, Transportation Management Plan (1996, updated 2002 and 2010).

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

#### Southwest Oregon Fire Management Plan (ODF 2014)

The Southwest Oregon Fire Management Plan (FMP) provides Southwest Oregon with an integrated concept for coordinated wildland fire planning and protection among federal, state, local government entities and citizen initiatives. The Fire Management Plan is not a decision document.

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

## 1.8 SCOPING AND ISSUES

Scoping is the process the BLM uses to identify issues related to the proposal (40 CFR 1501.7) and determine the extent of environmental analysis necessary for an informed decision. It is used early in the NEPA process to identify (1) the issues to be addressed, (2) the depth of the analysis, (3) alternatives or refinements to the Proposed Action, and (4) potential environmental impacts of the Proposed Action. Scoping is performed not to build consensus or get agreement on a project proposal, but rather to solicit relevant site-specific comments that could aid in the analysis and final design of the proposal.

Scoping has occurred for the Bieber Salt Project. The Bieber Salt Project appeared in the Butte Falls Resource Area's Schedule of Proposed Actions published in Medford's Messenger (BLM's quarterly newsletter) beginning in the winter 2016 edition. A letter briefly describing the Proposed Action and inviting comments was mailed to adjacent landowners, interested individuals, organizations, and other agencies on December 11, 2015. Three (3) comment letters were received during the 30-day scoping period.

Numerous articles were submitted for BLM review during the scoping process. The BLM reviewed these documents, and considered the information in developing the final Proposed Action and alternatives. A list of the literature submitted can be found in the References section of this EA.

### 1.8.1 Relevant 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 the environmental analysis.

#### 1.8.1.1 Forest Condition

**Issue 1:** How would thinning of conifer stands affect species composition, long-term productivity of stands, resiliency, and structural characteristics in the Matrix (GFMA and Connectivity) land use allocation within the Analysis Area?

#### 1.8.1.2 Terrestrial Wildlife and Special Status Species

**Issue 2:** How would timber harvest and road construction activities affect constituent elements (canopy cover, snags and down wood, large trees, mistletoe brooms, stand structure, and prey availability) within stands used by NSOs for nesting, roosting, and foraging?

**Issue 3**: How would timber harvest and road construction activities affect constituent elements (canopy cover, snags, large trees, and down wood) within stands used by fishers for denning, resting, foraging, and dispersal?

#### 1.8.1.3 Hydrology and Aquatic Resources

**Issue 4:** How would timber harvest, road work, and water source restoration activities affect attainment of Aquatic Conservation Strategy (ACS) objectives?

#### 1.8.1.4 Economics

**Issue 5:** How would the removal of forest products contribute towards the local and regional economy?

### 1.8.2 Issues Considered but not Further Analyzed

In addition to the issues listed above, there were other issues raised by the public or the interdisciplinary (ID) team during the development of the project that were considered but not further analyzed, often because the project's design or implementation of Project Design Features (PDFs) would eliminate or reduce effects on the resource. The PDFs are described in Chapter 2, Section 2.5 *Project Design Features*. In some cases, issues raised by the public or the ID team were not considered in detail as they were determined to be beyond the scope of this project. These issues, along with a rationale for their being "considered but not analyzed in detail" in this EA, are listed in Appendix A, *Issues Considered but Eliminated from Detailed Analysis*. Also see Chapter 2, Section 2.6 *Alternatives and Actions Considered but Eliminated from Detailed Analysis* for options and alternatives considered but not further analyzed.

# CHAPTER 2 - ALTERNATIVES

## 2.1 INTRODUCTION

This Chapter tells the story of how the project was developed, describes what is being proposed in detail, and presents the Proposed Action Alternative developed by the BLM to achieve the objectives identified in the Purpose and Need statements in Chapter 1. A "No Action" Alternative (Alternative 1) is presented to form a baseline for analysis. Project Design Features (PDFs), which apply the Best Management Practices as described in Appendix D of the RMP (and modified by Resource Management Plan Maintenance dated July 12, 2012), are integral to the design of the Proposed Action (Alternative 2). The PDFs are incorporated into the analysis of anticipated environmental impacts described in Chapter 3.

## 2.2 DEVELOPMENT OF THE PROJECT

### 2.2.1 Treatment Area Selection

The Bieber Salt Project was designed to conform to the 1995 Medford District Resource Management Plan (USDI 1995) and to meet the purpose and need identified in Chapter 1. The Bieber Salt Project is in the Matrix land use allocation (LUA), which includes federal lands outside of reserves and special management areas that are available for scheduled timber harvest at varying levels (USDI 1995). Matrix lands are intended to achieve sustainable timber production and other forest commodities, providing jobs and contributing to community stability through both growth and harvest, while also promoting the development of fire-resilient forests (USDI 1995, p. 38). The Bieber Salt Project was considered for treatment at this time as a result of a previous review that identified dense forested stands within the Project Area that need to be treated to reduce competition and promote forest resiliency. The Bieber Salt Project Area encompasses 25,630 acres within the 238,598-acre Little Butte Creek 5$^{th}$ field watershed (Map 1).

The Medford District's 2012 Integrated Vegetation Management analysis of the current conditions of watersheds within the Medford District evaluated all 5$^{th}$ field watersheds based on the specific timber, fuels, silviculture, and northern spotted owl needs. In 2015, the District re-assessed the watersheds and updated the rankings. The following categories with separate measurements were used to score and rank the watersheds: 1) percentage of BLM lands within the watershed; 2) departure acres in need of disturbance weighted by BLM ownership; 3) the amount of 10-30" diameter at breast height (DBH) class available for harvest; 4) the amount of high and moderate wildfire hazard and Fire Regime Condition Class (FRCC) within Wildland Urban Interface (WUI) within the watershed; 5) opportunities for enhancement of northern spotted owl sites; and 6) the amount of existing roads within the watershed. The Little Butte Creek 5$^{th}$ field watershed was ranked as a medium priority for treatment in 2012 and was updated to high priority in 2015.

Once the Project Area was established, an interdisciplinary team (IDT) of resource specialists was brought together to begin evaluating the area for potential treatments. The IDT filtered the Project Area through a series of screens before the Proposed Action was developed. The screening process was intended to ensure the proposal meets RMP guidelines and conservation and recovery actions for federally listed species. The screening process described below helped to distill feasible treatment areas from the larger Project Area.

The first step in the screening process was to identify ownership within the Project Area. Within the 25,630-acre Bieber Salt Project Area, the BLM manages 9,130 acres (36%). The following screens were then applied to BLM-administered lands within the Project Area. They are broken out into four categories to better understand the overarching reason for elimination.

#### 2.2.1.1 Policy – RMP Plan Level

**Timber Production Capability Classification (TPCC) Withdrawn:** TPCC is the process for partitioning forestland into major classes indicating relative suitability to produce timber on a sustained yield basis. TPCC withdrawn lands are lands identified as unavailable for planned forest management based on site specific information. There are exceptions to this rule (USDI 1995, p.72); however, for this project, forest management activities on TPCC withdrawn lands (3,429 acres) were screened from consideration.

**Known Owl Activity Centers (KSOACs):** KSOACs are the best 100 acres of northern spotted owl habitat around the nest site or owl activity center, for all documented sites as of January 1, 1994 in Matrix and AMA land allocations (USDA and USDI 1994a). KSOACs are managed as Late-Successional Reserves intended to preserve an intensively used portion of the breeding season home range close to a nest site or center of activity (USDI 1995). Because these areas are important to meeting objectives for species other than spotted owls, these areas are to be maintained even if they become no longer occupied by spotted owls (USDA and USDI 1994a). There are approximately 731 acres of KSOACs overlapping the Project Area and no proposed treatment would occur in the activity centers.

**Great Gray Owl Core and Buffers:** Great Gray Owl (GGO) Core or Meadow Buffer: As per the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (USDA and USDI 2001, p. 39), a no-harvest buffer of 300 feet around meadows and natural openings adjacent to potential GGO habitat and a ¼ mile protection zone around known nest sites has been provided.

**Special Habitat Buffers:** The Medford District RMP provides management guidelines to protect special habitats for plants and animals, such as meadows, cliffs, caves, and talus slopes with a no harvest buffer ranging from 100 to 200 feet depending on site-specific circumstances and the objective to protect the special habitat values; and new road locations would avoid special habitats (USDI 1995, pp. 45, 49).

**Riparian Reserves:** Northwest Forest Plan (NWFP) Riparian Reserves, as incorporated by the Medford District RMP, are located on federal lands throughout the Project Area. A BLM stream survey crew conducted surveys within the Bieber Salt Project Area in order to ensure that all areas needing Riparian Reserve protection were identified. The survey crew assessed stream conditions, documented the location of wetland and unstable areas, and determined whether stream channels were perennial, intermittent, or dry draws (USDA and USDI 1994, pp. C30-C31). Stream maps were updated with the new information. Riparian Reserves are excluded from commercial treatment units by clearly marking unit boundaries on the ground.

Riparian Reserve widths were determined using the NWFP Standards and Guidelines (USDA and USDI 1994, pp. C-30-31) and the *Little Butte Creek Watershed Analysis* (USDI and USDA 1997, p. 181), and are based on a site potential tree height of 165 feet. Site-specific widths for each Riparian Reserve have been mapped in GIS and would be implemented under the Action Alternative. Riparian Reserve widths in the Bieber Salt Project Area are as follows:

(1) Fish streams: 330-foot slope distance on each side of the stream.

(2) Perennial non-fish-bearing streams: 165-foot slope distance on each side of the stream.

(3) Intermittent non-fish-bearing streams: 165-foot slope distance on each side of the stream. Intermittent streams have a defined channel, annual scour and deposition, and are further described as short-duration or long-duration:

***Short-Duration Intermittent***: A stream that flows only during storm or heavy precipitation events. These streams can also be described as ephemeral streams.

***Long-duration Intermittent Stream***: A stream that flows seasonally, usually drying up during the summer.

(4) Unstable and potentially unstable ground: the extent of the unstable and potentially unstable ground.

(5) Springs, seeps and other non-stream wetlands less than one acre in size: the wetland and the area from the edges of the wetland to 165-foot slope distance.

(6) Constructed ponds and reservoirs, wetlands greater than one acre in size: Riparian Reserves consist of the body of water or wetland and the area to the outer edges of the riparian vegetation; or the extent of the seasonally saturated soil; or the extent of unstable or potentially unstable areas; or to a distance equal to the height of one site potential tree; or 150 feet slope distance from the edge of the wetland greater than 1 acre; or the maximum pool elevation of constructed ponds and reservoirs, whichever is the greatest.

**Key Watersheds:** A system of Key Watersheds was established under the NWFP (USDA and USDI 1994) and incorporated into the Medford District RMP as a component of the Aquatic Conservation Strategy (USDI 1995, pp. 22-23). Overlapping the Project Area is the South Fork/North Fork Little Butte Creek Tier 1 Key Watershed, which is intended to directly contribute to the conservation of at-risk anadromous salmonids and resident fish species. This Tier 1 Key Watershed is also identified as having a high potential of being restored as part of a watershed restoration program. Management direction for Key Watersheds includes reducing existing system and non-system road mileage outside roadless areas; or, if funding is insufficient to implement reductions, there will be no increase in road density within the Key Watershed (USDI 1995, p. 23).

#### 2.2.1.2 Policy – Project Level

**Northern Spotted Owl (NSO) Recovery Plan Recommendations:** In 2011, the U.S. Fish and Wildlife Service issued a Revised Recovery Plan for the Northern Spotted Owl (NSO). The Recovery Plan includes Recovery Actions, which are recommendations to guide activities that would help to further the recovery objectives for the northern spotted owl. The BLM worked with the U.S. Fish and Wildlife Service to incorporate the Recovery Goals and Actions in the Recovery Plan consistent with BLM laws and regulations. The effects to spotted owls and their critical habitat were considered while planning this project. The following strategies were implemented in order to meet the project objectives and reduce effects to northern spotted owls and their critical habitat. To the extent practicable, the Relative Habitat Suitability (MaxEnt) model described in the 2011 Revised Recovery Plan for the Northern Spotted Owl (USDI FWS 2011), the Medford District known owl sites layer, and recent spotted owl survey results were used to determine treatment options in order to reduce effects to known northern spotted owl sites. Refer to the Wildlife Issues section in Chapter 3 for more information (e.g. methodology, description of habitat types, etc.).

- Critical Habitat: Critical habitat for the northern spotted owl was first designated in 1992 in *Federal Register* 57 (USDI 1992), and includes the primary constituent elements that support

nesting, roosting, foraging (NRF) and dispersal. Designated critical habitat also includes forest land that is currently unsuitable, but has the capability of becoming NRF habitat in the future (57 FR 10:1796-1837). Critical habitat was revised for the northern spotted owl and the final designation was published by the USFWS in the *Federal Register* (signed on August 12, 2008, 73 Federal Register 157:47326) and became effective on September 12, 2008. The 2008 USFWS's Critical Habitat delineations were challenged in court and the 2008 designation of northern spotted owl CHU was remanded. The USFWS was ordered to revise the CHU designation. On February 28, 2012, the Service released the proposed critical habitat in the form of maps and the draft form of the *Federal Register* publication. The proposed rule was published in the *Federal Register* on March 8, 2012 (77 *Federal Register* 46:14062-14165). The final Critical Habitat Rule was published in the Federal Register on December 4, 2012 **(**77 Federal Register 233:71876-72068) and became effective January 3, 2013.

The 2012 Final Critical Habitat Rule and principles in the 2011 Revised Recovery Plan were used to inform specific prescriptions when treatment units were located within the 2012 Designated Critical Habitat. Adverse effects were avoided in occupied sites within critical habitat. Adverse effects in critical habitat located outside of the home ranges of known owl sites were only proposed in areas where the habitat could be improved in the long-term (i.e., proposed treatments in capable, dispersal, or roosting/foraging habitat within high habitat suitability according to the relative habitat suitability model); or treatments would improve stand resiliency. In limited cases, where road construction was necessary to access the proposed treatment acres and no other road was available, small amounts of Roosting/Foraging and Dispersal habitat removal would occur in the Project Area. The removal of small amounts of habitat from road and landing construction were considered in areas that would allow access to treatments that would have long-term benefits to spotted owl habitat.

- RA10 Important Habitat/Historical High Priority Site: In 2011, the U.S. Fish and Wildlife Service issued a Revised Recovery Plan for the Northern Spotted Owl (NSO). The Recovery Plan includes Recovery Actions, which are recommendations to guide activities that would help to further the recovery objectives for the northern spotted owl. Recovery Action 10 (RA 10) recommends conserving spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population. Within the administrative units of the Rogue River-Siskiyou National Forest (FS) and the Medford District BLM, an interagency, interdisciplinary team was created to develop interim guidance for incorporating RA 10 when planning and implementing management activities on federal lands in southwest Oregon. The southwest Oregon plan established two primary objectives as described in the plan; 1) prioritize known and historic spotted owl sites and 2) identify vegetation management that would enhance spotted owl habitat.

  The Bieber Salt interdisciplinary team worked to meet the intent of RA 10 as one purpose of the project is to protect and conserve federally listed species and their habitat, including the northern spotted owl. To the extent practicable, the BLM followed principles in the SW Oregon Recovery Action 10 Guidance Document (USDA and USDI 2013) to reduce impacts to sites with resident singles, recent pairs and/or reproduction activity within the Project Area. Northern spotted owl sites within the Project Area were prioritized in high and low categories based on occupancy and reproductive success data. The objective at the high priority sites was to avoid adverse effects by not removing or downgrading nesting, roosting, and foraging (NRF) habitat within the home range. The objectives at the low priority sites are to accelerate the growth of spotted owl habitat

or treat stands for ecological benefits as described in the Recovery Plan and the 2012 Designated Critical Habitat Rule. These objectives would result in short-term adverse effects, for long-term benefits. Approximately 139 acres was removed from consideration for timber harvest and detailed analysis.

- NSO Nest Patch: Northern Spotted Owl Nest Patch: The nest patch is the 300-meter radius (70 acres) area around a known spotted owl nest tree or center of activity that is important to owls. It is one of three scales developed in 2008 by a regional interagency team to analyze effects to northern spotted owls. The other two scales are the home range and 0.5 mile core area. Nest area arrangement and nest patch size have been shown to be an important attribute for site selection by spotted owls (Swindle et al. 1997, Perkins et al. 2000, Miller et al. 1989, and Meyer et al. 1998). The nest patch size also represents key areas used by juveniles prior to dispersal. Miller et al. (1989) found that on average, the extent of forested area used by juvenile owls prior to dispersal averaged approximately 70 acres.

- RA32 Deferred Stands: In 2011, the U.S. Fish and Wildlife Service issued a Revised Recovery Plan for the Northern Spotted Owl (NSO). The Recovery Plan includes Recovery Actions, which are recommendations to guide activities that would help to further the recovery objectives for the northern spotted owl. Recovery Action 32 (RA 32) recommends to "*maintain and restore such habitat while allowing for other threats, such as fire and insects, to be addressed by restoration management actions. These high-quality spotted owl habitat stands are characterized as having large diameter trees, high amounts of canopy cover, and decadence components such as broken-topped live trees, mistletoe, cavities, large snags, and fallen trees* (USFWS 2011, p. III-67)." The purpose of Recovery Action 32 is to provide refugia for northern spotted owls as they adapt to competitive pressures from an increasing population of barred owls.

  The BLM decided to defer forest management in stands identified as RA 32 stands within the Project Area at this time. Using the 2010 Draft RA 32 Habitat Evaluation Methodology (version 1.3) developed jointly by the Medford Bureau of Land Management, Rogue River-Siskiyou National Forest, and the Roseburg Office of the U.S. Fish and Wildlife Service, BLM wildlife biologists identified areas within the Bieber Salt Forest Management Project that met the intent of Recovery Action 32. Stands identified as RA 32 forest stands (323 acres) were removed from consideration for timber harvest and detailed analysis.

#### 2.2.1.3 Suitability of Stands

The timber sale planner and silviculturist assessed the timber harvest potential on BLM-administered lands within the Project Area using the Forest Operations Inventory (FOI) layer and other GIS layers. Identified treatment needs were based on the Medford District Resource Management Plan (RMP) silvicultural management systems for those lands (*North General Forest Management Area* (NGFMA)). The following criteria were used to eliminate stands from treatment consideration:

- Vegetative Condition – grasslands, shrublands, hardwood/woodlands.
- Young stands from previous regeneration harvest – not ready for treatment.
- Young stands regenerated from fire – too small for harvest.
- Stands below relative density thresholds – no treatment needed at this time.

#### 2.2.1.4 Feasibility

Potential treatment units were screened by members of the IDT (timber sale planner, engineer and logging systems specialist) for economic and logistical feasibility for treatment. For example, a potential unit may have been deemed uneconomical when the harvest volume per acre resulting from the application of canopy cover retention prescriptions to treat and maintain habitat for owls dropped to a level that was too low to be economically feasible.

Resource specialists determined other applicable soils, hydrologic, wildlife, and other RMP management guidelines to minimize impacts to resources.

### 2.2.2 Transportation Management Inventory and Assessment

An interdisciplinary transportation working group comprised of BLM resource specialists (road engineer, hydrologist, fisheries biologist, wildlife biologist, soils specialist, fuels specialist, forester, and outdoor recreation planner) was established to review the transportation system in the Bieber Salt Project Area and make recommendations for roads that could be analyzed.

An inventory and review of the existing transportation network was conducted to aid in the assessment of the current condition, to evaluate the transportation system for an appropriate level of management, as well as to identify opportunities to reduce road densities. Roads within the Project Area vary from primitive, four-wheel drive (jeep) roads (non-system roads) to engineer-designed roads with culverts, drainage features, and crushed rock surfacing or bituminous surfacing that receive regular maintenance by BLM (system roads). The inventory process specifically identified 1) roads that need maintenance to restore, repair, or improve road surfaces, culverts, and roadside drainage ditches in order to reduce road-related erosion and sedimentation to stream courses; 2) roads that are no longer serving resource programs needs and whether they are contributing to sedimentation and riparian habitat fragmentation; 3) roads needed to provide access for forest management identified to be in need of maintenance or repair; 4) existing closure status of roads ; 5) roads under existing agreements for private land access and reciprocal right-of-ways; as well as 6) completed a sign inventory. Opportunities to more appropriately manage the road system were incorporated into the Action Alternative described in the next section. Road decommissioning, as well as road maintenance, renovation, and improvement opportunities have been identified to address the needs acknowledged during the assessment process.

## 2.3 PROPOSED PROJECTS

### 2.3.1 Forest Management

The vegetation treatments proposed under the Bieber Salt Forest Management Project are divided into two categories: commercial and non-commercial treatments. Commercial refers to treatment areas where the trees to be removed are of sufficient size to be sold as saw logs to produce dimensional lumber or plywood veneer. Non-commercial refers to treatment stands where the material to be removed is smaller than eight inches diameter breast height (DBH).

Proposed treatments would apply silvicultural prescriptions to achieve management goals by putting stands on trajectories towards the development of structural complexity, age and size variability, increased vigor, and resiliency to disturbances (USDI 1995, p.62). The prescriptions take into account changes in the potential vegetation based on factors such as aspect, slope, available moisture, and soil type, in addition to species composition, stem density, and habitat considerations for late-successional species, particularly the northern spotted owl (NSO). For some stands, silvicultural objectives were superseded by owl habitat considerations and thus do not fully address forest health objectives. The

silvicultural prescriptions that would be used to accomplish commercial and non-commercial treatments are described in the next few sections.

#### 2.3.1.1 Commercial Treatments (Timber Harvest)

##### Density Management (DM)

Density Management is prescribed in stands that are currently providing northern spotted owl roosting and foraging habitat, in which smaller trees are targeted for removal over larger trees. The primary objective of the Density Management prescription is to reduce stand density in order to promote the growth and structural development of the remaining stand. Spatial distribution of the residual (leave) trees would be determined by the crown spacing of the healthiest dominant and co-dominant trees necessary to achieve a canopy cover of 60% or greater at the stand level. Stands would be treated to a relative density within a range of 0.50-0.60 index rating as a result and would be thinned using guidelines to reduce basal area to between 160 and 220 $ft^2$ per acre. Unique stand features such as snags, coarse woody debris, large hardwoods, and trees exhibiting old-growth characteristics would typically be retained to maintain desired structural components for wildlife.

Density Management would be a combination of thinning and group selection, to the extent or amount recommended by vegetation type and/or plant series that exists. Treatment would consist of both proportional thinning and thinning from below. Proportional thinning consists of removing trees from each size class and thinning from below consists of removing trees from the lower canopy classes, such as intermediate and suppressed trees. The proportional thinning would not meet the exact definition of a proportional thin because trees exhibiting old-growth characteristics would typically be retained (see Appendix A, Marking Guidelines). Generally, smaller trees would be targeted for removal over larger trees but the intent is to maintain the current structure and not remove single tree layers or simplify the stand. Trees targeted for removal would include those exhibiting a decline in crown ratio, narrow crown widths, and which contribute least to the canopy layer or structural diversity, unless removal compromises the required minimum canopy cover of 60%. Trees may be marked in small patches (i.e., groups of trees with poor crowns) and left in clumps (i.e., groups of old trees) to create hiding cover for wildlife species and increase spatial heterogeneity. The size of openings should be no greater than 0.20 acres and should not exceed 5% of the total treatment area.

##### Selective Thinning

There are three types of Selective Thinning prescriptions proposed in the Lost Creek Forest Management Project based on the vegetation type. The general silvicultural objectives for all Selective Thinning prescriptions include:

1) Reduce stand density to increase tree growth, quality, and vigor of the remaining trees;
2) Create diversified stand structure (height, age, and diameter classes);
3) Develop spatial heterogeneity within stands (e.g., fine-scale structural mosaic);
4) Increase resilience/resistance of forest stands to wildfire, drought, disease, insects, etc. by reducing stand density and ladder fuels; and
5) Increase growing space and decrease competition for large and/or legacy trees, especially pine, oak, and cedar.

Selective Thinning would be a combination of thinning and group selection, to the extent or amount recommended by vegetation type and/or plant series that exists. These stand treatments would generally target low vigor trees to reduce stand density and improve stand resiliency and individual tree health.

Trees infected with mistletoe would be selectively removed, where necessary and feasible, in order to reduce the level of infection in target stands and decrease the rate of proliferation. Treatment would be considered necessary when infected trees are adjacent to or are shading out younger, smaller trees, when mistletoe is likely to spread into unaffected areas without treatment, and when individual trees may be removed without substantial impacts to canopy cover. This would provide flexibility in allowing some infected trees to be retained for wildlife habitat purposes; mistletoe clumps provide nesting habitat for NSO and Johnson's hairstreak butterfly larvae feed exclusively on dwarf mistletoe.

Proportional thinning and thinning from below, as previously described, would be used to accelerate the growth of remaining trees while promoting desired species that are best adapted to site conditions. Spatial distribution of leave trees would be based on tree condition (live crown ratio and crown form). Stands would have a wide range of basal area or tree spacing targets based on stand types or conditions. Trees would be removed singly or in groups (openings); the amount and size of openings created would depend on vegetation types (Douglas-fir, mixed conifer, and white fir) and current stand development stages. Opening size would range from 0.10-0.25 acre where fire resilient and drought tolerant species need release to reduce competition. Opening size would range from 0.25-0.50 acres where regeneration is encouraged or where poor crown conditions exist (due to density-related suppression and mistletoe infection). The extent or amount of openings permitted would range from 5-10% of the total treatment unit area. Openings should be no closer than 100 feet from the next opening. Trees may be marked in patches (e.g., groups of trees with poor crowns) and left in clumps (e.g., groups of old trees) where necessary. Unique stand features such as snags, coarse woody debris, large hardwoods, and trees exhibiting old-growth characteristics would typically be retained to maintain desired structural components for wildlife. In addition to such stand features, rock outcrops, special status species sites, and seeps/wet areas would be protected. See Appendix B, Marking Guidelines for more information.

The following target conditions would be applied to Selective Thinning units based on their vegetation composition.

#### *Selective Thinning —Douglas-fir (ST/DF)*

Stands that are predominantly Douglas-fir and have low to moderate productive site conditions would be treated to a relative density range of 0.30-0.40. Stands would be harvested to a range of 40-50% canopy cover and would be thinned using guidelines to reduce basal area to between 100 and 140 ft² per acre. These stands are lacking suitable natural regeneration of drought tolerant and fire resilient species in the understory, while the overstory is greater than 90% Douglas-fir with scattered legacy ponderosa pine, incense cedar, and black oak. Treatment would allow more growing room for regeneration of less common but desired species such as sugar pine, ponderosa pine and incense cedar by creating openings suitable for growth and removing trees overtopping healthy regeneration.

#### *Selective Thinning —Mixed Conifer (ST/MC)*

Stands that are predominantly Douglas-fir and have moderate to high productive site conditions would be treated to a relative density range of 0.35-0.45. Stands would be harvested to a range of 40-50% canopy cover and would be thinned using guidelines to reduce basal area to between 110 and 160 ft² per acre. Depending on aspect and elevation these mixed conifer stands can have a relatively high amount of stand density due to the presence of shade tolerant species. These stands are generally dominated by a Douglas-fir, ponderosa pine, and white fir overstory, with less prominent species as incense cedar and sugar pine.

#### *Selective Thinning —White Fir (ST/WF)*

Stands that are predominantly white fir and have moderate to high productive site conditions would be treated to a relative density range of 0.35-0.45. Stands would be harvested to a range of 40-55% canopy

cover and would be thinned using guidelines to reduce basal area to between 120 and 140 ft² per acre. These stands are dominated by shade tolerant species in the understory and overstory. The overstory is greater than 90% white fir with remnant or legacy Douglas-fir and incense cedar.

#### 2.3.1.2 Commercial Harvest/Yarding Methods

Trees designated for removal as a result of application of the forest stand prescriptions described above would be moved from forest stands to landing areas using the following yarding methods:

##### Ground-Based Yarding

In ground-based yarding, a moving vehicle (skidder) travels to the logs and pulls (i.e. skids) them to the landing. The machines used for skidding are diverse and can be wheeled or tracked. Trees and logs are removed from the woods and yarded to the landing by lifting the front end of the logs off the ground. Skidders travel on skid trails that are approved by the BLM.

A feller-buncher fells and bunches trees mechanically. The typical feller-buncher is track mounted. Some must move from tree-to-tree for felling, while others use a boom to fell multiple trees from a single position. The feller-buncher bundles trees for a skidder to pick up and move to a landing.

A forwarder is a rubber-tired machine that typically works with a harvester. Harvesters move through the stand felling, delimbing, bucking, and bunching trees selected for harvest. Forwarders travel into the woods on slash created by the harvester. They load the logs piled by the harvester and carry them to the road where they are off-loaded. The logs carried by a forwarder do not touch the ground during travel. Ground-based yarding is generally limited to slopes of 35% or less.

Bull-lining is a ground-based yarding method where a cable is dragged from the skidder to the log and the log is dragged along the ground to a skid trail.

##### Skyline-Cable Yarding

Skyline-cable yarding is a cable system that pulls the logs to the landing using steel cables. A stationary machine, or yarder, would be located on the road and would pull logs up to the landing with one end of the log suspended. Skyline-cable yarding is typically used where the ground is too steep for ground-based yarding.

##### Pre-Designated Skid Trails and Landings

Skid trail route specifically selected by the BLM to facilitate yarding operations. The skid trail can be an existing skid trail or newly located and is intended to be used by the yarding operator. Skid trails are generally about 12 feet wide and vary in length.

New landings would be 0.5 acre or less and would be located on stable locations, such as ridgetops, stable benches, or flat areas outside of Riparian Reserves and 100-acre northern spotted owl cores, and would adhere to associated Project Design Features (see Section 2.5).

### 2.3.1.3 Non-Commercial Treatments

#### Understory Reduction (UR)

The silvicultural objectives here are as follows:

1. Reduce stand density to increase tree growth, quality, and vigor of existing understory trees;
2. Reduce understory stand density in the current stand and control the growth rates of existing understory trees for long term survivability.

Understory Reduction is used to accomplish pre-commercial thinning and fuels reduction treatments for even and uneven-aged conifer stands. Understory Reduction consists of cutting small trees less than 8 inches in diameter for conifer and less than 12 inches diameter for hardwood) and vegetation with chainsaws and disposing of the material by hand-piling and burning or use of a lop and scatter method in lighter fuels. Understory Reduction increases tree growth rates and promotes horizontal and vertical structural diversity in stands. Understory Reduction is also used in stands where pine and shade-intolerant hardwood species are diminishing in vigor and numbers because of overcrowded stand density conditions. This prescription may be applied to understories and/or areas of high stocking of small trees in commercial stands after harvest in conjunction with wildlife considerations and habitat objectives.

#### Fuels Treatment of Forest Management Activity Slash

The BLM would conduct a fuels assessment within each unit following harvest activity. This assessment would determine the fuel hazard and fire risk based on surface fuel loading, aspect, slope, access, and location of each unit. Fuels treatments could include lop and scatter, pile and burn, underburning, and biomass removal. Most fuels treatments would begin within 90 days after completion of harvest activities.

##### *Lop and Scatter*

When the slash (live and dead material nine inches or less in diameter) remaining in the units after harvest is less than 11 tons per acre, all stems and branches would be cut from the tree trunk and scattered. Trunks seven inches in diameter and less would be cut to 3-foot lengths and left on the ground. The depth of the slash would not exceed 18 inches.

##### *Slash Piling and Pile Burning*

Hand piling and hand pile burning would occur when the slash remaining in the units after harvest is greater than 11 tons per acre. Material between one and seven inches in diameter and longer than two feet would be piled by hand. The piles would be a minimum of four feet high and six feet in diameter. Piles would be burned in the fall, winter, or spring, and would occur within one year or less of being piled.

Mechanical piling and pile burning would occur when the slash remaining in the units after harvest is greater than 11 tons per acre and the slope is less than 35 percent. Mechanical equipment would pick up material and walk it to the pile. Material would not be pushed into a pile. Equipment would only travel on previously used skid trails. If machine piled, material between 2 and 12 inches in diameter and 2 feet long would be piled. The piles would be placed within the unit or at a landing, depending on the yarding method. The piles would be a minimum of 8 feet high and 10 feet in diameter. Piles would be burned in the fall to winter and would occur within one year or less of being piled.

##### *Underburning*

Underburning is proposed in timber sale units to treat residual slash and reduce fire hazard. In proposed timber sale units, underburning would be used to remove at least 60% of slash less than 3″ in diameter and a lesser amount of larger fuel size classes. Underburning would be implemented in the spring or fall.

Timber sale units are analyzed for possible underburning based on the anticipated amount of residual slash, resource objectives, strategic and logistical concerns (aspect, ridges, roads, proximity to other fuels treatments, values at risk, etc.). BLM fire and fuels management personnel would conduct post-treatment evaluations to determine the need for burning.

#### *Biomass Removal*

Whole trees or tree tops would be yarded to log landings, the tree tops and limbs removed and piled at the landings and the resulting piles of slash hauled away from the landings. Whole tree yarding and tree top yarding would not be required but are options for treating activity slash.

### 2.3.2 Transportation Management

#### 2.3.2.1 Temporary Routes

Temporary routes would allow operators temporary access to harvest units. Temporary routes would be located on stable areas such as ridge tops, stable benches, or flats with gentle to moderate slopes and use existing jeep road and skid trail footprints where possible. After harvest is complete, routes would be ripped, water barred, mulched, blocked, and seeded with native grass (where needed).

**Temporary route construction** would occur where no previous routes exist. An access route would be constructed to minimum standards. Construction would include clearing, grubbing, removing, and disposing of vegetation and debris from within established clearing limits. Work also includes the construction of a minimum-width subgrade by excavating, leveling, grading, and outsloping.

#### 2.3.2.2 Timber Hauling and Road Renovation

Before roads are used for forest management activities, they would be surfaced or spot rocked if needed; ditches would be cleaned where needed; catch basins would be cleaned or enlarged; brush growing near culvert inlets or outlets would be removed; culvert inlets and outlets would be cleaned; and brush, limbs, and trees would be removed along roadways to improve sight distance and allow for proper road maintenance.

Road surfacing is placing rock the full width and desired length of the road. Surfacing is done by grading and reshaping the road subgrade, then hauling, placing, and compacting the new surfacing material on the prepared subgrade.

Spot rocking involves placing rock on the road in areas as needed to help control erosion and maintain the road surface. This restores the road surface and road condition making it suitable for driving and hauling. Crushed aggregate rock would be placed on sections of inadequately surfaced roads that would be used for hauling timber.

#### 2.3.2.3 Roadside Vegetation Maintenance

Many BLM roads in the Bieber Salt Project Area have not been maintained in recent years. Large vegetation and trees have grown up along some roads since they were constructed and were not removed when there were smaller as part of a regular maintenance program. This vegetation prevents maintenance equipment from creating, maintaining, and improving proper road drainage patterns. The large vegetation and trees create berms on the outside shoulder of the road, which causes water to flow down the road in a concentrated flow instead of allowing water to disperse off the road at the earliest possible point (Figure 2-1).

Trees and vegetation up to 24 inches DBH would be removed up to 6 feet horizontally from the centerline of ditches and up to 6 feet horizontally from the outside shoulder of the road prism. Trees and vegetation would be cut rather than uprooted, unless otherwise approved. Remaining brush and stumps that would interfere with road grading and maintenance operations would be removed or ground down to a depth of 6 inches below the road surface or ditch line. Debris and trees that are not merchantable or desired for firewood cutting would be assessed by a BLM fuels specialist and would be hand piled and burned, clipped, or lopped and scattered, depending on the location. Fuel reduction would begin within 90 days after the vegetation maintenance project is completed.

**Figure 2-1. Vegetation growing along road is limiting road maintenance**

#### 2.3.2.4 Full and Partial Road Decommissioning

Road decommissioning would occur where roads are not needed at this time but may be used in the future. Partial decommissioning would water bar roads; remove culverts, and armoring if necessary, seed with native grasses, and mulch with weed-free mulch. Full decommissioning would include ripping, water barring, removing culverts, and armoring if necessary, seeding with native grasses, mulching with weed-free mulch, and planting to reestablish vegetation. In addition, any cross-drain culverts, road fills in stream channels, and potentially unstable fill areas would be removed to restore the natural hydrologic flow.

Decommissioned roads would be closed with a device similar to an earthen barrier or equivalent and would not be maintained in the future. Roads would be closed to vehicles on a long-term basis, but may be used again in the future.

### 2.3.3 Water Source Restoration

Restoration activities are proposed at seven existing water sources (Maps 1 to 4) to allow use by fire engines and water tenders for fire suppression and by wildlife for drinking water, habitat, and foraging opportunities. Restoration activities would include clearing brush and trees; removing accumulated sediment from developed spring sites; installing, repairing, or replacing spring boxes and culverts; repairing or replacing pipelines; installing, repairing, or replacing devices such as bentonite or pond liners that impede water seepage; installing safety devices such as fences and exit ramps; and completing minor road work such as grading and adding rock.

## 2.4 ALTERNATIVES ANALYZED IN DETAIL

### 2.4.1 Alternative 1 – No Action Alternative

The No Action Alternative describes a baseline against which the environmental effects of the Proposed Action can be compared. The No Action Alternative discusses the consequences of not taking action. No Action assumes the current resource trends would continue into the future. Under the No Action Alternative, no vegetation management would be implemented; there would be no commercial cutting of trees and there would be no understory reduction or fuels reduction treatments. Normal programmed road maintenance would be performed. Other activities authorized by separate NEPA analyses could happen. The analysis of the No Action Alternative answers the question: What would occur to the resources of concern if the Proposed Action does not take place?

Selection of the No Action Alternative would not constitute a decision to reallocate these lands to non-commodity uses. The decision maker does not need to make a specific decision to select the No Action Alternative. If that is the choice, the Proposed Action would simply be dropped and the NEPA process ended. Future harvesting, young stand forest development work, fuels reduction treatments, other connected actions, and road management in this area would not be precluded and could be analyzed under a subsequent NEPA document.

### 2.4.2 Alternative 2 – Proposed Action

Alternative 2 was developed to achieve the objectives described in Chapter 1, the Purpose and Need for the Bieber Salt Forest Management Project. Alternative 2 was designed to achieve forest health objectives while minimizing the impacts to northern spotted owls and other Special Status Species within forest stands in the Project Area. A summary of the projects proposed under Alternative 2 is listed below in Table 2-1.

**Table 2-1. Alternative 2: Summary of Proposed Projects[1]**

| **Forest Management** | |
|---|---|
| **Commercial Prescriptions** | **Est. Acres** |
| Density Management (DM) | 98 |
| Selective Thinning – Douglas fir (ST/DF) | 27 |
| Selective Thinning – Mixed Conifer (ST/MC) | 299 |
| Selective Thinning – White fir (ST/WF) | 7 |
| **Total** | **431** |
| **Non-commercial Prescriptions** | **Est. Acres** |
| Understory Reduction | 431* |
| Activity Fuels | 431* |
| **Total** | **431*** |
| **Timber Harvest Method** | **Est. Acres** |
| Ground-based Yarding | 335 |
| Skyline-Cable Yarding | 96 |

[1] The acres reported in this table are based on Geographic Information System (GIS) data and are rounded to the nearest whole acre; acres may differ from those reported in individual timber sale contracts/prospectuses due to differences in electronic mapping software versus data collected from GPS units. GIS calculates from horizontal distances and GPS accounts for slope distance. Total acres may vary slightly from other tables displayed throughout this document and the analysis file due to methods used for rounding data outputs. The acreage differences that may be detected are within less than (+-) 1% of the total project acreage analyzed and would not contribute to any differences in effects reported.

| | |
|---|---|
| **Total** | **431** |
| **Transportation Management** | **Est. Miles** |
| Temporary Route Construction | 0.06 |
| Road Renovation – Haul Routes | 32.63 |
| Roadside Vegetation Maintenance | 3.62 |
| Partial Road Decommissioning | 1.78 |
| Full Road Decommissioning | 0.19 |
| Pre-Designated Skid Trail | 0.63 |
| New Landings | 3 sites |
| **Other Projects** | |
| Water Source Restoration | 7 sites |
| * This is the maximum amount of acres that may be treated; actual acres treated could be less depending on post-harvest assessment. | |

## 2.5 PROJECT DESIGN FEATURES

Project Design Features **(**PDFs) are an integral part of the Action Alternative (Alternative 2) and would be considered in the analysis of impacts of the projects in Chapter 3. They are developed to avoid or reduce the potential for adverse impacts to resources. PDFs include seasonal restrictions on many activities in order to minimize erosion and reduce disturbance to wildlife. PDFs also outline protective buffers for sensitive species, mandate the retention of snags, and delineate many measures for protecting Riparian Reserves throughout the project. Where applicable, PDFs reflect Best Management Practices and standard operating procedures.

The PDFs listed below would be carried forward into contracts as required contract specifications. BLM contract administrators and inspectors monitor the operations of contractors to ensure that contract specifications are implemented as designed.

Best Management Practices (BMPs) are designed to reduce nonpoint source pollution to the maximum extent practicable and are considered the primary mechanisms to achieve Oregon Water Quality standards. Implementation of PDFs, in addition to establishment of Riparian Reserves, would exceed Oregon State Forest Practice Rules. A review of forest management impacts on water quality concluded that the use of BMPs in forest operations was generally effective in avoiding significant water quality problems; the report noted that proper implementation of BMPs was essential to minimizing non-point source pollution (Kattelmann 1996). BMPs would be monitored and, where necessary, modified to ensure compliance with Oregon Water Quality standards.

### 2.5.1 Common to All Proposed Projects

***Objective 1: Prevent and contain hazardous material spills.***

- During operations described in the proposed action, the operator would be required to have a BLM-approved spill plan or other applicable contingency plan. In the event of any release of oil or hazardous substance, as defined in Oregon Administrative Rules (OAR) 340-142-0005 (9)(d) and (15), into the soil, water, or air, the operator would immediately implement the site's plan. As part of the plan, the operator would be required to have spill containment kits present on the site during operations. The operator would be required to be in compliance with OAR 629-605-0130 of the Forest Practices Act, Compliance with the Rules and Regulations of the Department of Environmental Quality. Notification, removal, transport, and disposal of oil, hazardous substances, and hazardous wastes would be accomplished in accordance with OAR 340-142, Oil

and Hazardous Materials Emergency Response Requirements, contained in Oregon Department of Environmental Quality regulations.

- Store all hazardous materials and petroleum products in durable containers placed outside of Riparian Reserves. Locate so an accidental spill would be contained and would not drain into any stream system.
- Refuel equipment at least 190 feet from streams, ponds, or other wet areas. Equipment would not be stored in a stream channel overnight. Hydraulic fluid and fuel lines would be in proper working condition in order to minimize leakage into streams.
- Check equipment for leaks prior to starting work. Do not allow equipment use until leaks are repaired or leaking equipment is replaced.

***Objective 2: Minimize the spread of noxious weeds.***

- Ensure hay, straw, and mulch are certified as free of prohibited noxious vegetative parts or seeds, per 75 FR 159:51102. Straw or hay must be obtained from the BLM or purchased from growers certified by Oregon Department of Agriculture's Weed Free Forage and Mulch Program. If hay is used, it must be from native grasses only.
- Require equipment that would travel off system roads or temporary routes to be washed prior to entry onto BLM-administered lands.

***Objective 3: Protect Special Status, Survey and Manage, and Sensitive botanical species***

- Protect known Special Status, Survey and Manage (S&M), and Sensitive vascular plant, lichen, bryophyte, and fungi sites. Buffers would be determined based on species, proposed treatment, site-specific environmental conditions, and available management recommendations (Special Status Species Conservation Assessments and S&M Management Recommendations). The use of skid trails and/or the skidding of logs through plant site buffers would not be allowed except where approved by the Authorized Officer. Exceptions could be made on a case by case basis depending on the specific plant species.

***Objective 4: Protect known and newly identified cultural resources.***

- Cultural sites located within the Area of Potential Effect would be buffered. Buffers would be established sufficient to protect the features of the site from adverse impacts of any proposed management activities. Buffers would be designed by BLM archeologists or cultural resource specialists. No treatments would occur within this buffer. No fire line construction, prescribed burning, or hand piling/burning would occur within the flagged boundaries of the recorded cultural resources. Timber that is to be removed next to a buffer would be directionally felled away from buffers for one site-potential tree length.
- If, during project implementation, the contractor encounters or becomes aware of any objects or sites of cultural value on Federal lands, such as historical or pre-historical ruins, graves, grave markers, fossils, or artifacts, the contractor would immediately suspend all operations in the vicinity of the cultural value and notify the Contracting Officer or Contract Officer Representative so the site can be evaluated by a BLM archaeologist.

***Objective 5: Protect Special Status, Survey and Manage, and Sensitive wildlife species.***

- Protect raptor species, if any are located. Apply the appropriate buffers and seasonal restrictions based on species, proposed treatment, site-specific environmental conditions, and protection recommendations as determined by the BLM wildlife biologist (Table 2-2).
- If a gray wolf den or rendezvous site is identified prior to or during project activities, the BLM would implement a seasonal restriction from March 1 to June 30 and suspend project activities located within 1 mile of a known den or rendezvous site. Because these sites are difficult to locate and can change from year to year, this would be assessed on an ongoing basis throughout the life of this project through annual updates and communication with the US Fish and Wildlife Service (USFWS) and Oregon Department of Fish and Wildlife (Table 2-2).
- Protect known Special Status, Survey and Manage (S&M), and Sensitive terrestrial wildlife species through the incorporation of no-treatment buffers and seasonal restrictions. Buffers are determined based on species, proposed treatment, site-specific environmental conditions, and available management recommendations (Special Status Species Conservation Assessments and S&M Management Recommendations) (Table 2-2). No yarding is allowed through buffered wildlife sites.

**Table 2-2. Protection Measures and Seasonal Restrictions for Known Special Status, Survey and Manage and Sensitive Terrestrial Wildlife Species in the Project Area.**

| Wildlife Species | Status | Protection Measures | Known-Site Seasonal Restrictions |
|---|---|---|---|
| Bald Eagles | SSS/EPA | 30-acre Nest Core Area | 0.5-Mile, February 1 – August 15 |
| Bats | SSS | Retain Snags; 100-200 foot Cave Buffer | None |
| Cavity Nesting Birds | SSS | Retain Snags | None |
| Golden Eagles | SSS | 30-acre Nest Core Area | 0.5-Mile, March 1 – July 15 |
| Goshawks | SSS | Site-Potential-Tree-Height Nest Buffer | 0.25-Mile, March 1 – August 31 |
| Great Gray Owls | S&M | 0.25-Mile Nest Core Area; 300-foot Meadow Buffers | 0.25-Mile, March 1 – July 15 |
| Mollusks | SSS, S&M | Up to 0.10-acre Known-site Buffer; Retain Large Down Wood; 100-200 Foot Talus Buffer | None |
| Northern Spotted Owl | FE | 300-Meter Nest Patches | 0.25-Mile, March 1 – September 30 |
| Fisher | FP | Retain Large Down Wood and Snags* | None |
| Other Raptor Species | SSS | Retain Nest Trees | 0.25-Mile, March 1 – July 15 |
| Peregrine Falcons | SSS | 100-200 Foot Cliff Buffer | 1-Mile, January 1 – August 15 |
| Gray Wolves | FE | Retain Large Down Wood | 1-Mile, March 1 – June 30 |

* Snags felled for safety reasons or for logging systems (skyline corridors, etc.) would be left on site.

Status:

FE – Federally Endangered (ESA)
FT – Federally Threatened (ESA)
FP – Federally Proposed (ESA)
SSS – Special Status Species
S&M – Survey and Manage Species
EPA – Bald and Golden Eagle Protection Act

***Objective 6: Minimize disturbance to Wintering Elk.***

- Within the portions of the Project Area that are inside the Elk Winter Range, all roads, except major collectors and arterials would be closed between November 15 and April 1 to avoid disturbance to wintering elk. Minimize road construction in this area as well (USDI 1995, p. 48).

### 2.5.2 Timber Harvest

***Objective 1: Minimize impacts to wildlife species and special habitat elements.***

- Maintain existing snags except those that need to be felled for safety reasons or for logging systems (skyline corridors, etc.) to minimize impacts to cavity-dependent species. Snags felled for safety reasons would be left on site.
- Retain existing large coarse woody debris in the stands.
- Locate skid trails to minimize disturbance to coarse woody debris. Where skid trails encounter large coarse woody debris, a section would be bucked out for equipment access. The remainder would be left in place and would not be disturbed.
- Provide a 300-foot no-harvest buffer around meadows 10 acres or larger adjacent to suitable great grey owl nesting habitat (USDI 1995, p. 36; USDI BLM, USDA FS, USDI FWS 2004, p.5) (Table 2-2).
- Restrict harvest activities within 100 to 200 feet of special habitats (such as meadows, cliffs, caves, and talus slopes).
- Construct new landings outside of Riparian Reserves and designated 100-acre NSO cores.
- Seasonally restrict harvest activities from March 1 to September 30 within 0.25 mile of known NSO sites (within 0.5 mile for helicopter operations and blasting). The seasonal restriction could be waived if non-nesting status is determined. If any new owls are discovered in harvest units following the sale date, activities would be halted until mitigation options are determined.

***Objective 2: Minimize impacts from timber yarding operations.***

- Limit landings to 0.5 acre or less. All landings would be approved by the Authorized Officer before construction.
- Limit the width of skyline corridors to be as narrow as operationally feasible; do not exceed a 15-foot width.

***Objective 3: Limit residual stand damage from yarding activities***

- In tractor units, trees 21 inches DBH and smaller designated for cutting would be felled and yarded to approved landing locations as either whole trees or log segments. If excessive stand damage occurs from whole tree yarding, as determined by the Authorized Officer, bucking, limbing, or both would be required.
- In tractor units, trees over 21 inches DBH designated for cutting would be felled and cut into log lengths not to exceed 44 feet and would be completely limbed prior to yarding.

***Objective 4: Prevent off-site soil erosion and soil productivity loss***

*Temporary Route and Landing Construction and Timber Hauling:*

- Locate temporary routes and landings on stable locations such as ridge tops, stable benches, or flats with gentle to moderate side slopes and use existing jeep road and skid trail footprints where possible. Do not construct temporary routes or landings on steep slopes, slide areas or other unstable soils and headwalls, seeps, springs, high landslide hazard locations, or in Riparian Reserves.

- Limit temporary route and landing construction and reconstruction to the dry season (generally May 15 to October 15).
- Rip, seed, mulch with straw, water bar, and block new temporary routes and newly constructed landings in the same season of use. Seed must be native species, site-specific, and approved by the resource area botanist. If hauling on a temporary route is not completed in the same year the route is constructed, the route would be storm-proofed and blocked by October 15 or when soil moisture exceeds 25%.
- Restrict all timber hauling and landing operations on native surface or rocked roads whenever soil moisture conditions or rain events could result in road damage or the transport of sediment to nearby stream channels, generally October 15 to May 15. If the Authorized Officer, in consultation with resource area watershed specialists and engineers, determines that hauling would not result in road damage or the transport of sediment to nearby stream channels based on soil moisture conditions or rain events, the Contracting Officer or Contracting Officer's Representative may recommend a conditional waiver for hauling. The conditional waiver may be suspended or revoked if conditions become unacceptable as determined by the Authorized Officer.
- Install protective features such as certified weed-free straw bales, silt fences, geo-fabric rolls, and water bars where there is potential for haul-related road sediment to enter the aquatic system. Maintain protective features by removing accumulated sediment and placing sediment in stable location where it cannot enter the aquatic system.

*Ground-Based Yarding:*

- Designate skid trails with an average of 150-foot spacing. In order to minimize ground disturbance, use existing trails and avoid creating new skid trails where feasible.
- Apply native, site-specific seed approved by the resource area botanist and weed-free straw, water bar as needed, and block skid trails by October 15 of the year of harvest unless a waiver is in place for ground-based yarding to extend the dry season. Install waterbars at the same time as subsoiling unless skid trails are needed to complete harvest the following season. In that case, water bars would be constructed and straw would be applied to exposed soil prior to fall rains to reduce sedimentation during winter months. Water bar spacing on skid trails would be based on the RMP erosion-control measures for timber harvest, which considers slope and soil series (USDI 1995, p. 167).
- Use erosion-control techniques (e.g., water bar, apply native, site-specific grass seed and weed-free straw mulch, scatter chipped material, or scatter limbs and other fine material) on skid trails, forwarder trails, and landings to minimize sediment movement off site.
- Water bar skid trails based on gradient and erosion class guidelines (USDI 1995, p. 167). Where soil erosion is not expected to occur (e.g. flat ground), water bars would not be necessary.
- Restrict ground-based yarding and soil ripping operations from October 15 to May 15, or when soil moisture exceeds 25%.
- Once soil moisture exceeds 25%, ground-based operations may only occur when snow depth is at least 18 inches. In the condition where snow is present but soil moisture is below 25%, ground-based operations may occur. Stop ground-based harvest if rutting begins to occur within the unit or when soil moisture exceeds 25%.
- To minimize soil disturbance, mechanized felling equipment must have an arm capable of reaching at least 20 feet.

- Restrict tractor and mechanical operations to slopes generally less than 35%. In areas where it is necessary to exceed these gradients to access adjacent tractor area, use ridge tops where possible
- In order to restrict the amount of compacted soil to less than 12% in a timber harvest unit,
    - Allow mechanized equipment capable of creating and walking on slash (such as a cut-to-length system) to work off designated skid trails for 1 or 2 passes on at least 8 inches of slash and under dry soil conditions (less than 25% soil moisture content);
    - Allow mechanized equipment (feller-buncher systems) to work off designated skid trails during the dry season (soil moisture content less than 15%) for 1 or 2 passes only (one round-trip);
    - Space the 1 to 2-pass harvest trails a minimum of 50 feet apart off of designated skid trails;
    - Use low, ground-pressure equipment (8 psi or less);
    - Restrict all other use of ground-based equipment to designated skid trails; and
    - Stop the use of forwarding trails if logging equipment is causing continuous mineral soil displacement greater than 2 inches deep for a distance of 20 feet, a change of soil structure/compaction indicators at depths greater than 2 inches, or as determined by the Authorized Officer.

*Skyline Yarding:*

- Immediately after use, construct water bars by hand in cable yarding corridors where gouging occurs, as directed by the Authorized Officer. Construct water bars by hand and pull available slash on skyline-cable yarding corridors if gouging of mineral soil occurs for a continuous distance of 20 feet or more.
- Apply native, site-specific seed approved by the resource area botanist and certified weed-free straw to the top 20 feet of the skyline-cable yarding corridor where yarding logs to the road results in extended soil exposure.
- Use full or partial suspension when skyline-cable yarding.
- Avoid downhill yarding (USDI 1995, p. 166)

***Objective 5: Prohibit unauthorized OHV use***

- Place woody debris or other appropriate barriers (e.g., rocks, logs, and slash) on the first 100 feet of skid trails leading off system roads in all ground-based yarding units upon completion of yarding to block and discourage unauthorized vehicle use.

***Objective 6: Retain non-commercial hardwood and conifer tree species.***

- Retain Pacific yew and hardwoods, where operationally feasible.

***Objective 7: Protect Riparian Reserves***

- Do not cut vegetation within two site-potential trees (330 feet) of fish-bearing streams and within one site-potential tree (165 feet) of non-fish-bearing, perennial, and intermittent streams.
- No use of skid trails in Riparian Reserves, with the exception of one location to access a landing in Unit 20-2 along road 36-3E-29.6. At this location there would be existing designated skid trails used within a Riparian Reserve to skid logs to and down the 29.6 road to an existing landing

outside the Riparian Reserve. The Riparian Reserve is for a small spring located below the 29.6 road. There is no hydrologic connectivity from the road to the spring.

***Objective 8: Protect Rangeland Improvements***

- During logging operations use of techniques such as directional falling would be used to prevent damage to fences, cattle guards, livestock watering troughs and other improvements.
- If damage to range improvements does occur, the BLM shall be notified immediately and proper repair or replacement would occur within two weeks. Proper repair of fences and gates includes keeping wire properly attached to posts, splicing or replacing broken wire in kind, repairing structures such as corners, stress panels or gates, and any other work necessary to keep improvements functional. Repair of structures such as stress or corner panels and gates requires pre-approval by BLM staff. Repair or cleaning of cattle guards damaged or filled with sediment by logging activities would require approval of BLM Road Engineering Staff for structural integrity and public safety compliance.

***Objective 9: Prevent Livestock Trespass***

- During logging activities, operators would keep all gates closed and all livestock containment systems functional to keep livestock in authorized areas.

### 2.5.3 Road Maintenance, Decommissioning, and Quarry Work

***Objective 1: Prevent off-site soil erosion and soil productivity loss.***

- Suspend ground-disturbing activity if forecasted rain would saturate soils to the extent that there is potential for movement of sediment from the road to wetlands, floodplains, and waters of the state. Cover or temporarily stabilize exposed soils during work suspension. Upon completion of ground-disturbing activities, immediately stabilize fill material over stream crossing structures. Measures could include, but are not limited to, erosion control blankets and mats, soil binders, soil tackifiers, and slash placement.
- Restrict road renovation, closure, and decommissioning work from October 15 to May 15, or when soil moisture exceeds 25%.
- Block or barricade identified roads after use and before beginning of rainy season (generally by October 15).
- Rip and water bar all newly constructed temporary routes and landings to a depth of 18 inches or bedrock (whichever is shallower), apply native, site-specific seed approved by the resource area botanist and weed-free straw, and block upon completion of use. If hauling is not completed in the same year the route is constructed, storm proof and block the route by October 15 or when soil moisture exceeds 25%.
- Rip roads identified for decommissioning to a depth of 18 inches using a subsoiler or winged-toothed ripper; apply native, site-specific seed approved by the resource area botanist and weed-free straw, and block. Seeding and mulching would occur in the same operational season that construction activities occur.
- Restrict the application of dust abatement materials, such as lignin, magnesium chloride, or approved petroleum-based dust abatement products, during or just before wet weather, and at stream crossings or other locations that could result in direct delivery to a water body (typically not within 25 feet of a water body or stream channel).

- Place waste stockpile and borrow sites resulting from road reconstruction in a location where sediment-laden runoff can be confined, at least one site-potential tree height from a stream.

*For culvert removal, replacement, or installation:*

- Restrict culvert removal and replacement from October 15 to May 15, or when soil moisture exceeds 25%.
- When removing culverts, pull slopes back to the natural slope, or at least 2:1, to minimize sloughing and erosion and minimize the potential for the stream to undercut stream banks during periods of high stream flows.
- Apply site-specific native seed and straw to soils that are disturbed or exposed during stream culvert removal, replacement, and installation in the same operational season the work is completed.
- De-water streams during culvert installation and replacement to maintain optimum bedding material moisture content and minimize the movement of sediment downstream.
- Remove all possible excess sediment from stream channels during culvert removal, replacement, and installation in the same operational season the work is completed.
- Perform instream work from June 15 to September 15.

*For quarry development and operations:*

- Restrict quarry development and rock crushing operations whenever soil moisture conditions or rainstorms could cause the transport of sediment resulting from quarry operations to nearby stream channels (generally October 15 to May 15).
- If explosives are necessary in quarry development, require a detailed blasting plan to minimize the amount of rock material outside the designated quarry perimeter.
- Construct silt fences or other preventive structures (diversion ditches, settling ponds) as needed to prevent the potential for runoff from quarry operations into nearby stream channels.
- Plant site-specific native grass seed, native vegetation, or both within the same operating season to stabilize exposed soil in overburdened areas from quarry operations.

***Objective 2: Minimize disturbance to wildlife during their nesting season***

- Seasonally restrict blasting activities from March 1 to September 30 within 0.5 mile of known NSO sites. The seasonal restriction could be waived if non-nesting status is determined.
- Seasonally restrict mechanical roadside brushing activities and heavy equipment use from March 1 through September 30 within 200 feet of known NSO and raptor nests. This seasonal restriction could be waived if non-nesting status is determined.

***Objective 3: Minimize the spread of noxious weeds***

- Use approved rip rap, aggregate, and borrow material for road renovation and surfacing. BLM material sources would be surveyed prior to use and would be free of noxious weeds. If noxious weeds are found, they would be treated before material extraction and use.
- Aggregate, including rip rap, from a commercial source would be from an accredited, weed-free quarry or would have to be crushed between November 1st and June 15th immediately prior to

application. Aggregate stockpiled between June 16th and October 31st of the previous year would not be accepted.

### 2.5.4 Fuels Treatments Associated with Timber Harvest

***Objective 1: Minimize disturbance to wildlife during their nesting season***

- Seasonally restrict prescribed burning and site preparation with chainsaws from March 1st to July 15th within 0.25 mile of known active NSO nests. The seasonal restriction could be waived if non-nesting status is determined.

***Objective 2: Minimize amount of surface fuel loading from harvest activities***

- Conduct a post-activity fuels assessment in treated areas. Modifications or additional treatment recommendations would be based on the fuels assessment and the amount of slash created during harvest and small diameter thinning project activities. Treatments including, but not limited to, hand or machine slash piling, slash pile burning, underburning, and biomass removal may be needed to further reduce the fuels hazard to an appropriate level within all units.
- To reduce the amount of surface fuel loadings and emissions from prescribed burning, remove slash from the site, when feasible, by using whole tree harvesting, chipping limb slash in the harvest unit, or a combination of both methods. Where whole tree harvesting is permitted, landing slash would be chipped, burned, or moved off site.

***Objective 3: Minimize the spread of noxious weeds***

- When post-harvest slash is piled and burned on landings located along main roads, apply native, site-specific seed and weed-free straw to the burn pile scars after the close of the timber sale contract.

***Objective 4: Minimize affects to riparian areas***

- Do not machine pile slash within riparian areas.
- Do not treat vegetation or stack slash piles within 120 feet from fish-bearing, perennial streams and more than 50 feet from non-fish-bearing, intermittent streams. Piles would not be placed in channel bottoms and dry draws.
- Prohibit the use of foam agents within two site-potential trees (330 feet) of fish-bearing, perennial streams and within one site-potential tree (165 feet) of non-fish-bearing, intermittent streams during prescribed burning and mop-up activities.

***Objective 5: Conduct fuels reduction to minimize impacts to other resources.***

- Provide an approved prescribed fire plan prior to ignition of all prescribed burn units in compliance with the 2014 Interagency Prescribed Fire Planning and Implementation Procedures Guide (PMS 484). The prescribed burn plan would contain measurable objectives, a predetermined prescription, and an escape fire plan to be implemented in the event of an escape.
- To prevent fire escapes and to minimize damage to residual vegetation and trees, schedule burning to occur when weather and fuel conditions allow for lower fire intensities (typically late fall through spring).
- Conduct prescribed burning in compliance with Oregon Department of Forestry's Smoke Management Plan. Smoke emission control could also include conducting mop-up as soon as

possible after ignition is complete, covering hand piles to permit burning during the rainy season, and burning lighter fuels with lower fuel moistures to facilitate rapid and complete combustion, while burning larger fuels with higher moisture levels to minimize consumption.

- Slash piles would be placed at least 10 feet away from a leave tree. Burn slash piles when soil and duff moisture content is high.

### 2.5.5 Water Source Restoration

***Objective 1: Minimize disturbance to wildlife during their nesting season***

- Seasonally restrict chainsaw and heavy equipment use from March 1st through September 30th within 200 feet of known NSO or raptor nests. This seasonal restriction could be waived if non-nesting status is determined.

***Objective 2: Minimize the amount of surface fuel loading from restoration activities***

- Lop and scatter, hand pile and burn, chip, or remove from the site slash resulting from brushing and clearing activities in order to reduce fire hazard.

***Objective 3: Prevent off-site soil erosion and soil productivity loss***

- Dispose of end-haul material in stable sites outside of floodplains, as identified by the BLM Authorized Officer. Apply erosion control measures at disposal sites to minimize sediment delivery to water bodies.
- Use sediment-control measures such as weed free straw bales, filter cloth, or sediment fences.
- Perform water source restoration work between June 15th and September 15th.
- Temporarily suspend work if monitoring indicates rain storms have saturated soils to the extent that excessive stream sedimentation is possible.
- Apply native plant seed and weed-free straw as soon as possible after excavation or ripping to reduce erosion.
- Minimize disturbance to existing riparian vegetation in order to maintain slope stability and shade.

## 2.6 ALTERNATIVES AND ACTIONS CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

In the development of the Proposed Action, BLM considered numerous ways to meet the Purpose and Need. What is presented in this Environmental Assessment (EA) as the Proposed Action reflects what the planning team determined to be the best balance and integration of resource conditions, resource potential, competing management objectives and expressed interests of the various communities that have a stake in the project. Other actions or alternatives were discussed and eliminated from detailed study for the reasons given below.

1. **Develop an alternative that focuses on long-term benefits and implements the most appropriate silvicultural treatment based on stands needs, regardless of the impacts to the northern spotted owl (NSO) and their habitat, including treating in nest patches.**

**Rationale for Elimination:** The Bieber Salt Forest Management Project is designed to manage forest stands to promote tree survival and growth and to improve stand vigor, resiliency, and stability while protecting and conserving federally listed and proposed species (including the northern spotted owl) and managing their habitat to contribute toward their recovery in compliance with applicable laws and policies

(USDI 1995, pp. 17-18, 50-51). This alternative was not analyzed in detail as it would not meet the purpose and need of this project or conform to Medford District's current land use plan (USDI 1995) or BLM's Special Status Species Management Manual (USDI 2008), which states to "ensure that BLM actions are not likely to destroy or adversely modify designated critical habitat of any threatened or endangered species listed under the ESA" (USDI 2008, p. 13).

**2. Develop an alternative that prescribes regeneration harvest (including variable retention harvest) for stands that are highly suitable for that prescription, including within NSO Critical Habitat, NSO nest patches, or any other NSO habitat.**

**Rationale for Elimination:** Approximately 264 acres would be available for regeneration harvest based on their age and past management. One of the stated needs for this project is to protect and conserve federally listed species in compliance with the Endangered Species Act, approved recovery plans, and the Medford District RMP. The Revised Recovery Plan for the Northern Spotted Owl (Recovery Actions 10 and 32) (USFWS 2011), the 2012 Final Critical Habitat Rule (77 Federal Register 233:71876-72068), and the Ginger Springs Municipal Watershed Management Plan (USDI 1998) make regeneration harvest of those units not feasible at this time within the Bieber Salt Project Area. This alternative was not analyzed in detail because it would not meet the purpose and need of this project or conform to Medford District's current land use plan (USDI 1995) or BLM's Special Status Species Management Manual which ensures that BLM actions are not likely to destroy or adversely modify designated Critical Habitat of any threatened or endangered species listed under the ESA (BLM SSS Manual 6840, p. 13) (USDI 2008).

**3. Develop an alternative that includes thinning in Riparian Reserves. Include a variety of thinning intensities and gap cuts in the outer portions of Riparian Reserves.**

**Rationale for Elimination:** Within the Project Area, forest stands in both upland and riparian areas were considered for treatment to meet land use allocation objectives. Thinning in Riparian Reserves was considered if a need was identified for forest restoration treatments to attain Aquatic Conservation Strategy (ACS) and Riparian Reserve objectives (e.g. to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics) (USDI 1995, p. 27, 62). Through the proposal development process, thinning in Riparian Reserves were considered, but not carried forward as part of the final proposed action or alternative because there were very few opportunities to include riparian treatments due to the location of the proposed upland units in the Bieber Salt Project. This is in part due to the relatively low stream density for the area where proposed units are located. The Riparian Reserve adjacent to unit 35-2 was reviewed by the resource areas professional staff including the areas silviculturist, fish biologist, hydrologist, soil scientist, and layout forester who all agreed the Riparian Reserve did not need treatment at this time. Other proposed upland units had much smaller areas of Riparian Reserves adjacent to them and were not in need of treatment. The BLM looks for stands that are in the need of stocking control, stand reestablishment, establishment and management of desired nonconifer vegetation to acquire desired vegetation characteristics needed to attain the objectives of the ACS. The Interdisciplinary Team (IDT) determined that there would not be a benefit from the small amount of area that would be left to treat in order to meet ACS objectives.

**4. Develop an alternative that would avoid new road construction.**

This alternative would have eliminated any new road construction needed to improve vehicle access for the purpose of managing forest stands.

**Rationale for Elimination:** While new road construction was not avoided, road construction was limited when possible and the road construction proposed is temporary versus permanent. The Medford District RMP directs that all silvicultural systems (forest thinning strategies) applied to achieve forest stand

objectives would be economically practical (USDI 1995, p. 180; USDI 1994, p. 2-62). The economic feasibility of forest management actions is affected by the ease of access from the forest road system. An alternative that would eliminate all new road construction would have made it uneconomical to manage stands within the Project Area. While road construction was not completely eliminated, new temporary road construction was limited to less than a tenth of a mile (approximately 375 feet).

5. **The BLM considered about 100 acres of Small Diameter Thinning (SDT) and included it in the scoping notice.**

**Rationale for Elimination:** After further field evaluation, SDT was not needed in the project area because the stands proposed for this treatment were determined to not be ready for a thinning entry. A portion (about 21 acres) of one of the stands was determined to be in need of a thinning treatment and is included in the proposed action as a Selective Thinning unit.

## 2.7 MONITORING

Much of implementation monitoring is accomplished in the day to day work by BLM employees. Project supervisors, contract inspectors, and timber sale administrators review the work being done and assure compliance with the regulations and stipulations in the applicable administrative documents. The majority of actions described under the alternatives are implemented through a timber sale, service, or stewardship contract. In the case of contracts, implementation monitoring is accomplished through BLM's contract administration process. PDFs included in the project description are carried forward into contracts as required contract specifications. BLM contract administrators and inspectors monitor the daily operations of contractors to ensure that contract specifications are implemented as designed. The inspection reports would be shared with the Field Manager and Project lead and the ID team would be notified when inspection reports are available. If work is not being implemented according to contract specifications, contractors are ordered to correct any deficiencies. If unacceptable work continues, suspension of contracts and/or monetary penalties can be applied. Coordination with resource specialists to develop workable solutions would occur when site specific difficulties arise.

The BLM would monitor the extent of spotted owl habitat affected by the proposed Bieber Salt Project to ensure that those effects are consistent with the analysis in this EA and in relevant consultation documents. The BLM would report the results to the Service through annual monitoring reporting requirements. Implementation of Project Design Criteria (PDC) is monitored through the BLM sale-contracting program in coordination with the Resource Area wildlife biologist.

# CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

## 3.1 INTRODUCTION

### 3.1.1 Brief History of the Project Area

The history of the Little Butte Creek watershed provides the foundation for understanding the conditions that exist in the Project Area today. Natural processes and human activities influence and shape the vegetation and landscape found within the Project Area. They may cause slow and subtle changes only visible through the passage of time, or sudden, devastating changes that occur in an instant.

Fire was a common occurrence in this region and the natural fire return interval for Cascade mixed conifer forests was historically around 7-13 years (Sensenig 2002). These wildfires were largely of mixed-severity (low-medium severity) and occurred in a patchy distribution, creating a mosaic of stand ages, tree sizes, and structures across the landscape. Stand replacing fires occurred at substantially longer return interval of around 200 years. Lower elevation sites were dominated by oak savannahs with scattered individual white oak (*Quercus garryana*) which is adapted to low-density conditions with frequent wildfires. White oak communities were typically burned by Native American tribes for the purpose of regenerating vegetation and encouraging new growth for subsequent harvest periods. Fire was also a substantial factor in the development of old-growth stands by reducing competition from stems that would have otherwise increased competition for growing space and nutrients. Old-growth stands were generally open with scattered, large-diameter trees because smaller trees, which often lacked the thick bark necessary to resist fire, were often killed (Sensenig 2002).

From 1960 to 2015, the Project Area has experienced 87 small fires (less than 100 acres) on BLM-administered and private lands. Since 1930, five large fires totaling 3,065 acres have occurred in the Project Area.

Fire was the main disturbance agent for centuries until around the mid-19$^{th}$ century when two major activities, logging and fire suppression, put forest stands on a trajectory that greatly differed from historical development patterns and landscape-level variability. Much of the forestland within the Analysis Area therefore reflects unnatural and undesirable changes in characteristics and conditions, such as species composition, stand structure, and stand density.

Natural forces such as wildfires, floods, and windstorms have altered vegetation and stream conditions. Wildfires and windstorms influence vegetation patterns, stand ages, and species composition. Floods cause streams to change channels, wash away soils and streamside vegetation, deposit gravels and sediments, and form pools.

Human influences on the land have a continual and wide-ranging effect on the natural environment. Native Americans appear to have used this area lightly and probably visited seasonally to hunt game or gather edible plants. Native hunters and gatherers lived in low-elevation villages and moved into the higher elevations during the summer and early fall as edible plants and game animals became more abundant.

By the mid-1940s, much of the mature timber on timber company lands had been harvested and the demand for timber from Federal lands increased. The high demand for lumber during World War II also

served to increase timber harvest on Federal lands. Roads were built or extended to provide access to timber stands, improve fire protection capabilities, and provide access for recreation and administration.

Passage of the O&C Act in 1937 provided direction for Federal lands managed by the BLM in this area. The O&C Act is intended to contribute to the local economy by providing for Federal timberlands to be managed for permanent timber production on a sustained yield basis. One of the purposes of the O&C Act was to increase timber harvest on these lands to their timber-producing capacity. Timber harvest revenues were to provide a consistent level of income to the counties that contain O&C lands.

In January 2008, a windstorm brought strong winds and heavy rain and snow to southern Oregon. Wind gusts up to 90 miles per hour downed power lines and uprooted trees through the eastern portion of the BLM Medford District's Butte Falls Resource Area. Blown down trees occurred throughout the Big Butte Creek, Little Butte Creek, South Fork Rogue River, and Rogue River/Lost Creek fifth field watersheds. The blowdown severity varied from scattered individual trees to severely damaged stands showing catastrophic impacts. Blowdown was scattered across 6,300 acres of BLM lands. Through a series of roadside salvage and area salvage timber sales, the BLM salvage harvested approximately 5,000 acres throughout the 4, fifth field watersheds. The BLM salvaged blowdown on 1,439 acres located within the Bieber Salt Project Area.

In September 2008, the summer after the windstorm, lightning rolled over the Salt Creek drainage south of the Project Area and started the Doubleday Fire, which started within the Project Area and burned over the ridge towards the town of Butte Falls. The conditions were extreme with dry fuels and high winds. The fire burned a total of 1,271 acres with 316 acres in the Project Area; 105 acres burned on BLM lands within the Project Area. Of the 105 acres on BLM, 50 acres were salvaged in 2009 under the Doubleday Fire Salvage project. The BLM planted native conifers in the areas that sustained mortality of more than 90% of the conifer. Most of the private merchantable timber was salvaged and private lands were replanted soon after the fire.

Land ownership patterns, past timber harvest, windstorms, wildfires, and fire exclusion have helped to create the existing conditions in the Bieber Salt Project Area. Fire exclusion and harvest methods have contributed to the current high density and multiple-layered stand conditions in many of the proposed harvest units. Past harvest methods also influenced the locations and conditions of the roads within this watershed. These past practices have contributed to the affected environments described in detail later in this section.

Since 2002, the BLM has decommissioned 5.83 miles of road in the Project Area.

### 3.1.2 Consideration of Past, Ongoing, and Reasonably Foreseeable Actions in Effects Analysis

The current condition of the lands in the Bieber Salt Project Area is the result of a multitude of natural processes and human actions that have taken place over many decades. A catalogue and analysis, comparison, or description of all individual past actions and their effects which have contributed to the current environmental conditions would be practically impossible to compile and unduly costly to obtain. Ferreting out and cataloguing the effects of each of these individual past actions would be a time consuming and expensive task which would not add any clearer picture of the existing environmental conditions.

Instead of incurring these exorbitant costs in terms of time and money, it is possible to implement simpler, more accurate, and less costly ways to obtain the information concerning the effects of past

actions, which is necessary for an analysis of the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions." (See the definition of "cumulative impact" in 40 CFR § 1508.7.) For the Bieber Salt Forest Management Project, aerial photograph analysis and GIS databases were utilized in helping to determine past actions on both federal and private lands.

43 CFR § 46.115 states that when considering cumulative effects analysis, the agency must analyze the effects in accordance with relevant guidance issued by the Council on Environmental Quality (CEQ). As the CEQ points out in guidance issued on June 24, 2005, the "environmental analysis required under NEPA is forward-looking," and review of past actions is required only "to the extent that this review informs agency decision-making regarding the Proposed Action." Use of information on the effects of past action may be useful in two ways according to the CEQ guidance: for consideration of the Proposed Action's cumulative effects, and as a basis for identifying the Proposed Action's direct and indirect effects.

The CEQ stated in this guidance that "[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." This is because a description of the current state of the environment inherently includes the effects of past actions. The CEQ guidance specifies that the "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions." The importance of "past actions" is to set the context for understanding the incremental effects of the Proposed Action. This context is determined by combining the current conditions with available information on the expected effects of other present and reasonably foreseeable future actions.

Effects analyses completed for resources potentially affected by the Bieber Salt Forest Management Project describe indicators of importance along with the spatial (Analysis Area) and temporal scale of importance for determining the effects of multiple actions (past, current and reasonably foreseeable) on affected resources. As discussed above, the current condition assessed for each affected resource inherently includes the effects of past actions.

The analysis of the effects of other present and reasonably foreseeable actions relevant to the effects of the Proposed Action is necessary. How each resource analysis uses information concerning other ongoing or reasonably foreseeable activities is, however, dependent on the geographic scale of concern and attributes considered during each resource analysis.

The following listing of activities is only presented to provide an overview of land management activities occurring, or that recently occurred, within or adjacent to the Bieber Salt Project Area or associated Analysis Areas.

#### 3.1.2.1 Ongoing and Reasonably Foreseeable Actions

*Grazing Leases*

There are five active grazing allotments within the 25,630-acre Bieber Salt Forest Management Project Area. The Wasson Canyon pasture of the Big Butte Grazing Allotment is entirely encompassed by the Project Area boundary, while only portions of the Lake Creek Spring, Heppsie Mountain, Salt Creek, and Summit Prairie allotments are within the Project Area boundary. There are 9,130 acres of BLM-administered lands within the Project Area, of which 9,048 acres are within an active allotment. Therefore, 99% of BLM-administered lands and 63% of all lands in the Project Area are available for

grazing. The seasons of use range from April 16th to October 15th annually. See also Appendix A, Issue K for more information on grazing in the Project Area.

*Mining*

There are currently no active mining claims in the Project Area.

*Timber Harvest on Private Lands*

The landscape pattern in the Bieber Salt Project Area is largely determined by the checkerboard ownership. Blocks of BLM-administered lands intermingle with privately owned lands. Field observation and review of aerial photographs indicates most timber company lands within the watershed have been harvested. The majority of merchantable overstory trees were removed, leaving younger stands of Douglas-fir with lesser amounts of ponderosa pine, incense cedar, and scattered hardwoods. Some of these harvested acres have been planted and are now plantations of ponderosa pine or Douglas-fir of varied sizes and ages.

"The nonfederal forests within the range of the northern spotted owl are predominantly forests that have grown back since harvest and are generally even-aged stands. They are typically managed as commercial forests. . . . harvest generally occurs in a stand's fifth or sixth decade" (USDA and USDI 1994, pp. 3, 4-6). The Northwest Forest Plan states "these forests generally are now in early and mid-successional stages, with many at or approaching ages and sizes that will predictably result in harvest."

*Planned Forest and Fuels Management on BLM-administered Lands*

In February 2015, a wind storm blew over a large number of trees throughout the east side of the Butte Falls Resource Area. In the spring of 2016, approximately 20 acres of blowdown and standing hazard trees within forest stands, as well as trees along the roadside that have fallen into or alongside the road, or pose a hazard, will be harvested in the Wasson Canyon area (T. 36 S., R. 02 E., section 29 and T. 36 S., R 02 E., section 13).

An additional 1,371 acres of possible fuels treatments could occur under the Salty Gardner Project.

*Pacific Connector Gas Pipeline*

The PCGP Project is a proposed 234-mile long interstate natural gas transmission line designed to transport natural gas from the Jordan Cove Energy Project (JCEP) terminal to markets. The proposed pipeline right-of-way (ROW) crosses through 5.4 miles of the Bieber Salt Project Area through the following sections: The nearest proposed treatment unit is about 1.4 miles away; however, timber haul would occur on Salt Creek Road where the proposed pipeline right-of-way would cross.

In addition to various above-ground facilities located throughout the extent of the proposed transmission line, the PCGP proposal includes the construction of a 95-foot wide right-of-way (ROW) wherein a 36-inch steel pipeline would be installed below-ground. The proposal also includes use of both existing and newly-constructed roads.

The Federal Energy Regulatory Commission (FERC) is the federal agency responsible for authorizing interstate natural gas transmission facilities, as specified in section 311(e)(1) of the Energy Policy Act of 2005 (EPAct) and the Natural Gas Act (NGA). For the PCGP Project, in accordance with section 313(b)(1) of the EPAct, the FERC is the lead federal agency for the coordination of all applicable federal authorizations, and is also the lead federal agency for the preparation of the Project EIS in compliance with the requirements of NEPA, as outlined in the CEQ regulations for implementing the NEPA (40 CFR Parts 1500-1508), and the FERC's regulations (18 CFR Part 380).

Various other agencies, including the BLM, are cooperating agencies for the development of the Project EIS. A cooperating agency has jurisdiction by law or special expertise with respect to environmental impacts involved with the proposal, and is involved in the NEPA analysis, including the development of mitigating measures.

The FERC and the cooperating agencies each have their own actions related to the review and approval of the PCGP. In addition to analysis conducted by cooperating agencies, various federal, state, and local permits, approvals, and consultations identified for construction and operation of the JCEP and PCGP must be acquired and completed prior to the start of pipeline construction. Agencies included in this process include (but are not limited to) the Federal Communication Commission (FCC), U.S. Army Corps of Engineers (COE), Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Environmental Quality (ODEQ), Department of Transportation and the Federal Aviation Administration (DOT/FAA), Bureau of Reclamation (BOR), the National Marine Fisheries Service (NMFS), and Douglas, Jackson, Klamath and Coos counties.

The Final Environmental Impact Statement (FEIS) for the Pacific Connector Gas Pipeline project was published in September 2015 and protests were received through December 21, 2015.

FERC is the agency that authorizes the siting and construction of LNG facilities. FERC issued its decision, called an Order, on March 11, 2016 denying the proponents' applications to site and construct both the LNG facility in Coos Bay and the pipeline that would have supplied it with natural gas. The applicants may request a rehearing of the Order within 30 days. If they do, FERC may consider the request for 30 days after the rehearing request is filed.

Without an Order from FERC approving the projects, BLM's consideration of the Right-of-Way Grant application and the draft amendments to the RMPs on four affected districts would become moot.

*Resource Management Plans for Western Oregon*

The BLM is revising the resource management plans for the western Oregon BLM Districts, including the Medford District. The Proposed Resource Management Plan/Final Environmental Impact Statement was released for public review in April 2016. The revised management plan will provide guidance for the management of BLM lands in western Oregon. The Record of Decision is expected to be signed in June-July 2016.

## 3.2 Forest Condition

### Issue 1: How would thinning of conifer stands affect long-term productivity of stands, resiliency, species composition, and structural characteristics in the Matrix (GFMA and Connectivity) land use allocation within the Analysis Area?

### 3.2.1 Introduction

One purpose and need identified for the Bieber Salt Forest Management Project is to improve long-term productivity and resiliency within treated stands, promote desirable species composition, and produce a sustained yield of timber products from BLM-administered lands to support local and regional economic activity. As a result, the treatment and modification of forest vegetation is the primary focus of this analysis and Project Design Features reflect that focus. This section describes the current condition of the forested environment and how that relates to the proposed actions and subsequent vegetation conditions within the Project Area and the effects of the project on forest resources.

### 3.2.2 Analysis Area/Spatial Extent

The Bieber Salt Forest Management Project is located within the Salt Creek and Lower North Fork Little Butte Creek sub-watersheds in the Little Butte Creek 5th field watershed. For purposes of analyzing the effects on forest condition, the Analysis Area includes all BLM-administered land within the Bieber Salt Project Area (Maps 1 to 4). Due to the stand-level impacts of the proposed actions and the different management strategies between private and federal land, the Analysis Area encompasses only those BLM-administered lands on which the proposed actions would have direct effects. The total size of the Project Area is 25,629 acres, or approximately 40 square miles. BLM-administered lands comprise 9,132 acres within this area, private ownership comprises 15,450 acres, and the remaining 1,050 acres are Forest Service lands.

### 3.2.3 Methodology

Forest condition and forest health information for the Analysis Area was compiled using the following sources:

- 1995 Medford District Resource Management Plan/Environmental Impact Statement (RMP/EIS);
- The Little Butte Creek Watershed Analysis (1997) provided baseline information specific to forest vegetation and the impacts of managing forest stands;
- Geographic information system (GIS) data which describes the kind, amount, and distribution of forest vegetation on BLM-administered lands across the watersheds and subwatersheds in which the projects are located;
- Field visits to proposed treatment units and stand exam data collected; and
- Research publications, which provide baseline information specific to forest vegetation, fire effects, and plant succession.

### 3.2.4 Assumptions

- Forest management activities would occur on BLM-administered lands allocated to planned, sustainable harvest. The type, quantity, and impacts of timber management activities were analyzed in the Medford RMP/EIS for both the short- (10 years) and long-term (decades).
- Most private forestlands have been and would continue to be intensively managed with final harvest on commercial economic rotations averaging 60 years (USDA and USDI1994, pp. 3&4-5 to 3&4-7).
- Impacts to forest vegetation by predicted regional climate change is uncertain. The regional climate has become warmer and wetter with reduced snowpack and continued change is likely (USDI 2008).

### 3.2.5 Forest Environment

The forest environment is comprised of accumulated live and dead plant biomass generally arranged in terms of the dominant vegetation in the overstory, midstory and understory. This report identifies five metrics that describe the forested environment as it relates to the project effects within the Bieber Salt Forest Management Project. These characteristics of forest environment can be manipulated and mitigated to achieve defined modifications in the composition, structure, ecosystem functions and potential effects. The metrics that are modeled over time are as follows:

1) *Basal Area*: Basal area is the common term used to describe the average amount of an area (usually an acre) occupied by tree stems. It is defined as the total cross-sectional area of all stems in a stand measured at breast height, and expressed as per unit of land area (typically square feet per acre).
2) *Relative Density Index*: Various scientific methods have been developed that can predict or identify a threshold level of density at which a forest stand will decline in production and health due to the impacts of excessive competition. Relative Density Index (RDI) is one such measure and is defined as the ratio of actual stand density to the maximum stand density attainable or expected for that stand, which is dependent upon the species composition. The maximum stand density or carrying capacity used in these equations is the density at which self-thinning (mortality) will occur. Relative density measures help determine if resources are being optimally utilized in stands and at which point density-dependent mortality will occur. Drew and Flewelling (1979) concluded that the correlative density index rating of 0.55 and greater for any given stand marks the initial point of imminent mortality and suppression.
3) *Trees per Acre:* The most basic measure of stand density expressed as the number of trees per acre (TPA).
4) *Quadratic Mean Diameter:* Quadratic mean diameter (QMD) is a measure of the average mean diameter of all trees in a measurement unit, which is calculated using the central tendency of the averages.
5) *Canopy Cover*: Canopy cover refers to the proportion of the forest floor covered by the vertical projection of the tree crowns….Measurements of canopy cover assess the presence or absence of canopy vertically above a sample of points across an area of forest. Canopy cover is a key metric important to stand-level microclimate, wildlife habitat requirements, and prey protection.

## 3.2.6 Affected Environment

### 3.2.6.1 Location

The Bieber Salt Forest Management Project is located in Southwest Oregon northeast of the city of Medford. See Chapter 1, Section 1.3 for a more detailed description of the project location.

### 3.2.6.2 Topography

Elevation ranges from 1,560 to 5,240 feet and 43% of the total area is within the Transient Snow Zone (see Appendix A, Issue I).

### 3.2.6.3 Physiography

The Bieber Salt Project Area is located within the Cascades West Physiographic Province and includes portions of the Oak Savanna Foothills and Southern Cascades Ecological Regions (EPA).

### 3.2.6.4 Geology/Soils/Site Potential

Growth and development patterns of forest stands are in part driven by site productivity, which is a function of soil type, elevation, and available water and nutrients. Equations and graphs for predicting the height growth of dominant and codominant trees is useful for determining site productivity because the average height growth of dominant and codominant trees is a major component of volume growth (Hann & Scrivani, 1987). According to Hann & Scrivani (1987), "The height growth of dominant trees is relatively independent of stand density and therefore can be used as a measure of site productivity." Site index is the most common measure of a site's productivity and is defined as the average height of the dominant trees in an even-aged stand at a selected base age (usually 50 or 100 years). A higher site

index value indicates a higher level of productivity. Site index values range from 40 to 140 and are often associated with site classes, which is a rating value that explicitly quantifies the level of productivity of the stand being observed. Soil factors such as topsoil depth, soil texture, nutrient availability, elevation, and drainage affect the productivity of a site and the potential height growth of trees on that site. Potential height growth can be calculated for dominant and codominant trees of a particular species based on the given quality of a site (Tappeiner et. al, 2007). The average Site index for trees measured in proposed treatment units within the Analysis Area is 81.21, with a range of 60-104. The resulting average Site Quality Class designation is Class IV, although consideration of the full range would include Class V and III. The values are considered to be in the low to medium productivity range.

#### 3.2.6.5 Climate

The climate of the Analysis Area is generally warm and dry with typically cool, wet winters and hot, dry summers. Average summer temperatures range from the high 70s to the low 90s. Occasional daytime temperatures in the summer may reach the low 100s. Winter lows drop regularly to 10° to 20°F. Annual precipitation averages 35 inches. Most of the precipitation occurs from mid-October to mid-April as rain or snow.

#### 3.2.6.6 Disturbance Ecology

**Fire Ecology:** The historical role of fire, fire suppression, and previous management activities have led to the development of stand conditions that reduce tree growth, resiliency to insects and pathogens, and structural heterogeneity. The level of competition and the impacts of current stand conditions necessitate treatment in the proposed units. Treatments can reduce existing negative conditions by improving growth in residual trees and assisting the development of trees with old-growth characteristics such as high volume growth, thick bark, and better resilience towards fire, insects, and pathogens.

Fire has shaped the evolutionary trajectories of nearly all terrestrial ecosystems within the Cascade Range bioregion, which includes the Bieber Salt Analysis Area. It is widely accepted that forested environments across the west have been altered by Euro-American land use practices. Most forest lands in Southwest Oregon were logged, grazed, and burned beginning in the mid to late 19th century (Atzet and Martin 1992). These activities were followed by a century or more of fire exclusion in addition to a policy of fire suppression, which was implemented on BLM-administered lands and has successfully excluded fire from much of the landscape. The exclusion of fire has had a profound influence on the structure, function and composition of forest stands and forest landscapes in these fire-adapted systems. Reduced fire frequency in mixed conifer forests has created unprecedented accumulations of biomass (Stephens and Sugihara 2006). Higher stand densities and increased horizontal and vertical continuity of fuels has increased the risk of undesirable disturbance events such as high intensity fire, including crown fire (Scott and Reinhardt 2001, Hardy 2005). Fire has historically played a crucial role in the development of forests as a disturbance agent which has helped to manage stand density, influence species composition, create snags, affect the availability of certain key nutrients, and direct the pattern of plant succession. It is therefore an important variable to consider when analyzing forest conditions. For a more detailed description of fire history in the Project Area, see Chapter 3, Section 3.1.1

**Insects and Disease:** Douglas-fir dwarf mistletoe (*Arceuthobium douglasii*) is present throughout the Project Area. Mistletoe infection spreads faster in high-density stands. In open, low-density stands mistletoe spread is slow because the seeds, which are projected outward as far as 49 feet, cannot easily reach the canopies of nearby trees. Mistletoe can reduce growth and vigor of infected trees in addition to branch and top kill, poor wood quality, and mortality, particularly in trees with higher levels of infection (Tainter and Baker 1996). Once infected trees lose vigor, they become increasingly susceptible to other infectious diseases and insect attacks. The majority of proposed treatment units have low to moderate

levels of infection although two units have high levels of infection. The Dwarf Mistletoe Rating (DMR) system is a method of assessing infection severity by dividing the tree crown into thirds and giving each section a rating of 0-2 depending on the level of infection. The highest rating possible is six (6). The DMR rating in proposed treatment units ranges from 1.0-4.8, the average being a rating of 2.0.

#### 3.2.6.7 Dominant Vegetation

Overstory vegetation is primarily composed of Douglas-fir (*Pseudotsuga menziesii*) trees with a mixture of other conifer tree species like pine, cedar, and white fir (*Abies concolor*). White fir, due to its high shade tolerance, is becoming dominant and is actively competing out other conifers of lower shade tolerance in addition to competing with trees of similar shade tolerance.

#### 3.2.6.8 Plant Associations

The Analysis Area lies within three different forest zones as described by Franklin and Dyrness (1973): Interior Valley, Mixed-Conifer, and White Fir. Within each forest zone are different plant series and plant association groups (PAGs), which are based on the concept of "potential natural vegetation": the vegetation composition reflective of climax conditions developed without disturbance by biotic and abiotic factors such as fire, insects, and humans after approximately 500 years. Douglas-fir and white fir are the most dominant plant series within the Analysis Area. The PAGs found in the Analysis Area are listed in Table 3-1. These climax conditions, however, would not necessarily occur naturally because of the historical reoccurrence of fire and its role in the development of species composition, seral stages, and plant succession. Thus, the effects of disturbance on the landscape must be taken into consideration when evaluating vegetation conditions. Species composition and growth conditions are also influenced by key environmental variables such as soil, precipitation, nutrient availability, aspect, and temperature.

The Interior Valley Zone encompasses the lower elevation ranges of the Analysis Area (up to about 2,700 feet) in the Oak Savannah Foothills region and contains the Oregon white oak (*Quercus garryana*) plant series and ponderosa pine plant series. This area is characterized by a more xeric (dry) soil moisture regime and higher average temperatures which are more suitable conditions for species adapted to drier conditions.

The Mixed-Conifer Zone encompasses the mid to upper elevation ranges (2,460 to 4,592 feet) east of the Oak Savanna Foothills closer to and within the Southern Cascades Ecological Region and has higher levels of precipitation and lower average temperatures than that of lower elevation sites. This is the most dominant zone within the Analysis Area. Plant series that typify this area include Douglas-fir series, western hemlock series, and white fir series. The PSME-QUKE/RHDI6 association contains an overstory of Douglas-fir, sugar pine, and ponderosa pine with a smaller component of California black oak (*Quercus kelloggii*), madrone (*Arbutus menziesii*), and incense-cedar (*Calocedrus decurrens*). Poison oak is common in the shrub layer. This plant association is the warmest of the Douglas-fir dry associations.

**Table 3-1. Table of Plant Association Groups within the Analysis Area**

| White Oak | Ponderosa Pine | Douglas-fir | White Fir | Western Hemlock |
|---|---|---|---|---|
| QUGA4-PSME/RHDI6 | PIPO-PSME | PSME-QUKE/RHDI6 | ABCO-PSME/SYMO-ROGY/TRLA6 | TSHE/BENE2-GASH/POMU |
| | | PSME/BENE2/POMU | ABCO/BENE2/WHMO | TSHE-ABCO/BENE2/LIBOL |
| | | | ABCO/BENE2-ROGY/CHUM | |

Abbreviations:

ABCO: White fir
BENE2: Dwarf Oregon grape
CADE27: Incense cedar
GASH: Salal
PIPO: Ponderosa pine
POMU: Western sword fern
PSME: Douglas-fir
QUGA4: Oregon white oak
QUKE: Black Oak
RHDI6: poison oak
SYMO: Creeping snowberry
TRLA6: Starflower
TSHE: Western Hemlock
WHMO: Whipplevine

The White Fir Zone is generally located at elevations above that of the Mixed-Conifer Zone but its presence is not substantial and it can be difficult to directly ascertain the scope and characteristics that make this zone distinct from the Mixed-Conifer Zone. The White Fir Zone is distinguished from the Mixed-Conifer Zone in the following ways: stands are comprised exclusively of white fir, species found within the Mixed-Conifer Zone are reduced in importance or are absent, and the environment has cooler temperatures (Franklin and Dyrness, 1973). The white fir series is dominant and plant associations have similar species compositions in that white fir is the dominant overstory species with a lower composition of Douglas-fir and an understory composition that includes chinquapin, white fir, and Douglas-fir. The ABCO-PSME/SYMO-ROGY/TRLA6 plant association may include sugar pine and ponderosa pine in the overstory, indicating that this occurs in drier areas within the white fir plant series. Given the species composition of stands it is likely that the White Fir Zone overlaps with the Mixed-Conifer Zone in most of the units.

### 3.2.6.9 Current Forest Conditions

Forest conditions have reached their current state through centuries of disturbance patterns but the most recent developments in forest management and utilization of timber have had a more pronounced impact on the landscape seen today. Fire was the main disturbance agent for centuries until around the mid-19$^{th}$ century when two major activities, logging and fire suppression, put forest stands on a trajectory that greatly differed from historical patterns and landscape-level variability. Much of the forestland within the Analysis Area therefore reflects unnatural and undesirable changes in characteristics and conditions, such as lack of species diversity, homogenous stand structure, and high stand density.

### 3.2.6.10 Landscape Pattern

Vegetation Condition Classes[1] separate trees into different size classes based on their diameter and can be used to describe the relative distribution of seral stages[2] across a watershed or landscape and assess

[1] Vegetation Condition Class - The BLM Medford District Watershed Analysis Committee designated 8 vegetation condition classes to describe the types of and size of vegetation present on the landscape. The condition classes are as follows: grass and herbaceous vegetation; shrub lands; Hardwood/Woodlands; early seral stage trees (0 to 5 years of age); seedlings/saplings (0 to 4.9 inches DBH); poles (5 to 11 inches DBH); mid (11 to 21 inches DBH); and mature (21 inches DBH and larger trees). (DBH=diameter at breast height)

landscape patterns. These classes are more easily defined by the vegetation size rather than by age; size and age are only roughly correlated due to the impacts of variable site factors and competition. The proportion of these vegetation condition classes within the Analysis Area demonstrates the various site conditions which influence the development of vegetation types and conditions and serves as a waypoint along the successional trajectory of stands. Table 3-2 shows the proportions of Vegetation Condition Classes within the Analysis Area. The above condition classes in themselves do not describe the structural characteristics of the vegetation and its degree of intactness (open vs. closed canopy, partial cut previously, never entered, etc.). Since most of the stands naturally exist with several cohorts, lumping them into one diameter range, such as the condition class definitions do, will often not permit the assessment of the functional characteristics of the class for vegetative and habitat assessments. They also do not allow the separation of functional old-growth stands from mature stands. For that reason, three optional descriptors have been added which can provide additional information for the condition classes. These are: 1) McKelvey Rating for the operations inventory (OI) unit; 2) whether the OI unit is intact or not; and 3) dominant age class for the OI unit entered in Micro*storms (USDI 1994c, p. 26).

**Table 3-2. Vegetation Conditions Classes- Bieber Salt Analysis Area**

| Vegetation Conditions Class | Acres | Percentage of Total | Percentage of Forestland |
|---|---|---|---|
| Grasslands/Shrubs | 615 | 6.8% | 0% |
| Hardwoods/Woodlands | 2,327 | 25.6% | 0% |
| Seedlings/Saplings (0-4.9" DBH) | 839 | 9.2% | 13.7% |
| Poles (5-11" DBH) | 316 | 3.5% | 5.1% |
| Mid Seral (11-21" DBH) | 1,729 | 19.0% | 28.1% |
| Mature/Old-Growth (21" DBH +) | 3,261 | 35.9% | 53.1% |
| **Total Acres** | **9,087** | **100.00%** | |
| **Total Forestland Acres** | **6,145** | | **100.00%** |

The data in Table 3-2 shows the majority of BLM-administered land in the Analysis Area, that is forestland, is comprised of dominant and codominant trees, although the relative proportion of this class has likely decreased as stand density has increased since this data was recorded. The desired landscape-level size class composition is of mixed proportionality and a mosaic of different sizes, which creates a heterogeneous forest structure. Regeneration and growth of smaller size classes is highly desirable at levels that do not generate high levels of competition and cause stand-wide growth stagnation. These proportions differ between stands but the general composition of lands within the Analysis Area is important when considering the entire landscape vegetation pattern.

Stand densities in the Mixed Conifer zone and White Fir Zone that average 0.35-0.45 Relative Density Index (RDI) and stands in the Interior Valley Zone that average 0.25-0.35 RDI would allow for optimal tree growth and limited mortality. According to stand exam data recorded in proposed treatment units, relative density indices range from 0.41-0.84 RDI (with an average of 0.55 RDI). This suggests that the majority of stands have either entered the zone of imminent mortality or would enter that zone in a relatively short period of time.

[2] Seral stages - The series of relatively transitory plant communities that develop during ecological succession from bare ground to the climax stage (USDI 1995, p. 112)

Species adapted to very low levels of competition, such as sugar pine and ponderosa pine, are even more susceptible to competition-related impacts than species such as Douglas-fir and white fir. Pines are generally found in drier sites that have less available water so competition from nearby trees would further reduce water availability. This has implications for stand conditions in the face of increasing occurrence of drought as well. Without a regular interval of disturbance from fire these sites have become overstocked with trees of all species but primarily Douglas-fir, which is of medium shade tolerance, and white fir, which has a high shade tolerance and is capable of thriving in the understory and eventually reaching a dominant position within stands.

#### 3.2.6.11 Coarse Woody Material

Many ecological processes have created even and uneven-aged forest stand structure in the Analysis Area over the last century. These same processes are responsible for the variable amounts of coarse woody material (CWM) contained in the proposed treatment areas. As with many stands across the landscape there are areas of surplus and areas deficit CWM loadings as they relate to the Guidelines for Snag and Down Wood Prescriptions in Southwestern Oregon (White 2001), which states that amounts of CWM across landscapes are highly variable and should vary over time with stand development. Amounts of CWM are influenced by forest stand history, soils and respective plant associations, climate, and topography. "The Northwest Forest Plan and the ROD directed development of baseline down wood and snag levels based on plant association groups" (White 2001). These groups are described as an intermediate scale between plant series and plant associations, which are described earlier in this chapter. Plant association groups will reflect ecological processes, such as productivity, that directly influence the production of snags and down wood.

### 3.2.7 Environmental Consequences

#### 3.2.7.1 Specific Assumptions

There are basic assumptions associated with any type of growth and yield vegetation modeling used for planning purposes. It is important to note that parameters describing stand conditions and potential treatment effects are outcomes of an empirical model. As such, they should be interpreted with a local real world understanding of reported stand variables in treated and untreated areas. Output data reflect modeling assumptions (i.e. growth curves, regeneration dynamics, and spatial variability) and variability within the common stand exam plots.

#### 3.2.7.2 Specific Methodology

Forest Vegetation Simulator (FVS) was used to quantify the effects of proposed vegetation treatments on composition, structure and ecosystem function. The program applies specific growth equations to tree data to model future stand conditions, such as growth, mortality, and regeneration, based on treatment parameters defined by the user. FVS is not a spatially explicit growth and yield model; even so, it does allow field data to be modeled over time.

#### 3.2.7.3 Alterative 1- No Action

Under Alternative 1, no forest, restoration, or transportation management actions would be implemented and there would be no direct effects to forest condition on BLM-administered lands in the Project Area. Alternative 1 would not meet the silvicultural objective to reduce stand densities to natural carrying capacities and create favorable growing conditions to improve individual tree health (vigor) for desirable species.

Forest stands would remain at the 0.55 RDI average, allowing density-dependent mortality to occur and leaving forested stands more susceptible to insect and disease agents (see Table 3-3). Stand densities

would continue on their current trajectory of stand development and remain overpopulated. The current average relative density for the area indicates that, physiologically, stands have entered the zone of imminent mortality. Tree vigor and growth would continue to decline as stands continue along this trajectory. Growing conditions become stagnant at or above stand density index of 0.55 RDI, resulting in intensified competition and the stand begins excluding the weakest trees. According to Tappeiner (2007), individual trees in dense stands have small crowns and a reduced capacity for diameter growth compared to trees in less-dense stands. If current conditions persist, large diameter trees decline in number and individual tree vigor would be reduced. Additionally, it can be expected that the existing large sized CWM concentrations contained in the Project Area would persist and even increase due to the density-related mortality referred to above. An elevated risk of disturbance, namely fire, would likely negatively impact the desired conditions of the stand.

A shift in species composition has major implications on forest processes and function. Shade-tolerant trees would become a large component of the canopy that would contribute to a dense forest structure prone to high stand density, density-dependent mortality, drought-induced mortality, and/or mortality caused from insect and disease agents.

Without management action, shade intolerant species like ponderosa pine and trees of large diameter would continue to decline in number due to competition. Changes in species composition may become permanent over time as the viability of seed banks decline. Any future density management activities would require planting to address this issue. Furthermore, the development of large diameter trees would be substantially diminished under high levels of density. Trees growing under these conditions lose vigor and are less resilient to drought because of competition for limited resources. Long periods of suppression can impact the relative speed with which a tree may develop adequate hydraulic architecture to support growth after release. Suppressed trees are also more susceptible to disturbance agents stress; a stand in which the majority of trees lack necessary protective characteristics, such as thick bark, would suffer higher rates of mortality than stands with adequate growth and optimal individual tree development. Structural homogeneity would persist until a natural disturbance event occurs, such as a wildfire, which would likely be of high severity given the high quantity of fuels in unmanaged stands. Alternative 1 would not meet the silvicultural objective to promote the growth and establishment of tree species that are well adapted and resilient to environmental conditions and natural disturbance regimes.

Higher levels of insect and disease infestation/infection are expected as stand density increases (Fetig et al. 2007). Tree mortality represents a reduction in stand volume production, a loss of revenue, and poor forest health. Diseases such as Douglas-fir dwarf mistletoe would persist and perpetuate the infection cycle on sites currently infected. Disease-susceptible trees continue to recolonize these sites and understory trees become infected and their likelihood of attaining large sizes is low. The pathogen survives on the site unless susceptible trees cease to inhabit the area. Alternative 1 would allow the unchecked spread of disease to continue on the sites. The direction from the Medford District RMP (USDI 1995, p. 194) is to "design silvicultural treatments so that within-stand endemic levels do not increase and where possible, the affected trees contribute to the achievement of land use allocation objectives." The No Action Alternative would not meet the stated need to maintain and promote vigorously growing conifer forests, reduce tree mortality, and provide timber resources, in accord with sustained yield principles, on BLM-Administered Matrix lands within the Bieber Salt Project Area.

### 3.2.7.4 Alternative 2 - Proposed Action

**Direct/Indirect Effects**

Alternative 2 proposes to treat 431 acres, or approximately seven percent, of forestland in the Analysis Area. Selective Thinning would be used to treat 333 acres of forest stands and the remaining 98 acres would be treated using a Density Management prescription. Refer to Chapter 2 for descriptions of the Silvicultural Prescriptions.

Table 3-3 shows the differences in stand conditions between taking no action (Alternative 1) and the proposed action (Alternative 2). Stand data such as diameter at breast height (for poles through mature classes), forest type (PP, DF, MC, WF), and tree height was collected in the proposed treatment units. Both alternatives were modeled through Forest Vegetation Simulator (FVS) in order to estimate the differences in impacts to stand characteristics that collectively affect northern spotted owl habitat quality. Table 3-3 shows how changes in the average mean diameter of all trees (QMD), basal area (BA), trees per acre (TPA), canopy cover, and relative density develop with and without management intervention. The table also highlights the trends associated with stand density and canopy cover as silvicultural prescriptions are applied.

**Table 3-3. Current and Future Stand Conditions and Effects on Habitat**

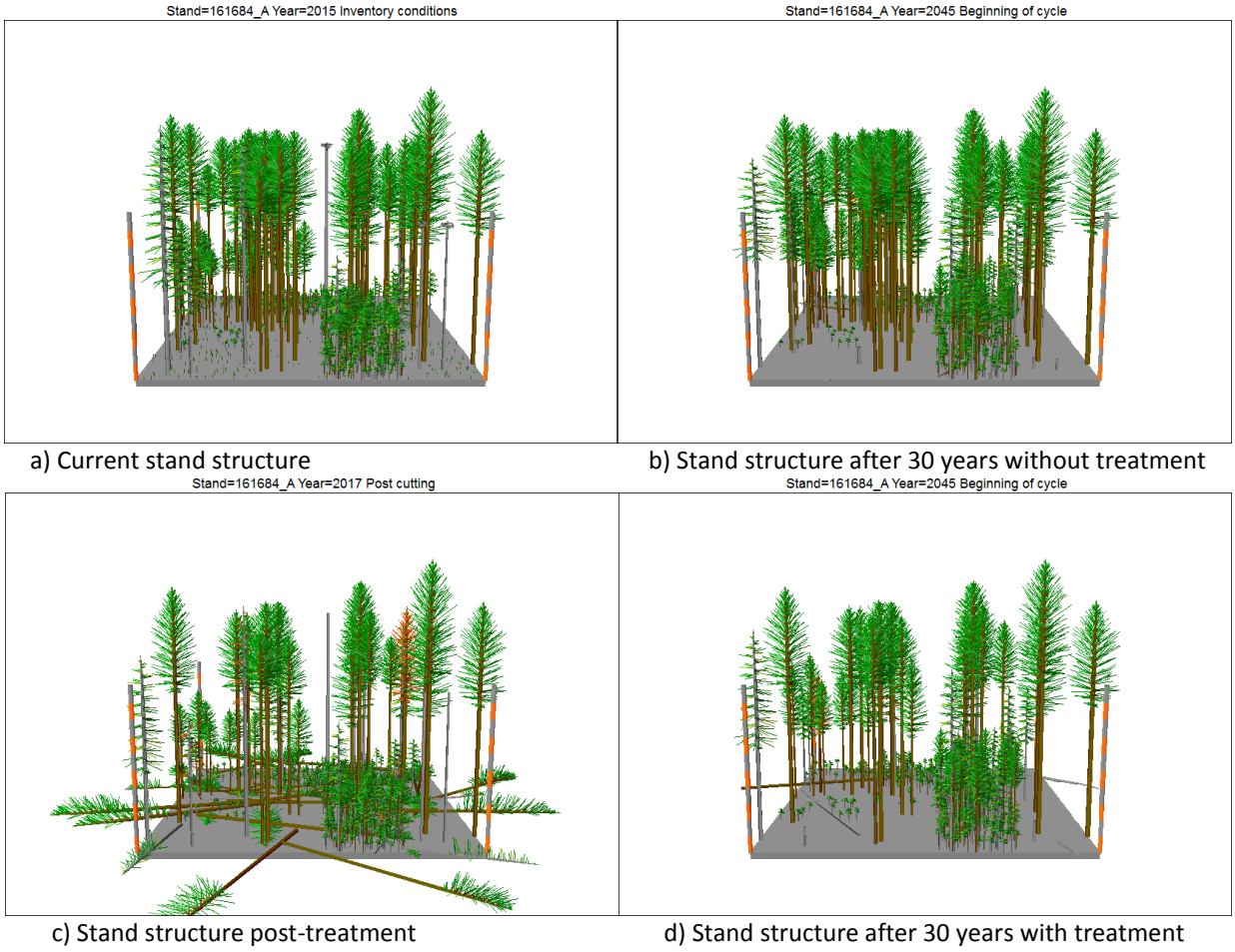
| | QMD (inches) | BA ($ft^2$) | TPA | Canopy Cover (%) | Relative Density |
|---|---|---|---|---|---|
| **Selective Thinning/Mixed Conifer – Dispersal Maintain** | | | | | |
| Current Conditions | 15 | 250 | 418 | 63 | 0.64* |
| 30 years No Action | 18 | 290 | 340 | 63 | 0.69* |
| Post-Treatment | 16 | 150 | 322 | 40 | 0.37 |
| 30 Years Post-Treatment | 17 | 180 | 306 | 47 | 0.44 |
| **Density Management/Mixed Conifer - Roosting/ Foraging Maintain** | | | | | |
| Current Conditions | 11 | 210 | 297 | 67 | 0.62* |
| 30 years No Action | 14 | 236 | 240 | 70 | 0.64* |
| Post-Treatment | 13 | 160 | 172 | 60 | 0.46 |
| 30 Years Post-Treatment | 16 | 200 | 154 | 63 | 0.51 |
| **Selective Thinning/Mixed Conifer - Roosting/ Foraging Downgrade** | | | | | |
| Current Conditions | 10 | 223 | 431 | 69 | 0.71* |
| 30 years No Action | 11 | 252 | 367 | 71 | 0.85* |
| Post-Treatment | 14 | 140 | 140 | 49 | 0.40 |
| 30 Years Post-Treatment | 15 | 167 | 130 | 54 | 0.43 |

*Relative Density (Curtis 1982) indices above 0.55 = zone of occurrence of suppression mortality. Without stand treatments that reduce trees per acre, RDIs that remain above the 0.55 RDI threshold leaves stands more vulnerable to drought, insect, and disease mortality. Reducing stand density is critical in meeting the stated purpose and need of the Bieber Salt Forest Management Project.

Table 3-3 displays that 30 years following treatment these stands would have a lower average canopy cover than if left untreated; however, stand densities would be reduced and the remaining trees would have more optimal growing conditions than "No Action" 30-year projection. The proposed treatments would reduce stand densities immediately post-treatment and would set the stand on a more desirable stand development trajectory to create a multiple canopy, multi-age stand for the future (refer to Figure 3-1d). These treatments would accelerate the development of forest stand conditions that meet long-term

management objectives for northern spotted owl habitat and shift stand trajectories to encourage the development of key habitat components for the future, such as structural diversity and a variety of tree ages. Reducing stand densities through thinning treatments would promote the growth and establishment of tree species that are well adapted or most resilient to environmental conditions and natural disturbance regimes. Stands in which treatments are not applied would maintain a higher level of relative density, which are typically above optimal levels that would lead to competition-induced mortality and reduced growth rates over the following 30-year period. below illustrates the differences in stand structure conditions in a mature stand at its current condition; what it would look like in 30 years with no treatment; and what the condition would be directly post-treatment and 30 years post-treatment if it was treated using the Selective Thinning prescription. The Stand Visualization System (SVS) was used to create visual images of these scenarios using data generated through FVS.

**Figure 3-1. Stand Structure Conditions of a Project Stand over a 30-Year Period**




a) Current stand structure

b) Stand structure after 30 years without treatment

c) Stand structure post-treatment

d) Stand structure after 30 years with treatment

Although relative densities would increase over time as trees continue to grow and regeneration occurs, the proposed treatments would put stands on a more desirable developmental trajectory so that future increases in density would have less substantial impacts on forest health. The proposed treatments would also accelerate the development of forest stand conditions that meet long-term management objectives for northern spotted owl habitat and shift stand trajectories to encourage key habitat components for the future. Reducing stand densities through thinning treatments would promote the growth and establishment of tree species that are well adapted or most resilient to environmental conditions and natural disturbance regimes. Additionally, existing large sized CWD concentrations in the Project Area

would be retained through the incorporation of Project Design Features (see Section 2.5.2, Timber Harvest PDFs) and via marking guidelines (see Appendix B).

The selective removal of individual trees would also produce stands with desirable species compositions that reflect natural/undisturbed conditions and structural heterogeneity. The high shade tolerance of white fir has allowed it to thrive in the understory of other species and, in many cases, it has become dominant and it actively out-competing trees of lower shade tolerance. Sugar pine and ponderosa pine would have retention priority because they are adapted to drier, open site conditions with low relative densities of around 0.30 RDI and because they are present in relatively low numbers compared to other conifer species. Thinning around these trees would reduce competition and increase available growing space to promote growth and longevity.

A selection of trees within all canopy layers would be harvested in order to create structural complexity. The creation of openings in select areas of the stand would allow for regeneration to occur and the development of new canopy layers would contribute to overall canopy structure. Trees that are of low to mid shade tolerance would be the priority regeneration species because shade-tolerant species currently dominate the later seral classes and upper canopy layer in many stands.

Alternative 2 would reduce the impacts of disease at the stand level by controlling the spread of the Douglas-fir dwarf mistletoe through the removal of heavily-infected trees and by maintaining and encouraging species such as pine and incense cedar that are resistant to Douglas-fir dwarf mistletoe. This project does not attempt to eradicate dwarf mistletoe from the landscape; rather, it attempts to minimize it in specific areas so that the Forest Health objectives and management direction pertaining to all land use allocations as defined by the 1995 Medford District Resource Management Plan can be attained. The Medford District RMP (USDI 1995, p. 194) instructs to "design silvicultural treatments so that within-stand endemic levels do not increase and where possible, the affected trees contribute to the achievement of land use allocation objectives." With or without management activities, dwarf mistletoe would continue to be a stand and landscape feature on lands managed by the BLM, and Douglas-fir mistletoe would occur at natural rates within these conifer-dominated forest types and would maintain enough of a presence to provide habitat for special wildlife species such as the northern spotted owl and Johnson's hairstreak butterfly.

Due to competing management objectives, some stands proposed for treatment (approximately 23% of the proposed treatment acres) would not meet the long-term silvicultural objectives of shifting the trajectory of stands to more optimal growth and resiliency. However, in the short-term, stands would see a reduction in stand density, which would reduce competition and allow for slightly better growing conditions. Retaining 60% canopy cover or greater in select stands would not allow for forest health objectives to be met. The proposed treatment units that would have canopy cover of 60% or greater retained would reduce stand density and increase the growth and vigor of the remaining trees; however, stands would still have an average RDI of 0.55 or above and density-induced mortality is anticipated in the long-term.

Many stands within the Analysis Area exhibit simple, single layer structure or possibly a two-aged structure with overstory trees and understory trees but which lack mid-layer structure. These stands are overstocked and therefore lack growing space to accommodate new cohorts of trees to grow, excluding the shade-tolerant white fir. To create multi-layered structure, with multiple heights and age classes, space must be created through thinning and the creation of openings.

The Understory Reduction, which would occur post-harvest where determined necessary, would increase the growth, resiliency, and vigor of understory trees by selectively removing small-diameter

trees in the understory. As in the Density Management and Selective Thinning treatments, Understory Reduction treatments would further reduce relative densities and increase the average mean diameter of all trees (QMD) in treated stands. Competition would be reduced and the remaining trees would have more optimal growing conditions. This would further aid the development of a multi-structured stand with varying age classes and sizes and allow for the eventual growth of understory trees into the overstory. Leaving the healthiest and best-formed understory trees would maintain forest health and vigor in the future and maintain treatment objectives for future stand development.

In summary, Alternative 2 would meet silvicultural and management objectives described in the Medford District RMP on approximately 77% of commercially treated acres. The remaining 23% of commercially treated acres, where silvicultural treatments maintain a canopy cover greater than 60%, it is likely that conifer growth and yield projections would not be met on these acres. However, these silviculture treatments would reduce short-term impacts to forest stands previously described in this section. Silvicultural treatments would improve and/or maintain vigorously growing conifer forests, reduce tree mortality, and encourage a mixture of tree species that are more fire resilient and have greater longevity than the current composition. Short-term reductions in canopy cover would eventually recover and treated stands would be put on a trajectory towards developing optimal conditions.

#### Cumulative Effects

##### *Past Actions*

Actions that have occurred within the Project Area include timber sales, salvage logging operations, and fuels reduction treatments, which have been implemented to meet a variety of objectives (see Section 3.1.1). The current condition described in the Affected Environment section inherently includes the effects of past actions that have occurred in the Analysis Area.

##### *Ongoing and Reasonably Foreseeable Actions*

No commercial forest management projects or salvage logging operations are currently occurring on BLM-administered lands in the Bieber Salt Project Area. The Salty Gardner Fuels Reduction Treatment Project, which has been ongoing in and around the Project Area, is being implemented as seasonal conditions allow. The effects of this project include a reduction in fuel load, improvement in stand structure and tree growth, and reduced threat of high-severity wildfire across the treatment area and in forestland in close proximity to the treatment area. The cumulative effects of the proposed project and the Salty Gardner Fuels Reduction Treatment Project would be a decrease in the amount of available fuels, improved stand growth, and reduced competition on up to 1,371 acres in the Project Area. Removing live trees to reduce fuel loads naturally improves forest productivity and health due to the reduction in competition while the reduced threat of wildfire would prevent mortality in untreated and dense stands.

In the summer of 2016, approximately 20 acres of blowdown and standing hazard trees within forest stands, as well as trees along the roadside that have fallen into or alongside the road or pose a hazard, are scheduled to be harvested in the Wasson Canyon area. The anticipated effects of this project are similar to those of the fuels reduction treatments described above, although forest productivity and health would not improve because the project is removing only dead and down trees, which do not contribute to stand-level competition and health. The reduction of fuel sources will reduce the threat of high-severity wildfire within the treatment area and adjacent areas, which may include stands within the proposed project.

***Findings***

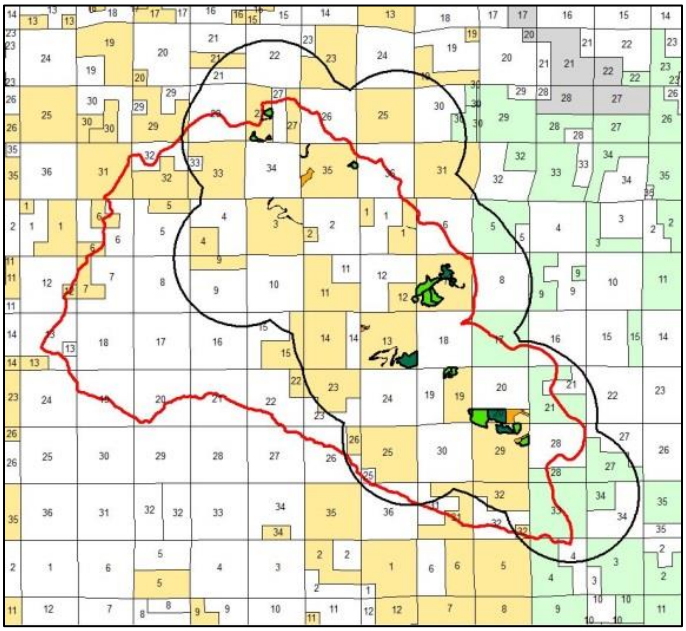
The proposed forest thinning treatments under Alternative 2 would have no adverse cumulative effects to forest health, vigor, and resiliency when considering past, ongoing, and reasonably foreseeable actions within the Analysis Area. This project would increase the total acreage of treated stands within the Analysis Area by 431 acres, for a total of up to 451 acres of commercial harvest and 1,802 acres of fuels reduction treatments. Units that have been previously harvested met their objectives of improving forest composition and increasing vigor and growth. The conditions created by the proposed treatment would build upon the positive impacts of those past projects by improving forest health and productivity at a larger landscape level. Some units proposed for treatment would improve upon past treatments in those same units by improving canopy structure variability and generating new tree cohorts. Fuels generated as a result of the project would be treated appropriately and thus wildfire threat would not be increased. Future projects are not expected to differ substantially in their objectives or methodology, so there is consistency in the nature of forest management projects proposed by the BLM.

## 3.3 Northern Spotted Owl Habitat

**Issue 2: How would timber harvest and road construction activities affect constituent elements (canopy cover, snags and down wood, large trees, mistletoe brooms, stand structure, and prey availability) within stands used by northern spotted owls for nesting, roosting, and foraging, dispersal, and within their Critical Habitat.**

This section analyzes the potential impacts from the proposed forest management activities on northern spotted owl habitat.

**Figure 3-2. The Analysis Area and the Bieber Salt Project Area**



### 3.3.1 Methodology

- The northern spotted owl Habitat Analysis Area includes all areas of suitable northern spotted owl habitat on federal lands (BLM and Forest Service) within the home range circles (1.2 miles) for the 10 known owl sites affected by, or in the vicinity of, the proposed projects; and, includes all areas of suitable northern spotted owl habitat on federal lands within the provincial home

range radius (1.2 miles) of proposed treatment units. Figure 3-2 illustrates the Analysis Area (black) in relation to the Project Area (red).

- The process for conducting biological evaluations and assessments includes a review of existing records, field reconnaissance, field surveys, and analysis of potential impacts. The project wildlife biologist conducted a review of potential wildlife habitat using field assessments, maps, aerial photographs, GIS software, wildlife survey data, and stand exam records for the Analysis Area.
- The BLM wildlife biologist classified northern spotted owl habitat in the Analysis Area by habitat type (Table 3-4) using 1997 IVMP (Interagency Vegetation Mapping Project), FOI (Forest Operations Inventory), TPCC (Timber Production Capability Classification), and on-site habitat analysis. IVMP is a joint Forest Service/BLM project that derives a 25-meter pixel-based vegetation map from 1997 satellite imagery. The 1997 IVMP provides a representation of vegetation age classes across all ownerships within the Analysis Area. The vegetation map has been classified into categories according to the Interagency Vegetation Standards that were adopted by the Interagency Advisory Committee. IVMP data is primarily useful for cumulative effects analysis that includes public and private lands. The FOI gives a more detailed description of age classes on BLM-administered lands because it is based on field data as well as aerial photo inventories. The combined data allows the vegetation to be grouped into the early, mid-, and late seral age classes for comparison purposes, although these data sources have differing degrees of detail and resolution. The TPCC refers to the suitability of the soil to produce timber.
- RA32 Habitat Evaluation Methodology 1.3 was used to determine the presence or absence of highly suitable, structurally complex northern spotted owl nesting habitat in all project units under consideration in this analysis. This methodology complies with the Recovery Action 32 (RA32) recommendation in the *Revised Recovery Plan for the Northern spotted owl* (USDI FWS 2011) to maintain all of the older and more structurally complex, multilayered coniferous forests.
- Using recommendations from Recovery Action 10 (RA10) in the northern spotted owl Recovery Plan, known northern spotted owl sites within the Analysis Area were identified and considered for habitat retention or enhancement (see Chapter 2, section 2.2, Development of the Project).
- The BLM is conducting strategic surveys for northern spotted owls following the 2011 Protocol for Surveying Proposed Management Activities that May Impact Northern spotted owls (USDI FWS 2011).

### 3.3.2 Assumptions

- Late-successional forest is forested habitat 80 years or older. Late-successional forest generally, but not always, provides suitable dispersal, foraging, and/or nesting habitat for northern spotted owls. Suitable northern spotted owl nesting habitat is usually 80 years and older, but also contains other attributes, such as multiple tree layers, snags, and decaying logs. Northern spotted owl habitat is specifically rated for its suitability for northern spotted owls, while late-successional forest (not always rated as suitable northern spotted owl habitat) may provide habitat for other wildlife species.

### 3.3.3 Affected Environment

#### 3.3.3.1 Northern spotted owl Habitat

The northern spotted owl (NSO), listed as threatened under the Endangered Species Act, is associated with the existing habitats found within the Analysis Area. Northern spotted owls prefer coniferous forest

with multiple vertical layers of vegetation; a variety of tree species and age classes; and the presence of large logs and large diameter live and dead trees (snags) for nesting/roosting/foraging habitat. They may also be found in younger stands with multilayered, closed canopies, large diameter trees, and abundance of dead and down woody material. Based on studies of owl habitat selection, including habitat structure and use and prey preference throughout the range of the owl, northern spotted owl habitat consists of four components: nesting, roosting, foraging, and dispersal (Thomas, et al. 1990) (Table 3-4).

**Table 3-4. Northern spotted owl Habitat Types**

| Habitat Type | Description |
|---|---|
| High-quality habitat (RA32)<br>Subset of NRF habitat | Older, multilayered, structurally complex forests characterized as having large trees greater than 17 to 21 inches in diameter (depending on annual precipitation), high canopy cover (greater than 60%), and quantifiable decadence components such as broken-topped live trees, mistletoe, cavities, large snags, and fallen trees (Figure 3-4). RA32 habitat may vary due to climatic gradients across the range. |
| Suitable nesting/roosting/ foraging (NRF) | These forests have a high canopy cover (greater than 60%), a multilayered structure, and large overstory trees greater than 21 inches in diameter. Deformed, diseased, and broken-top trees, as well as large snags and down logs, are also present. Nesting/roosting/foraging habitat meets all northern spotted owl life requirements. |
| Roosting/Foraging (RF) | Canopy cover greater than 60% and canopy structure generally single layered. Overstory trees are generally greater than 16 inches in diameter. Snags and down wood not considered a requirement. |
| Dispersal | This habitat is not suitable for nesting, but provides requirements believed important for northern spotted owl dispersal. Canopy cover is generally between 40 and 60%. In stands with greater than 60% canopy cover, overstory tree diameters are generally between 11 and 16 inches DBH. The area has the capability of becoming foraging or nesting habitat. Deformed trees, snags, and down wood are absent or less prevalent than in Type 1 habitat. |
| Capable | Does not presently meet northern spotted owl needs but has the potential to grow into habitat Types 1, 2, or 5. |
| Non-habitat | Does not have the potential to develop into late-successional forest or supporting old-growth dependent species. |

Suitable nesting/roosting/foraging habitat in southwest Oregon is typified by mixed-conifer habitats with recurrent fire history, patchy habitat components, and higher incidences of woodrats. A review of current habitat ratings of 12,553 acres of federal lands (BLM and Forest Service) within the Analysis Area indicates that 25% (3,139 acres) of federal lands provide nesting/roosting/foraging habitat (of which 323 acres were identified as RA32 habitat); 5% (638 acres) provide roosting/foraging habitat; 21% (2,664 acres) provide dispersal-only habitat; 38% (4,727 acres) provide capable habitat; and 11% (1,385 acres) is non-habitat. Suitable nesting/roosting/foraging and roosting/foraging habitat also functions as dispersal habitat.

#### 3.3.3.2 Critical Habitat

In December 2012, the USFWS released the *Revised Critical Habitat for the Northern spotted owl*, which designated northern spotted owl critical habitat on federal lands. A CHU (critical habitat unit) identifies geographic areas that contain features essential for the conservation of the northern spotted owl and may require special management considerations. For the northern spotted owl, these features include particular forest types of sufficient area, quality, and configuration distributed across the range of the species that will support the needs of territorial owl pairs throughout the year, including habitat for nesting/roosting/foraging, and dispersal. Approximately 66% (8,292 acres) of federal land within the Analysis Area is designated as critical habitat (only federal land is designated as critical habitat).

**Table 3-5. Percentage of Habitat Types Present in the Analysis Area and within Critical Habitat**

| Habitat Type | NRF | RF | Dispersal | Capable | Non-Habitat |
|---|---|---|---|---|---|
| **Analysis Area** | 25% | 5% | 21% | 38% | 11% |
| **Analysis Area CHU** | 25% | 6% | 24% | 38% | 7% |

The Bieber Salt projects are within CHU 10, subunits KLE-4 and KLE-5. The KLE 4 subunit occurs in Jackson, Klamath, and Douglas Counties, Oregon and comprises 254,442 acres of lands managed by the BLM and USFS (United States Forest Service). The KLE-5 subunit occurs in Jackson County, Oregon and comprises 38,283 acres of lands managed by the BLM and USFS. Special management considerations or protections are required in these subunits to address threats to the essential physical or biological features from current and past timber harvest, losses from wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. The KLE-4 subunit is expected to function primarily for east-west connectivity between subunits and critical habitat units, but also for demographic support. The KLE-5 subunit is expected to function primarily for north-south connectivity between subunits and also for demographic support.

**Figure 3-4. Example of the RA32 habitat identified and retained in the Analysis Area.** Photo by David Roelofs

#### 3.3.3.3 Northern Spotted Owl Recovery Plan

The 2011 *Revised Recovery Plan for the Northern spotted owl* recommends retaining or enhancing all known northern spotted owl sites as well as retaining high quality habitat (see Section 3.3.1). The Recovery Plan is not a regulatory document; it provides guidance to bring about recovery through prescribed management actions and supplies criteria to determine when recovery has been achieved.

The BLM works with the USFWS to incorporate the Recovery Goals and Actions in the Recovery Plan consistent with BLM laws and regulations.

The current foundation of the northern spotted owl recovery plan is the 1994 Northwest Forest Plan. Management direction and land use allocations in the standards and guidelines of the Northwest Forest Plan are intended to constitute the USFS and BLM contributions to the recovery of the northern spotted owl (USDA and USDI 1994). The Medford District ROD/RMP and the Northwest Forest Plan provide a network of late-successional reserves (including 100-acre activity centers), connecting riparian corridors, connectivity/diversity blocks, and 15% late-successional forest retention on federal lands in fifth field watersheds.

#### 3.3.3.4 Known Northern Spotted Owl Activity Centers

The Northwest Forest Plan designated 100 acres of the best habitat on federal lands to be retained as close as possible to the northern spotted owl nest site, or activity center, for all sites known as of January 1, 1994. This was intended to preserve an intensively used portion of the breeding season home range close to a nest site or center of activity (USDI 1995) (USDA and USDI 1994). These known northern spotted owl activity centers are managed as late-successional reserves. Eight 100-acre activity centers are located within the Analysis Area.

#### 3.3.3.5 Provincial Home Range

The home range is a circular area around a northern spotted owl center of activity. The size of the home range is based on the geographic province in which it is located. The Bieber Salt Project is located within the West Cascades province. The provincial home range for the West Cascades province is a 1.2-mile radius from the northern spotted owl center of activity. Proposed projects are located within the provincial home ranges of 10 known northern spotted owl sites (Table 3-6). A known northern spotted owl site is defined as a location with evidence of historic or current use by northern spotted owls. Evidence includes breeding, repeated location of a pair or single bird during a single season or over several years, presence of young before dispersal, or some other strong indication of occupation. Each of the owl sites is a mixture of private and public lands. Two of the known northern spotted owl sites were discovered after January 1, 1994 and do not have established 100-acre activity centers (Forest Service and Bureau of Land Management 1994, C-10). In the past 10 years, three of the 10 known sites had a pair of northern spotted owls, with one known site having a pair in the past five years. Surveys detected a single owl during night surveys in five known sites in the past five years, on separate occasions, but it is not known if it was the same owl moving around the area or separate owls. The BLM conducted surveys in the Analysis Area in 2015; a nesting pair has been documented in Site #3255B in 2015.

Based on studies, suitable (nesting/roosting/foraging) habitat coverage of at least 40% or higher at the home range scale (Bart and Forsman 1992) (Bart 1995) and 50% or higher at the core area scale (Dugger, Wagner, et al. 2005) is likely necessary for maintaining northern spotted owl life history functions. As the amount of suitable habitat in an owl's home range decreases, so does site occupancy, reproduction, and survival. A combination of forest fires, severe wind storms, and timber harvest on private and BLM-administered lands has occurred in these home ranges. Each home range located within the Bieber Salt Analysis Area currently contains less than the 40% suitable nesting/roosting/foraging habitat than the best available information indicates are the habitat amount values important to northern spotted owl habitat fitness at the home range scale.

The BLM integrated Recovery Action 10 (RA10) into project planning to minimize effects to northern spotted owls and their habitat within known home ranges. BLM incorporated RA10 to the extent it was compatible with the primary purpose and need of the project: provide for a sustainable supply of timber

and help meet the Medford BLM's annual timber volume target and improve forest health. To the extent practicable, the BLM followed principles in the SW Oregon Recovery Action 10 Guidance Document (USDA, USDI, and USDI FWS 2013) to reduce impacts to sites with recent pair or reproduction activity within the Analysis Area.

The project's wildlife biologist prioritized the northern spotted owl sites within the Analysis Area in high or low categories based on occupancy and reproductive success data. One of the 10 sites (Table 3-5) rated as high in the RA10 prioritization because of their recent pair occupation or reproductive status within the last five years. The remaining nine sites within the Analysis Area rated as low in the RA10 prioritization because of the poor recent northern spotted owl occupation history. The objective at the high priority sites is to avoid adverse effects by not removing or downgrading nesting/roosting/foraging habitat within the home range. A core team consisting of the project's wildlife biologist, silviculturist, and forester worked together using the RA10 methodology to identify areas to conserve or enhance within northern spotted owl home ranges based on whether they were ranked as high or low. The Core Team focused on reducing the amount of timber harvest within the 0.5-mile core area because it is the area that provides the important habitat elements of nest sites, roost sites, and access to prey that benefit northern spotted owl survival and reproduction (Bingham and Noon 1997).

**Table 3-6. Northern spotted owl Sites within the Bieber Salt Analysis Area**

| Site # | Survey Results 2011 - 2015 | Historic Summary | | | | |
|---|---|---|---|---|---|---|
| | | Number of Years | | | Last Year | |
| | | Surveyed (at least 1 visit) | With Pairs | Nested with Young | With Pair | Nested with Young |
| **RA10 High Priority Sites** | | | | | | |
| 3255B | Occupied by pair. Nested 2012 – 2015. Barred owl, also, in 2015. | 24 | 11 | 10 | 2015 | 2015 |
| **RA10 Low Priority Sites** | | | | | | |
| 0887O | Single male detected once in 2014 and twice in 2012. | 22 | 1 | 0 | 1991 | - |
| 0955O | Single female subadult detected in 2014. | 25 | 13 | 5 | 2003 | 2003 |
| 1303O | Undetected. | 26 | 3 | 2 | 1996 | 1994 |
| 2004O | Undetected. Single barred owl observed in 2015. | 26 | 10 | 2 | 2006 | 2006 |
| 2005O | Barred owl pair in 2015. Single barred owl in 2014. Single NSO male detected once in 2012. | 26 | 12 | 2 | 2002 | 2000 |
| 3256O | Wind storm in 2008 removed habitat. Not surveyed 2012 – 2015. Undetected in 2011. | 20 | 15 | 3 | 2008 | 2000 |
| 3349O | Resident single male in 2015. | 27 | 1 | 0 | 1992 | - |

| Site # | Survey Results 2011 - 2015 | Historic Summary | | | | |
|---|---|---|---|---|---|---|
| | | Number of Years | | | Last Year | |
| | | Surveyed (at least 1 visit) | With Pairs | Nested with Young | With Pair | Nested with Young |
| 3378O | Single male detected once in 2014 and twice in 2013. | 23 | 1 | 0 | 1992 | - |
| 4466O* | Undetected in 2014. Not surveyed 2011 – 2013, 2015. | 10 | 2 | 1 | 1998 | 1998 |
| *Sites discovered after January 1, 1994. | | | | | | |

#### 3.3.3.6 Late-Successional Forest

The Medford District RMP (USDI 1995, p. 39, 47) and the Northwest Forest Plan (USDA and USDI 1994) require that 15% of all federal forest lands within fifth field watersheds retain late-successional forest conditions, generally defined as stands 80 years or older. Late-successional forest conditions allow for northern spotted owl dispersal, foraging, or nesting opportunities. Currently, 77% (6,494 / 8,416 acres) of BLM forested land in the Little Butte Creek fifth field watershed is in late-successional condition.

#### 3.3.3.7 Connectivity/Diversity Blocks

The 1995 Medford District ROD/RMP designated connectivity/diversity blocks that are located throughout the northern GFMA matrix land use allocation. These blocks provide habitat connectivity for old growth dependent and associated species within the northern GFMA and between late-successional reserves. Each block is to maintain at least 25% to 30% in late-successional forest (Bureau of Land Management 1995, p. 40). These blocks may be a combination of northern spotted owl nonhabitat and nesting/roosting/foraging, dispersal, and capable habitat. The Analysis Area contains one connectivity/diversity block in T35S, R2E, section 25. There are no proposed treatments within this block and it will not be analyzed further.

#### 3.3.3.8 Northern spotted owl Population Trends

Northern spotted owl reproduction, or productivity, varies widely year-to-year, depending on how spring weather conditions affect prey availability (Franklin, et al. 2000). Eleven demographic study areas have been established to represent owl status across the range of the northern spotted owl (Forsman, Anthony and Dugger, et al. 2011). Owl sites and productivity are annually monitored within these areas to:

- Assess changes in population trend and demographic performance of northern spotted owls on federal forest lands within the range of the owl; and

- Assess changes in the amount and distribution of nesting/roosting/foraging and dispersal habitat for northern spotted owls on federal forest lands.

The Medford District shares the Klamath Demographic Study Area with Roseburg BLM and the Rogue River-Siskiyou National Forest. The Klamath Study Area is one of eight long-term study areas that were

established before the owl was listed and before the Northwest Forest Plan was developed. The Klamath Study Area is located northwest of the Bieber Salt Analysis Area.

The Southern Oregon Cascades Demographic Study Area is adjacent to the Bieber Salt Analysis Area, on Forest Service lands. Metadata analysis evaluates population statistics of the owls in the demographic study areas. Recent metadata analyses were completed in 2011 and 2014, which found that fecundity, the number of female young produced per adult female, is declining. Forsman (2011) concluded that fecundity, apparent survival, or populations were declining on most study areas, and that increasing numbers of barred owls and habitat loss were partly responsible for these declines.

According to the 2012 Annual Report for the Southern Oregon Cascades Demography Study Area, at least one northern spotted owl was detected at 71 (42%) of the sites. This represented a 3.5% increase from 2011. However, the 44 pairs located were the fewest recorded during the study. The average fecundity rate in 2012 was 0.24 (averaged across sites in Matrix and LSR land use allocations, and wilderness). There were 22 juveniles detected in the Southern Oregon Cascades Study Area in 2012 (Dugger et al. 2013). The 2013 data indicates the occupancy and fecundity rates declined compared to 2012. At least one northern spotted owl was detected at 60 (35%) of the sites in 2013, which represents a decline in occupancy of 7% from 2012. The average fecundity rate was 0.20 in 2013, which also represents a decline from 2012. Thirteen juveniles were detected in the study area in 2013 (Dugger et al. 2014). The 2014 data indicates the occupancy rate declined compared to 2013. At least one northern spotted owl was detected at 53 (31%) of the sites in 2014, which represents a decline in occupancy of 4%from 2013. The average fecundity rate was 1.31 in 2014, which is an increase from 2013. Forty-seven juveniles were detected in the study area in 2014 (Dugger et al. 2015).

#### 3.3.3.9 Barred Owls

Barred owls (*Strix varia*) are native to eastern North America, but have moved west into northern spotted owl habitat. The barred owl's range now completely overlaps that of the northern spotted owl (Courtney et al. 2004). Barred owls are considered generalists and make use of a variety of vegetation and forage species (Wiens, Anthony and Forsman 2014). Existing evidence suggests barred owls compete with northern spotted owls for habitat and prey with near total niche overlap. Interference competition (Dugger, Anthony and Andrews 2011) (Van Lanen et al. 2011) is resulting in increased northern spotted owl site abandonment, reduced colonization rates, and likely reduction in reproduction (Olson et al. 2005) (Dugger, Anthony and Andrews 2011) (Forsman et al. 2011) (Wiens, Anthony and Forsman 2014), ultimately resulting in probable range-wide population reductions (Forsman et al. 2011). Barred owl effects on northern spotted owl survival and colonization appear to be substantial and additive to effects of reduction and fragmentation of habitat in northern spotted owl home ranges. The magnitude of the barred owl effect may increase somewhat as habitat quantity decreases and fragmentation increases (Dugger, Anthony and Andrews 2011).

It has been established that activities that reduce the quantity of older forests adjacent to northern spotted owl activity centers reduce the probability of continued occupancy, survival, and reproduction (Franklin, et al. 2000) (Olson, Glenn, et al. 2004) (Dugger, Wagner, et al. 2005) (Dugger, Anthony and Andrews 2011) (Schilling, Dugger and Anthony 2013). When barred owls are present, the effect of such activities on northern spotted owl pair survival (estimated as probability of extinction of a single territory and termed "extinction probability") may be exacerbated by 2–3 times (Dugger, Anthony and Andrews 2011). Some northern spotted owls appear to be able to successfully defend territories and reproduce when barred owls are present, (Dugger, Anthony and Andrews 2011) (Wiens, Anthony and Forsman 2014), but the mechanism that allows them to persist is currently unknown.

Single barred owl detections were made eight different times, along with one barred owl pair detection during northern spotted owl surveys between 2011 and 2015 within the Analysis Area. Barred owls were detected within three different northern spotted owl home ranges (Table 3-6), but also outside of home ranges. It is unknown how many different barred owls these single detections represent; however, it has been confirmed that there is at least one pair in the Analysis Area. While the BLM did not specifically survey for barred owls, a study in the Oregon Coast range suggests that over the course of a season, northern spotted owl surveys to protocol (> 3 visits) allow approximately 85% of the barred owls present in the area to be detected (Wiens, Anthony and Forsman 2011). Additionally, the USFWS's *Protocol for Surveying Proposed Management Activities That May Impact Northern spotted owls* (2011 Northern spotted owl Survey Protocol) allows for a reasonable assurance that northern spotted owls in an area will be detected, even where barred owls are present. The USFWS and cooperators conducted analyses of historical northern spotted owl survey data, leading to estimates of detection rates for northern spotted owls that account for the effects of barred owl presence. These detection rates, along with data on northern spotted owl site colonization and extinction probabilities, and empirical analysis of northern spotted owl site occupancy, were employed in developing the survey protocol used by the BLM in the Analysis Area. Use of the 2011 Protocol serves two primary purposes: (1) provide a methodology that results in adequate coverage and assessment of an area for the presence of northern spotted owls, and (2) ensure a high probability of locating resident northern spotted owls and identifying owl territories that may be affected by a proposed management activity, thereby minimizing the potential for unauthorized incidental take (USDI FWS 2011, p. 4).

## 3.3.4 Environmental Consequences

### 3.3.4.1 Alternative 1 - No Action

Under Alternative 1, no forest management activities would occur. Stands providing suitable northern spotted owl habitat would remain owl habitat. Without treatments, the trajectories of some stands to grow into suitable habitat would continue at a slower rate. Without forest management actions, simplified stands would take longer to develop heterogeneity and multiple tree layers, and stands would remain overstocked and at a higher risk of stand-replacement fire. Simplified stands would remain as dispersal or roosting/foraging habitat longer than if they were opened up and allowed to develop lower tree layers, becoming nesting/roosting/foraging habitat. Stand-replacing fires would remove habitat until it can recover in up to 80 years.

### 3.3.4.2 Alternative 2 - Proposed Action

**Direct and Indirect Effects**

***Northern Spotted Owl Habitat***

The following management actions are proposed on 439 acres in Alternative 2: Density Management, Selective Thinning/Douglas Fir (DF), Selective Thinning/Mixed Conifer (MC), Selective Thinning/White Fir (WF), temporary route construction, roadside vegetation maintenance, log landing construction, and timber haul (Table 3-7.). See also Table 3-9: *Anticipated Impacts to Individual Owl Home Ranges*, and Table 3-10: *Proposed Projects and the Potential Impact to Critical Habitat*.

Logging activity disrupts ground-level shrub and woody debris habitat for northern spotted owl prey species; however, the shrub layer would fill back in within 2 to 5 years and current down woody debris would be left on site. The impacted prey species would rebound within 2 to 30 years.

Understory Reduction and treatment of activity fuels would work in conjunction with the commercial prescriptions described below and would not increase the effects to owl habitat described below.

Haul routes that would be renovated, and roads that would be partially or fully decommissioned, are not functioning as northern spotted owl habitat and therefore would not contribute to northern spotted owl habitat downgrade or removal. A seasonal restriction for projects that could cause a noise disturbance to nesting northern spotted owls would be implemented (See Chapter 2, PDFs and Noise Disturbance Issue CBE).

Pre-designated skid trails would not contribute to reducing the overall canopy cover within stands of trees (0.14 miles are proposed within stands in dispersal habitat). The majority of proposed pre-designated skid trails are in locations that are not currently functioning as northern spotted owl habitat (0.49 miles are proposed outside stands). Existing down wood would be avoided or moved, and retained, when located (See Chapter 2, Section 2.5). A seasonal restriction for projects that could cause a noise disturbance to nesting northern spotted owls would be implemented (See Chapter 2, Section 2.5 and Appendix A, Issue O).

Water source restoration sites (7 sites) are not functioning as northern spotted owl habitat and therefore would not contribute to northern spotted owl habitat downgrade or removal. A seasonal restriction for projects that could cause a noise disturbance to nesting northern spotted owls would be implemented (Chapter 2, Section 2.5.5 Water Source Restoration PDFs and Noise Disturbance Issue CBE).

The proposed projects (Density Management, Selective Thinning, roadside vegetation maintenance, Understory Reduction, and treatment of activity fuels) that would maintain northern spotted owl habitat include:

- Canopy cover within treated nesting/roosting/foraging, roosting/foraging, or dispersal stands would be retained at or above 60% and 40%, respectively;
- Decadent woody material, such as large snags and down wood, would remain post-treatment; and
- Multiple canopy, uneven-aged tree structure that was present prior to treatment would remain post-treatment.

The proposed projects (Selective Thinning) that would downgrade northern spotted owl roosting/foraging habitat include:

- Canopy cover within treated roosting/foraging would be brought to between 40% and 60%;
- Decadent woody material, such as large snags and down wood, would remain post-treatment;
- Multiple canopy, uneven-aged tree structure that was present prior to treatment would remain post-treatment; and
- Heterogeneity in tree structure and forest health would be promoted.

The proposed projects (temporary route and new landing construction) that would remove northern spotted owl habitat include:

- Canopy cover would be brought below 40%; and
- Down wood and fallen large snags would be moved adjacent to the treated footprint as down wood.

**Table 3-7. Proposed Projects and the Potential Impact to NSO Habitat**

| **Forest Management** | | | |
|---|---|---|---|
| **Commercial Prescriptions** | **Current Habitat** | **Treatment Affect** | **Est. Acres** |
| Density Management | RF | RF Maintained | 98 |
| Selective Thinning | RF | RF Maintained | 43 |
| Selective Thinning | RF | RF Downgrade | 67 |
| Selective Thinning | Dispersal | Dispersal Maintained | 211 |
| Selective Thinning | Capable | No Effect | 10 |
| Selective Thinning Other | See Transportation Management | See Transportation Management | 2 |
| | | **Total** | **431** |
| **Timber Harvest Method** | **Current Habitat** | **Treatment Affect** | **Est. Acres** |
| Ground-based Yarding | See Prescriptions | See Prescriptions | 335 |
| Skyline-Cable Yarding | See Prescriptions | See Prescriptions | 96 |
| | | **Total** | **431** |
| **Non-commercial Prescriptions** | **Current Habitat** | **Treatment Affect** | **Est. Acres** |
| Understory Reduction & Activity Fuels | RF | RF Maintained | 141 |
| Understory Reduction & Activity Fuels | RF | RF Downgrade | 67 |
| Understory Reduction & Activity Fuels | Dispersal | Dispersal Maintained | 210 |
| Understory Reduction & Activity Fuels | Capable | No Effect | 11 |
| Other | See Transportation Management | See Transportation Management | 2 |
| | | **Total** | **431** |
| **Transportation Management** | **Current Habitat** | **Treatment Affect** | **Est. Acres** |
| Temporary Route Construction | RF | RF Removed | 0.14 |
| Temporary Route Construction | Dispersal | Dispersal Removed | 0.24 |
| Temporary Route Construction | Capable | No Effect | 0.35 |
| Roadside Vegetation Maintenance | NRF | NRF Maintained | 0.37 |
| Roadside Vegetation Maintenance | RF | RF Maintained | 0.57 |
| Roadside Vegetation Maintenance | Dispersal | Dispersal Maintained | 2.27 |
| Roadside Vegetation Maintenance | Capable | No Effect | 2.88 |
| Roadside Vegetation Maintenance | Non-Habitat | No Effect | 0.37 |
| New Landings | RF | RF Removed | 1.44 |
| New Landings | Dispersal | Dispersal Removed | 1.44 |
| | | **Total** | **10** |
| | | **Grand Total Treatment Acres** | **439** |
| **Transportation Management** | **Current Habitat** | **Treatment Affect** | **Est. Miles** |
| Road Renovation – Haul Routes | Non-Habitat | No Effect | 32.63 |

| | | | |
|---|---|---|---|
| Partial Road Decommissioning | Non-Habitat | No Effect | 1.78 |
| Full Road Decommissioning | Non-Habitat | No Effect | 0.19 |
| Designated Skid Trail | Capable | No Effect | 0.49 |
| Designated Skid Trail | Dispersal | Dispersal Maintained | 0.14 |
| | | **Total Miles** | **35** |
| **Other Projects** | **Current Habitat** | **Treatment Affect** | **Sites** |
| Water Source Restoration | Non-Habitat | No Effect | 7 |

**Density Management** (98 acres) would be a combination of both proportional thinning and thinning from below. Proportional thinning consists of removing trees from each size class and thinning from below consists of removing trees from the lower canopy classes, such as intermediate and suppressed trees. The proportional thinning would not meet the exact definition of a proportional thin because trees exhibiting old-growth characteristics would typically be retained (see Appendix A, Marking Guidelines).Generally, smaller trees would be targeted for removal over larger trees but the intent is to maintain the current structure and not remove one single tree layer and simplify the stand. Trees targeted for removal would include those exhibiting a decline in crown ratio, narrow crown widths, and which contribute least to the canopy layer or structural diversity.

Density Management would:

- Maintain 98 acres of roosting/foraging habitat.

Trees may be marked in small patches (i.e., groups of trees with poor crowns) and left in clumps (i.e., groups of old trees) to create hiding cover for wildlife species and increase spatial heterogeneity. The size of patches or openings would be no greater than 0.20 acres and would not exceed 5% of the total treatment unit area.

Through Density Management, maintaining diversity and heterogeneity within the stand, opening up the canopy to promote regeneration, and reducing tree density to accelerate growth of remaining trees, would have a long-term benefit towards creating future nesting/roosting/foraging habitat.

**Selective Thinning** would be a combination of thinning and group selection, to the extent or amount recommended by vegetation type and/or plant series that exists. These stand treatments would generally target low vigor trees to reduce stand density and improve stand resiliency and individual tree health.

- **Selective Thinning** (333 acres) would be harvested to a range of 40-60% canopy cover and would be thinned using guidelines to reduce basal area to between 110 and 160 $ft^2$ per acre. These stands are generally dominated by a Douglas-fir, ponderosa pine, and white fir overstory, with less prominent species as incense cedar and sugar pine. Selective Thinning would:
    - Maintain 43 acres of roosting/foraging habitat;
    - Downgrade 67 acres of roosting/foraging habitat to dispersal habitat;
    - Remove 1 acre of roosting/foraging habitat for landings and temp routes;
    - Maintain 211 acres of dispersal habitat;
    - Remove 1 acre of dispersal habitat for landings and temp routes; and
    - Have no effect on 10 acres of capable habitat.

Through Selective Thinning, stand density would be reduced in order to reduce stand mortality from wildfire, drought, disease and insects, and promote tree growth, quality, and vigor of the remaining trees; stand structure would be diversified; spatial heterogeneity would be developed; and growing space would be increased for large legacy pine, oak, and cedar. The increased stand diversity and structure promoted through Selective Thinning would have a long-term benefit by pushing stands towards future suitable roosting/foraging and nesting/roosting/foraging habitat sooner than if not treated.

Also, through Selective Thinning, trees infected with mistletoe would be selectively removed where mistletoe is likely to spread into unaffected areas without treatment, in order to reduce the level of infection in target stands and decrease the rate of proliferation. Scattered mistletoe-infected trees were noted while conducting habitat assessments across approximately 52% of proposed project acres. Northern spotted owls have been observed nesting in mistletoe clumps within the Analysis Area.

**Landing and temporary route construction outside proposed treatment units** (2 acres) would:

- Remove up to one acre of roosting/foraging and up to one acre of dispersal habitat, which would become capable habitat; and
- Use up to 0.4 acres of capable habitat for landings and temporary routes with no effect on owl habitat.

**Roadside vegetation maintenance** would remove vegetation from about 6 to 24 inches in diameter sixfeet horizontally from the center line of the ditch away from the road and six feet horizontally from the outside shoulder of the road. Vegetation may be hardwood or conifer trees that have grown up since the road was constructed and were not removed during road maintenance when the vegetation was smaller. Roadside vegetation maintenance would:

- Remove vegetation along up to 3.6 miles of road and would maintain up to 0.4 acres of nesting/roosting/foraging, 0.6 acres of roosting/foraging, 2.3 acres of dispersal habitat, and be no effect on 3.0 acres of capable and 0.4 acres of non-habitat.

The roadside treatment is not expected to change the overall function of the northern spotted owl habitat adjacent to the roads. The change in canopy cover within blocks of habitat would be negligible because of the narrow treatment width of six feet on either side of the road. Uncut trees adjacent to the treatment would still provide canopy cover.

Where roosting/foraging (2 acres) and dispersal habitat (2 acres) removal would occur, post-harvest canopy cover would be below 40%, and where roosting/foraging downgrade would occur (67 acres), post-harvest canopy cover would be between 40% and 60%. Northern spotted owls would no longer use these areas for roosting/foraging for 15 to 30 years until larger diameter trees (16 inches and greater) are present, or the canopy cover returns to above 60%. Before project implementation, these acres will be surveyed for owls to protocol. If northern spotted owls are located in new areas, the project would be modified to avoid negatively affecting owls, or the BLM would reinitiate consultation with the USFWS.

Following proposed harvest, the amount of roosting/foraging would decrease by 69 acres (0.5% of federal lands in the Analysis Area) while dispersal habitat would increase by 65 acres and capable habitat would increase by four acres in the Analysis Area. There would be no change in the amount of nesting/roosting/foraging habitat. Northern spotted owls can still use the remaining nesting/roosting/foraging; roosting/foraging; and dispersal habitat for dispersing through the landscape. Northern spotted owls can disperse across a fragmented mosaic of non-forested areas and a variety of forest age classes (Forsman, Anthony and Reid, et al. 2002).

**Table 3-8. Northern Spotted Owl Habitat Pre- and Post-Treatment in the Analysis Area**

| Habitat Type | NRF | RF | Dispersal | Capable | Non-Habitat |
|---|---|---|---|---|---|
| Analysis Area (Current) | 25% | 5% | 21% | 38% | 11% |
| Analysis Area (Post-Treatment) | 25% | 4.5% | 21.7% | 37.8% | 11% |

The proposed forest management project does not attempt to eradicate dwarf mistletoe from the landscape; rather, it attempts to minimize it in specific areas so that the forest health objectives and management direction pertaining to all land use allocations as defined by the 1995 Medford District Resource Management Plan can be attained. Specifically, treatments occurring within mistletoe-infected stands meet the following objectives and direction:

- Promote tree survival and restore the vigor, resiliency, and stability of forest stands that are necessary to meet land use allocation objectives (USDI 1995, p. 62, 72).
- Design and implement silvicultural treatments in stands that are in a condition, or that will soon be in a condition, which prevents management objectives from being achieved. Treatments are intended to restore the ability of stands to respond to other management and to reduce the risk of mortality from insects, disease, and wildfire (USDI 1995, p. 62).
- Design forest condition restoration treatments to be consistent with the long-term objectives of the allocation in which the treatment is proposed. Develop treatments in an interdisciplinary manner (USDI 1995, p. 62).

Mistletoe would not be eradicated from the treatment areas or Analysis Area, and would continue to persist in all nesting/roosting/foraging habitat for continued use by nesting northern spotted owls. Also, within project units, treatments will provide flexibility in allowing some infected stems to be retained for wildlife habitat purposes. As treated stands become suitable nesting/roosting/foraging habitat, the retained mistletoe would spread and create new nesting opportunities for owls.

Timber harvest proposed in Alternative 2 would have short-term adverse impacts to northern spotted owl habitat because 68 acres of roosting/foraging would be downgraded to dispersal habitat. The long-term benefit, however, would be the development of greater structural diversity within the treated stands and faster tree growth for the trees that are retained. In addition, 2 acres of roosting/foraging, and 2 acres of dispersal would be removed for landing and temporary route construction outside of timber harvest units. The landings and temporary routes would be decommissioned, following harvest, allowing reforestation to occur and a return to suitable habitat. The short-term impacts of these 4 acres of habitat removal do not have the potential to adversely impact owls because it only represents 0.06% of the total owl habitat in the Analysis Area.

The long-term (>10 years) effects of the Proposed Action are anticipated to increase the health and vigor of the residual stands post-treatment. It is more likely that the treated stands would develop into more complex, structurally diverse forests in the long-term in comparison to the No Action Alternative. In fact, thinning dense stands may be necessary in order to achieve old-growth forest characteristics in the absence of natural disturbance events (Tappeiner et al. 1997). Thinning younger forest stands may provide growing conditions that more closely approximate those historically found in developing old-growth stands (Hayes et al. 1997). Many of the treatments as proposed under Alternative 2, especially those that would occur in roosting/foraging and dispersal habitat, would have long-term beneficial effects to northern spotted owls by increasing growth rates of the residual stand and accelerating the

development of late-successional structural complexity within the treated areas than would occur if left untreated.

In Southwest Oregon, woodrats and flying squirrels are the primary sources of food for northern spotted owls. Sakai and Noon (1993) found the highest number of dusky-footed woodrats in sapling and brushy pole timber (20 – 30 year old). Although these young stands are seldom used for nesting or foraging by spotted owls, these areas are a good source of woodrats dispersing into older stands that are more frequented by foraging spotted owls and are accessible to owls hunting along the edges where old forest meets young. Flying squirrels prefer multi-layered, structured stands, preferably with tree crowns that extend down most of the bole of the trees. However, a consistent mid-layer can make up for crowns that do not extend that far down. Stands with such structure provide cover from predation. Flying squirrels nest predominantly in cavities of live trees, but will also nest in stick nests near the bole of a tree. Woodrats and flying squirrels rely on a shrub layer near the forest floor for cover and foraging.

Proposed treatments on approximately 40 acres are within stands that currently have bottom, middle, and top layer structure and also provide roosting/foraging habitat for northern spotted owls. While these stands were not surveyed for flying squirrel or woodrat presence, they may have a higher abundance of flying squirrels and woodrates because of the increased cover from predators. These stands would be treated by Density Management (19 acres of roosting/foraging maintained) and Selective Thinning (21 acres of roosting/foraging downgrade).

Proposed treatments on approximately 108 acres are within stands that currently lack the middle tree layer, but have a bottom and top tree layer structure and also provide roosting/foraging habitat for northern spotted owls. While these stands were not surveyed for woodrat presence, they may have a higher abundance of woodrats because of the increased cover from predators. These stands would be treated by Density Management (75 acres of roosting/foraging maintained) and Selective Thinning (33 acres of roosting/foraging downgrade).

Prey abundance may be reduced in up to 54 acres of roosting/foraging habitat from 5 to 20 years until a shrub layer begins to form and tree structure and canopy cover return to suitable levels that spotted owls would again use. Nine out of the 10 northern spotted owl home ranges within the Analysis Area overlap one another. Table 3-9 displays effects within each owl home range, when considered separately (some units are within more than one home range). Within northern spotted owl home ranges, log landing and temporary route construction would remove up to 2 acres of roosting/foraging habitat within two low priority sites and up to one acre of dispersal habitat within one high priority site (3255B). Selective Thinning would downgrade up to 26.5 acres of roosting/foraging within three low priority sites. Treatments that would downgrade existing roosting/foraging habitat were designed to enhance northern spotted owl habitat over the long-term. The remainder of the 302 acres of treatments (Density Management, Selective Thinning, and roadside vegetation maintenance) in northern spotted owl habitat (nesting/roosting/foraging, roosting/foraging, and dispersal) within owl home ranges was designed to maintain northern spotted owl habitat.

**Table 3-9. Anticipated Impacts to Individual Owl Home Ranges**

| Owl Site | Treatment Impact | Acres |
|---|---|---|
| 0887O | Dispersal Maintained | 90 |
| | No Effect | <1 |
| | RF Maintained | 31 |
| 0955O | Dispersal Maintained | 9 |

| Owl Site | Treatment Impact | Acres |
|---|---|---|
| | RF Maintained | 3 |
| 1303O | Dispersal Maintained | 91 |
| | No Effect | 1 |
| | NRF Maintained | <1 |
| | RF Downgrade | 6 |
| | RF Maintained | 44 |
| | RF Removed | 2 |
| 2004O | Dispersal Maintained | <1 |
| | No Effect | <1 |
| | No Effect | <1 |
| | NRF Maintained | <1 |
| 2005O | Dispersal Maintained | 7 |
| 3255B | Dispersal Maintained | 68 |
| | Dispersal Removed | 1 |
| | No Effect | 3 |
| | RF Maintained | 94 |
| 3256O | Dispersal Maintained | 8 |
| | No Effect | 1 |
| | No Effect | <1 |
| | NRF Maintained | <1 |
| | RF Downgrade | 21 |
| | RF Maintained | <1 |
| 3349S07 | Dispersal Maintained | 2 |
| 3378O | Dispersal Maintained | 14 |
| | No Effect | 1 |
| | NRF Maintained | <1 |
| | RF Downgrade | 6 |
| | RF Maintained | 43 |
| | RF Removed | 2 |
| 4466O | Dispersal Maintained | <1 |
| | No Effect | 1 |
| | No Effect | <1 |
| | NRF Maintained | <1 |

Within the Analysis Area, the BLM wildlife biologist evaluated and identified 323 acres of highly suitable, structurally complex RA32 habitat in areas initially proposed for harvest. These acres were subsequently dropped from further consideration in this project. Late-successional forest, RA32 habitat, and 100-acre known northern spotted owl activity centers would remain post-harvest, allowing opportunities for future dispersal and nesting. Harvest units would have buffers (areas of no harvest) around Special Status and Survey and Manage mollusk, plant, and fungi species. Maintaining stand diversity through the retention of these buffers, snags, and large down wood would provide habitat features important to the northern spotted owl's prey base while also providing for future nesting opportunities. Foraging opportunities, however, would be slowed in the 67 acres of habitat downgrade

as suitable habitat begins to return. Nesting opportunities would develop in 20 to 30 years as the canopy cover returns to over 60% and additional tree layers fill in the gaps.

#### 3.3.4.3 Critical Habitat

While the Analysis Area includes portions of critical habitat sub-units KLE-4 and KLE-5, actions proposed under Alternative 2 are only located within 2012 critical habitat sub-unit KLE-5 on up to 335 acres (Table 3-10). No actions are proposed in subunit KLE-4 and it will not be analyzed further.

**Table 3-10. Proposed Projects and the Potential Impact to Critical Habitat**

| **Forest Management** | | | |
|---|---|---|---|
| **Commercial Prescriptions** | **Current Habitat** | **Treatment Impact** | **Est. Acres** |
| Density Management | RF | RF Maintained | 98 |
| Selective Thinning | RF | RF Maintained | 0.12 |
| Selective Thinning | RF | RF Downgrade | 63 |
| Selective Thinning | Dispersal | Dispersal Maintained | 159 |
| Selective Thinning | Capable | No Effect | 10 |
| Selective Thinning Other | See Transportation | See Transportation | 2 |
| | | **Total** | **332** |
| **Timber Harvest Method** | **Current Habitat** | **Treatment Impact** | **Est. Acres** |
| Ground-based Yarding | See Prescriptions | See Prescriptions | 243 |
| Skyline-Cable Yarding | See Prescriptions | See Prescriptions | 89 |
| | | **Total** | **332** |
| **Non-commercial Prescriptions** | **Current Habitat** | **Treatment Impact** | **Est. Acres** |
| Understory Reduction & Activity Fuels | RF | RF Maintained | 98 |
| Understory Reduction & Activity Fuels | RF | RF Downgrade[3] | 63 |
| Understory Reduction & Activity Fuels | Dispersal | Dispersal Maintained | 159 |
| Understory Reduction & Activity Fuels | Capable | No Effect | 10 |
| Other | See Transportation | See Transportation | 2 |
| | | **Total** | **332** |
| **Transportation Management** | **Current Habitat** | **Treatment Impact** | **Est. Acres** |
| Temporary Route Construction | RF | RF Removed | 0.03 |
| Temporary Route Construction | Dispersal | Dispersal Removed | 0.10 |
| Temporary Route Construction | Capable | No Effect | 0.13 |
| Roadside Vegetation Maintenance | NRF | NRF Maintained | 0.22 |
| Roadside Vegetation Maintenance | RF | RF Maintained | 0.39 |
| Roadside Vegetation Maintenance | Dispersal | Dispersal Maintained | 1 |
| Roadside Vegetation Maintenance | Capable | No Effect | 0.76 |
| Roadside Vegetation Maintenance | Non-Habitat | No Effect | 0.31 |
| New Landings | RF | RF Removed | 1 |
| New Landings | Dispersal | Dispersal Removed | 1 |
| | | **Total** | **5** |
| | | **Grand Total** | **335** |

[3] Treatment impact of downgrade would occur as a result of Selective Thinning prescription, not the Understory Reduction prescription or treatment of activity fuels.

The Proposed Action is not expected to affect the intended conservation function of this unit (north-south connectivity between subunits and demographic support) because, within the Analysis Area, the remaining acres of nesting, roosting/foraging, and dispersal habitat within Riparian Reserves, 100-acre northern spotted owl activity centers (800 acres), retained RA32 habitat (323 acres), project treatment areas that would continue to maintain habitat function (160 acres of dispersal habitat would be maintained and 98 acres of roosting/foraging habitat would be maintained), late-successional reserves (LSR) (232 acres), and untreated stands in KLE-5 would allow northern spotted owls to effectively disperse within and beyond this critical habitat sub-unit. Although the Proposed Action would remove one acre of dispersal habitat and one acre of roosting/foraging habitat within the KLE-5 sub-unit, the overall objectives of the proposed actions are to restore ecological processes or long-term forest health to forested landscapes, which is consistent with the 2011 Revised Recovery Plan (USFWS 2011) and the 2012 Final CHU designation **(**Federal Register 77 FR 233:71876-72068).

**Table 3-11. Northern Spotted Owl Critical Habitat Pre- and Post-Treatment in the Analysis Area**

| Habitat Type | NRF | RF | Dispersal | Capable | Non-Habitat |
|---|---|---|---|---|---|
| **Analysis Area CHU (Current)** | 25% | 6% | 24% | 38% | 7% |
| **Analysis Area CHU (Post-Treatment)** | 25% | 5% | 25% | 38% | 7% |

The BLM has determined the proposed projects (Density Management, Selective Thinning, roadside vegetation maintenance, Understory Reduction, and treatment of activity fuels) that would maintain northern spotted owl habitat within designated critical habitat would not noticeably impact northern spotted owl critical habitat or adversely affect critical habitat because:

- Canopy cover within treated nesting/roosting/foraging, roosting/foraging, or dispersal stands would be retained at or above 60% and 40%, respectively;
- Decadent woody material, such as large snags and down wood, would remain post-treatment;
- Multiple canopy, uneven-aged tree structure that was present prior to treatment would remain post-treatment;
- Heterogeneity in tree structure would be promoted in Density Management and Selective Thinning units;
- No northern spotted owl nest trees would be removed; and
- All nesting/roosting/foraging and roosting/foraging habitats on federal lands in the Analysis Area would be surveyed for northern spotted owls prior to stand treatments. If northern spotted owls are located in new areas, the project will either be modified to avoid negatively affecting owls, or the BLM will reinitiate consultation with the USFWS.

With regard to the downgrade of 63 acres, and the removal of one acre, of roosting/foraging habitat in critical habitat:

The proposed projects (Selective Thinning) that would downgrade northern spotted owl roosting/foraging habitat include:

- Canopy cover within treated roosting/foraging would be brought to between 40% and 60%;
- Decadent woody material, such as large snags and down wood, would remain post-treatment;

- Multiple canopy, uneven-aged tree structure that was present prior to treatment would remain post-treatment; and
- Heterogeneity in tree structure and forest health would be promoted.

The proposed projects (temporary route and new landing construction) that would remove northern spotted owl habitat include:

- Canopy cover would be brought below 40%; and
- Down wood and fallen large snags would be moved adjacent to the treated footprint as down wood.

**Figure 3-3. Example of a Roosting/Foraging Stand that would be Temporarily Downgraded in CHU**

***Late-Successional Forest***

Where temporary roads and landings would be constructed, Alternative 2 would temporarily reduce the amount of late-successional habitat by three acres in the Analysis Area until it returns after 80 years.. The watershed would retain 77% of the BLM-administered land in the watershed in late-successional habitat after harvest, well over the 15% retention requirement. Existing large down wood and snags would be retained. Those snags identified to be felled for safety reasons would be left on-site. Where temporary routes or skid trails encounter large down wood, a section would be cut out and moved aside for access. Areas of closed canopy would remain in each section.

***Known Northern spotted owl Activity Centers***

Vegetation treatments would not occur within the 100-acre known northern spotted owl activity centers. If owls are found to be nesting, seasonal restrictions for noise disturbance would be in effect up to 0.25 mile from these activity centers during the nesting season (See Appendix A, Issue O).

***Provincial Home Ranges***

Within the higher priority provincial home ranges that have had pair status in the last five years, forest treatments would maintain the function of dispersal, roosting/foraging, and nesting/roosting/foraging habitat and would create healthier stand conditions (refer to analysis of impacts to northern spotted owl habitat).

***Connectivity/Diversity Blocks***

The actions proposed under Alternative 2 meet the Medford District ROD/RMP requirements for retaining 25% late-successional forest in connectivity/diversity blocks (USDI 1995, p. 40). No

treatments are proposed within the connectivity/diversity blocks. As a result, there would be no reduction in late-successional forest within the connectivity/diversity blocks.

**Cumulative Effects**

Cumulative effects are those effects on the environment that result from the incremental effect of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency or person(s) undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Technical issues that complicate analysis of cumulative effects include the large spatial and temporal scales involved, the wide variety of processes and interactions that influence cumulative effects, and the lengthy lag-times that often separate a land-use activity and the landscape's response to that activity.

Wildfires, fire suppression, road building, windstorms, and timber harvest throughout the Analysis Area have resulted in habitat modification and fragmentation, and have changed the distribution and abundance of wildlife species surrounding the Analysis Area. The associated habitat loss has negatively affected late-successional forest habitat dependent species by reducing stand seral stage and changing habitat structure. Species associated with younger forested conditions, however, have benefited from these changes due to the increased acres of young stands. Within the last eight years, blowdown salvage has occurred on 1,440 acres, fire mortality salvage occurred on 50 acres, and forest thinning occurred on 15 acres of BLM-administered lands.The change in habitat was included in the basin-wide update of the baseline situation. As thinned canopies continue to grow, some of these stands would return to being nesting/roosting/foraging habitat in 30 to 80 years.

Private lands surrounding the Analysis Area are made up of early-, mid-, and late-seral forests, agricultural, and shrub/oak lands. Most private forest lands are managed as tree farms for production of wood fiber on forest rotations. It is expected that any remaining late-seral forests on private timber lands will be converted to early-seral forest over the next one or two decades. For those species dependent on early-seral habitat, private forest lands do not always provide quality habitat as competing vegetation that includes flowering plants, shrubs and hardwood trees are regularly sprayed to reduce competition with future harvestable trees.

Ongoing and foreseeable management actions that are occurring and are potentially having an impact on NSO habitat in Analysis Area include:

- In the spring of 2016, approximately 20 acres of blowdown and standing hazard trees within forest stands, as well as trees along the roadside that have fallen into or alongside the road, or pose a hazard, will be harvested in the Wasson Canyon area; and
- Salty Gardner hazardous fuels reduction project, up to 1,371 acres.

Specific to northern spotted owls, the hazard tree, blowdown, and fuels reduction activities coupled with other past, present and future management activities ongoing within the Analysis Area would not preclude the northern spotted owl from dispersing, foraging, or nesting within the Analysis Area. The fuels reduction, hazard tree, and blowdown projects would not diminish the overall amount of suitable habitat found within the Analysis Area. No other planned or on-going projects on BLM-administered lands would diminish the overall amount of suitable habitat. Some private lands within the Analysis Area may be subject to intensive timber harvest, but the timing and magnitude of such harvest is unknown. Even when considering potential treatments on private lands, up to 3,139 acres of suitable nesting/roosting/foraging, 568 acres of roosting/foraging, and 2,732 acres of dispersal habitat within the

Analysis Area would remain functional and provide adequate habitat for spotted owls to disperse, forage or reproduce within the Analysis Area. The overall design of the treatments and the Project Design Features would either maintain the function of suitable spotted owl habitat or promote future, long-term benefits to spotted owl habitat within the Analysis Area.

This project, when coupled with other recent actions in the Analysis Area, would not preclude the northern spotted owl from nesting, foraging, or dispersing within the Analysis Area, but would diminish the spotted owl's foraging area by 69 acres in the short-term.

Available evidence suggests that the presence and distribution of barred owls may affect habitat quality for spotted owls (Wiens 2012 and Yackulic et al. 2013). Additionally, many studies suggest that the two species compete for resources and maintaining older, high quality forest habitat may help spotted owls persist, at least in the short-term. There are no known forest conditions that give spotted owls a competitive advantage over barred owls. While not common, Wiens (2012) did find spotted owls and barred owls occupying the same territories concurrently. It is also not known if forest habitat removal directly results in a range expansion of barred owls (USDI FWS 2013).

The BLM surveyed for RA 32 (structurally complex forest) within the Bieber Salt Analysis Area and identified 323 acres of RA32 habitat. All 323 acres of RA 32 habitat, as well as an additional 2,816 acres of nesting/roosting/foraging habitat were deferred from treatment under this project. The intent of RA 32 is to maintain the older and more structurally complex multi-layered conifer forests on federal lands in order to not further exacerbate the competitive interactions between northern spotted owls and barred owls. Since the BLM is not proposing to treat structurally complex forest and is retaining additional nesting/roosting/foraging habitat within the Analysis Area, the likelihood that inter-species competition would be exacerbated as a result of this project would be minimal. Some competitive interactions are still anticipated to occur since barred owls have been observed in the Analysis Area.

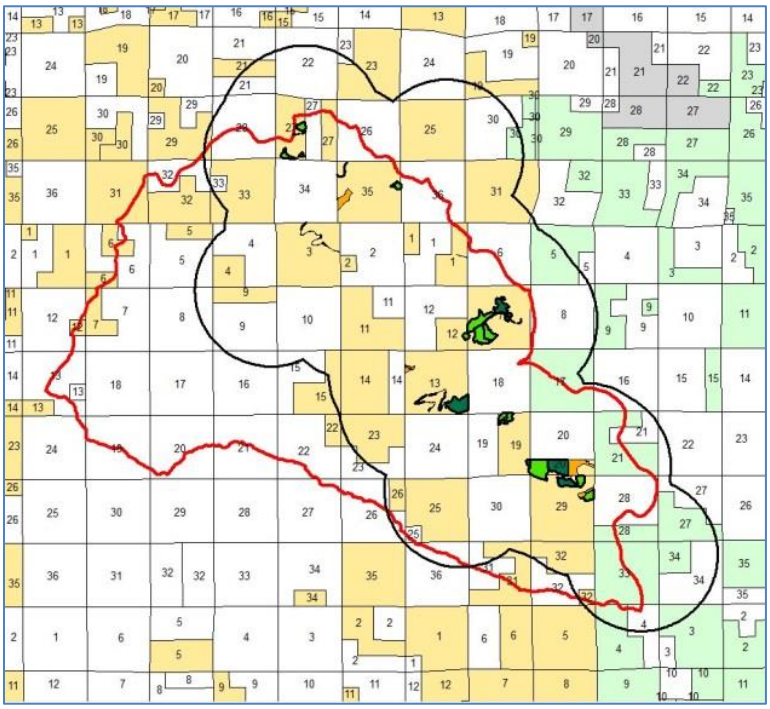
## 3.4 Fisher

### Issue 3: How would timber harvest activities affect constituent elements (canopy cover, snags, and large trees, and down wood) within stands used by fishers for denning, resting, foraging, and dispersal?

### 3.4.1 Methodology

The Analysis Area used for assessing impacts to fisher is the same Analysis Area used for northern spotted owls (NSO) (see Section 3.3.1). Home range size for fisher is quite variable, but in the southern Cascade Mountains, it ranges from approximately 6,000 to 15,000 acres (female and non-breeding-season males, respectively). Thus, the 12,553-acre NSO Habitat Analysis Area is a conservative approximation of 1 to 2 fisher home ranges and would be expected to yield a reasonable representation of effects to the species. Figure 3-4 below illustrates the Analysis Area (black) in relation to the Project Area (red).

**Figure 3-4. The Analysis Area and the Bieber Salt Project Area**



The process for conducting biological evaluations and assessments includes a review of existing records, field reconnaissance, field surveys, and analysis of potential impacts. The project wildlife biologist conducted a review of potential wildlife habitat using field assessments, maps, aerial photographs, GIS software, wildlife survey data, and stand exam records for the Analysis Area.

The BLM wildlife biologist classified habitat in the Analysis Area using 1997 IVMP (Interagency Vegetation Mapping Project), FOI (Forest Operations Inventory), TPCC (Timber Production Capability Classification), and on-site habitat analysis. IVMP is a joint Forest Service/BLM project that derives a 25-meter pixel-based vegetation map from 1997 satellite imagery. The 1997 IVMP provides a representation of vegetation age classes across all ownerships within the Analysis Area. The vegetation map has been classified into categories according to the Interagency Vegetation Standards that were adopted by the Interagency Advisory Committee. IVMP data is primarily useful for cumulative effects analysis that includes public and private lands. The FOI gives a more detailed description of age classes on BLM-administered lands because it is based on field data as well as aerial photo inventories. The combined data allows the vegetation to be grouped into the early, mid-, and late seral age classes for comparison purposes, although these data sources have differing degrees of detail and resolution. The TPCC refers to the suitability of the soil to produce timber.

### 3.4.2 Assumptions

The northern spotted owl (NSO) nesting/roosting/foraging (NRF) habitat-type described in the NSO affected environment section adequately describes suitable fisher denning and resting habitat because there is a direct correlation of key habitat features used to assess NSO habitat and fisher habitat (high canopy cover, multi-storied stands, large snags, and large down trees on the forest floor).

### 3.4.3 Affected Environment

On October 7, 2014, the USFWS issued a proposal to list the West Coast Distinct Population Segment (DPS) of fisher (*Pekania pennanti)* as a Threatened species under the ESA (79 FR 194:60419-60425).

The USFWS published a finding in April 2016 that the west coast population of fisher will not be listed under the Endangered Species Act. The October 7, 2014, proposed rule to list the West Coast DPS of fisher as a threatened species is withdrawn as of April 18, 2016 (81 FR 74:22709-22808). The USFWS stated that the best available science shows current threats are not causing significant declines to the West Coast populations of fisher and that listing is not necessary at this time to guarantee survival. Fishers remain a Special Status Species (BLM Bureau Sensitive Species).

Fishers (a mammal from the weasel family) are found in forest woodland landscape mosaics that include conifer-dominated stands. Their occurrence is closely associated with low- to mid-elevation forests (generally less than 4,100 feet) with a coniferous component, large snags or decadent live trees and logs for denning and resting, and complex physical structure near the forest floor (Aubry and Lewis 2003). Forest type is probably not as important to fishers as the vegetative and structural complexity that lead to abundant prey populations and potential den sites (Lofroth et al. 2010). Fishers do not appear to occur as frequently in early-successional forests as they do in late-successional forests in the Pacific Northwest (Powell and Zielinski 1994), but they will use harvested areas if patches of habitat with residual components (i.e., logs, hardwoods) and areas where patches of larger trees are left in the landscape (Lofroth et al. 2010). In addition, Buskirk and Powell (1994) hypothesized that the physical structure of the forest and prey associated with forest structures are the critical features that explain fisher habitat use, not specific forest types. Prey and scavenged remains recovered from den and rest sites in southwest Oregon include rabbit, ground squirrel, flying squirrel, woodrat, opossum, skunk, porcupine, bobcat, deer and elk carrion, jay, woodpecker, grouse, berries, and yellow jackets ( Lofroth et al. 2011; Aubry and Raley 2006).

Females usually give birth in cavities (natal dens) in large live or dead trees. These cavities are in trees with openings that access hollows created by heartwood decay (Aubry and Raley 2002). After the kits become more active, the females move them to a larger den (maternal den) on or near the forest floor. These dens are primarily cavities in the lower bole or butt of live or dead large trees. Fishers also use snags, mistletoe brooms, rodent nests, logs, and cull piles for rest sites (Lofroth et al. 2010).

Currently, there are two populations of fisher in Oregon which appear to be genetically isolated from each other: a small population in the Southern Cascades near Prospect and Butte Falls, and a second population in southwestern Oregon in the Klamath Siskiyou Mountains (Lofroth et al. 2010; Aubrey et al. 2004). This is considered to be the result of the presence of potentially strong ecological and anthropogenic barriers including the white oak savanna habitat of the Rogue Valley and Interstate 5. Based on DNA analyses, individuals in the southern Oregon Cascades appear to be descendants of animals reintroduced from British Columbia and Minnesota during the late 1970s and early 1980s by the Oregon Department of Fish and Wildlife (Drew et al. 2003). Animals in the eastern Siskiyou Mountains of Oregon are genetically related to individuals in the northwestern California population, which is indigenous (Wisely et al. 2004; Farber and Franklin 2005).

The Fisher Analysis Area is north of the Klamath Siskiyou Mountains, within the Southern Oregon Cascades range of the fisher.

Fishers are highly mobile and have large home ranges, and travel over large areas. In the Southern Cascades population, the average home range for females was approximately 6,200 acres (25 $km^2$). Male home ranges varied from approximately 36,300 acres (147 $km^2$) during breeding season to 15,300 acres (62 $km^2$) during the nonbreeding season (Aubry and Raley 2006). One male dispersed approximately 34 miles (55 km) to the Big Marsh area on the Deschutes National Forest (Aubry and Raley 2002). Other fisher research studies on the west coast have shown that fisher mean home range

size vary considerably. Females' mean home ranges vary from 1.7 $km^2$ to 59 $km^2$, and males' from 7.4 $km^2$ to 177.5 $km^2$.

The northern spotted owl NRF habitat-type described in Section 3.3.3.1 adequately describes suitable fisher denning and resting habitat because there is a direct correlation of key habitat features used to assess NSO habitat and fisher habitat (high canopy cover, multi-storied stands, large snags, and large down trees on the forest floor). Using northern spotted owl habitat as a surrogate for fisher habitat has been accepted by the courts as a reasonable practice (*KS Wild v. US BLM*, Case No. 06-3076-PA, Order and Judgment 9/10/2007).

Based on the NSO habitat analysis, approximately 3,139 acres of suitable fisher denning and resting habitat exist on Federal lands within the Fisher Analysis Area. All of these acres may not provide optimal fisher habitat, however, because past harvest practices and land ownership patterns have resulted in fragmented habitat. BLM "checkerboard" ownership may be one of the primary factors limiting the ability of BLM-administered lands to provide optimal habitat for fishers (USDA and USDI 1994). This checkerboard ownership pattern was created by the Congressional acts that provided land grants, and is beyond the scope of the BLM's authority.

Approximately 0.4 acres of suitable fisher denning and resting habitat would be impacted by roadside vegetation maintenance treatments. There are no other actions are proposed in fisher denning and resting habitat.

A known population of fisher is present in the southern Cascades near the communities of Prospect and Butte Falls. A research project by Pacific Northwest Research Station Olympia Forestry Services Laboratory (PNW) and Rogue River National Forest (RRNF) documented fishers in the Rogue River/Lost Creek, Big Butte Creek, and South Fork Rogue River 5$^{th}$ field watersheds on BLM-administered lands near RRNF lands. Protocol surveys for fishers were conducted in the Analysis Area in 2008 by a Medford BLM fisher biological survey team. A fisher was detected in the Analysis Area at two camera stations approximately 1.5 miles apart in the Bowen Creek area. It is unknown whether this is the same fisher or two different individuals. DNA samples were analyzed from one of the camera stations and it was confirmed to be a female fisher. The size of the fisher population on Butte Falls Resource Area and RRNF lands is unknown, although 22 fishers were captured from 1995 to 2001 in the PNW study (Aubry and Raley 2002).

## 3.4.4 Environmental Consequences

Impacts to fishers are measured in acres by changes to denning and resting habitat from the proposed activities. Effects are analyzed at the Fisher Analysis Area scale. This scale is appropriate because fishers are wide ranging species and this scale is large enough to address habitat effects that could affect the species.

### 3.4.4.1 Alternative 1 - No Action

Under Alternative 1 (No Action) no management activities would be implemented. Without treatment, current stand conditions would likely develop into less complex stand structures and simplified species composition than of late-successional stands (Sensenig 2002), or at the very least, would require much longer time scale to develop into structurally complex forest (Tappeiner et al. 1997). Habitat conditions would remain generally unchanged at the unit scale in the short-term unless major disturbance such as a wildfire, wind event, or disease induced mortality occurred.

Fishers would be expected to behave and utilize the habitat within the Analysis Area in the same fashion as they have in the past. Much of the discussion under the NSO No Action Alternative is also relevant to the fisher, as both species are associated with mature and late-successional habitats.

#### 3.4.4.2 Alternative 2 - Proposed Action

**Direct and Indirect Effects**

Fisher occurrence is closely associated with low to mid-elevation (generally less than 4,100 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 (Aubry and Lewis 2003). Forest type is probably not as important to fishers as the vegetative and structural complexity that lead to abundant prey populations and potential den sites (Lofroth et al. 2010). The most applicable data available to the BLM where these key structural habitat components are located across the landscape is the northern spotted owl nesting, roosting and foraging (NRF) habitat models and field assessments.

There is considerable information on the importance of structural elements (e.g. large trees and snags with cavities) for fisher. The strongest and most consistent habitat association observed across all fisher studies in the West Coast Distinct Population Segment was the use of cavities in live trees and snags by reproductive females with kits. Natal dens are typically found in the largest trees available in a stand and there is a preference towards hardwood cavities when present on the landscape. These large trees with cavities and platforms are also used extensively by both sexes for resting sites. Naney (2012) stated that the reduction in structural elements used for denning and resting distributed across the landscape was the highest ranked and geographically most consistent threat to fishers. Currently, there are no empirical thresholds at which the reduction of structural elements may begin to negatively affect fishers (Naney et al. 2012).

Other threats to fishers in SW Oregon include overstory reduction, roads, fragmentation, uncharacteristically severe wildfires, and the reduction of structural elements mentioned above (Naney et al. 2012). These changes in habitat have the greatest effect on fisher new home range establishment. Fishers typically have large home ranges, use habitat at multiple spatial scales, and typically avoid areas with little or no contiguous canopy cover (Lofroth et al. 2010). Fragmentation is primarily influenced by land ownership patterns, management practices, and is a higher threat on commercial timber lands (Naney et al. 2012). These effects likely have the strongest influence on females because males have been known to disperse great distances to settle new home ranges. Although not always successful, dispersing juveniles have been documented moving long distances and navigation across or around landscape features including rivers, highways and rural communities (Lofroth et al. 2010). In a study in the south Oregon Cascades, juvenile males averaged a dispersal distance of 18 miles (Aubry and Raley 2006). Dispersal into and through the Fisher Analysis Area probably only occurs from, and to, the north and east of the Analysis Area because the west and south side of the Analysis Area is surrounded by non-habitat.

According to the closet fisher study (Aubry and Raley 2006) to the Fisher Analysis Area, fisher male non-breeding home ranges average 24 $mi^2$ (15,320 acres) and females average 9.6 $mi^2$ (6,177 acres). Since female home ranges frequently overlap, the Fisher Analysis Area has the potential to contain at least two female home ranges and one male home range, and possibly more, depending on their home range juxtaposition on the landscape surrounding the Analysis Area. Surveys conducted in 2008 confirmed fisher presence in the Analysis Area; genetic analysis determined the gender was female. This detection was within the breeding season and likely represents a resident fisher within its home range. The nearest proposed timber harvest treatment is approximately one mile away from this detection.

A considerable amount of research exists describing denning and resting habitat use and landscape-level selection (Lofroth et al. 2010), but very little is known regarding how forestry practices affect how fishers continue to use previously untreated areas. Historically, a change in habitat is used as a surrogate to determine the effects of habitat modification in lieu of published research. As previously mentioned, our best tool for determining suitable fisher habitat, while not implying a level of fitness, is to use spotted owl habitat models. Field surveys have shown that spotted owl NRF habitat can contain similar decadent attributes or structural elements that fisher use for denning and rest sites. The proposed treatments in Alternative 2 would treat (and maintain) 0.4 acres out of 3,139 acres (total) of NRF habitat in the Fisher Analysis Area.

As described more fully under the NSO analysis, the management activities proposed under Alternative 2 would not reduce the amount of suitable denning and resting (NRF) habitat present in the Analysis Area. Minimal negative effects to fishers are anticipated from harvest activities because the proposed treatments would retain the habitat features important to fishers across the treated areas. As required by the PDFs in Chapter 2, all snags and coarse woody material would remain within the treated areas post-treatment.

The commercial treatments under Alternative 2 would have short-term negative effects to habitat for some fisher prey species due to the reduced vegetation. These effects are relatively short-term, as understory vegetation typically returns within five years and some of the fishers' prey species take advantage of early-seral stages. The immediate effects to fisher foraging opportunities would be minimal, because the large amount of untreated areas within the Analysis Area would continue to provide hunting habitat while canopy cover in the treated stands increases. Additionally, treatments would retain key habitat characteristics such as legacy trees, large snags and large down wood to provide existing and future habitat for fishers.

Disturbance from treatment activities would likely be the principal effect to fisher within the Analysis Area. However, fishers are highly mobile and with large home ranges, they would likely move to another part of their home range while the activity is ongoing. Unrelated to disturbance, ongoing radio telemetry work in the nearby Ashland watershed has shown that fishers are quick to respond to environmental changes (e.g. heavy snowfall) and move to other parts of their home ranges (Clayton 2012a).

Under Alternative 2, there are Project Design Features that would minimize impacts to fishers. These include the retention of key structural elements such as legacy trees, snags, large down wood, and large hardwoods for denning. Also, the majority of treatments (Density Management and Selective Thinning) proposed under Alternative 2 are expected to increase areas of structural complexity within stands that have remained homogenous from previous treatments. While 4% of the Analysis Area (Federal lands) is proposed for treatments, areas such as Riparian Reserves, NSO RA-32 habitat, 100-acre KSOAC owl cores, NSO Nest Patches, Administratively Withdrawn land, and other reserves will continue to provide undisturbed habitat for fishers.

**Cumulative Effects**

Cumulative effects are those effects on the environment that result from the incremental effect of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency or person(s) undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Cumulative effects for wildlife species and habitat are reviewed at the watershed level to capture the varying habitats, species home ranges, and varying degrees of species mobility. Technical issues that complicate analysis of cumulative effects

include the large spatial and temporal scales involved, the wide variety of processes and interactions that influence cumulative effects, and the lengthy lag-times that often separate a land-use activity and the landscape's response to that activity.

Fire suppression, road building, and timber harvest throughout the Analysis Area have resulted in habitat modification and fragmentation, and have changed the distribution and abundance of wildlife species surrounding the Analysis Area. Timber harvest has occurred on BLM-administered lands in the Little Butte Creek Watershed since 1950. The associated habitat loss has negatively affected late-successional forest habitat dependent species by reducing stand seral stage and changing habitat structure. Species associated with younger forested conditions, however, have benefited from these changes due to the increased acres of young stands.

Private lands surrounding the Analysis Area are made up of early-, mid-, and late-seral forests, agricultural, and shrub/oak lands. Most private forest lands are managed as tree farms for production of wood fiber on forest rotations. It is expected that any remaining late-seral forests on private timber lands will be converted to early seral forest over the next one or two decades. For those species dependent on early-seral habitat, private forest lands do not always provide quality habitat as competing vegetation that includes flowering plants, shrubs and hardwood trees are regularly sprayed to reduce competition with future harvestable trees.

Ongoing and foreseeable management actions that are occurring and will have effects within the Analysis Area include:

- In the spring of 2016, approximately 20 acres of blowdown and standing hazard trees within forest stands, as well as trees along the roadside that have fallen into or alongside the road, or pose a hazard, will be harvested in the Wasson Canyon area; and
- Salty Gardner hazardous fuels reduction project will treat up to 1,371 acres.

Specific to fisher, the hazard tree, blowdown, and fuels reduction activities coupled with other past, present and future management activities ongoing within the watershed would not preclude the fisher from foraging or denning within the watershed. The hazard tree and blowdown project would result in small scale changes to fisher resting and denning habitat, but would not diminish the overall amount of suitable habitat found within the watershed. No other planned or on-going projects on BLM-administered lands would diminish the overall amount of suitable habitat. Some private lands within the watershed may be subject to intensive timber harvest, but the timing and magnitude of such harvest is unknown. Even when considering potential treatments on private lands, up to 3,139 acres of suitable resting and denning habitat within the Analysis Area would remain functional and provide adequate habitat for fishers to occupy, forage or reproduce within the Analysis Area. The overall design of the treatments and the Project Design Features would maintain the function of suitable fisher habitat within the Analysis Area.

Noise disturbance would be the primary cause of negative effects to fisher. The Bieber Salt Project would result in an increased amount of noise disturbance within the watershed in addition to the other on-going management activities in the watershed. Even considering other on-going management activities, however, a large percentage of the watershed would remain untreated.

Fishers have large home ranges and would be able to move away from areas of disturbance while the disturbance is occurring, without impacting their ability to forage and disperse within their home range. The treatments proposed as part of the Bieber Salt Project, as well as the other on-going management activities would be spread out both spatially and temporally, which would reduce the level of

disturbance across the watershed. Considering the cumulative effects of this project and other project activities within the watershed, the project would not preclude the fisher from foraging or denning within the Analysis Area.

## 3.5 Aquatic Conservation Strategy

### Issue 4: How would timber harvest, road work, and water source restoration activities affect attainment of Aquatic Conservation Strategy (ACS) objectives?

The Record of Decision for the Northwest Forest Plan contains Standards and Guidelines for the management of the land use allocations designated in the Northwest Forest Plan (USDA and USDI 1994) and incorporated into the 1995 Medford District ROD/RMP (USDI 1995). The Aquatic Conservation Strategy (ACS) provides clarification of the intent of the Standards and Guidelines "in order to provide guidance for situations not specifically covered by the standards and guidelines" (USDA and USDI 1994, B-1).

### 3.5.1 Components of the Aquatic Conservation Strategy

The Northwest Forest Plan's (NWFP) Aquatic Conservation Strategy (ACS) has four components: Riparian Reserves, Key Watersheds, Watershed Analysis (WA), and Watershed Restoration. It is guided by nine objectives which are meant to focus agency actions to protect ecological processes at the watershed and site scale.

#### 3.5.1.1 Riparian Reserves

The 1995 Medford District ROD/RMP (p. 27) states, "As a general rule, management actions/direction for Riparian Reserves prohibits or regulates activities that retard or prevent attainment of Aquatic Conservation Strategy and Riparian Reserve objectives."

Medford District ROD/RMP Management direction for timber management within Riparian Reserves (USDI 1995, p. 27) states, "Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy and Riparian Reserve objectives."

Riparian Reserve widths for streams, springs, wetlands, and unstable soils have been determined according to the protocol outlined in the NWFPs Aquatic Conservation Strategy and are listed in the Project Design Features (PDFs) for the Bieber Salt Project (Chapter 2, Section 2.5).

#### 3.5.1.2 Key Watersheds

Key watersheds serve as refugia for "maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species" (USDI 1995, p. 22). They also have a high potential of being restored as part of a watershed restoration program. The portion of the Little Butte Creek Watershed from the North and South Fork confluence upstream is a Tier 1 Key Watershed which includes the North Fork Little Butte Creek drainages and Wasson Canyon drainage in the Project Area.

#### 3.5.1.3 Watershed Analysis

The relevant watershed analysis for the Bieber Salt Project is the 1997 Little Butte Creek Watershed Analysis (USDI and USDA 1997). Watershed analysis is intended to enable the planning of watershed- or landscape-scale projects that achieve ACS objectives. Watershed analysis will serve as the basis for the design of Best Management Practices during project-specific planning (USDI 1995, p. 152).

In 2011, the BLM conducted a review and updated the Best Management Practices to provide direction regarding road maintenance practices and road-related actions (IM-OR-2011-018). The update was intended to minimize or prevent sediment delivery to waters of the United States in compliance with the Clean Water Act. Those Best Management Practices were incorporated into the Medford District RMP.

#### 3.5.1.4 Watershed Restoration

The Medford District ROD/RMP (USDI 1995, p. 23) states, "Watershed restoration will be an integral part of a program to aid recovery of fish habitat, riparian habitat, and water quality. The most important components of a watershed restoration program are control and prevention of road-related runoff and sediment production, restoration of the condition of riparian vegetation, and restoration of instream habitat complexity."

Most of the restoration activities in the watershed have focused on restoring fish passage to provide better access to habitat on upstream private and federal lands. Projects that have been done in a collaborative effort with the local watershed council, Oregon Department of Fish and Wildlife (ODFW) and/or the BLM include culvert removal and replacement, dam removal, road decommissioning, and irrigation ditch fish screens and siphoning.

### 3.5.2 Project Summary

The BLM is proposing forest management activities on 431 acres of Matrix lands. There is no proposed vegetation activity in Riparian Reserves with the exception of restoring seven water source (pump chance) sites. There is no riparian thinning proposed in the Bieber Salt Project Area. Forest management activities could include density management and selective thinning based on species type, and slash disposal activities such as piling and burning. Proposed road projects include temporary route construction; designated skid trails, including using existing skid trails to an existing road through a Riparian Reserve that buffers a spring; road renovation on haul routes; partial and full road decommissioning; roadside vegetation maintenance; and water source restoration.

### 3.5.3 Project Design Features That Would Maintain or Restore ACS Objectives

Project Design Feature (PDFs) listed in Chapter 2 that apply to maintaining or restoring ACS objectives include those listed under Sections 2.5.1 Common to All Proposed Projects; Objective 1: Prevent and contain hazardous material spills; 2.5.2 Timber Harvest; Objective 4: Prevent off-site soil erosion and soil productivity loss; Objective 5: Prohibit unauthorized OHV use; Objective 7: Protect Riparian Reserves; 2.5.3 Road Maintenance, Decommissioning, and Quarry Work; Objective 1: Prevent off-site soil erosion and soil productivity loss; 2.5.4 Objective 4: Minimize affects to riparian areas; 2.5.4 Fuels Treatments Associated with Timber Harvest Objective 4 Minimize affects to riparian areas; and 2.5.5 Water Source Restoration Objective 3: Prevent off-site soil erosion and soil productivity loss.

### 3.5.4 ACS Consistency Analysis

The following discussion is based on the proposed project activities combined with specific PDFs that would maintain or restore each ACS objective. ACS objectives are analyzed based on short- (10 years or less) and long- (>10 years) term effects of the project, and are analyzed at a project scale and watershed scale.

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

**Project Scale**

**Short-Term:** The Bieber Salt Project would maintain the distribution, diversity, and complexity of the watershed and landscape-scale features. Project Design Features would ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted. Project Design Features include full Riparian Reserves on all streams, lakes, wetlands, ponds, springs with the exception of using existing skid trails in the portion of a spring buffer above an existing road, and meadows; no new landing construction in Riparian Reserves; wet season restrictions on hauling and road construction; and blocking and decommissioning temporary routes in the same season the route is used.

**Long-Term:** The Bieber Salt Project is expected to maintain watershed features in the long-term. Topography, slope, forest fire regime, climate, and the distribution of soil types and plant communities are some of the landscape-scale features affecting aquatic systems in the Little Butte Creek Watershed. One of the treatment objectives of the Bieber Salt Project is to restore certain plant communities in order to compensate for an altered fire regime that has created increased stand densities. Treatments would reduce stand densities to natural carrying capacities and create favorable conditions to improve individual tree health (vigor) for desirable species and to promote the growth and establishment of tree species that are well adapted or most resilient to environmental conditions and natural disturbance regimes (EA 1-4) The restoration of these stands would restore landscape scale features at the site level, but would have a minor benefit at the watershed scale due to the small amount of acres treated in the watershed.

A total of 1.78 miles of road would be partially decommissioned. A total of 0.06 miles (approximately 320 feet) of temporary route construction would provide temporary access to timber harvest units, which would be fully decommissioned after use. No new permanent road construction is proposed in this project.

Riparian Reserves would continue to function because no timber harvest would occur in Riparian Reserves along all streams, wetlands, ponds, lakes, and springs.

**Watershed Scale**

Short-Term: Riparian Reserves are expected to maintain the distribution, diversity, and complexity of watershed and landscape-scale features primarily because there are no proposed vegetation treatments in Riparian Reserves on all streams, lakes, ponds, wetlands, and springs.

Long-Term: There would be no long-term impacts from this project at the watershed scale because of the implementation of full Riparian Reserves to protect aquatic systems and road decommissioning to restore the complexity of watershed scale features by removing road related impacts.

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

**Project Scale and Watershed Scale**

**Short-Term/Long-Term:** In the Little Butte Creek Watershed, BLM-administered land is concentrated in the steeper slopes of the tributary streams of the drainages. Here, longitudinal connectivity and road densities are the primary issues for aquatic species. No activities planned under the Bieber Salt Project

would affect spatial and/or temporal connectivity, as no culverts are proposed for addition, replacement, or removal on perennial channels. No physical or chemical barriers associated with the proposed forest management activities and associated projects are expected to occur either in the short-term or long-term.

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

**Project Scale and Watershed Scale**

**Short-Term/Long-Term:** No actions are proposed in the Bieber Salt Project that would negatively affect the physical integrity of the aquatic system. Full Riparian Reserves would be in place on all streams, wetlands, ponds, lakes, and springs with the exception of using existing skid trails in the portion of a spring buffer above an existing road; therefore, all banks and stream configurations would remain unchanged during timber sale operations. There are no stream crossings proposed during temporary road construction so stream bank and bottom configurations would remain unchanged. Roadwork would occur on existing roads and not change any stream banks or bottom configurations. Water source restoration would occur within the existing pump chance footprint and not affect stream banks or bottom configuration. The Bieber Salt Project would not negatively affect the physical integrity of the aquatic system in the short- or long-term at either the project or watershed scale.

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

**Project Scale**

**Short-Term/Long-Term:** Water quality would be maintained through the use of Riparian Reserves and PDFs in the Project Area. There would be no effect on water temperature because shade would not be reduced along any stream channels during timber harvest. Water quality would be improved in the short-term as a result of road renovation, although small amounts of sediment could be mobilized and transported to streams when the work begins. There would likely be a small amount of fine sediment entering stream channels in the Analysis Areas from timber hauling. Sediment inputs would be minor relative to existing sediment levels. There are no point sources of pollution associated with this project. Project Design Features to maintain water quality include storing hazardous materials and petroleum products and fueling equipment outside of Riparian Reserves.

Water quality would be maintained in the long-term. Road renovation and decommissioning would reduce sediment input from roads. There would be a slight improvement in water quality at the project scale as a result of the adding crushed rock to roads identified for renovation where funding permits and partial decommissioning a total of 1.78 miles of road.

**Watershed Scale**

**Short Term/Long Term:** Water quality would be maintained at the watershed scale because Riparian Reserves would continue to function and protect riparian, aquatic, and wetland ecosystems. Road renovation would reduce sediment input to local stream channels but would have little impact on reducing sediment at the watershed scale.

Water quality would be maintained as Riparian Reserves continue to grow large conifers. Road work would help maintain or improve water quality; although, the effect at the watershed scale would be small because of the approximately 200 road miles in the watersheds analyzed.

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

**Project Scale**

**Short Term/Long Term:** The current sediment regime would be maintained because Riparian Reserves would continue to filter sediment and protect aquatic systems from additional sediment loads that may result from management actions.

The sediment regime would be maintained in the short-term as a result of road renovation, although small amounts of sediment could be mobilized and transported to streams when the work begins. There would likely be a small amount of fine sediment entering stream channels in the analysis areas from timber hauling. Sediment inputs would be minor relative to existing sediment levels.

The current sediment regime would be maintained and slightly improved as a result of 34 miles of proposed road renovation, 1.78 miles of partial road decommissioning, and 0.19 miles of full decommissioning. The volume of sediment would be reduced locally as a result of adding crushed rock to roads identified for renovation.

**Watershed Scale**

**Short Term/Long Term:** The current sediment regime would be maintained during implementation of the Bieber Salt Project because timber harvest would occur outside of Riparian Reserves. The sediment regime would be maintained or improved through 34 miles of proposed road renovation, 1.78 miles of partial road decommissioning, and 0.19 miles of full decommissioning.

The sediment regime would be maintained at the watershed scale. Although the road work would reduce the volume of sediment at the site scale, this would be immeasurable at the watershed scale when compared to the volume of sediment generated from roads throughout the watershed.

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

**Project Scale**

**Short-Term:** Riparian Reserves throughout the Project Area would continue to function. Patterns of sediment, nutrient, and wood routing would not be changed. The project would not diminish large wood recruitment, alter the flow regime, reduce flood-prone areas, or impinge on watershed function.

The Wasson Canyon Analysis Area currently has a potential risk for peak flow enhancement. Alternative 2 would not increase the risk for peak flow as a result of timber harvest because there would be no treatments that would result in canopy cover of less than 30% (see Appendix A, Issues Considered but Eliminated, Issue H). The amount of area in the TSZ with less than 30% crown closure would remain at 47% after timber harvest in the Wasson Canyon Analysis Area. There would not be an

increase in peak flows to cause erosion to stream channels and therefore there would be no risk of sedimentation to fish habitat downstream.

Peak flows would not be affected by the harvest activities because the amount of canopy retained after harvest would be within the range of natural variability, which is assumed to be approximately 40% for forested lands in the Southern Cascade ecoregion.

Long-Term: In the long-term, it is expected that large wood recruitment would increase within Riparian Reserves as stands continue to grow and eventually enter the stream as snags fall and blowdown occurs.

**Watershed Scale**

**Short-Term/Long-Term:** Riparian Reserves throughout the Bieber Salt Project Area would continue to recover and maintain patterns of sediment, nutrient, and wood routing. Peak, high and low water flows would remain unchanged at the watershed scale. At the watershed scale, there would be no effects detectable from the background levels because PDFs would be implemented to ensure instream flows are maintained. Project Design Features include full Riparian Reserves, no new landings in Riparian Reserves, restrictions on wet season hauling and road construction, and decommissioning temporary routes in the same season of use.

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

**Project Scale**

**Short-Term/Long-Term**: The Bieber Salt Project would maintain the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands because canopy cover would remain within the range of natural variability after timber harvest and no harvest would occur within Riparian Reserves. Full Riparian Reserves would be applied to all streams, wetlands, ponds, and springs, with the exception of using existing skid trails in the portion of a spring buffer above an existing road. Project activities would be restricted within 300 feet of meadows 10 acres or larger in size. There would be no mechanical disturbance within meadows or wetlands.

**Watershed Scale**

**Short-Term/Long-Term:** The Bieber Salt Project would maintain the timing, variability, and duration of floodplain inundation and the water table elevation in meadows and wetlands because project activities would not increase the risk of peak flows or water accumulations, project activities would not occur in meadows, and full Riparian Reserves would be implemented on all streams, lakes, ponds, springs, and wetlands.

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

**Project Scale**

**Short-Term:** The Bieber Salt Project would maintain species composition and structural diversity of plant communities in riparian areas and wetlands because full riparian reserve buffers would be in place

on all streams, wetlands, ponds, and springs during timber harvest. Temporary route construction would occur on approximately 320 feet of stable ground away from streams. Water source restoration at seven sites would include clearing brush and trees where access is needed to the pump chance and removing sediment along with vegetation that has accumulated in the pump chance. This would cause a reduction in vegetation in and around the pump chance, but this effect would be short-term and would not affect the species composition and structural diversity of plant communities in riparian areas and wetlands.

Riparian Reserves would continue to ensure nutrient filtering and appropriate rates of surface erosion, bank erosion, and channel migration. Riparian Reserves would supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Long-Term: The Bieber Salt Project would maintain species composition and structural diversity of plant communities in Riparian Reserves because this project would use full Riparian Reserves on all streams, ponds, lakes, springs with the exception of using existing skid trails in the portion of a spring buffer above an existing road, and wetlands. There would be no change to plant communities in riparian areas because there would be no timber harvest in Riparian Reserves.

**Watershed Scale**

**Short-Term/Long-Term:** The Bieber Salt Project is not expected to affect species composition and structural diversity in riparian areas or wetlands at the watershed scale because riparian species such as willow, ash, yew, maple, and California black oak would not be removed from Riparian Reserves in the watershed.

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

**Project Scale**

**Short-Term/Long-Term**: The Bieber Salt Project would maintain populations of native plant, invertebrate, and vertebrate riparian-dependent species because no riparian hardwood species would be removed and full Riparian Reserve buffers would be implemented on all streams, wetlands, ponds, lakes, and springs, with the exception of using existing skid trails in the portion of a spring buffer above an existing road. Project Design Features that would be implemented include restrictions on wet season hauling and road construction, no new landings in Riparian Reserves, and decommissioning temporary routes in same season of use. Project Design Features would minimize disturbance to plants, soil, and water; keep project activities from causing large disturbances at the project scale; and limit the risk of spreading noxious weeds.

**Watershed Scale**

**Short-Term/Long-Term:** The Bieber Salt Project is not expected to affect populations of native plant, invertebrate, and vertebrate riparian-dependent species at the watershed scale because full Riparian Reserve buffers would be used during project implementation on all stream, wetlands, ponds, and springs with the exception of using existing skid trails in the portion of a spring buffer above an existing road in the Little Butte Creek Watershed.

### 3.5.5 ACS Summary

Timber harvest, road work, and water source restoration would not affect the attainment of ACS objectives in the Bieber Salt Project. This project would maintain all ACS objectives in the short-term

and long-term at both the site and watershed scales because of no permanent roads would be constructed; full Riparian Reserve buffers would be utilized during timber harvest on all stream channels, lakes, ponds, springs (with the exception of using existing skid trails in the portion of a spring buffer above an existing road), and wetlands; and additional PDFs would be applied to limit effects to soil, water, and plants. This project is not expected to affect the aquatic environment. The project would allow Riparian Reserves to continue to function, and protect streams within the Bieber Salt Project Area.

Full Riparian Reserves would continue to provide shade to streams. Proposed actions would maintain an adequate distance from streams to avoid sediment deposition harmful to fish habitat. Any effects from all proposed actions are expected to be negligible and within the range of natural variability for maintenance of fish populations and habitat.

## 3.6 Economics

### Issue 5: How would the removal of forest products contribute towards the local and regional economy?

This section analyzes the potential impacts of proposed forest management activities on economics.

### 3.6.1 Methodology

Economics focuses on the Medford District ROD/RMP objective of producing a sustainable supply of forest commodities from Matrix lands to provide jobs and contribute to community stability (USDI 1995, p. 38). In addition to commodity supply, evaluation of the economic feasibility of management actions is a consideration in project design (USDI 1995, pp. 179-180). The Analysis Area includes all BLM-administered lands within the Project Area. This analysis considers the commodity supplies and associated employment opportunities that would be contributed from lands in the Analysis Area.

Economic values that are assessed include total commodity output (wood fiber harvested), total dollar return to the Federal Treasury, and dollar value per unit of output. Units of output are measured as MBF (thousand board feet) of harvest for sawlog material and BDT (bone dry ton) for forest biomass that is used. The values used per MBF of harvest are based on February 2016 prices for Douglas-fir ($650 per MBF). Level of commodity output provides the basis for assessing commodity supply, resultant employment levels, and estimates of net revenue and revenue per unit of output to the Federal Treasury. Positive net revenue serves as an indicator of economic feasibility and revenue per unit of output indicates the level of economic efficiency.

The economic effects of noncommodity-based activities are only assessed where there is a correlation to commodity supply. Management actions, such as habitat improvement or fuel hazard reduction, have economic effects; however, the primary focus of these actions is not for inputs to the economy but to provide for resource enhancement. As a result, the economic effects of these actions are recognized but are not a primary decision factor in considering implementation of an action alternative.

### 3.6.2 Assumptions

- Affected employment levels per MMBF (million board feet) processed is 9.07 jobs in the solid wood products industry (USDA and USDI 1994, 3&4-293).
- Economic values are static and intended to provide for a relative comparison among alternatives.
- Average harvest levels are from historical yields of treatments in the Butte Falls Resource Area similar to those proposed in the Bieber Salt Project Area. Assumed harvest levels range from 10

MBF per acre, for more intensive thinning prescriptions, to 5 MBF per acre for lower volume harvest areas such as Density Management thinning treatments that would maintain northern spotted owl nesting, roosting, and foraging (NRF) habitat.

- The estimated return to the Federal Treasury is based on current pond values excluding estimated logging costs. Logging costs are based on average yarding distances as well as average road renovation, and temporary route construction and reconstruction costs for each alternative.
- Volumes used in this analysis are estimates and actual average volume from the proposed action alternative is estimated to range from 4 to 10 MBF/acre.
- Fuels hazard reduction creates approximately 28.8 jobs per $1 million invested (Moseley and Nielson-Pincus 2009).
- Cost for fuels hazard reduction treatments cost approximately $1,000 per acre based on past similar treatments within the Butte Falls Resource Area.

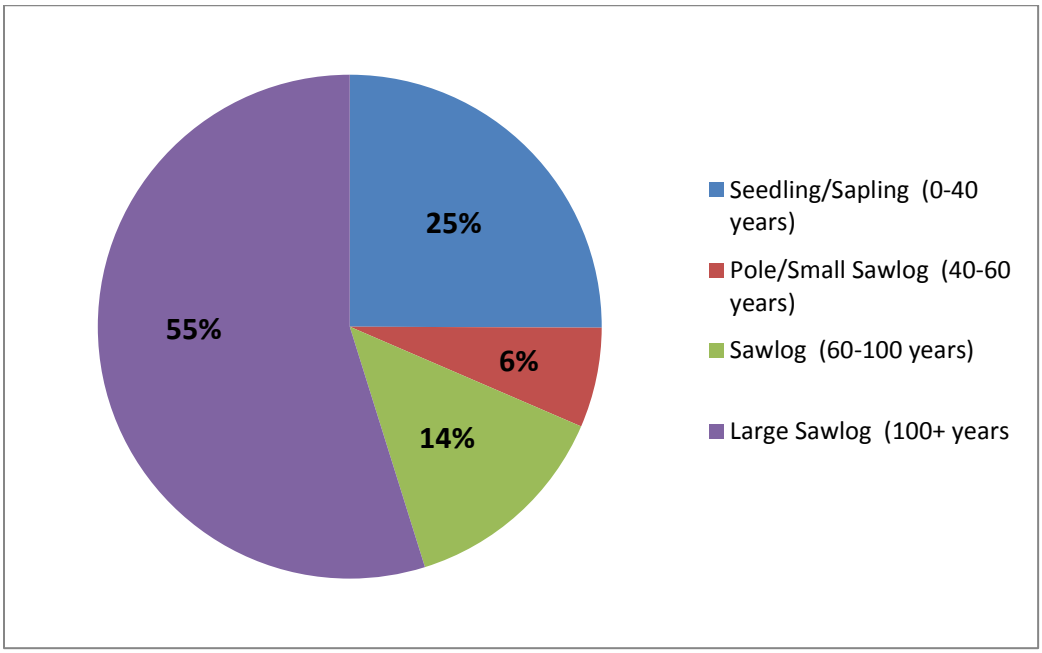
### 3.6.3 Affected Environment

A regional perspective of the economic setting is provided in the Northwest Forest Plan (USDA and USDI 1994, pp. 261-319). One primary variation from the economic setting regarding commodity production from Federal lands is that actual timber harvest levels have lagged behind levels projected in the Northwest Forest Plan (USDI 2005, p. 36). During the first 10 years of Northwest Forest Plan implementation (1995–2004), the total BLM timber volume offered for the Medford District averaged 74% of the planned 57 MMBF levels. From 2005 to 2014, the Medford District BLM has offered 51% of the annual target harvest level of 57 MMBF. The overall reduction in timber harvest across all ownerships in the region has resulted in a demand for logs in western Oregon that is being filled with log imports (USDI 2005, p. 35).

Merchantable timber on Matrix land is highly dispersed and the stocking levels of merchantable-size trees are variable. Individual tracts of BLM-administered land within the Bieber Salt Project Area are fragmented by a mixed ownership pattern with private lands. Individual BLM tracts range from 40 acres to 640 acres in size. Matrix lands within each tract are further fragmented by varying land use allocations under the Medford District Resource Management Plan (RMP) (USDI 1995). This, in conjunction with past harvest treatments on these lands, has resulted in the existing stages of development with respect to potential timber supply. Stages of development by general age and merchantability class on BLM-administered land within the Project Area are summarized in Figure 3-5.

Figure 3-5 shows a fairly regulated condition with respect to commodity supply. Approximately 31% of the Matrix land base exists in a precommercial (seedling/sapling) and developing commercial (pole/small sawlog) condition. Assuming no disturbance occurs, the larger size classes would be expected to increase in representation over time with younger stands becoming less prevalent on the land base. Treatment under existing management direction would tend to accelerate growth to the next development stage through thinning of the younger size classes. The seedling-to-pole size class would not be maintained through regeneration of the large sawlog component.

**Figure 3-5. Forest Stands in the Project Area by General Age and Merchantability Class**




Economic factors that affect supplying forest commodities in an economically feasible manner are the amount and distribution of material available for harvest, method of harvest, access to harvest areas, and associated costs to mitigate the effects of harvest such as slash treatment. These factors considered individually or collectively have an effect on the economic feasibility (positive net revenue) and economic efficiency (revenue per unit of harvest) of harvest proposals.

The amount and distribution of commercial forest products existing on Matrix lands is interrelated with access and method of harvest. Harvest of timber stands with a relatively higher harvest volume per acre in a concentrated area would result in lower access and removal costs compared to stands with relatively lower harvest volumes located in a more dispersed pattern.

Common methods of harvest (yarding trees from stump to truck) are primary factors affecting actual harvest costs. Tractor yarding is the least-cost method of removal with typical logging costs around $100/MBF, with cable yarding incurring a higher removal cost at around $200/MBF, and helicopter yarding the most costly removal method at approximately $400/MBF. Appropriate harvest methods vary and are generally based on management objectives in conjunction with site conditions such as access, topography, and available harvest volume. Where lower cost harvest methods can be used, economic efficiency is increased. Economic feasibility is affected when relatively lower harvest volumes or values are associated with higher cost yarding methods.

Important factors to consider in determining the economic feasibility of ground-based yarding systems (tractor, skidder) are the maximum yarding distance and the average yarding distance to the landing. Maximum yarding distance varies by the type of ground-based equipment used. Typical logging operations in this area would use either crawler tractors or rubber-tired skidders. The maximum yarding distances generally range from 700 feet for tractors and 1,000 feet for skidders. Optimum average yarding distance is in the 500- to 700-foot range for this equipment. Slope is a limiting factor for tractor yarding in the Bieber Salt Project Area. Tractor yarding is limited to slopes generally less 35%. Felling costs would be minimized by using mechanized felling equipment in tractor yarding units.

Skyline-cable yarding is proposed on steeper-slopes (>35%) within the Project Area. Strategically located existing roads or new routes, generally at the top of units, are necessary in order to feasibly harvest units using skyline-cable yarding systems. Optimum yarding distance for skyline-cable yarding systems is 1,000 feet with a maximum yarding distance capability of 4,000 feet. Harvest volume per acre, size of harvest trees, and move-in/move-out costs are other important factors that contribute to an economically feasible skyline-cable yarding operation. Limited road access and topographic features such as convex slopes, uneven terrain, and long, constant slopes can present difficulties for skyline-cable yarding systems.

Access to harvest areas is a factor with respect to the number of road systems needed and the condition of those roads. Cost factors include the level of road improvement needed for hauling material, road surface condition with respect to the length of the operating season, use restrictions during wet conditions, and move-in/move-out costs of equipment where multiple road systems are used for access. Economic feasibility and efficiency is reduced where road improvement costs and the number of road miles or road systems needed for harvest access increase.

Mitigation of harvest effects includes costs associated with actions such as ripping compacted soils, decommissioning or closing roads, treating harvest slash, and operating under seasonal restrictions. The cost and level of mitigation needed is situation dependent.

## 3.6.4 Environmental Consequences

### 3.6.4.1 Alternative 1 - No Action

**Direct and Indirect Effects**

Under the No Action Alternative, proposed management actions would be deferred. There would be no timber volume from the Project Area in fiscal year 2016 to contribute toward the Medford District's annual allowable sale quantity and there would be no return to the Federal Treasury. Under this alternative, timber harvest would not provide any forestry-related jobs. This would include jobs directly related to the timber harvest such as timber fallers, logging crews, log truck drivers, road crews, and sawmill employees. Opportunities for future timber harvest in the short- and long-term would remain unchanged in the Project Area. With no action, there would be a lost opportunity in maximizing volume growth potential in mature stands (100 years and older) and in younger stands where densities are high.

Indirectly, fire suppression costs would be higher because fuel loads on planned timber harvest units would not be reduced. Also, water source restoration would not occur, which would limit access and water availability if a fire occurred in the Project Area. No action would cause the potential for increased fire suppression costs because of higher severity fires, limited safe access to areas, and reduced water availability. There would be no reduction in long-term maintenance costs on the permanent road system without completing roadside vegetation maintenance.

### 3.6.4.2 Alternative 2 - Proposed Action

**Direct and Indirect Effects**

Under Alternative 2, approximately 2.8 MMBF would be harvested on 431 acres resulting in an estimated harvest of 6.5 MBF per acre. Direct employment as a result of timber harvest and processing a commodity would result in approximately 25 full-time equivalent jobs. The estimated return to the

Federal Treasury for timber harvest would be $478 per MBF for a total value of approximately $1.3 million.

Indirectly, fire suppression costs would be lower due to the reduced fuel loads on 431 acres of Selective Thinning and Density Management, along with the associated activity fuels treatment. Water source restoration would aid in reducing fire suppression costs by supplying firefighters with better access to larger quantities of water. Road maintenance costs would be decreased in the long-term along 3.62 miles of road within the Project Area.

Alternative 2 would meet the purpose and need of this project and Medford District RMP direction to provide for harvest activity on timber stands available for harvest in the Project Area. This would provide harvest volume and net revenue to the Federal Treasury from commercial stands, and improve future timber supply potential in developing stands through thinning treatments. Harvest would contribute approximately 2.8 MMBF to the Medford District's Allowable Sale Quantity of 46 MMBF for fiscal year 2016.

The 299 acres of Selective Thinning and 98 acres of Density Management could be available for harvest again in 10 to 20 years. In the long-term, volume growth capability would be increased on areas treated.

**Cumulative Effects**

There is 20 acres of blowdown and standing hazard trees proposed for salvage harvest within the Project Area in 2016. A total of approximately 27 MBF will be harvested from this sale with a return to the Federal Treasury of $13,500. Direct employment as a result of timber harvest and processing a commodity would result in approximately 0.2 full-time equivalent jobs.

An additional 1,371 acres of possible fuels treatments could occur within the Project Area and reduce potential fire suppression costs. These treatments could potentially create approximately 39 jobs.

The economic output of these projects in combination with the anticipated economic output from the Proposed Action (Alternative 2) would be $1.3 million. When combined, these actions would contribute 2.8 MMBF to the Medford District's ASQ of 46 MMBF for FY16 from the Bieber Salt Project Area.

# CHAPTER 4 - CONSULTATION AND COORDINATION

This section describes any public participation and consultation or coordination with agencies and organizations that occurred during the preparation of this project.

## 4.1 PUBLIC INVOLVEMENT AND INTERAGENCY COORDINATION

### 4.1.1 Scoping

The BLM promotes public involvement in the planning process by soliciting input to determine the scope of the issues to be addressed by the EA. This process, known as scoping, is also used to help identify impacts and potential alternatives that will be analyzed during the development of the project. Scoping input is both internal and external to the agency. Internal scoping uses an interdisciplinary team of resource specialists to identify issues, alternatives, and data needs. External scoping involves notifying other agencies, organizations, tribes, local governments, and the public of the proposed project and providing opportunity for feedback. See Chapter 1, Section 1.8 for more information on the scoping that occurred for this project and the issues that were identified.

### 4.1.2 Interagency Coordination

#### 4.1.2.1 ESA Consultation

Section 7 of the ESA requires the BLM to work with the US Fish and Wildlife Service (T&E plant and wildlife species) and NOAA Fisheries (T&E fish species) for actions the BLM funds, authorizes, or proposes to ensure the project is not likely to jeopardize the continued existence of listed plant, wildlife, or fish species, or destroy or adversely modify their designated critical habitat.

Before requesting consultation, the BLM determines whether or not the project may affect the listed species or critical habitat. If the project would affect the species, but the effect would be relatively minor, consultation is informal and the BLM submits a written request for informal consultation. If US Fish and Wildlife Service or NOAA Fisheries agrees with the BLM's determination, then informal consultation concludes with the US Fish and Wildlife Service or NOAA Fisheries issuing a letter of concurrence.

If the BLM determines a project is likely to adversely affect a listed species or critical habitat, then formal consultation is required and the BLM submits a written request, or biological assessment, for formal consultation to US Fish and Wildlife Service or NOAA Fisheries. During formal consultation, the US Fish and Wildlife Service or NOAA Fisheries reviews the project to determine if the project is likely to jeopardize the continued existence of a listed species, or destroy or adversely modify critical habitat. The agencies submit the results of the review to the BLM in a biological opinion.

***T&E Wildlife***

The federally threatened northern spotted owl and the endangered gray wolf are the only threatened and endangered wildlife species within or near the Bieber Salt Project Area. The BLM has determined that the Bieber Salt Forest Management Project is likely to adversely affect the northern spotted owl. Formal consultation with the U.S. Fish and Wildlife Service (USFWS) for federally-listed wildlife species (northern spotted owl and gray wolf) will begin when the Biological Assessment (BA) is sent to the USFWS in June 2016 by the Medford District BLM. Meetings and a field trip to proposed project units

have already taken place as part of a more streamlined consultation process. A Biological Opinion (BO) from the USFWS is expected in August 2016. No Decision will be made until we receive the BO.

#### *T&E Plants*

The Bieber Salt Project is within the range of one threatened and endangered plant, the federally endangered Gentner's fritillary (*Fritillaria gentneri*). Suitable habitat for this species includes oak woodlands, chaparral shrublands, meadows, mixed hardwood-conifer woodlands, and the transition zones between these plant communities.

The BLM has a programmatic consultation for T&E plants that generically covers the activities proposed in this EA. The Biological Assessment and Letter of Concurrence (#01EOFW00-2014-I-0013) prescribe measures, called Project Design Criteria, to ensure that management actions will not likely adversely affect populations or habitat. One of the project design criteria for Gentner's fritillary for large-scale forest management projects is to conduct two years of surveys if the project is within the range of the species, contains suitable habitat, and the action would negatively impact the population. The Bieber Salt Project is within the range of suitable habitat for *Fritillaria gentneri;* therefore, surveys were completed and no sites were found.

#### *T&E Fish*

The resource area fisheries biologist determined there would be no-effect to federally-listed Southern Oregon Northern California Coast Coho (SONCC) Salmon or Coho Critical Habitat (CCH) and Essential Fish Habitat (EFH) in the Bieber Salt Project; therefore, consultation with the NOAA Fisheries for this federally-listed fish species was not needed. There are no anticipated effects to stream channels, sediment and large wood routing, or stream shade resulting from timber harvest and road construction and renovation. Any mechanism for sediment delivery at stream crossings has been arrested through the use of PDFs and BMPs.

### 4.1.3 Tribal Coordination

Letters describing the preliminary Proposed Action initiating consultation with the local federally recognized Native American Tribes were sent on December 17, 2015. Further consultation in the form of meetings and phone calls took place and did not identify any concerns.

### 4.1.4 State Historic Preservation Office

Consultation with the State Historic Preservation Office (SHPO) was not needed as the BLM determined that the project will have "no effect" to cultural resources.

## 4.2 Document Availability

A letter or email announcing the availability of the EA for public review was mailed to those that submitted scoping comments, grazing lessees, tribes, Rogue River-Siskiyou National Forest, Jackson County Commissioners, Association of O&C Counties, Oregon Department of Forestry, Oregon Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and the library at Southern Oregon University.

The Bieber Salt EA is available on the BLM ePlanning website at:
https://eplanning.blm.gov/epl-front-office/eplanning/nepa/nepa_register.do

A notice of the EA availability published in the *Medford Mail Tribune* newspaper will begin the 30-day comment period for the Bieber Salt Forest Management EA.

# CHAPTER 5 - LIST OF PREPARERS

This section lists the BLM staff involved in the preparation of the Double Bowen project and this document.

| | | |
|---|---|---|
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| Dave Roelofs | Wildlife Biologist | Northern Spotted Owl Habitat/Wildlife |
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| Alex Benavides | Hydrology Technician | Stream Buffers |
| Amy Meredith | Soil Scientist | Soil |
| AJ Donnell | District Fish Biologist | Fisheries |
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# REFERENCES


Agee, J.K., Skinner, C.N. 2005. Basic principles of forest fuel reduction treatments. Forest Ecology and Management 2005. © 2005 Elsevier B.V.

Atzet, T., Powers, R. F., McNabb, D. H., Amaranthus, M. P., & Gross, E. R. (1987). Maintaining Long-Term Forest Productivity in Southwest Oregon and Northern California. (pp. 185-201). Portland: Timber Press Inc.

Aubry, K.B., and C.M. Raley. 2002. Ecological characteristics of fishers in the southern Oregon Cascade Range. Final progress report. USDA Forest Service, Pacific Northwest Research Station, Olympia, WA

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.

Aubry, K.B. et al. 2004. Zoogeography, Spacing patterns, and Dispersal in Fishers: Insights Gained from Combining Field and Genetic Data.

Aubry, K., and C. Raley. 2006. Ecological characteristics of fishers (Martes pennati) in the southern Oregon Cascade Range. USDA Forest Service, Pacific Northwest Research Station, Olympia Forestry Sciences Laboratory, Olympia, WA.

Bart , J. 1995. Amount of Suitable Habitat and Viability of Northern Spotted Owls. Conservation Biology, Pages 943-946 Volume 9, No. 4, August 1995.

Bart, J. and E.D. Forsman. 1992. Dependence of Northern Spotted Owls, *Strix occidentalis caurina*, on Old-Growth Forests in the Western United States. Biological Conservation 62(2):95-100.

Bingham, B. and B.R. Noon. 1997. Mitigation of Habitat Take: Application to Habitat Conservation Planning. Conservation Biology 11(1):127-139.

Buskirk. S., and R.A. Powell. 1994. Habitat ecology of fishers and American martens. Pages 283-296. In S.W. Buskirk, A.S. Harestad. M.G. Raphael. and R.A. Powell (editors). Martens, Sables and Fisher: Biology and Conservation. Cornell University Press, Ithaca New York.

California Partners in Flight. 2002. Version 2.0. The oak woodland bird conservation plan: a strategy for protecting and managing oak woodland habitats and associated birds in California (S. Zack, lead author). Point Rayes Bird Observatory, Stinson Beach, CA.

Clayton, Dave. 2012 a. Fisher movement in response to environmental conditions. Personal Communication in February, 2012. Rouge Siskiyou National Forest Biologist.

Courtney, S. P., J. A. Blakesley, R. E. Bigley, M. L. Cody, J. P. Dumbacher, R. C. Fleischer, A.B. Franklin, J. F. Franklin, R. J. Gutiérrez, J. M. Marzluff, L. Sztukowski. 2004. Scientific evaluation of the status of the Northern Spotted Owl. Sustainable Ecosystems Institute. Portland, OR.

Drew, R.E., J.G. Hallett, K.B. Aubry, K.W. Culling, S.M. Koepf, and W.J. Zielinski. 2003. Conservation genetics of the fisher (Martes pennanti) based on mitochondrial DNA sequencing. Molecular Ecology 12: 51-62.

Dugger, K.M., F. Wagner, R.G. Anthony, and G.S. Olson. 2005. ―The relationship between habitat characteristics and demographic performance of northern spotted owls in southern Oregon.‖ Condor 107:863-878.

Dugger, K.M., R.G. Anthony, and L.S. Andrews. 2011. Transient dynamics of invasive competition: barred owls, spotted owls, habitat, and the demons of competition present. Ecological Applications 21(7):2459-2468.

Dugger , K., S. Andrews, E. Fleigel, L. Friar, T. Phillips, T. Tippin, and F. Wagner. 2013. Demographic characteristics of northern spotted owls (Strix occidentalis caurina) in the southern Oregon Cascades. Oregon Cooperative Fish and Wildlife Research Unit (OCFWRU), Annual research report for 2012. USDA Forest Service, Pacific Northwest Research Station, Corvallis, OR and Dept. of Fish and Wildlife, Oregon State Univ., Corvallis, OR. 21p.

Dugger , K., S. Andrews, E. Fleigel, L. Friar, T. Phillips, T. Tippin, and F. Wagner. 2014. Demographic characteristics of northern spotted owls (Strix occidentalis caurina) in the southern Oregon Cascades. Oregon Cooperative Fish and Wildlife Research Unit (OCFWRU). Annual research report for 2013. USDA Forest Service, Pacific Northwest Research Station, Corvallis, OR and Dept. of Fish and Wildlife, Oregon State Univ., Corvallis, OR.

Farber, S.L., and T. Franklin. 2005. Presence-absence surveys for Pacific fisher (Martes pennanti) in the Eastern Klamath Province of Interior Northern California. Timber Products Company, Yreka, CA. 35.

Federal Energy Regulatory Commission (FERC), Office of Energy Products. 2014. *Draft Environmental Impact Statement: Jordan Cove Energy and Pacific Connector Gas Pipeline Project—FERC/EIS—0256D.* Cooperating Agencies: USDA Forest Service, Department of the Army, Corp of Engineers, US Environmental Protection Agency, US Department of Homeland Security Coast Guard, US Department of Transportation Pipeline and Hazardous Materials Safety Administration, USDI Bureau of Reclamation, USDI Fish and Wildlife Service.

Federal Register. 2014. 79(194) FR 60419, 7 October, 2014. Pages 60419 – 60443.

Federal Register, 1999. *Designated Critical Habitat; Central California Coast and Southern Oregon/Northern California Coasts Coho Salmon.* Vol. 64, No. 86. 24049.

Forsman, E.D., R.G. Anthony, J.A. Reid, P.J. Loschl, S.G. Sovern, M. Taylor, B.L. Biswell, A. Ellingson, E.C. Meslow, G.S. Miller, K.A. Swindle, J.A. Thrailkill, F.F. Wagner and D.E. Seaman. 2002. Natal and breeding dispersal of northern spotted owls. Wildlife Monographs 149:1–35.

Forsman, E.D.; Anthony, R.G.; Dugger, K.M.; Glenn, E.M.; Franklin, A.B.; White, G.C.; Schwarz, C.J.; Burnham, K.P.; Anderson, D.R.; Nichols, J.D.; Hines, J.E.; Lint, J.B.; Davis, R.J.; Ackers, S.H.; Andrews, L.S.; Biswell, B.L.; Carlson, P.C.; Diller, L.V.; Gremel, S.A.; Herter, D.R.; Higley, J.M.; Horn, R.B.; Reid, J.A.; Rockweit, J.; Schaberl, J.; Snetsinger, T.J.; Sovern, S.G. 2011.

Population demography of northern spotted owls. Studies in Avian Biology 40. Berkeley, CA: University of California Press. 106 pp.

Franklin, A.B., D.R. Anderson, R.J. Gutiérrez, and K.P. Burnham. 2000. Climate, habitat quality, and fitness in northern spotted owl populations in northwestern California. Ecological Monographs 70(4):539-590.

Gucinski, H, M Furniss, R Ziemer, and M Brookes. 2001. Forest roads: a synthesis of scientific information. General Technical Report PNW-GTR-509. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. 103p.

Hayes, J.P., Samuel S. Chan, William H. Emmingham, John C. Tappeiner, Loren D. Kellog, and John D. Bailey. 1997. Wildlife Responses to Thinning Young Forests in the Pacific Northwest. Journal of Forestry, Vol. 95, No. 8.

Lofroth, E.C., C.M. Raley, J.M. Higley, R.L. Truex, J.S. Yaeger, J.C. Lewis, P.J. Happe, L.L. Finley, R.H. Naney, L.J. Hale, A.L. Krause, S.A. Livingston, A.M. Meyers, and R.N. Brown. 2010. Conservation of Fishers (*Martes pennanti*) in South-Central British Columbia, Western Washington, Western Oregon, and California – Volume 1: Conservation Assessment. USDI Bureau of Land Management, Denver, Colorado, USA.

Lofroth, E.C., J.M. Higley, , R.H. Naney, C.M. Raley, J.S. Yaeger, S.A. Livingston and R.L. Truex. 2011. Conservation of Fishers (*Martes pennanti*) in South-Central British Columbia, Western Washington, Western Oregon, and California – Volume 2: Key Findings From Fisher Habitat Studies in British Columbia, Montana, Idaho, Oregon, and California. USDI Bureau of Land Management, Denver, Colorado, USA.

Luce, C.H. and T.A. Black. 2001. *Effects of Traffic and Ditch Maintenance On Forest Road Sediment Production.* In: Proceedings of the Seventh Federal Interagency Sedimentation Conference, March 25-29, 2001, Reno Nevada, pp. V67-V74.

McIver, J.D., and R. Ottmar. 2006. Fuel mass and stand structure after post-fire logging of a severely burned ponderosa pine forest in northeastern Oregon. Forest Ecology and Management 238(1-3): 268-279.

Megahan, W.F. 1974. Erosion over time on severely disturbed granitic soils: a model. Research Paper RP-INT-156. USDA Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT.

Moseley, Cassandra and Nielson-Pincus, Max. (2009). Economic Impact and Job Creation from Forest and Watershed Restoration: A Preliminary Assessment. Ecosystem Workforce Program (Briefing paper #14). University of Oregon. Eugene, OR.

Naney, R.H., L.L. Finley, E.C. Lofroth, P.J. Happe, A.L. Krause, C.M. Raley, R.L. Truex, L.J. Hale, J.M. Higley, A.D. Kosic, J.C. Lewis, S.A. Livingston, D.C. Macfarlane, A.M. Meyers, and , J.S. Yaeger. 2012. Conservation of Fishers (*Martes pennanti*) in South-Central British Columbia, Western Washington, Western Oregon, and California – Volume 3: Threat Assessment. USDI Bureau of Land Management, Denver, Colorado, USA.

Oregon Department of Agriculture. 2015. Noxious Weed Policy and Classification System. (http://www.oregon.gov/oda/programs/weeds/oregonnoxiousweeds/pages/aboutoregonweeds.aspx). Oregon Department of Environmental Quality (ODEQ). 2004. *Draft Rogue basin riparian condition assessment report.* DEQ, Medford, Oregon.

Powell, R. A. and W. J. Zielinski. 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.

Powers, Robert F, Felipe G Sanchez, Andrew D Scott, and Deborah Page-Dumroese. 2004. *The North American Long-Term Soil Productivity: Coast to Coast Findings from the First Decade.* USDA Forest Service Proceedings RMRS-P-34.

Sakai, H.F. and B.R. Noon. 1993. Dusky-footed woodrat abundance in different-aged forests in northwestern California. Journal of Wildlife Management 57: 373-382.

Sensenig, T.S. 2002. Development, Fire History and Current and Past Growth, of Old-Growth and Young-Growth Forest Stands in the Cascades, Siskiyou and Mid-Coast Mountains of Southwestern Oregon. On file at Medford District BLM.

Tappeiner, John C., David Huffman, David Marshall, Thomas A. Spies, John D. Bailey. 1997. Denisty, Ages, and Growth Rates in Old-Growth and Young-Growth Forests in Costal Oregon. Can. J. For. Res. 27: 638-648.

Thomas, J.W., E.D., Forsman, J.B. Lint, E.C. Meslow, B.R. Noon, and J. Verner. 1990. A conservation strategy for the northern spotted owl: report of the Interagency Scientific Committee to address the conservation of the northern spotted owl. USDA Forest Service, USDI Bureau of Land Management, USDI Fish and Wildlife Service, and USDI National Park Service. Portland, OR. 427 pp.

Trombulak, S.C. and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology. 14(1): 18-30.

U.S. Department of Agriculture (USDA), Forest Service and University of Washington. 1995. Pacific Northwest Research Station. Stand Visualization System.

U.S. Department of Agriculture (USDA), Forest Service ,U.S. Department of the Interior (USDI), Bureau of Land Management, and U.S. Department of the Interior (USDI) Fish and Wildlife Service. 2013. Recovery Plan Implementation Guidance: Interim Recovery Action 10. Medford, OR.

U.S. Department of Agriculture (USDA), Forest Service and U.S. Department of the Interior (USDI), Bureau of Land Management. 2010. RA 32 Habitat Evaluation Methodology. Version 1.3. Medford District BLM and Rogue River-Siskiyou National Forest. Medford, OR.

U.S. Department of Agriculture (USDA), Forest Service and U.S. Department of the Interior (USDI), Bureau of Land Management. 2004. Survey protocol for the great grey owl within the range of the northwest forest plan. Version 3.0. BLM Instruction Memorandum No. OR-2004-050.

U.S. Department of Agriculture (USDA), Forest Service and U.S. Department of the Interior (USDI), Bureau of Land Management. 2001. Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer and other Mitigation Measures Standards and Guidelines. Government Printing Office. Portland, OR.

U.S. Department of Agriculture (USDA), Forest Service and U.S. Department of the Interior (USDI), Bureau of Land Management. 1994. *Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the Range of the Northern Spotted Owl and standards and guidelines for management of habitat for late successional and old-growth forest related species within the range of the Northern Spotted Owl*. Portland, OR.

U.S. Department of Agriculture (USDA), Forest Service and U.S. Department of the Interior (USDI), Bureau of Land Management. 1994b. 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.

U.S. Department of the Interior (USDI), Bureau of Land Management. 2014. *Biological Assessment of activities that may affect the federally listed plant species, Gentner's Fritillary, Cook's Lomatium, and Large-flowered Woolly Meadowfoam, on Bureau of Land Management, Medford District and Cascade Siskiyou National Monument.*

U.S. Department of the Interior (USDI), Bureau of Land Management, Medford District Office and U.S. Department of Agriculture (USDA), Forest Service, Rogue River National Forest. 1997. Little Butte Creek watershed analysis. Medford District Office, Medford, Oregon.

U.S. Department of the Interior (USDI), Bureau of Land Management. 2012. *Medford District Resource Management Plan Maintenance. Updated Best Management Practices to Reduce Sediment Delivery from BLM Roads in Oregon.* Medford, OR.

U.S. Department of the Interior (USDI), Bureau of Land Management. 2011a. *Instruction Memorandum No. OR-2011-074, Incorporating Road and Sediment Best Management Practices into Resource Management Plans*. Portland, OR.

U.S. Department of the Interior (USDI), Bureau of Land Management. 2011b. Instruction Memorandum No. OR-2012-018. Final State Director's Special Status Species List. http://www.fs.fed.us/r6/sfpnw/issssp/agency-policy/.

U.S. Department Of Interior (USDI), Bureau of Land Management. 2011b. Instruction Memorandum No. OR-2012-018. Final State Director's Special Status Species List. http://www.fs.fed.us/r6/sfpnw/issssp/agency-policy/.

U.S. Department Of Interior (USDI), Bureau of Land Management. 2010. Record of Decision (ROD) for the Vegetation Treatments using Herbicides on BLM Lands in Oregon. Portland, OR: Government Printing Office. 2010

U.S. Department Of Interior (USDI), Bureau of Land Management.. 2010. Western Oregon Transportation Management Plan: Western Oregon Districts. Updated from 1996 and 2002 versions.

U.S. Department Of Interior (USDI), Bureau of Land Management. 2008. Final Environmental Impact Statement for the Revision of the Resource Management Plans of the Western Oregon Bureau of Land Management Volume I. II vols. Portland, OR: Government Printing Office, 2008.

U.S. Department of the Interior (USDI), Bureau of Land Management. 2008. Instruction Memorandum No. 2009-039. December 17, 2008. Revised 6840 Special Status Species Manual and Direction for State Directors to Review and Revise Existing Bureau Sensitive Species Lists.

U.S. Department of the Interior (USDI), Bureau of Land Management. 2008b. Instruction Memorandum No. OR-2008-050. Migratory Bird Treaty Act – Interim Management Guidance.

U.S. Department of the Interior (USDI), Bureau of Land Management. 2005. Analysis of the Management Situation. Government Printing Office, Portland, OR. 166.

U.S. Department of the Interior (USDI), Bureau of Land Management. 2004. Information Bulletin OR-2004-145. Implementation of Special Status Species Policies for the Former Survey and Manage Species: Project Evaluations for Former S&M Species in Which Surveys are Not Feasible, Attachment 5. July 16, 2004.

U.S. Department of the Interior (USDI), Bureau of Land Management. 1998a. Instruction Memorandum No. OR-99-026. December 1998. Survey and Manage Survey Protocols – Vascular Plants. Available at: http://www.blm.gov/or/plans/surveyandmanage/files/15-vascular_plants.pdf

U.S. Department of the Interior (USDI), Bureau of Land Management. 1998b. Medford District Integrated Weed Management Plan (IWMP) and Environmental Assessment (EA) OR-110-98-14. In: Medford District Integrated Weed Management Plan (IWMP) and Environmental Assessment (EA) OR-110-98-14. Medford, OR.

U.S. Department of the Interior (USDI), Bureau of Land Management. 1996. Implementation of coarse woody debris standards and guidelines. State Office Information Bulletin No. OR-97-064 (11/20/96). Oregon State Office. Portland, OR.

U.S. Department of the Interior (USDI), Bureau of Land Management, Medford District. 1995. *Final EIS and Record of Decision Medford District Resource Management Plan.* Medford, OR.

U.S. Department of the Interior (USDI), Bureau of Land Management, Medford District. 1994. *Medford District proposed resource management plan/environmental impact statement* (PRMP/EIS). Medford OR.

USDI Bureau of Land Management, Medford District. 1988. Timber Production Capability Classification (TPCC). Medford District Handbook Update M.2.0. 5251-1.

USDI Bureau of Land Management. 1990. *Special Status Species Policy for Oregon and Washington*. http://www.fs.fed.us/r6/sfpnw/issssp/agency-policy/

U.S. Department of the Interior (USDI), Bureau of Land Management. 1992. Manual 9015: Integrated Weed Management. Release 9-321.

USDI Fish and Wildlife Service. 2014. Informal Consultation for the Medford District Bureau of Land Management's proposed activities on Federally Listed Plant Species and Designated Critical Habitat (FWS reference #01EOFW00-2014-I-0013).

U.S. Department of the Interior (USDI), Fish and Wildlife Service. 2012 Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Northern Spotted Owl. 77 FR 14062 14165

U.S. Department of the Interior (USDI), Fish and Wildlife Service. 2011. Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). U.S. Fish and Wildlife Service, Portland, Oregon. xvi + 258 pp.

U.S. Department of the Interior (USDI), Fish and Wildlife Service. 2008. Final Recovery Plan for the Northern Spotted Owl (Strix occidentalis caurina). Region 1, US Fish and Wildlife Service, Portland, OR.

U.S. Department of the Interior (USDI), Fish and Wildlife Service. 2008b. Birds of Conservation Concern. Division of Migratory Bird Management, Arlington, VA. http://migratory birds.fw.gov/reports/bcc2008.pdf.

U.S. Department of the Interior (USDI), Fish and Wildlife Service. 2006. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions. Federal Register September 12, 2006, Vol. 71 (176) 53777. Washington, DC.

U.S. Department of the Interior (USDI), Fish and Wildlife Service. 2004. Northern Spotted Owl Five Year Review: Summary and Evaluation.

U.S. Department of the Interior (USDI), Fish and Wildlife Service. 1992. Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Northern Spotted Owl. Federal Register January 15, 1992, Vol. 57 (10) 1796-1837. Washington, DC.

Van Lanen, N. J., A. B. Franklin, K. P. Huyvaert, R. F. Reiser Ii, and P. C. Carlson. 2011. Who hits and hoots at whom? Potential for interference competition between barred and northern spotted owls. Biological Conservation 144:2194-2201.

Watershed Professionals Network.(WPN) 1999. *Oregon watershed assessment manual*. June 1999. Prepared for the Governor's Watershed Enhancement Board, Salem, Oregon.

Wiens, J.D., R.G. Anthony, and E.D. Forsman. 2011. Barred owl occupancy surveys within the range of the northern spotted owl. Journal of Wildlife Management 75:531-538.

Wiens, J. D. 2012. Competitive interactions and resource partitioning between northern spotted owl and barred owl in western Oregon. Oregon State University, Corvallis.

Wiens, J. D., R. G. Anthony, and E. D. Forsman. 2014. Competitive interactions and resource partitioning between northern spotted owls and barred owls in western Oregon. Wildlife Monographs 85:1-50.

Wineteer, M. 2016. Botanical Resources Evaluation and Analysis for Bieber Salt Project EA.

Wisely, S.M., S.W. Buskirk, G.A. Russell, K.B. Aubry, and W.J. Zielinski. 2004. Genetic diversity and structure of the fisher (Martes pennanti) in a peninsular and peripheral metapopulation. Journal of Mammalogy 85 (2004): 640-648.

Yackulic, C. B., J. Reid, J. D. Nichols, J. E. Hines, R. Davis, and E. Forsman. 2013. The roles of competition and habitat in the dynamics of populations and species distributions. Ecology 95:265-279.

## REFERENCES SUBMITTED DURING SCOPING

Anlauf, K., Gaeuman, William, and Jones, K. 2011. 'Detection of Regional Trends in Salmonid Habitat in Coastal Streams, Oregon', Transactions of the American Fisheries Society, 140: 1, 52 — 66, First published on: 15 February 2011.

Anlauf, K., K. Jones, and C. Stein. 2009. The Status and Trend of Physical Habitat and Rearing Potential in Coho Bearing Streams in the Oregon Coastal Coho Evolutionary Significant Unit. OPSW-ODFW-2009-5, Oregon Department of Fish and Wildlife, Salem.

Cederholm, C., L. Reid. 1987. Impact of Forest Management on Coho Salmon (Oncorhynchus kisutch) Populations of the Clearwater River, Washington: A Project Summary. Hydrological and Biological Responses to Forest Practices: The Alsea Watershed Study. 373-398.

Colombaroli, D., Gavin, D. 2010. Highly episodic fire and erosion regime over the past 2,000 y in the Siskiyou Mountains, Oregon PNAS 2010 107 (44) 18909-18914; published ahead of print October 18, 2010, doi:10.1073/pnas.1007692107.

Environmental Services City of Portland. 2010. Avoiding Impacts on Nesting Birds During Construction and Revegetation Projects Version 2.

Furniss, M., Roelofs, T., Yee, C. 1991. Road Construction and Maintenance. *Influences of Forest and Rangelend Management on Salmonid Fishes and Their Habitats.* 297-323.

Hobson, K. A., A. G. Wilson, S. L. Van Wilgenburg, and E. M. Bayne. 2013. An estimate of nest loss in Canada due to industrial forestry operations. *Avian Conservation and Ecology* 8(2): 5. http://dx.doi.org/10.5751/ACE-00583-080205.

Newcombe, C., Jensen, J. 1996. Channel Suspended Sediment and Fisheries: A Synthesis for Quantitative Assessment of Risk and Impact. *North American Journal of Fisheries Management.* 16(4): 693-727.

Odion DC, Hanson CT, Arsenault A, Baker WL, DellaSala DA, et al. 2014. Examining Historical and Current Mixed-Severity Fire Regimes in Ponderosa Pine and Mixed-Conifer Forests of Western North America. PLoS ONE 9(2): e87852. doi:10.1371/journal.pone.0087852.

Zielinski, W. J., C. Carroll, and J. R. Dunk. 2006. Using landscape suitability models to reconcile conservation planning for two key forest predators. Biological Conservation 133, pp. 409-403.

# APPENDIX A - ISSUES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

The following issues were raised by the public or the interdisciplinary (ID) team during the development of the project. The BLM considered these issues but did not analyze them in detail, often because the project's design or implementation of Project Design Features (PDFs) would eliminate or reduce effects on the resource. In some cases, issues raised by the public or the ID team were not considered in detail as they were determined to be beyond the scope of this project. These issues, along with a rationale for their being "considered but not analyzed in detail" in this EA, are listed below.

## Air Quality

**Issue A:** How would the smoke created from burning timber slash affect air quality?

**Background Information:** For all prescribed burning activities, the Medford District BLM is required to be in compliance with the Oregon Smoke Management Plan (OAR 629-048-0010). The Oregon Smoke Management Plan designates SSRA (Smoke Sensitive Receptor Areas), which are areas designated for the highest level of protection under the smoke management plan, as described and listed in OAR 629-048-0140. The SSRA closest to the Project Area is the Bear Creek Valley, as described in OAR 629-048-0160. The objective of the Smoke Management Plan is to prevent smoke from prescribed burns from entering the SSRA.

Medford District BLM is also required to be in compliance with the Oregon Visibility Protection Plan (OAR 340-200-0040, Section 5.2) which mandates that prescribed burning does not affect the visibility of Class I areas. Class I areas are defined in the Clean Air Act as Forest Service wildernesses and national memorial parks over 5,000 acres, National Parks over 6,000 acres, and international parks. Local Class I areas include Crater Lake National Park, Kalmiopsis Wilderness, and Rogue Wilderness. The Project Area is not within a Class I area.

Prior to conducting prescribed burning activities, the BLM must register prescribed burn locations with Oregon Department of Forestry. The specific location, size of the burn, fuel loadings, ignition source, time, and duration of ignition are reported prior to ignition. Smoke management advisories or restrictions are generated on a daily basis by the State Meteorologist. This information is used to determine the appropriate time to conduct the planned prescribed burn. Most prescribed burning on the Medford District is accomplished by hand-pile burning. Hand-pile burning generally occurs throughout the winter months during storm events when unstable atmospheric conditions are present in order to maximize mixing and lessen smoke impacts to localized areas. All piles would be covered with 4 mil polyethylene plastic sheeting to facilitate rapid ignition and consumption of fuels to minimize residual smoke.

**Rationale:** Effects on air quality from activity slash burning would be short-term and localized. All units are not burned at the same time or even in the same year. A large portion of particulate matter emissions produced during prescribed burning are "lifted" by convection into the atmosphere where it is dissipated by horizontal and downward dispersion. At distances greater than 5 miles, the air concentrations for these emissions are expected to be small. Under these conditions and by following the prescribed fire

management guidelines in the Oregon Smoke Management Plan, there would be negligible direct or indirect effects on air quality within the Project Area and the SSRA.

Prescribed burning would comply with the guidelines established by the Oregon Smoke Management Plan and the Visibility Protection Plan (OAR 340-200-0040, Section 5.2). As a result, prescribed burning emissions are not expected to adversely affect annual PM10 attainment within the Bear Creek Valley SSRA. In addition, the BLM does not expect prescribed burning to affect visibility within the Crater Lake National Park and neighboring wilderness smoke sensitive Class I areas (Kalmiopsis and Rogue Wilderness Areas) due to the distance from the Project Area and implementation of smoke management guidelines. Therefore, this issue was not analyzed further.

## Botanical Species and Noxious Weeds

**Issue B:** How would soil disturbance and compaction from ground based tractor and cable yarding, reduction of canopy cover from timber harvest, and underburning/pile burning affect the persistence of Bureau Sensitive and S&M plants and fungi in the Project Area?

**Background Information:** The BLM has completed botanical surveys following requirements and the appropriate protocols for T&E, Sensitive, and S&M plants and fungi in proposed timber harvest units and where temporary road construction is proposed and will conduct surveys for the remaining proposed project areas in spring and summer 2016 (Wineteer 2016, Table 1).

One population of the T&E species *Fritillaria gentneri* was documented adjacent to a pump chance proposed for restoration. The site is located more than 100 feet away from the pond and the work would fall within the programmatic consultation with Fish and Wildlife Service (USDI 2014, USDI FWS 2013). Project Design Criteria in the Biological Assessment and Letter of Concurrence require a 100-foot radius buffer between sites and areas where heavy equipment is used in order to prevent direct impacts to plants or changes to habitat conditions.

Twelve sites of five different S&M fungi species are located in timber harvest units. The BLM would buffer sites with 30 to 100 feet radius buffers to prevent direct impacts from logging equipment or indirect impacts from changes in environmental conditions when canopy cover is reduced. Buffer sizes vary depending on the species, proposed treatment, current canopy cover and canopy cover remaining after treatment, management recommendations, population size, and species rarity (Table A-1).

**Table A-1. Special Status Fungi Buffers**

| SPECIES | TREATMENT TYPE | CANOPY COVER AFTER TREATMENT | BUFFER SIZE (radius) |
|---|---|---|---|
| *Clavariadelphus sachalinensis* | Selective Thinning-Mixed Conifer | 40-50% | 30-100 feet |
| *Cortinarius olympianus* | Selective Thinning-Mixed Conifer | 40-50% | 100 feet |
| *Leucogaster citrinus* | Selective Thinning-Mixed Conifer | 40-50% | 100 feet |
| *Ramaria rubripermanens* | Selective Thinning-Mixed Conifer | 40-50% | 50 feet |
| *Spathularia flavida* | Selective Thinning-Mixed Conifer | 40-50% | 30 feet |

No Sensitive or S&M vascular or nonvascular plant populations have been documented yet in proposed action areas; however, if sites are discovered during the final surveys in spring and summer 2016, they would be protected from direct or indirect impacts with no-treatment buffers.

**Rationale:** This issue was considered but not fully analyzed in detail as the implementation of Project Design Criteria reduces the potential for adverse impacts and further analysis would not lead to a more informed decision.

The proposed water source restoration project would be "not likely to adversely affect" *Fritillaria gentneri* with the implementation of Project Design Criteria. Timber harvest activities would be "no effect" to *Fritillaria gentneri* because the BLM has completed surveys in those areas and no sites occur there. The BLM would complete surveys in the rest of the project areas in spring and summer 2016. If no sites are discovered, the project would be "no effect" to *Fritillaria gentneri.* If sites are discovered, they would be protected according to Project Design Criteria in the Biological Assessment and Letter of Concurrence from the Fish and Wildlife Service (USDI 2013, USDI FWS 2014) and the project would be "not likely to adversely affect" this T&E species.

Because the BLM has or will conduct surveys for Sensitive and S&M plants and fungi prior to a decision being made and would protect sites that are discovered, the actions proposed in this EA would not trend Sensitive species toward listing or affect the persistence of S&M plants and fungi or have the potential to add cumulative effects to these species.

The BLM did not survey for Sensitive or S&M fungi in stands less than 180 years old because the protocol does not require it. If sites are present in those stands, they could be impacted during timber harvest activities. The BLM assumes that conducting equivalent effort surveys in old growth habitat, protecting known sites, and the presence of reserves (Riparian Reserves, Late-Successional Reserves, and known northern spotted owl activity centers) where suitable habitat exists for Sensitive and S&M fungi and sites would be undisturbed by management actions, would ensure the persistence of S&M fungi (USDI 2004, 5-2), prevent Sensitive species from trending toward listing, and would eliminate the potential for cumulative effects to these species.

**Issue C:** How would the movement of vehicles and equipment on and off system roads; soil disturbance and vegetation removal from road and landing construction; road decommissioning; underburning and pile burning; water source restoration; and the removal of canopy cover during timber harvest affect the introduction and spread of noxious weeds in the Project Area?

**Background Information:** The BLM has documented noxious weed species in the Project Area over many years of surveys and incidental sightings. Eight species of noxious weeds occur throughout the Project Area (Table A-2). All species are Category B on Oregon Department of Agriculture's Noxious Weed list (ODA 2015), with two species (rush skeletonweed and spotted knapweed) also listed as Target species. The BLM prioritizes treatment of Category A and T list noxious weeds and treats Category B species as funding and time allow.

**Table A-2. Noxious Weeds Documented in the Project Area through March 31, 2016**

| Species | Category | Frequency in Project Area | Locations | Proposed Treatment Strategy |
|---|---|---|---|---|
| Bull thistle | B | Many, mostly unreported | Openings in timber stands, landings, roadsides | None |
| Canada thistle | B | One | Haul route | Spray |
| Himalayan blackberry | B | Many, many unreported | Riparian or other wet areas, roadsides | None |
| Medusahead rye | B | Many, mostly unreported | Open canopy habitats, roadsides | None |
| Puncture vine | B | One | Beginning of Salt Creek Road on private | Spray, working with landowner |
| Rush Skeletonweed | B and T | One | Haul route | Continue spraying |
| Spotted knapweed | B and T | Two | Haul route, near landing | Continue spraying one site, begin spraying the second site |
| Yellow star-thistle | B | Many | Haul routes, next to pump chance, open canopy habitats | Continue or begin spraying in critical areas-along roads and where disturbance is planned; biocontrols are relied on in other areas |

**Rationale:** This issue was considered but not fully analyzed in detail as the implementation of PDFs; on-going treatments; and monitoring of proposed projects, both pre- and post-treatment, reduces the risk of spreading noxious weeds; and, further analysis of the issue would not lead to a more informed decision.

To reduce the risk of introducing noxious weeds into the Project Area, the BLM would implement Project Design Features (PDFs) to require equipment that would be working off the main roads to be cleaned of plant parts before entering BLM-administered lands. This would reduce the possibility of bringing in weed seed or plant parts from outside the Project Area. Seed or plant parts could still be transported within the project boundary from infested to non-infested areas by vehicles or equipment when they move from one area to another. Areas that are particularly vulnerable to weed infestations are newly disturbed soil, such as skid roads, landings, new road construction, ripped roads, pump chances, burn pile scars, areas that are underburned; and areas where canopy cover would be removed or reduced. Noxious weeds could invade these newly disturbed areas when seed or plant parts are transported by vehicles, equipment, or individuals during management actions; by the public or landowners during on-going access of roads and lands in the project boundary; or by natural processes such as transportation on animals, on wind, or in water. Seeding disturbed areas with native species and mulching with weed-free straw would help desirable vegetation become established and compete with noxious weeds on landings and roads that have been ripped after use or during road decommissioning and at pump chance sites after restoration.

Weed populations occur throughout the Project Area on private as well as on public lands. The BLM will continue treating some noxious weed populations in the Project Area and will treat new populations of category A and T species that are discovered and category B species as feasible given limited funding and time. The BLM will continue to monitor and treat weed populations in areas where disturbance occurs. However, while some noxious weed populations will be eradicated or reduced, other populations will increase and new populations will become established whether or not the action alternative is

implemented. Weed management is an on-going process on BLM-administered lands throughout the Medford District. Cooperation with landowners and other agencies increases the success of these efforts.

## Climate Change

**Issue D**: How would the proposed project affect carbon storage and greenhouse gas emissions?

**Background Information:** The Medford District BLM has conducted analysis on past projects to determine the effects of individual forest management projects on carbon storage and carbon dioxide emissions. These individual BLM proposed actions showed changes in greenhouse gas levels far too small to provide much meaningful information. Recent EAs on the Medford District that included an analysis of effects on carbon storage and greenhouse gas emissions includes the Evans Creek Forest Management Project (2011) and the Twin Ranch Forest Management Project (2010) in the Butte Falls Resource Area, and the Howard Forest Management Project (2014) and the Heppsie Forest Management Project (2012) in the Ashland Resource Area. All projects had comparable treatments. In those documents, carbon storage and carbon emissions of the proposed actions were calculated to determine the net contributions of greenhouse gases resulting from potential treatments. Carbon emissions (carbon dioxide) were calculated from timber harvest activities (including fuel consumption) and post-harvest fuel treatments. These EAs found proposed actions would reduce carbon stores temporarily but it would result in net increases over time. For the Heppsie Project "within 10 years after harvest the carbon emission level (3.7 tonnes/acre) for the 20-year analysis period would be offset by carbon storage in tree growth" and "total live tree carbon would equal pre-treatment levels after about 75 years of tree growth" (p. 3-158). The total carbon dioxide emitted during the 20-year analysis periods is considered negligible in the context of total U.S. carbon dioxide emissions of 6 billion metric tons (Heppsie EA, p. 3-158, Evans Creek EA, p. 177, Twin Ranch EA, p. 111, Howard EA, p. 3-114).

**Rationale:** This issue was considered but eliminated from further detailed analysis because the Medford BLM has determined no further analysis of greenhouse gas emissions and carbon storage are warranted at the individual project level to make a determination of potential for significant effects. The analysis completed for other similar forest management projects showed that emissions were negligible in the context of total U.S. carbon dioxide emission, and proposed actions would reduce carbon stores temporarily but would result in net increases over time.

## Cultural Resources

**Issue E:** How would soil disturbance from timber management and road activities, and soil heating from fuels management affect cultural resources?

**Background Information:** There are no known cultural resources within or near the project Area of Potential Effects (APE). The APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of cultural resources that are listed or eligible for listing to the National Register of Historic Places (NRHP). The project APE includes forest management treatment units, designated skid trails, temporary roads, roads planned for decommissioning, pump chance sites, landing areas, and haul routes. Five previous Class III cultural resource surveys have taken place within the Bieber Salt Project Area from 1997 to 2010, covering 1,591 acres. An additional 46 acres were surveyed by the investigating archaeologist in 2016 using Class III standards. No new cultural sites were discovered and no previously recorded sites are located within the Bieber Salt APE.

**Rationale:** This issue was considered but eliminated because no known cultural resources exist in or near the project APE where soil disturbance and soil heating from project activities will take place.

## Fire/Fuels

**Issue F:** What effects would timber management activities have on fuel loading, fuel structure, and fire behavior?

**Background Information:** Fire behavior describes how a wildland fire burns based on environmental characteristics such as surface fuels, vegetation, canopy base height, density or closure, slope, aspect, weather, and elevation. The identification of fuel models helps to describe the fuels available to a fire based on the amount, distribution, and continuity of the vegetation and wood. Fuels combined with weather and slope can be used to predict potential surface fire behavior characteristics such as rate of spread, flame lengths, and fire line intensity.

Historically, fire was a normal occurrence and has played a key role as a natural disturbance process throughout southwestern Oregon. However, fire suppression and forest management activities have altered the historic vegetative patterns within the Project Area on both public and private lands.

Thinning treatments are intended to create multi-aged and multi-layered stands. Stands would be left in a condition more resilient to environmental stressors such as fire, drought, and insects. Isolated unthinned areas could exhibit isolated and group torching of trees during a wildland fire, however, the reduced canopy bulk density of the stand and openings would limit large scale crown fire potential. Because of the structural diversity these stands would still represent timber understory and timber litter fuel types but with reduced surface fuel loading. Stands would exhibit a decrease in overall potential fire behavior and an increase in suppression capability. Treated stands would experience a decrease in fire hazard and risk for 5 to 15 years or until vegetation density returned to existing levels.

Timber management activities generally increase the surface fuels within a stand. However, whole tree harvesting with disposal of the tops at the landings is the most effective method of preventing surface fuel increases within the residual stand (Agee and Skinner 2005). At the landings, slash would be piled, chipped, sold for firewood, or prescribed burned. Slash remaining within the stands would be lopped and scattered or hand piled and burned.

Lopping and scattering the activity slash would reduce the vertical height and horizontal continuity of the fuel bed. However, it would temporarily increase the surface fuel loads. This would put the stand into a slash fuel model resulting in higher predicted flame lengths, fire duration, and intensity. In 10 to 15 years after lopping and scattering, the effect of the slash on fire behavior would be overcome by the effects of decomposition and new vegetation growth (McIver and Ottmar 2006).

Hand piling and burning would decrease fuel loading of material one to six inches in diameter by 85% to 95%. Fuels greater than 6 inches in diameter would be left on the surface and would contribute to the coarse woody debris load. This treatment would move stands from a slash fuel type into a timber fuel type, which would result in a reduced rate of fire spread and average flame length.

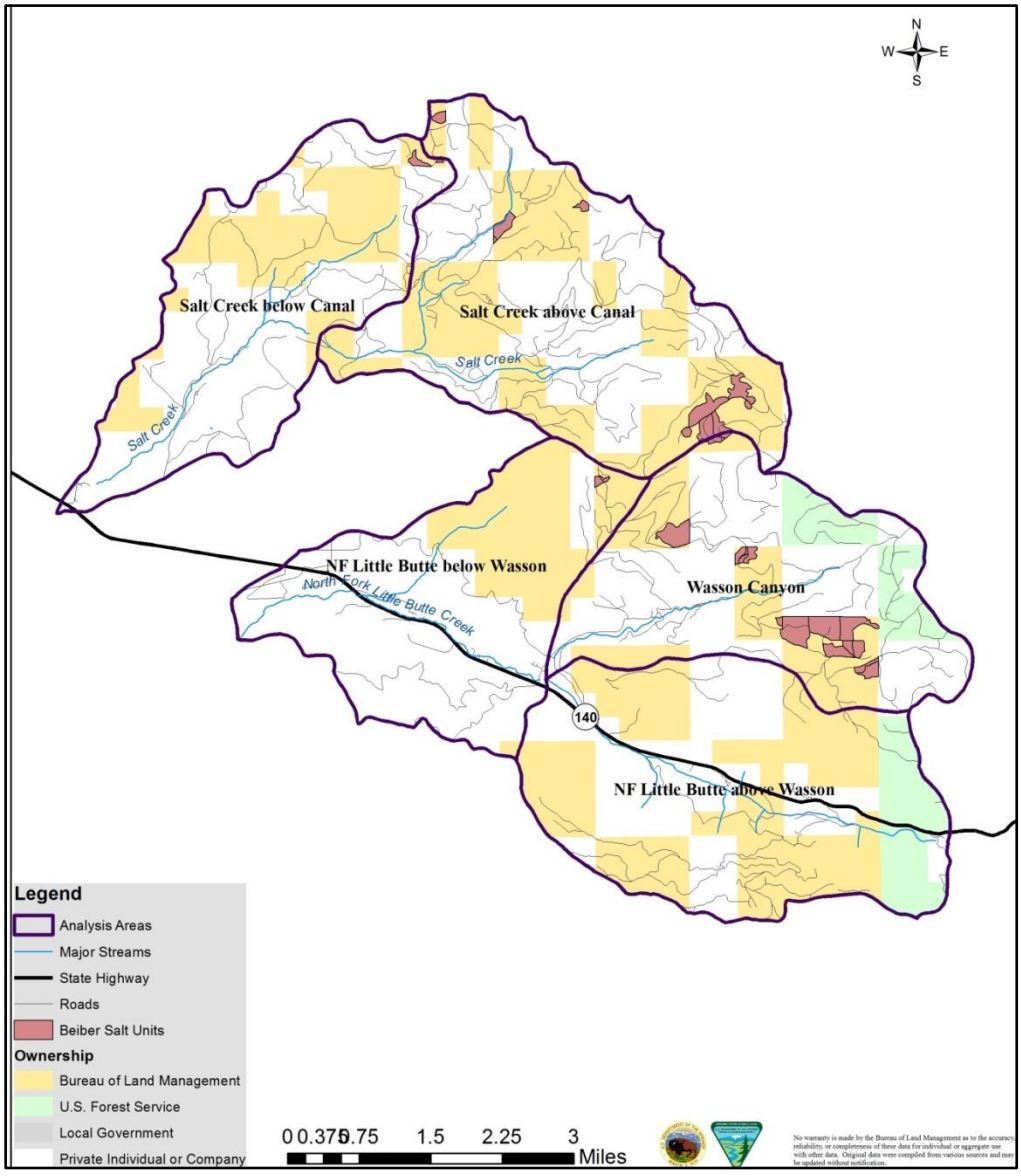
**Rationale:** Immediately following forest management activities and prior to slash disposal, fire behavior potential could increase from the current condition due to increased surface fuels. Following slash disposal treatments, a reduction in potential fire behavior would occur due to the reduction in surface fuel loading and change in horizontal and vertical fuel arrangement.

The BLM fuels management specialist would conduct a fuels assessment within each unit following timber harvest activity. This assessment would determine the fuel hazard and fire risk based on surface fuel loading, aspect, slope, access, and location of each unit. The fuels management specialist would mitigate remaining slash concentrations within the stands by a lop and scatter or handpile and burn treatment. At the landings, slash would be piled, chipped, sold for firewood, or prescribed burned. Post-treatment surface fuel loading would be reduced because the majority of the slash would be removed from the unit.

Timber management activities could have potential short term adverse effects on fuel loading, fuel structure, and fire behavior. However, planned fuels reduction mitigation measures would minimize the short term effects and the resultant long term effects would be negligible.

## Hydrology and Aquatic/Fisheries Resources

**Figure A-1. Bieber Salt Analysis Areas for Hydrology Issues**



**Issue G:** How would the creation and use of skid trails/corridors in upland areas, road work, and timber haul affect water quality?

**Background Information:** The use of skid trails and skyline corridors for logging, road work, and timber haul have the potential to create soil erosion and subsequent sedimentation causing a reduction in water quality. The impacts to water quality can be minimized or eliminated through careful planning and project implementation and the use of Best Management Practices (BMPs), Project Design Features (PDFs), and Riparian Reserves.

Of all forest management activities, roads typically have the greatest potential to influence aquatic habitat in forested watersheds. Roads have three primary effects on hydrologic processes: (1) they intercept rainfall directly on the road surface and road cutbanks and affect subsurface water moving down the hill slope; (2) they concentrate flow, either on the surface or in an adjacent ditch or channel; and (3) they divert or reroute water from paths it otherwise would take were the road not present (Gucinski et al. 2001).

Impacts include both near-term and ongoing (chronic) impacts. Near-term impacts stem from activities that include new ground disturbance, such as construction or maintenance of road segments. These activities lead to increased potential for erosion and transport of sediment to channels. Sediment contribution to channels stemming from these activities generally diminishes after 1 to 3 years (Luce and Black 2001) (Megahan 1974).

Weathering of road surfaces can lead to chronic sediment and turbidity contributions to aquatic habitats, and maintenance and use of roads (such as for timber hauling) can accelerate rates of erosion, particularly during the wet season (Luce and Black 1999) (Reid and Dunne 1984). Intercepted runoff that becomes concentrated over erodible road surfaces mobilizes and transports sediment with it. Surfaces armored by pavement do not experience this type of chronic weathering, while rocked roads are more resistant than natural-surface roads. For these reasons, natural-surface (or depleted rocked surface) roads with a high degree of hydrological connectivity are generally more likely than surfaced roads (rocked or paved) to contribute sediment to streams. Approximately 21% (25.2 miles) of BLM roads in the Bieber Salt Project Area are natural surface roads.

**Rationale:** This issue was considered but eliminated from detailed analysis as the project was designed to maintain water quality, or would reduce impacts to the point that they would be minor and undetectable. Water quality would be maintained through the use of Project Design Features (PDFs) when creating and using skid trails for timber harvest. PDFs would restrict the location of these trails outside of Riparian Reserves (at least 165 feet) on slopes less than 35%, with the exception of one location to access a landing in Unit 20-2 along road 36-3E-29.6. At this location there would be existing designated skid trails used within a Riparian Reserve to skid logs to and down the 29.6 road to an existing landing outside the Riparian Reserve. The Riparian Reserve is for a small spring located below the 29.6 road. There is no hydrologic connectivity from the road to the spring. The proposed skid trails would be used during the dry season when soil moistures are low and the chance for runoff and erosion are also low. Other PDFs that would maintain water quality while creating and using skid trails include using designated skid trails, installing water bars, and using other erosion control techniques such as scattering tree limbs and other fine material on skid trails. See Chapter 2 (Section 2.5) for a full listing of PDFs.

Water quality would be maintained during the creation and use of skyline yarding corridors through the use of PDFs such as constructing waterbars where gouging occurs and pulling available slash on

corridors if gouging occurs for a distance of 20 feet or more. The use of full or partial suspension would limit the amount of gouging that would occur to maintain water quality. There would be no skyline corridors located in Riparian Reserves or within 165 feet of streams. Skyline corridors would not have a hydrologic connection to streams and water quality would be protected.

Proposed activities that would be hydrologically connected to the stream network include timber hauling, road renovation, and road decommissioning. Short-term (one to five years), small, undetectable above background levels, inputs of sediment at stream crossings in the Bieber Salt Project Area could result from these actions.

Water quality would be maintained through the use of PDFs when completing road work for timber haul. Examples of PDFs to maintain water quality during road work include restricting the work to be done during the dry season, suspending work during forecasted rain events, and stabilizing disturbed areas during work suspension or upon completion over stream crossing structures.

Given the dry season haul restriction, inputs would occur only during a precipitation event following a season of hauling and would be spatially spread over many input locations. It is extremely unlikely that sediment input from these activities would be detectable above background levels and would have an effect on aquatic habitat. Sediment increases would be minor and undetectable relative to existing sediment levels and would not contribute measurable or detectable effects above already elevated background levels. Over the long-term, road renovation on haul routes would reduce road-related sediment inputs by adding rock to depleted areas and natural surface roads. Improving drainage would also reduce sediment inputs by reducing erosion to the road surface and ditchlines. Decommissioning approximately 1.78 miles of road would address sediment from roads by placing roadbeds in a stable, well-drained, maintenance-free condition that would produce little road-related sediment.

**Issue H:** How would the increase in road density due to temporary road construction affect the risk of peak flow increase?

**Background Information:** There is approximately 320 feet (0.06 miles) of temporary road proposed for construction in the Project Area. This proposed temporary road is located in the North Fork Little Butte Creek below Wasson Canyon Analysis Area (Figure A-1). The current road density in this Analysis Area is 4.4 miles per square mile.

**Rationale:** This issue was considered but eliminated from detailed analysis because of the small amount of temporary road proposed for construction and the temporary effects of the proposed road. Approximately 320 feet of temporary road is proposed to be constructed in the North Fork Little Butte below Wasson Canyon Analysis Area. There are approximately 25 miles of road in the Analysis Area drainage where this road is proposed for construction. This small amount of additional road that would be located in a stable area away from streams would not increase the amount of runoff to a point that would increase the risk of peak flows.

In addition, the proposed road would be temporary and would be fully decommissioned within the same season of use before the beginning of the rainy season. The decommissioning would involve ripping the roads surface to decrease the amount of compaction and allow infiltration thereby eliminating the risk for increased peak flows as a result of temporary road building.

Approximately 0.4 miles (2,112 feet) would be partially decommissioned in the North Fork Little Butte below Wasson Canyon Analysis Area. The road surface would not be ripped to reduce compaction so infiltration would not be improved. These roads would recover over time and as vegetation is established runoff would be reduced locally but would not have any effect on peak flows in the Analysis Area.

**Issue I:** How would reduction in canopy cover from timber harvesting affect the risk of peak flow events in the transient snow zone?

**Background Information:** Elevations in the Bieber Salt Analysis Areas range from 1,560 feet to 5,240 feet. Within the Analysis Areas, rain predominates in the lower elevations (generally below 3,500 feet). The majority (approximately 64%) of the Bieber Salt Analysis Areas is located within the rain zone (Table A-3). A mixture of snow and rain occurs between approximately 3,500 and 5,000 feet elevation; this area is referred to as the transient snow zone (TSZ). The snow level in this zone fluctuates throughout the winter in response to alternating warm and cold fronts. Snow packs in this elevation range are often shallow and are quickly melted by rain (rain-on-snow event) and warm winds. The Wasson Canyon Analysis Area contains the largest amount of TSZ at 74%. The Bieber Salt Analysis Areas contain a small amount of land in the snow zone (above 5,000 feet elevation).

**Table A-3. Acres by Precipitation Zone in the Bieber Salt Analysis Areas**

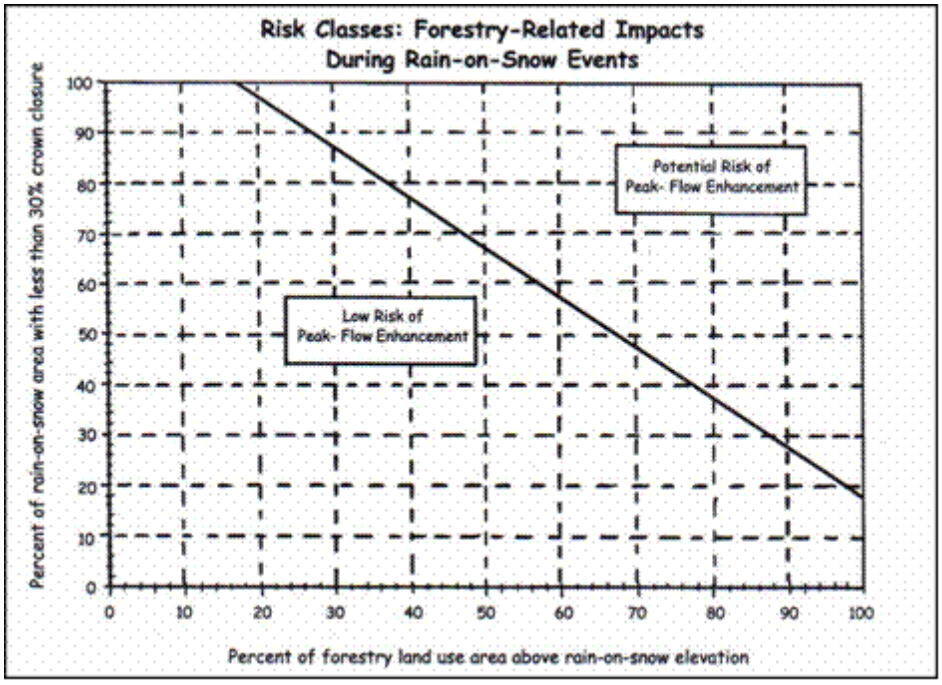
| Analysis Area | Rain Zone | Transient Snow Zone | Total | Percent in Transient Snow Zone |
|---|---|---|---|---|
| NF Little Butte above Wasson | 5,112 | 1,071 | 6,183 | 17% |
| NF Little Butte below Wasson | 4,313 | 303 | 4,616 | 6% |
| Salt Creek above Canal | 2,407 | 3,901 | 6,308 | **62%** |
| Salt Creek below Canal | 4,362 | 358 | 4,719 | 8% |
| Wasson Canyon | 1,281 | 3,626 | 4,907 | **74%** |
| **Total** | **17,474** | **9,258** | **26,733** | **36%** |

Peak flows occur during the winter when periodic snowfall totally or partially melts during warm, mid-winter rain-on-snow events. Low flows normally coincide with the period of low precipitation from July through October. Significant flows can also be produced by local, high-intensity summer storms, although these events are relatively rare and their effect is limited to the local area.

The degrees to which hydrologic processes are affected by vegetation canopy reduction (e.g. land clearing or timber harvest) are summarized based on the extent and location. Extent refers to the amount of a drainage area that is below critical thresholds, and therefore at risk. Location refers to whether or not canopy reduction occurs within the transient snow zone. The risk of peak-flow enhancement is estimated from the OWAM (Oregon Watershed Assessment Manual) risk-assessment graph (Figure A-2) that uses the percent of the Analysis Area within the transient snow zone and the percent of the transient snow zone with less than 30% crown closure (Table A-4). This method indicates that drainages with more than 25% of the area in the transient snow zone may be at risk for possible peak flow increases. The transient snow zone occupies more than 25% of two of the five Analysis Areas associated with the proposed project (Table A-4). In addition, the peak flow risk assessment method

uses the percent of rain-on-snow area that currently has less than 30%crown closure. We used the most recent aerial photos to estimate the area with less than 30% crown closure in the rain-on-snow zone.

**Figure A-2. Estimating the risk of peak-flow enhancement from forestry-related impacts during rain-on-snow events (WPN 1999: IV-11)**




Values that fall below the diagonal line represent a low risk of peak-flow enhancement, while values above the diagonal line indicate a potential risk of peak-flow enhancement. The diagonal line roughly represents peak-flow increases of 8 to 10%, which represents the lower boundary of detectability. For the two Analysis Areas that are more than 25% in the rain-on-snow zone, Table A-4 and Figure A-2 was used to determine the percent of rain-on-snow zone with less than 30% crown closure that represents the boundary between the two risk classes. When the values of crown closure below 30% are combined with values exceeding 25% within the TSZ (bold highlight Table A-4), only the Wasson Canyon Analysis Area reflect values that may indicate altered timing and increased potential for peak flows.

**Table A-4. Percent Effective Crown Closure Below 30% in Transient Snow Zone of Total Area**

| Analysis Area | Percent Forested Area Less Than 30% CC | Total TSZ Acres | Total Acres | Percent in Transient Snow Zone | Percentage CC below 30% |
|---|---|---|---|---|---|
| NF Little Butte above Wasson | 806 | 1,071 | 6,183 | 17% | 75% |
| NF Little Butte below Wasson | 74 | 303 | 4,616 | 6% | 24% |
| Salt Creek above Canal | 1,676 | 3,901 | 6,308 | **62%** | 43% |
| Salt Creek below Canal | 200 | 358 | 4,719 | 8% | 56% |
| Wasson Canyon | 1,727 | 3,626 | 4,907 | **74%** | **47%** |
| **Total** | 4,483 | 9,258 | 26,733 | 36% | 48% |

Therefore, only one of the Analysis Area drainages, Wasson Canyon, currently has a potential risk of peak-flow enhancement with 74% of the land above the rain-on-snow elevation and 47% of the rain-on-snow elevation with less than 30% crown closure. The remaining Bieber Salt Analysis Areas are currently in the low risk of peak-flow enhancement.

The historic crown closures for the Analysis Areas associated with the proposed project are in the Southern Cascades ecoregion (Watershed Professionals Network 2001, A-80, A-204). Forest types within the Southern Cascades ecoregion historically had 40–45% canopy crown closure (Watershed Professionals Network 2001, A-83). For analysis purposes, historic crown closure is assumed to be approximately 40% for forested lands in the Southern Cascades ecoregion.

**Rationale:** This issue was considered but eliminated from further analysis because it was determined that the proposed actions would not increase the risk for peak flow events.

Within the Wasson Canyon Analysis Area, the only Analysis Area that currently has a potential risk for peak-flow enhancement, proposed timber harvest would not increase the risk for peak flow because there would be no treatments that would result in crown closure of less than 30%. The amount of area in the TSZ with less than 30% crown closure would remain at 47% after timber harvest. There would not be an increase in peak flows to cause erosion to stream channels; therefore, there would be no risk of sedimentation to fish habitat downstream.

In addition, peak flows would not be affected by the harvest activities because the amount of canopy retained after harvest would be within the range of natural variability, which is assumed to be approximately 40% for forested lands in the Southern Cascade ecoregion.

**Issue J:** How would ground disturbance from timber harvest, timber hauling, and other road activities affect federally-listed and native fish species and their habitat?

**Background Information:** The proposed Bieber Salt Forest Management Project is located in southwest Oregon northeast of Medford in the Salt Creek and Lower North Fork Little Butte Creek sub-watersheds in the Little Butte Creek 5th field watershed (Figure A-3). The Project Area contains Coho Critical Habitat (CCH) for Southern Oregon Northern California Coast (SONCC) coho salmon and Essential Fish Habitat (EFH) for coho and Chinook salmon in the following drainages: Little Butte Creek, North Fork Little Butte Creek, Salt Creek and Wasson Canyon Creek.

Coho (*Oncorhynchus kisutch)* salmon, fall Chinook salmon (*O. tshawytscha),* summer and winter steelhead (*O. mykiss*), and Pacific lamprey (*Entosphenus tridentate*) are native migratory fish species present in the watershed. Chinook distribution includes the mainstem of Little Butte Creek from its mouth to the confluence of the South and North Forks of Little Butte Creek, at which point they begin to diminish in part due to passage barriers downstream which hinder their upstream migration. Coho and steelhead occur far up both forks, and are also present in many of the larger tributary streams in the watershed. In the Project Area coho are only present in the North Fork Little Butte Creek. Steelhead presence extends further upstream in all streams including Salt Creek and Wasson Canyon Creek.

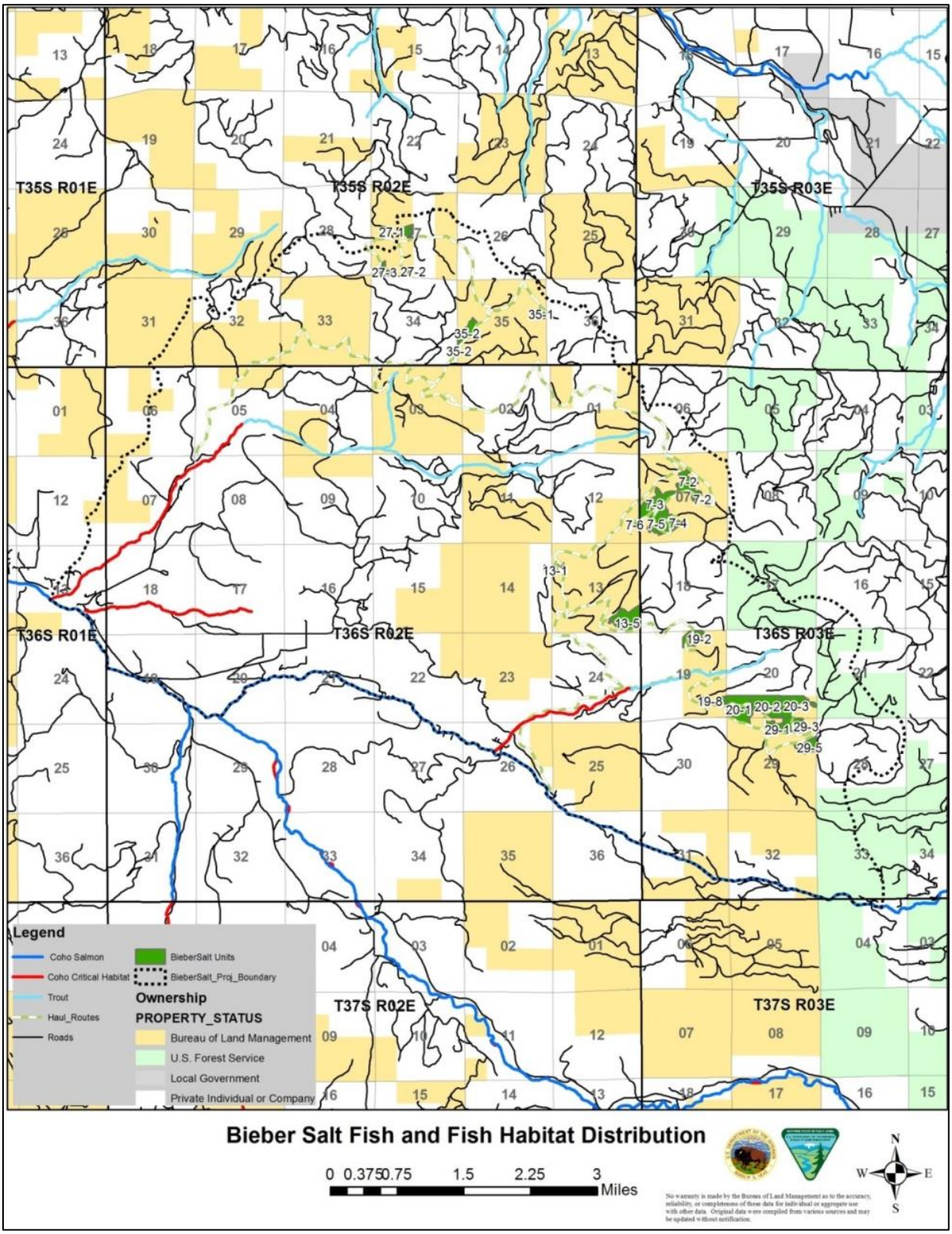
Cutthroat trout (*O. clarkia*), sculpin (*Cottus spp.*), Klammath small-scale sucker (*Catostomus rimiculus*), and rainbow trout (*O. mykiss*) are native fish species present in the watershed that do not migrate to the ocean. Most of these species distribution extends well upstream in both forks of Little Butte Creek. Cutthroat and rainbow trout are typically found the farthest upstream.

Little Butte Creek is used as a migratory corridor for adult and juvenile coho and steelhead to access their primary spawning and rearing habitats located in the larger tributaries. Fall Chinook salmon are mainstem spawners and utilize suitable spawning locations in in Little Butte Creek. Some steelhead and coho likely also spawn in the mainstem, especially during periods of low flow when access into spawning tributaries is difficult. Both forks of Little Butte Creek and the larger tributaries are utilized as spawning and rearing habitat for coho, steelhead, and resident trout species. In the Project Area coho salmon only utilize North Fork Little Butte Creek for spawning and rearing habitat. Table A-5 and Figure A-3 display fish and fish habitat distribution within the Bieber Salt Forest Management Project.

**Table A-5. Known and assumed historic salmonid and habitat distribution, by river miles, in the streams draining the Bieber Salt Forest Management project.**

| Catchment | Coho | Steelhead CCH/EFH | Trout |
|---|---|---|---|
| Salt Creek | 0 | 3.1 | 8.2 |
| Wasson Canyon Creek | 0 | 1.9 | 3.7 |
| North Fork Little Butte Creek | 10.4 | 10.4 | 10.4 |
| Little Butte Creek | 16.9 | 16.9 | 16.9 |

**Figure A-3. Bieber Salt Fish and Fish Habitat Distribution that includes Coho Critical Habitat using Steelhead distribution as a surrogate.**



**Rationale:** This issue was considered but not fully analyzed in detail because it would not lead to a more informed decision. The amount of new material added to the local stream network would be minor compared to background levels.

Proposed activities that would be hydrologically connected to the stream network include timber hauling and associated road activities. In the short-term (one to five years), there would likely be small inputs of sediment at channel crossings in the Bieber Salt Project Area resulting from these actions. Direct inputs of fine sediment resulting from timber hauling and road activities would be of insufficient magnitude to meaningfully affect fish or fish habitat and would not be detectable above background levels. Project Design Features (PDFs) (Chapter 2, section 2.5 PDFs), site conditions, and the spatial separation of most road work from SONCC coho salmon or critical habitat, make it unlikely that SONCC coho salmon or critical habitat would be exposed to measureable quantities of sediment.

Proposed haul routes are predominately gravel surfaced roads leading to paved roads which have lower potential for sedimentation than native surface roads. Road renovation (adding rock, blading, etc.) work would be restricted from October 15$^{th}$ to May 15$^{th}$, or when soil moisture exceeds 25% (Chapter 2, Section 2.5.3, Objective 1). All timber hauling and landing operations on native surface or rocked roads would be restricted whenever soil moisture conditions or rain events could result in road damage or the transport of sediment to nearby stream channels, generally October 15$^{th}$ to May 15$^{th}$ (Chapter 2, Section 2.5.2, Objective 4). If the Authorized Officer, in consultation with resource area watershed specialists and engineers, determines that hauling would not result in road damage or the transport of sediment to nearby stream channels based on soil moisture conditions or rain events, the Contracting Officer or Contracting Officer's Representative may recommend a conditional waiver for hauling (Chapter 2, Section 2.5.2, Objective 4). Protective features would be installed and maintained such as certified weed-free straw bales, silt fences, geo-fabric rolls, and water bars where there is potential for haul-related road sediment to enter the aquatic system (Chapter 2, Section 2.5.2, Objective 4). Therefore, the combination of well vegetated ditchlines, PDFs, and the ability to suspend wet weather haul is expected to prevent unacceptable sediment delivery fish-bearing streams and likely undetectable compared to existing background levels. Over the long-term, road renovation would improve drainage and reduce road-related sediment inputs.

Upland work, including timber harvest and follow-up activity slash treatments, would have no effect on fine sediment levels due to the filtering action of Riparian Reserve buffers, implementation of PDFs designed to prevent overland sediment movement, and Best Management Practices contained in the Medford District ROD/RMP (USDI 1995). Stream temperatures would not be affected as no riparian vegetation, in the primary shade zone, adjacent to perennial streams would be removed.

Under the No Action Alternative, some roads or road segments within the Project Area would continue to be chronic sediment sources until they are properly repaired, maintained, or removed as part of another (unplanned) project. Lack of maintenance on area roads (cleaning ditch lines, culvert replacements and maintenance, rocking, grading, etc.) would continue to produce sediment off poorly drained roads.

Future private timber harvest and land development are expected to continue at existing trends and rates in fine sediment production within the Project Area. The Bieber Salt Project would, in the short-term, contribute a small amount of sediment to stream channels within the Project Area, in addition to the sediment contributed annually from all other sources. In summary, no measurable changes in the

aquatic habitat conditions are anticipated to result from implementation of this proposed project and, as such, there would not be a cumulative effect to aquatic habitats.

## Range/Grazing

**Issue K:** How would proposed harvesting affect grazing and rangeland management in the Project Area?

**Background Information:** There are five active grazing allotments within the 25,630-acre Bieber Salt Forest Management Project Area. The Wasson Canyon pasture of the Big Butte Grazing Allotment is entirely encompassed by the Project Area boundary, while only portions of the Lake Creek Spring, Heppsie Mountain, Salt Creek, and Summit Prairie allotments are within the Project Area boundary. There are 9,130 acres of BLM-administered lands within the Project Area, of which 9,048 acres are within an active allotment. Therefore, 99% of BLM-administered lands and 63% of all lands in the Project Area are available for grazing. There are 13 lessees who have a total of 14 grazing leases within the Project Area for authorization to graze 1,633 cattle, utilizing 3,956 AUM's. The 1,633 cattle authorized to graze 3,956 AUM's is calculated using entire allotment acreage, which includes use outside of the Project Area boundary. Allotment information in Table A-6 includes active allotment acreage. An AUM is the amount of forage required to sustain a cow/calf pair for one month. The seasons of use range from April 16th to October 15th annually.

**Table A-6. Grazing Allotments in the Bieber Salt Project Area**

| Allotment Name* (number of leases) | Allotment Acres in Project Area | Percent of Total Allot. Acres | Current. Authorized AUMs | Current Authorized (#cattle) | Season of Use |
|---|---|---|---|---|---|
| Big Butte (3)* | 14,549 | 33% | 1,575 | 666 | 4/16 – 10/13 |
| Salt Creek (1) | 470 | 56% | 85 | 72 | 4/16 – 6/15 |
| Summit Prairie (8)* | 176 | <1% | 1,656 | 669 | 4/16 - 9/30 |
| Lake Ck Spring (1) | 658 | 5% | 347 | 173 | 5/16 – 7/15 |
| Heppsie Mountain (1) | 229 | 4% | 293 | 53 | 5/1 – 10/15 |
| **Total** | **16,082** | | | | |

* Timber harvest is proposed in forest stands within these allotments.

The forested portions of these grazing allotments are seldom accessed by livestock resulting in utilization levels that are generally none to slight (0-10%) within the forest plant community. The AUM rates/carrying capacities that are approved in a grazing lease account for the 0-10% use in forested areas.

**Rationale:** This issue was considered but eliminated from detail analysis because it would not lead to a more informed decision. Proposed timber harvest would decrease stand density which would increase forage production by allowing more light to the forest floor for understory growth of herbaceous vegetation in the two allotments where timber harvest is proposed (Table A-6). Harvest and hauling activities could influence known patterns of grazing use and distribution, but is not likely due to treatment locations and the amount of acres treated in comparison to the amount of acres that are available for grazing use. Annual compliance and utilization monitoring occurs within the allotments and would occur where timber harvest and hauling is proposed.

## Recreation and Visual Resource Management

**Issue L:** How would proposed timber management, road activities, and water source restoration affect the use of developed recreation sites and dispersed recreational activity in the Project Area?

**Background Information:** Recreational resources in the Bieber Salt Planning Area are managed under the Medford District BLM's 1995 Resource Management Plan. Recreation use across the Medford District BLM is described in the Medford District Proposed Resource Management Plan/Environmental Impact Statement (USDI 1994). BLM-administered lands fall into two recreation management categories; Special Recreation Management Areas (SRMA) and Extensive Recreation Management Areas (ERMA). ERMAs are all BLM-administered lands not included in SRMAs identified in the Medford District PRMP/FEIS (USDI 1994, p. 3-71) that provide for dispersed recreation opportunities across the Medford District BLM. SRMAs are those areas identified with high concentrations of recreation use and developed facilities.

There are no developed BLM recreation sites or SRMAs within the Project Area. Highway 140 runs east/west approximately one mile south of the southernmost proposed treatment unit. The Butte Falls-Fish Lake Highway runs in a northwest/southeast direction approximately three miles from the northern most proposed treatment unit. The Project Area is primarily accessed from the south via Wasson Canyon and Salt Creek roads, and from the north via the Double Day Road.

An extensive network of BLM system roads provides the recreation user opportunities to discover a multitude of recreation activities. Road densities are moderate for lands in the Planning Area, providing access for most BLM-administered land parcels within the Planning Area. Recreational use is generally low and dispersed in nature, consisting primarily of hunting, driving for pleasure and exploration, and off-highway vehicle riding. BLM-administered lands are designated as 'open' to off-highway vehicles most of the year. A small part of the Project Area north of Salt Creek Road and west of the Double Day Road is within a Jackson County Cooperative Travel Management Area. The private and public lands within this area are managed for wildlife habitat and watershed health, and are closed to motorized vehicles from mid-October through April, except for roads posted as open. Most dispersed camping occurs in association with hunting (primarily deer and elk season) in the fall season.

**Rationale:** This issue was considered but not analyzed in further detail as the proposed actions would not have the potential to have an adverse impact on dispersed recreational activities in the Project Area.

Timber operations occurring intermittently in the Bieber Salt Project Area have the potential to disrupt Extensive Recreation Use Areas in several ways: 1) timber sale units and landing areas could be closed or generally just avoided by the public while operations are taking place for public safety concerns; 2) noise disturbance from helicopters, logging trucks, and other timber harvesting equipment; and 3) increased road congestion from logging trucks and timber operators. It is difficult to predict or quantify the degree of effect to each person as people may be affected differently depending on the values each person places on the various uses of public lands. Regardless of the degree each person may be affected, the loss of use of the small percentage of Extensive Recreation Management Areas available across the Project Area, intermittently, would minimally impact the recreating public for the following reasons: 1) standard safety precautions such as signing and closures would be used to avoid conflicts between the recreating public and timber sale operations ; and 2) recreation use for Extensive Recreation Management Areas is considered relatively light across the Medford District.

**Issue M:** How would proposed timber management, road activities, and water source restoration affect the Visual Resource Management Class III landscape?

**Background Information:** The 1995 Medford District ROD/RMP designated lands within the Project Area to be managed as visual resource management (VRM) Class III (USDI 1995, p. 70). Management direction is to manage "for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer" (USDI 1995, p. 70). The entire Project Area is located within VRM Class III.

**Rationale:** This issue was considered but not analyzed in further detail as the proposed actions would not have the potential to have an adverse impact on visual resources in the Project Area. The Visual Resource Inventory ranked the lands in the Project Area as Scenic Quality B, medium sensitivity, and located in the background and seldom seen distance zones from Highway 140. Because of the viewing angle and tall conifers providing screening along the highway, the portion of the Project Area closest to the highway will not be seen by Highway 140 travelers. Where some of the units may be visible from Highway 140, they are in the distance over four miles away, and thus should not be apparent to the average viewer. Units located further to the north will be more visible to travelers on minor BLM roads; however, that area is not as visually sensitive as the area within the foreground view shed of Highway 140.

## Soil Productivity and Stability

**Issue N:** How would cable and ground-based yarding and associated road construction and activities affect soil productivity (compaction, displacement, and change in organic matter and soil chemistry)?

**Background Information:** Soil is a fundamental resource that controls the quantity and quality of such renewable forest resources as timber, wildlife habitat, forage, and water yield. Soil productivity is the inherent capacity or potential of a soil to produce vegetation, and the fundamental measure of soil productivity is the site's carrying capacity for plant growth. The key properties directly affected by management are site organic matter (OM) and soil porosity. These two properties regulate critical site processes through their roles in microbial activity, soil aggregate stability, water and gas exchange, physical restrictions on rooting, and resource availability (Powers et al. 2004, p. 194). Site organic matter and soil porosity are most important when measuring the effects of management, although other factors such as water regimes, soil biological types and populations, and soil loss can also affect long-term soil productivity.

Many factors can affect soil productivity such as: compaction, displacement, erosion, organic matter loss and more. Impacts to soils and soil productivity were evaluated at the project level scale, which is also referred to below as the Analysis Area. The project level scale includes all areas where proposed projects would occur (treatment units, temporary route construction, designated skid trails, etc.).

Figure A-4 displays the Soil Map Units as surveyed by the Natural Resource Conservation Service in relation to proposed treatment units and fragile soils. Table A-7 following the map provides the description for the soil map units listed in the maps legend.

**Figure A-4. Soil Map Units in the Bieber Salt Analysis Area**

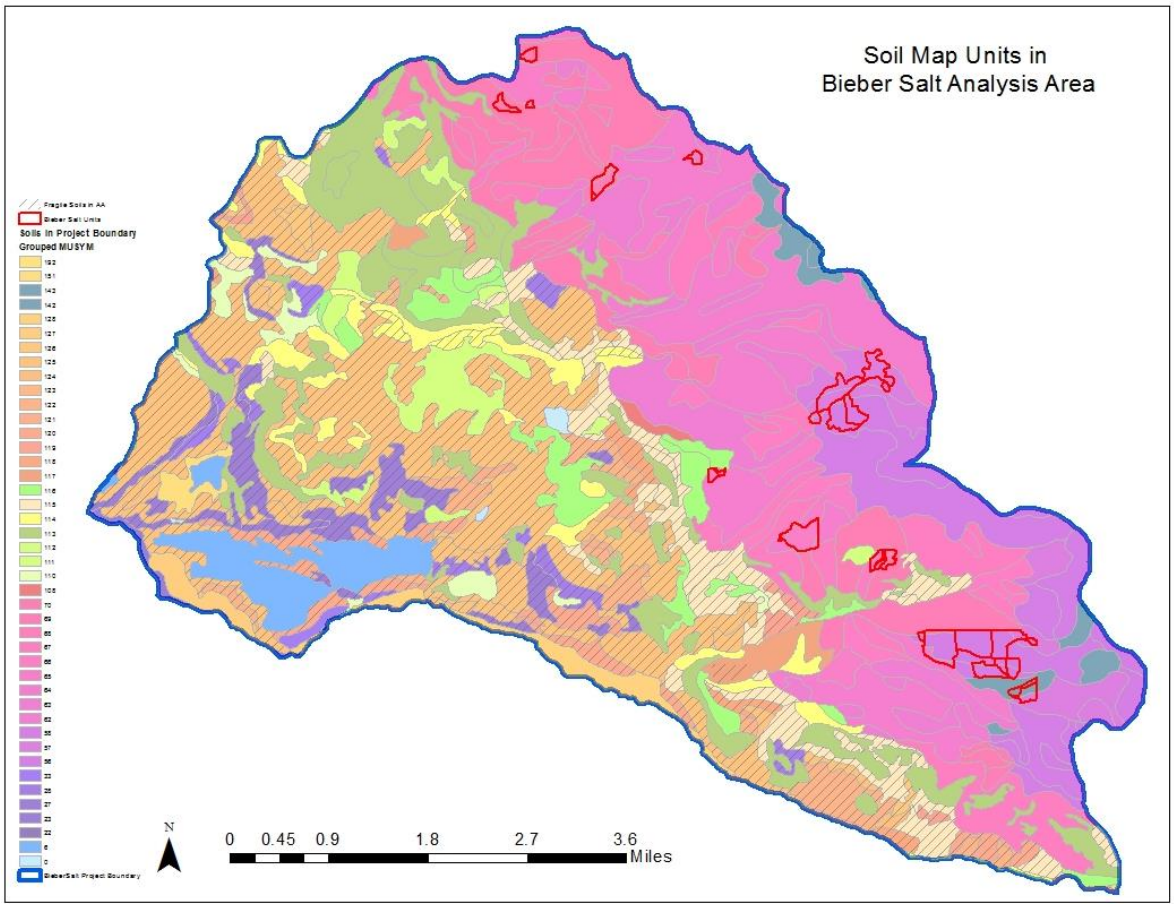



**Table A-7. Soil Map Unit Descriptions Present in the Proposed Units**

| Soil Series[1] | Soil Map Unit Number | Surface Texture | Depth | O Horizon | Fragile Soil |
|---|---|---|---|---|---|
| Farva | 56C, 57E, 57G, 58E | Very cobbly loam | 35 inches to partially weathered Andesite bedrock. | Oi 0-1/2 inch | No |
| Freezener | 62C, 64E, **65C, 67G** | Gravelly Loam | 60+ inches to bedrock. | Oi 1½ inches | No |
| Geppert | **65C, 67G,** 69E, 69G, 70E, 70G | Very cobbly loam | 30 inches to Andesite bedrock. | Oi ½ inch | No |
| McMullin | 116E | Gravelly loam | 17 inches to fractured Andesite bedrock. | none | No |
| McNull | 116E | loam | 32 inches to fractured Andesite Bedrock with clay films. | Oi 0-1 inch | No |
| Pinehurst | 143E | Loam | 60+ inches to igneous bedrock. | Oi 0-1 inch | No |

[1] Soil series descriptions are saved in the Project File and are available upon request.

Proposed actions that could affect soil productivity include timber harvest and yarding, fuels and understory reduction treatments, temporary route and landing construction, roadside vegetation maintenance, and road renovation and decommissioning. Refer to Table 2-1 (Chapter 2, Section 2.3) for a complete list of proposed project descriptions.

**Rationale:** This issue was considered but not analyzed in further detail because the project's impacts on soil productivity are expected to be within the range of anticipated effects identified in the Final Environmental Impact Statement (FEIS) for the Medford District ROD/RMP (USDI 1994, pp. 4-12 through 4-16), which accounted for soil compaction on up to 12% or less of the treatment unit. In addition, potential for soil erosion would be minimized due to the implementation of rehabilitation PDFs. Project Design Features (PDFs) are an integral part of the design of this project and have been incorporated to minimize the potential for effects to soils.

Refer to the Project Design Features section 2.5.2: Timber Harvest, Objective 4: Prevent off-site soil erosion and soil productivity loss and Objective 5: prohibit unauthorized OHV use; section 2.5.3: Road Maintenance, Decommissioning, and Quarry work, Objective 1: prevent off-site soil erosion and soil productivity loss; and section 2.5.4: Fuels Treatments Associated with Timber Harvest, Objective 5: Conduct fuels reduction to minimize impacts to other resources.

#### Timber Harvest and Yarding

In the Project Area, 96 acres are proposed for skyline yarding and 335 acres are proposed for ground-based yarding. Ground-based equipment would cause compaction and topsoil displacement, mostly on skid trails, and in skyline yarded units, soil displacement would occur within the yarding corridors. The amount of compaction and soil displacement would be within the acceptable limit (12% of the area) accounted for in the Medford District FEIS and ROD/RMP (USDA and USDI 1994, pp. 4-12 to 4-16 and USDI 1995, p. 166).

Soil erosion from ground-based yarding is not anticipated because skidding would mainly occur on gentle slopes. If soil erosion were to occur, it would be localized to skid trails and would not be displaced off-site because of the gentle slope, low degree of soil erodibility, and the adjacent undisturbed soils. The duff organic horizon and vegetation adjacent to ground disturbance would catch displaced soil particles. PDFs such as waterbarring, seeding, mulching, and dry condition haul would limit the amount of soil erosion and, if it were occurring, limit the distance soil particles would be displaced.

In skyline units, water bars would be constructed where gouging occurs and partial or full suspension would be required. These two restrictions would reduce the amount of displacement and further erosion to acceptable levels anticipated in the FEIS for the Medford District RMP (USDA and USDI 1994, pp. 4-12 to 4-16).

Additionally, activities where unacceptable soil loss would have likely occurred were dropped from the proposal during the field review and development process.

#### Fuels and Understory Reduction Treatments

The increased potential of soil particle movement as a result of fuels and understory reduction treatments would be low due to the gentle slope, spacing of piles, and vegetation between the piles. High soil temperatures generated by burning piles would severely and negatively affect soil properties in 3-

5% of the unit by physically changing soil structure and reducing nutrient content. In most pile burning operations, the duff and woody debris associated with the piles is completely consumed.

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

#### Temporary Route and Landing Construction

Temporary route construction is proposed for 0.06 miles. Based on an estimate that the average temporary route is approximately four acres for every one mile of route, 0.24 acres are expected to be disturbed. Temporary route construction would result in a temporary full loss of soil productivity. After rehabilitation, compaction levels are improved, but not alleviated, nor are productivity losses; however, rehabilitation puts the soil on an expedited trajectory towards prior productivity levels in the long-term (>10 years). Temporary route construction has the potential to cause soil erosion; however, the gentle topography of the area, the nature of the soil along the proposed route, and the implementation of PDFs would minimize the potential for soil erosion to occur.

New landings are proposed as well. In total, three landings are proposed to be constructed. The anticipated effects of landing construction are similar to temporary route construction.

#### Roadside Vegetation Maintenance

The effects of roadside vegetation maintenance on soil productivity are expected to be very minimal. There is not expected to be soil disturbance from this activity. The threshold for soil compaction is 12% of the unit area. This threshold is identified in the Best Management Practices in the RMP which is based on the assumed 5% loss of productivity that would occur on harvested lands in the RMP (USDI 1995, page 4-13).

#### Road Renovation and Decommissioning

The proposed 0.19 miles of full road decommissioning would result in an improvement in soil productivity in the long-term on 0.76 acres due to the physical fracturing of the compacted soil layer that would occur. The effects to soils from full road decommissioning are direct. Full road decommissioning would physically alleviate soil compaction by breaking up the massive soil structure that resulted from road construction and use. This would allow for better water and air infiltration, reduce erosion, and increase the rate of re-vegetation (Switalski, Bissonette, DeLuca, Luce, & Madej, 2004). Soil erosion from full road decommissioning is expected to be avoided or minimized due to the incorporation of PDFs. For example, seasonal restrictions for all full road decommissioning activities would reduce the potential for runoff and off-site erosion from intensive winter storms and saturated soil conditions.

The partial road decommissioning of 1.78 miles of road would reduce soil erosion and could improve soil productivity on 7.12 acres; however, it would take longer (could range as much as 15-50 years or more) than full road decommissioning because ripping would not occur. However, through time and non-use, natural processes would work to slowly improve the conditions.

## Terrestrial Wildlife and Special Status Species

**Issue O:** How would noise associated with proposed timber harvest activities, water source restoration, and road work affect northern spotted owls during their nesting season?

**Background Information:** The proposed Bieber Salt Forest Management Project is located within the range of the northern spotted owl and has the potential to cause noise disturbance near spotted owl nest sites.

Guidance from the U.S. Fish and Wildlife Service (USFWS) and the Medford District RMP (USDI 1995) would be followed, and surveys would be conducted in the Project Area to determine nesting status. The Medford RMP recommends a seasonal restriction. No timber harvest within 0.25 mile of nest sites between March 1st and September 30th. No disturbance from would occur within 100-acre core areas. The USFWS has also recommended certain noise disturbance distances for activities other than timber harvest (see Chapter 2, section 2.5 Project Design Features).

**Rationale:** This issue was considered but not fully analyzed in detail because the potential for spotted owls to be impacted by noise associated with proposed project activities is eliminated through the implementation of PDFs (Chapter 2, Section 2.5).

Nesting owls are confined to an area close to the nest, but once the young fledge, they can move away from noise and activities that might cause them harm. Since all project activities would follow mandatory PDFs that restrict activities to outside of the breeding season (March 1st to September 30th) and beyond recommended disturbance distance thresholds (see Table 2-2 in Chapter 2, Section 2.5.1, Objective 5), as established by the US Fish and Wildlife Service, no harm to nesting owls, or their young, is expected from project related noise.

**Issue P:** What disruption and habitat effects would the activities associated with timber harvest and road construction have on Bureau Sensitive and S&M wildlife species?

**Background Information:** The project wildlife biologist has evaluated the effects of the proposed projects in Bieber Salt and has determined that the No Action Alternative along with the Action Alternative would not rise to the level that would result in the following Bureau Special Status wildlife species to no longer be able to persist within the Project Area.

Special Status wildlife species known or suspected to be present in the Bieber Salt Project Area based on habitat types, field survey data, and/or literature reviews are: Foothill yellow-legged frog, bald eagle, Lewis' woodpecker, peregrine falcon, white-headed woodpecker, great gray owl, Johnson's hairstreak butterfly, fisher, fringed myotis bat, Pacific marten, Townsend's big-eared bat, and western pond turtle.

Special Status wildlife species known or suspected on Butte Falls Resource Area but not suspected to be present in the Bieber Salt Project Area based on habitat types, field survey data, and/or literature reviews are: Franklin's and Western Bumblebees, Oregon spotted frog, willow flycatcher, streaked horned lark, Oregon vesper sparrow, grasshopper sparrow, purple martin, tricolored blackbird, white-tailed kite, chase sideband snail, Oregon shoulderband snail, Siskiyou hesperian snail, travelling sideband snail, Crater Lake Tightcoil snail, pallid bat, red tree vole, and vernal pool fairy shrimp. These species will not be evaluated any further.

**Rationale:** This issue was considered but not fully analyzed in detail because the BLM would implement Project Design Features and Survey and Manage buffers that would provide protection for populations of Bureau Sensitive (Special Status Species) and Survey and Manage wildlife species to continue to persist within the Project Area.

- For species that use, or live within, riparian zones: there would be a 165- to 330-foot no-harvest riparian buffer. No ground-based machinery would be used within Riparian Reserves, with the exception of one location to access a landing in Unit 20-2 along road 36-3E-29.6. At this location there would be existing designated skid trails used within a Riparian Reserve to skid logs to and down the 29.6 road to an existing landing outside the Riparian Reserve. The Riparian Reserve is for a small spring located below the 29.6 road.
- For raptor species: there would be no-harvest buffers and seasonal restrictions around known nest sites.
- For species dependent upon late-successional characteristics: unique stand features such as snags, coarse woody debris, large hardwoods, and trees exhibiting old-growth characteristics would be retained to maintain desired structural components for wildlife.
- Special habitats, such as meadows and caves, would have no-harvest buffers.
- Existing late-successional habitat (stand ages of 80 years or older) would be maintained.
- Riparian Reserves, 100-acre northern spotted owl activity centers, and other reserves would also provide habitat for Bureau Sensitive and Survey and Manage species.

**Issue Q:** How would proposed activities affect gray wolf denning and rendezvous sites during their reproductive season?

**Background Information:** Wolves use a variety of habitats, but use primarily coincides with wild ungulate ranges, including winter range, summer range and calving/fawning areas. Important wolf habitat components for reproduction are denning sites and rendezvous sites. Den sites may be in hollow logs, clefts between rocks, deep riverbank hollows, spaces under upturned trees or rock overhangs, or in abandoned dens of other animals.

The edge of the nearest, known, established wolf pack activity area is approximately six miles away. A wolf can travel miles in a day and sustained direct effects to individuals from the proposed actions would be improbable. Although unlikely, there may be brief, chance encounters between harvest personnel and a wolf. The majority of the roads in the area are open to year-round traffic; therefore, the likelihood of harvest personnel encountering a wolf is no greater than other forest visitors.

**Rationale:** This issue was considered but eliminated from further analysis as there no potential for adverse impacts to wolves that could lead to a significant impact as a result of the proposed projects. Unique stand features such as snags, coarse woody debris, large hardwoods, and trees exhibiting old-growth characteristics would be retained to maintain desired structural components for wildlife. Effects from disturbance would be assessed on an ongoing basis throughout the life of the proposed project through annual updates and communication with the US Fish and Wildlife Service and Oregon Department of Fish and Wildlife and a one mile seasonal restriction from noise disturbance would be implemented for known active den sites from March 1$^{st}$ through June 30$^{th}$.

There would be no effects to wolves because the proposed activities would not disturb key wolf areas such as den sites and rendezvous sites, would not change prey availability, and would not increase public access in the area known to be used for denning and rendezvous sites.

**Issue R:** How would proposed activities affect elk within the Elk Winter Range?

**Background Information:** Management for elk in Elk Winter Range areas is focused primarily on improving forage and cover conditions and decreasing the density of roads that are open to vehicular traffic, particularly in the winter. During the winter months, elk feed on woody plants, including Douglas-fir and western red cedar seedlings and elderberry. Elk take shelter in forested habitat.

**Rationale:** This issue was considered but eliminated from detailed analysis as the proposed actions would not have the potential to lead to adverse effects with the implementation of required Project Design Features. Elk foraging habitat and cover would be maintained and managed for within Elk Winter Range. Selective Thinning would create more diverse stand conditions and would create openings allowing for sun tolerant herbaceous plants and shrubs to regenerate. No late-successional forest would be removed. Activities would be restricted to avoid disturbance to wintering elk between November 15$^{th}$ and April 1$^{st}$. No new, permanent road construction would occur, and approximately two miles of roads would be decommissioning as part of this project. Temporary routes would be decommissioned after harvest. Meadows would be buffered, providing cover adjacent to foraging habitat.

**Issue S:** How would proposed timber harvesting activities affect woodpeckers and cavity nesters?

**Background Information:** Bureau Sensitive woodpeckers such as the Lewis' woodpecker and white-headed woodpecker may be present in the Project Area.

Lewis's woodpeckers are associated with open woodlands near streams and rivers. Habitat preference includes hardwood oak stands with scattered ponderosa pine near grassland shrub communities. Species may be present in the Project Area during the fall and winter seasons (migratory), but no project activities are proposed within their preferred habitat.

The white-headed woodpecker is typically associated with open ponderosa pine or mixed conifer stands dominated by ponderosa pine. They forage on ponderosa pine seed and insects and use large snags (> 20 inches) for nesting. Proposed project units are not dominated by ponderosa pine, but the woodpecker may be present in the wider Project Area.

**Rationale:** This issue was considered but eliminated from detailed analysis because unique stand features such as snags, coarse woody debris, large hardwoods, and trees exhibiting old-growth characteristics would typically be retained to maintain desired structural components for wildlife. Additionally, treatments would promote and retain healthy ponderosa pine trees within the mixed-conifer stands.

**Issue T:** How would timber harvesting activities and brush removal affect Neotropical bird population trends?

**Background Information:** The following bird species have been located, or are likely present, within the Project Area: Olive-sided Flycatcher (BCC), Purple Finch (BCC), Rufous Hummingbird (BCC), and Northern Goshawk (BCC), Band-tailed pigeon (GBBC).

BLM has issued interim guidance for meeting BLM's responsibilities under the Migratory Bird Treaty Act and EO (Executive Order) 13186. Both the Act and the EO promote the conservation of migratory bird populations. The interim guidance was transmitted through IM (Instruction Memorandum) No. 2008-050. The IM relies on two lists prepared by the U.S. Fish and Wildlife Service in determining which species are to receive special attention in land management activities; the lists are *Bird Species of Conservation Concern* (BCC) found in various Bird Conservation Regions and *Game Birds Below Desired Condition* (GBBDC). In December 2008, the US Fish and Wildlife Service released *The Birds of Conservation Concern 2008*(USDI FWS 2008b). This publication identifies species, subspecies, and populations of migratory and non-migratory birds in need of additional conservation actions, updating the April 2008 Birds of Conservation Concern List. This list meets US Fish and Wildlife Service mandates for the conservation of migratory non-game birds.

Additionally, the US Fish and Wildlife Service and the BLM signed a Memorandum of Understanding in April 2010 that identified strategies to avoid or minimize adverse impacts on migratory birds. The Bieber Salt Forest Management Project would follow these guidelines to reduce the impacts to migratory birds. For example, many of the PDFs, such as seasonal restrictions, that minimize effects to some wildlife species would also benefit migratory birds.

**Rationale:** This issue was considered but eliminated from detailed analysis as the proposed actions would not have the potential to lead to adverse effects with the implementation of required Project Design Features. Implementation of treatments might occur during bird nesting season. However, many of the PDFs (seasonal restrictions, special status plant and wildlife buffers, and riparian buffers) would benefit migratory birds and help minimize the amount of disturbance during nesting season. The treatments would be broken into smaller units and would occur over the course of several years. Smaller, staggered treatments would minimize the immediate disturbance to nesting birds. Over time, these treatments would create a mosaic landscape with increased structure and biodiversity which may provide a long-term benefit to bird and wildlife species. These resources would all be considered as the project evolves. The BLM fire and fuels management personnel would conduct post-treatment evaluations to determine the need for follow-up maintenance treatments and coordinate with the wildlife biologist and botanist.

There would be no perceptible shift in species composition the following breeding season because of the limited scale of habitat modifications in relation to the Project Area. Adequate undisturbed areas within and adjacent to the Project Area would maintain habitat for displaced individuals. Overall, populations in the region would be unaffected due to this small amount of habitat and/or reproduction loss. These effects would not be measurable at the regional scale. Analyzing bird populations at this scale is supported by Partners in Flight (California Partners in Flight 2002).

## Other

**Issue U:** How would road and landing construction and yarding corridors affect unauthorized off-highway vehicle (OHV) use and trail creation and illegal dumping and firewood cutting in the Project Area?

**Background Information:** BLM-administered lands are designated as 'open' to off-highway vehicles most of the year. A small part of the Project Area north of Salt Creek Road and west of the Double Day Road is within a Jackson County Cooperative Travel Management Area. The private and public lands within this area are managed for wildlife habitat and watershed health, and are closed to motorized vehicles

from mid-October through April, except for roads posted as open. Treatments with direct access to roads have the potential to 'open up' land to off-highway vehicle intrusions.

**Rationale:** This issue was considered but eliminated from further detailed analysis as the potential for adverse effects from unauthorized OHV use would be greatly reduced through the implementation of the following Project Design Features:

- Place woody debris or other appropriate barriers (e.g., rocks, logs, and slash) on the first 100 feet of skid trails leading off system roads in all ground-based yarding units upon completion of yarding to block and discourage unauthorized vehicle use.
- Rip, seed, mulch with straw, water bar, and block new temporary routes and associated landings in the same season of use. Seed must be native species, site-specific, and approved by the resource area botanist. If hauling on a temporary route is not completed in the same year the route is constructed, the route would be storm-proofed and blocked by October 15$^{th}$ or when soil moisture exceeds 25%.

The BLM proposes to close and decommission roads that are not needed at this time but may be used in the future. Roads would be closed with a device similar to an earthen barrier or equivalent and would not be maintained in the future. Roads would be closed to vehicles on a long-term basis, but may be used again in the future. Closing and decommissioning roads in the Project Area would help reduce off-highway vehicle use and trail creation and illegal dumping and firewood cutting.

**Comment V**: Estimate the number of trees to be logged (20-30 inches DBH and >30 inches DBH) and disclose the information in the EA for analysis and public comment.

**Response:** The environmental assessment has three defined functions. (1) It briefly provides sufficient evidence and analysis for determining whether to prepare an EIS; (2) it aids in an agency's compliance with NEPA when no EIS is necessary (i.e., it helps to identify better alternatives and mitigation measures); and (3) it facilitates preparation of an EIS when one is necessary (40 CFR §1508.9(a)). The BLM has disclosed in the EA the relevant and applicable information available to the agency.

Information regarding the number and location of trees that would be marked for harvest does not become available until after the analysis is completed, and the stands are marked and cruised. Furthermore, there are no requirements that mandate the BLM to disclose the precise number of trees to be harvested of any diameter. Public disclosure and Agency consideration of the exact number of trees to be harvested is not necessary for a reasoned choice among alternatives for a project where the objectives are to manage a landscape, not individual trees. The EA contained the information on the current stand condition, and explained how the proposed treatments would affect the stands relative to the goals set out in the RMP and the stated Purpose and Need of the Project.

# APPENDIX B - SILVICULTURAL MARKING GUIDELINES

## SILVICULTURAL OBJECTIVES AND PRESCRIPTIONS

The marking guidelines will guide the implementation of the silvicultural prescriptions for the Bieber Salt Forest Management Project. The intent of the prescriptions is to improve species composition, stand productivity, stand resiliency, and structural characteristics in the proposed treatment units while considering impacts to late-successional species, particularly the northern spotted owl (NSO). Trees infected with mistletoe would be selectively removed, where necessary and feasible, in order to reduce the level of infection in target stands and decrease the rate of proliferation. Post-treatment stand characteristics would include a more diverse species composition, increased growing space, trees with characteristics that provide resilience to insects and pathogens, and structural heterogeneity in forest canopy structure.

The marking guidelines rely on target basal area, target canopy cover, estimation of future growth, current and projected structural development, and species selection to achieve the desired outcomes. Tables B-1 to B-4 display information about each proposed treatment unit, including size, stand age, northern spotted owl habitat type, and target basal area and canopy cover retention levels.

Due to competing management objectives, some stands proposed for treatment would not meet the long-term silvicultural objectives but would, in the short-term, stands would see a reduction in stand density, which would reduce competition and allow for slightly better growing conditions. Retaining 60% canopy cover or greater in select stands would not allow for forest health objectives to be met.

### General Guidance Applicable to all Silvicultural Prescriptions

- Mark trees that are to be removed with blue paint.
- Retain the average basal area target prescribed for each unit.
- To encourage the maintenance and establishment of drought tolerant and fire resilient species, favor leaving sugar pine, ponderosa pine, incense cedar, Douglas-fir, and white fir, respectively.
- Do NOT try to create uniformity/evenness in stand conditions in marking; DO try to encourage creation of spatial heterogeneity. Retain clusters of trees where appropriate; do NOT feel imperative to thin clustered tree stems.
- Strive to maintain or create diverse vertical and horizontal stand structure by leaving trees of all crown classes with crown ratios of $\geq$ 30%. Strive for stand diversity in regard to diameter classes, species composition, tree heights (crown classes) (see Figure B-2, p. B-7), trees per acre, and the vigor of individual trees. See page B-5 for characteristics of low vigor trees.
- The preference is to retain trees with old-growth characteristics as described below:
    - Larger and older than the second-growth trees in the current stand, an indication that the tree may be one of the seed trees of the present-day stand. These trees have a bottle-brush shape (non-symmetrical crown). (These characteristics apply to all conifer species.)

- Large-diameter limbs indicating that the tree was once open-grown and had a large crown. Limbs (live or dead) are usually heavy and gnarled, are covered with mosses and lichens, and are close to the ground. (These characteristics apply to all conifer species.)
- Douglas-fir with thick bark, deep fissures and a chocolate brown color. (Second-growth trees have more gray color in the bark.) Ponderosa pines with thick bark, plate-like and yellow orange in color.

- The intent of retaining trees with the aforementioned characteristics is to retain and/or promote structural complexity within stands treated. There may be situations where trees with the above-mentioned characteristics may be harvested if determined by OSHA health and safety guidelines to present a risk to people or due to logging system operations.
- Always try to reduce competing vegetation from around healthy pines, oak, and incense cedar to ensure their survival without compromising the prescribed canopy cover and/or basal area targets for the stand.
- Protect large hardwoods, particularly unique trees for stand diversity, structure, and wildlife habitat. Leave conifers that have their crown entangled in a hardwood tree or pose a threat from potential damage from timber falling. Unless determined to be a safety hazard by OSHA health and safety guidelines or interfering with logging system operations, all hardwoods greater than 12 inches DBH should be reserved.
- Retain all snag stages 1-5 and coarse woody material (CWM) of various size and decay classes, unless determined by OSHA health and safety guidelines to present a risk to people. Snags fallen for safety reasons within these units will be left as CWM to further contribute towards key habitat elements. Avoid marking trees that may damage these snags from the process of timber falling. These components will provide additional structural complexity and habitat diversity.
- In draws which are not designated as Riparian Reserves, leave trees in the center of the draw bottoms for soil stability (10-feet on each side is recommended).
- Do not cut mark a seed tree. Do not cut mark any tree, that if felled, would endanger a seed tree.
- Where mistletoe is encountered, target heavily infected trees for removal first, then, focus on leaving resistant species (sugar pine, ponderosa pine, incense cedar, and white fir), followed by uninfected or the least infected Douglas-fir trees with infections confined to the lower third of the tree. Dwarf mistletoe infected trees may be marked for removal if prescribed canopy cover retention and/or the target trees per acre for the stand is not compromised and where preservation of mistletoe is not needed to preserve Johnson's hairstreak butterfly habitat.

## Guidelines Specific to Individual Units

### Density Management

- Retain a canopy cover of 60% or greater.
- Stands would be treated to a relative density within a range of 0.50-0.60 RDI.
- Reduce basal area to between 160 and 220 $ft^2$ per acre.

- Unique stand features such as snags, coarse woody material, large hardwoods, and trees exhibiting old-growth characteristics would be retained to maintain desired structural components for wildlife.
- Trees targeted for removal would include those exhibiting a decline in crown ratio, narrow crown widths, and which contribute least to the canopy layer or structural diversity, unless removal compromises the required minimum canopy cover of 60%.
- Trees may be marked in small patches (i.e., groups of trees with poor crowns) and left in clumps (i.e., groups of old trees) to create hiding cover for wildlife species and increase spatial heterogeneity.
- The size of patches or openings should be no greater than 0.20 acres and should not exceed 5% of the total treatment unit area.
- In Unit 20-2 where the Johnson's hairstreak butterfly is present, generally retain mistletoe-infected trees in order to preserve butterfly habitat. Single trees with mistletoe may be thinned if they are actively competing with more desirable trees.

**Table B-1. Density Management/Mixed Conifer (DM/MC) Units**

| Unit | Acres | Age | Rx | Habitat | Effects Call | Target BA | Target CC% |
|---|---|---|---|---|---|---|---|
| 7-2 | 31 | 160 | DM/MC | Roosting/Foraging | Maintain | 160 BA | 60% |
| 19-8 | 3 | 150 | DM/MC | Roosting/Foraging | Maintain | 160 BA | 60% |
| 20-2 | 44 | 120 | DM/MC | Roosting/Foraging | Maintain | 160 BA | 60% |
| 29-1 | 19 | 120 | DM/MC | Roosting/Foraging | Maintain | 160 BA | 60% |

## Selective Thinning - Mixed Conifer

- In Dispersal and Capable units leave a canopy cover of 40% or greater.
- In RF/maintain units, leave a canopy cover of 60% or greater.
- In RF/downgrade units the canopy cover may be reduced to 40%.
- Stands that are predominantly Douglas-fir and have moderate-high productive site conditions would be treated to a relative density range of 0.35-0.45 RDI.
- Reduce basal area to between 110 and 160 $ft^2$ per acre. Depending on aspect and elevation these mixed conifer stands can have a relatively high amount of stand density due to the presence of shade tolerant species.
- Opening size would range from 0.10-0.25 acre where fire resilient and drought tolerant species need release to reduce competition. Opening size would range from 0.25-0.50 acres where regeneration is encouraged or where poor crown conditions exist (due to density-related suppression and mistletoe infection).
- In Units 7-4, 20-1, and 20-3 retain mistletoe-infected trees in order to preserve Johnson's hairstreak butterfly habitat. Single trees with mistletoe may be thinned if they are actively competing with more desirable trees.

**Table B-2. Selective Thinning/Mixed Conifer (ST/MC) Units**

| Unit | Acres | Age | Rx | Habitat | Effects Call | Target BA | Target CC% |
|---|---|---|---|---|---|---|---|
| 7-3 | 36 | 70 | ST/MC | Dispersal | Maintain | 130 BA | 40% |
| 7-4 | 20 | 120 | ST/MC | Dispersal | Maintain | 120 BA | 40% |
| 7-5 | 29 | 120 | ST/MC | Dispersal | Removal | 120 BA | 40% |
| 7-6 | 5 | 70 | ST/MC | Dispersal | Maintain | 120 BA | 40% |
| 13-5 | 43 | 100 | ST/MC | Roosting/Foraging | Maintain | 160 BA | 60% |
| 20-1 | 52 | 120 | ST/MC | Dispersal | Maintain | 140 BA | 40% |
| 20-3 | 33 | 120 | ST/MC | Roosting/Foraging | Downgrade/Enhance | 130 BA | 40% |
| 27-1 | 9 | 250 | ST/MC | Dispersal | Maintain | 120 BA | 40% |
| 27-2 | 2 | 100 | ST/MC | Dispersal | Maintain | 140 BA | 40% |
| 27-3 | 10 | 300 | ST/MC | Dispersal | Maintain | 120 BA | 40% |
| 29-2 | 7 | 10 | ST/MC | Capable | No Effect | 120 BA | 40% |
| 29-3 | 12 | 10 | ST/MC | Dispersal | Maintain | 130 BA | 40% |
| 29-4 | 7 | 10 | ST/MC | Roosting/Foraging | Downgrade/Enhance | 140 BA | 40% |
| 29-5 | 14 | 120 | ST/MC | Dispersal | Maintain | 140 BA | 40% |
| 35-2 | 21 | 50 | ST/MC | Roosting/Foraging | Downgrade/Enhance | 120 BA | 40% |

## Selective Thinning - Douglas-fir

- Stands would be harvested to a minimum of 40% canopy cover.
- Stands that are predominantly Douglas-fir and have low-moderate productive site conditions would be treated to a relative density range of 0.30-0.40 RDI.
- Reduce basal area to between 100 and 140 $ft^2$ per acre. These stands are lacking suitable natural regeneration of drought tolerant and fire resilient species in the understory, while the overstory is composed of greater than 90% Douglas-fir with scattered legacy ponderosa pine, incense cedar, and black oak.
- Opening size would range from 0.10-0.25 acre where fire resilient and drought tolerant species need release to reduce competition. Opening size would range from 0.25-0.50 acre where regeneration is encouraged or where poor crown conditions exist (due to density-related suppression and mistletoe infection).

**Table B-3. Selective Thinning/Douglas-fir (ST/DF) Units**

| Unit | Acres | Age | Rx | Habitat | Effects Call | Target BA | Target CC% |
|---|---|---|---|---|---|---|---|
| 13-1 | 7 | 110 | ST/DF | Roosting/Foraging | Downgrade/Enhance | 130 BA | 40% |
| 19-1 | 11 | 130 | ST/DF | Dispersal | Maintain | 140 BA | 40% |
| 19-2 | 9 | 130 | ST/DF | Dispersal | Maintain | 140 BA | 40% |

## Selective Thinning - White Fir

- Stands would be harvested to a range of 40-55% canopy cover.
- Stands that are predominantly white fir and have moderate-high productive site conditions would be treated to a relative density range of 0.35-0.45 RDI.

- Reduce basal area to between 120 and 140 ft² per acre. These stands are dominated by shade tolerant species in the understory and overstory. The overstory is greater than 90% white fir with remnant or legacy Douglas-fir and incense cedar.
- Opening size would range from 0.10-0.25 acre where fire resilient and drought tolerant species need release to reduce competition. Opening size would range from 0.25-0.50 acres where regeneration is encouraged or where poor crown conditions exist (due to density-related suppression and mistletoe infection).

**Table B-4. Selective Thinning/White Fir (ST/WF) Units**

| Unit | Acres | Age | Rx | Habitat | Effects Call | Target BA | Target CC% |
|---|---|---|---|---|---|---|---|
| 35-1 | 7 | 90 | ST/WF | Dispersal | Maintain | 120 BA | 40% |

## Characteristics of Low Vigor Trees

### Low vigor trees

Trees meeting the following criteria:

- Crown ratios <30%
- Crowns are ragged and thin (thin appearance when viewed against the sky).
- Crown top is rounded, and the crown width is narrow or flat on one or more sides.
- Needle color very poor, yellowish.
- Mistletoe infected, with a rating of 4, 5, or 6.

### Low Vigor Ponderosa Pine

Trees meeting the following criteria:

- Crowns are ragged and thin.
- Foliage in parts of crown is thin, bunchy, or unhealthy; needles are average to shorter than average in length.
- Needle color is poor to fair.
- Some twigs or branches lack foliage and some twigs or branches are fading or dead.
- Localized weakened parts of crowns are present.
- Crown top is rounded, and the crown width is narrow or flat on one or more sides.

### Low Vigor Douglas-fir and White Fir

Trees meeting the following criteria:

- Crown has thin appearance when viewed against the sky.
- Short Needle length is short.
- Needle color is very poor, yellowish.
- Dead or dying twigs or branches in the crown form holes; sparse and ragged crown appearance.

- Poor crown ratio is poor.
-

## Snag Classes

Table B-5 displays the snag Deterioration Stages. All stages should be retained on the landscape.

**Table B-5. Physical Characteristics of Snags by Deterioration Stage**

| | |
|---|---|
| 1 | • Limbs and branches all present<br>• Pointed tree top<br>• Tight bark<br>• Recently dead |
| 2 | • Few limbs<br>• No fine branches<br>• Pointed or broken tree top<br>• Variable level of bark remaining |
| | |
| | |
| | |

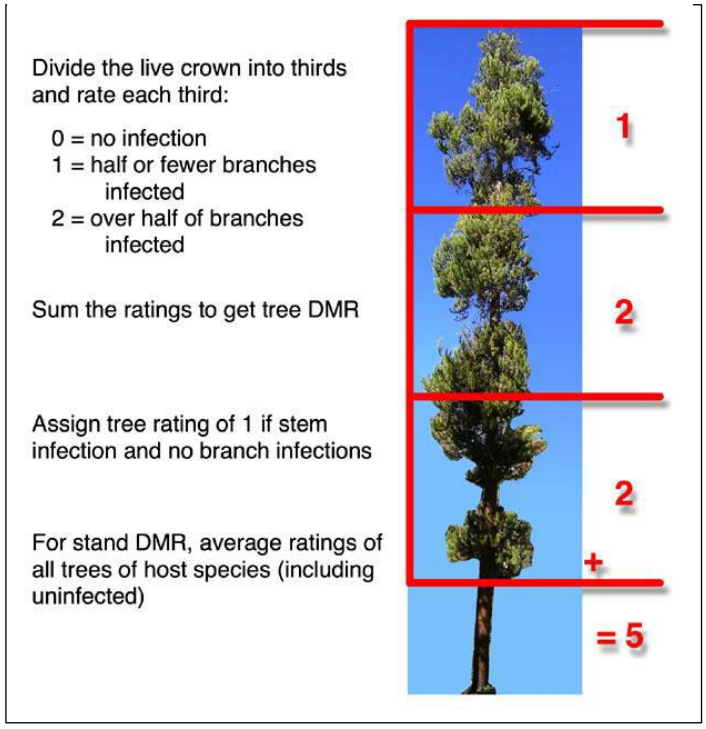
## Mistletoe Treatment

Target the removal of Douglas-fir trees with a mistletoe rating of 4, 5, or 6.

To determine the mistletoe rating for individual trees use the 6 class rating system (Figure B-1).

**Step 1:** Divide the live crown into thirds
**Step 2:** Rate each third separately. Each third should be given a rating of 0, 1, or 2.
"0—no visible infections.
"1—light infection (one-half or less of total number of branches are infected).
"2—heavy infection (more than one-half of the total number of branches is infected).
**Step 3:** Add ratings of each third together to obtain a rating for the tree.

**Figure B-1. Douglas-fir Dwarf Mistletoe Rating (DMR) System**




Source: The American Phytopathological Society, 2006.

**Figure B-2. Canopy Class Diagram**

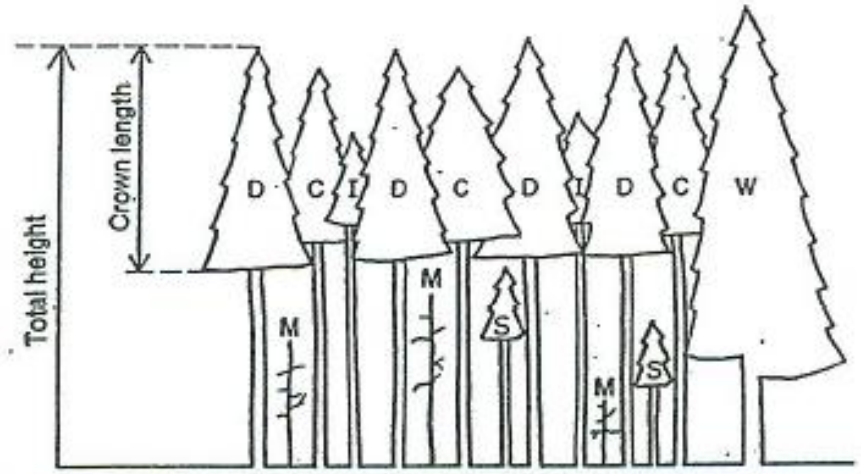



*Figure 2.—Crowns of trees in even-aged stands are classified into crown types: D = Dominant, C = Codominant, I = Intermediate, W = Wolf, S = Suppressed, M = Mortality. The "crown ratio" is equal to the proportion of total tree height that is occupied by live crown. In this illustration, the dominants have a 50 percent crown ratio, while the wolf tree has an 80 percent crown ratio.*

# APPENDIX C – ACRONYMS & GLOSSARY

ACS – Aquatic Conservation Strategy
AMA – Adaptive Management Area
ARPA – Archaeological Resources Protection Act
ASQ – Allowable Sale Quantity
AUM – Animal Unit Month
BA – Biological Assessment
BAFH – Biological Assessment of Forest Habitat
BCC – Bird Species of Conservation Concern
BCR – Bird Conservation Region
BLM – Bureau of Land Management
BMP – best management practice
BOR – Bureau of Reclamation
CAA – Clean Air Act
CAP – capable habitat
CC – canopy cover
CCH – Coho Critical Habitat
CEQ – Council on Environmental Quality
CFR – Code of Federal Regulations
CHU – critical habitat unit
COE – US Army Corps of Engineers
CWA – Clean Water Act
CWD – coarse woody debris
DBH – diameter at breast height
DEQ – Department of Environmental Quality
DOT – Department of Transportation
DR- Decision Record
DSP – dispersal habitat
EA – Environmental Assessment
EF – east fork
EFH – essential fish habitat
EIS – environmental impact statement
ENSO – El Nino Southern Oscillation
EP Act – Energy Policy Act
ESA – Endangered Species Act
ESU – evolutionarily significant unit
EO – Executive Order
FAA – Federal Aviation Administration
FCC – Federal Communications Commission
FEIS – Final Environmental Impact Statement
FERC – Federal Energy Regulatory Commission
FG – fragile for slope gradient
FLPMA – Federal Land Policy Management Act
FMP – Fire Management Plan
FOI – Forest Operations Inventory
FONSI – Finding of No Significant Impact
FP – fragile for mass movement
FW – fragile for ground water
GBBDC – Game Birds Below Desired Condition
GFMA – General Forest Management Area
GIS – Geographic Information System
GGO – great gray owl
GTRN – Ground Transportation Network
HUC – hydrologic unit code
IDT/ ID Team – interdisciplinary team
IM – instructional memorandum
JCEP – Jordan Cove Energy Project
KLE – Klamath East Critical Habitat Unit
KOP – known observation point
KSA – Klamath Study Area
KSOAC – Known Spotted Owl Activity Center
LAA – likely to adversely affect
LNG – liquefied natural gas
LSR – Late Successional Reserve
mbf – thousand board feet
MOA – memorandum of agreement
MOU – memorandum of understanding
NAAQS – National Ambient Air Quality Standards
NEPA – National Environmental Policy Act
NF – north fork
NGA – Natural Gas Act
NH – nesting habitat
NLAA – not likely to adversely affect
NMFS – National Marine Fisheries Service
NRCS – National Resource Conservation Service
NRF – nesting, roosting, and foraging habitat
NSO – northern spotted owl
NWFP – Northwest Forest Plan
O & C – Oregon and California Act, 1938
ODA – Oregon Department of Agriculture
ODEQ – Oregon Department of Environmental Quality
ODF – Oregon Department of Forestry
ODFW – Oregon Department of Fish and Wildlife
OHV – off-highway vehicle
OM – organic matter
ORS – Oregon Revised Statutes
OSHA – Occupational Safety and Health Administration
OSMP – Oregon Smoke Management Plan
PCE – primary constituent element
PCGP – Pacific Connector Gas Pipeline
PCT – pre-commercial thinning
PDF – Project Design Features
PDO – Pacific Decadal Oscillation
PE – polyethylene
PM – particulate matter

PM 2.5 – particulate matter smaller than 2.5 microns
PM 10 – particulate matter smaller than 10 microns
PNW – Pacific Northwest
QMD – quadratic mean diameter
RA-32 – Recovery Action 32
RAWS – Remote Automated Weather Station
RDI – relative density index
RMP – Resource Management Plan
ROD – Record of Decision
ROW – right-of-way
RR – Riparian Reserve
S & M – Survey and Manage
SDWA – Safe Water Drinking Act
SEIS – Supplemental Environmental Impact Statement
SF – south fork
SNEP – Sierra Nevada Ecosystem Project
SONCC – Southern Oregon/Northern California Coasts
SSP – Special Status Plants
SSRA – Smoke Sensitive Receptor Area
SSS – Special Status Species
SVS – Stand Visualization System
T&E – Threatened and Endangered
TMDL – total maximum daily load
TP – tree planting
TPA – trees per acre
TPCC – timber production capability class
TSZ – transient snow zone
USDA – United States Department of Agriculture
USDI – United States Department of the Interior
USFS – United States Forest Service
USFWS – United States Fish and Wildlife Service
VRM – visual resource management
WA – Watershed Analysis
WF – west fork
WOPR – Western Oregon Plan Revision
WQMP – Water Quality Management Plan
WUI – Wildland Urban Interface
WQRP – Water Quality Restoration Plan

## Glossary of Terms

**A**

**Abiotic:** Non-living elements of an environment.

**Activity Fuel:** The combustible material resulting from or altered by forestry practices such as timber harvest or thinning, as opposed to naturally created fuels.

**Affected Environment:** The area impacted by the Proposed Action.

**Allowable Sale Quantity:** The gross amount of timber volume, including salvage that may be sold annually from a specified area over a stated period of time in accordance with the approved land use plan.

**Alternative:** Other options to the proposed action by which the BLM can meet its purpose and need.

**Analysis Area:** Varies by resource and includes those areas that could potentially be affected by the Proposed Action. In some cases, the Analysis Area extends beyond the Project Area boundary.

**Animal Unit Month (AUM):** The amount of forage required to sustain the equivalent of one cow and a calf for one month.

**Anthropogenic:** Of human origin or influence.

**Aquatic:** Living or growing in or near the water.

**Authorized Officer:** The Federal employee who has the delegated authority to make a specific decision.

**Available Water Capacity:** That portion of soil water which plants can extract.

**B**

**Basal Area:** The cross-sectional area of a single stem including the bark, measured at breast height (4.5 ft. above the ground); the cross-sectional area of all stems of a species or all stems in a stand measured at breast height and expressed per unit of land area.

**Baseline:** The starting point for analysis of environmental consequences.

**Best Management Practices (BMPs):** State-of-the-art mitigation measures, generally considered benchmark standards.

**Biotic:** Living elements of an environment.

**Brush:** To remove shrubby undergrowth.

**Bryophyte:** A type of nonvascular plant including mosses, liverworts, and hornworts.

**Bureau Sensitive Species.** A Special Status Species category established by the BLM that includes those plant and animal species eligible for status as federally-listed, Federal candidate, state listed, or state candidate (plant) species; approved for this category by the BLM State Director; or included under agency species conservation policies.

**C**

**Canopy Cover:** The percent of a fixed area covered by the crown of an individual plant species or delimited by the vertical projection of its outermost perimeter; small openings in the crown are included.

**Carrying Capacity:** the maximum population that can be supported indefinitely by its supporting systems.

**Coarse Woody Debris**: The portion of a tree that has fallen or been cut and left in the woods. Usually refers to pieces at least 20″ in diameter (USDI 1995, p. 102).

**Core area:** A 0.5-mile radius circle (approximately 500 acres) from the nest or center of activity that delineates the area most heavily used by northern spotted owls during the nesting season; it is included in the provincial home range circle. Core areas represent the areas that are defended by territorial owls and generally do not overlap the core areas of other owl pairs (Anthony and Wagner 1998) (Dugger, Wagner, et al. 2005) (Zabel, et al. 2003) (Bingham and Noon 1997).

**Cultural Resources:** Those resources of historical and archaeological significance.

**Cumulative Effects:** Those effects on the environment that result from the incremental effect of

the action when added to past, present, and reasonably foreseeable future actions regardless of what agency or person(s) undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

**D**

**Dispersal:** The movement of an individual from their origin to a new site.

**Dispersal Habitat:** Northern spotted owl habitat which is not suitable for nesting, roosting, or foraging, but has sufficient patchy cover to be used for travel between suitable stands, a minimum of 40% canopy cover, and an average tree diameter greater than 11 inches with flying space for owls in the understory.

**Diversity:** The aggregate of species assemblages (communities), individual species, the genetic variation within species, and the processes by which these components interact within and among themselves. The elements of diversity are 1) community diversity (habitat, ecosystem), 2) species diversity, and 3) genetic diversity within a species. All three change over time.

**Dripline:** The line extending vertically from the exterior edge of a tree's live crown to the ground.

**Duff:** The partially decomposed organic material of the forest floor beneath the litter of freshly fallen twigs, needles, and leaves.

**E**

**Ecosystem:** A system made up of a community of animals, plants, and micro-organisms and its interrelated physical and chemical environment.

**Edge Effect:** The modified environmental conditions or habitat along the margins of forest stands or patches.

**Effects Analysis:** Predicts the degree to which the environment will be affected by an action.

**Endangered Species:** Any animal or plant species in danger of extinction throughout all of a significant portion of its range. These species are listed by the US Fish and Wildlife Service.

**Endemic:** A species that is unique to a specific locality.

**Environmental Assessment (EA):** A concise, public document containing a federal agency's analysis of the significance of potential environmental consequences of a proposed action. The EA need not contain the level of analysis contained in an Environmental Impact Statement (EIS). An EA is used to determine whether an EIS is needed or a "finding of no significant impact" (FONSI) is warranted.

**Environmental Impact Statement (EIS):** A detailed statement of a federal project's environmental consequences, including adverse environmental effects that cannot be avoided, alternatives to the proposed action, the relationship between local short-term uses and long-term productivity, and any irreversible or irretrievable commitment of resources.

**Ephemeral Stream:** A stream that flows only in direct response to precipitation, and whose channel is at all times above the water table.

**Erosion:** The detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

**F**

**Fauna:** The animals of a specified region or time.

**Finding of No Significant Impact (FONSI):** A finding that explains that an action will not have a significant effect on the environment and, therefore, an EIS will not be required.

**Fire Regime:** The characteristic frequency, extent, intensity, severity, and seasonality of fires within an ecosystem.

**Flora:** The plants of a specified region or time.

**Fuel load:** the oven-dry weight of fuel per unit area.

**Fully Decommission:** The road surface would be decompacted so that the former compacted surface would be rendered loose and friable to a depth of 12 to18 inches or to a point where 10-inch diameter stones are the dominant substrate (whichever is shallower). Slash, boulders, and other debris would be placed along the roads "entire length" as determined by availability of materials to provide

ground cover and discourage mechanized use. Blockage at the entrance would consist of placing logs, slash, boulders, berms, and other material so the entrance is camouflaged for a minimum distance of 100 feet and vehicle access is precluded. Seeding with approved native seed species and mulching with weed-free straw or approved native materials would occur within Riparian Reserves and within 100 feet of the roads entrance. All drainage structures would be removed.

## G

**Ground Water:** Water in the ground that is in the zone of saturation; water in the ground that exists at or below the water table.

**GTRN (Ground Transportation Road Network):** Roads over which the BLM has jurisdiction and maintenance responsibilities.

## H

**Habitat:** A specific set of physical conditions in a geographic area(s) that surrounds a single species, a group of species, or a large community. In wildlife management, the major components of habitat are food, water, cover, and living space.

**Habitat Fragmentation:** The breakup of extensive habitat into small, isolated patches which are too limited to maintain their species stocks into the indefinite future.

**HUC5:** Fifth field hydrologic unit code, or watershed.

**HUC6:** Sixth field hydrologic unit code, or subwatershed.

**HUC7:** Seventh field hydrologic unit code or tributary to a subwatershed.

**Hydrology:** The science dealing with the properties, distribution, and circulation of water.

## I

**Impact:** Synonymous with "effects." Includes ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Impacts may also include those resulting from actions which may have both beneficial and detrimental (adverse) effects. Impacts may be considered as direct, indirect, or cumulative.

**Implementation Action:** An action that implements land use plan decisions.

**Indicators:** Parameters of ecosystem function that are observed, assessed, measured, or monitored directly or indirectly to determine attainment of a standard(s).

**Infiltration:** The downward entry of water into the soil.

**Infiltration Rate:** The rate at which water enters the soil.

**Intermittent Stream:** Seasonal stream; a stream that flows only at certain times of the year when it receives water from springs or from some surface source, such as melting snow in mountainous areas.

**Invertebrate Species:** Any animal without a backbone or spinal column.

## K

**Key Watershed:** A watershed containing (1) habitat for potentially threatened species or stocks of anadromous salmonids or pother potentially threatened fish, or (2) greater than 6 square miles with high-quality water and fish habitat.

## L

**Landing:** A cleared area in the forest to which logs are yarded or skidded for loading onto trucks for transport.

**Late-Successional Forest:** Forest seral stages which include mature and old-growth age classes.

**Lichen:** A composite organism formed from the symbiotic association of a fungus and an alga.

**Long-Term Closure:** The road would be effectively blocked and winterized prior to the wet season. Blockage at the entrance would consist of placing logs, slash, boulders, earthen berms, and other material so the entrance is camouflaged for a minimum distance of 100 feet and vehicle use is precluded. Prior to closure the road will be left in an erosion-resistant condition.

## M

**Mass Movement:** Soil and rock movement downslope (e.g. slumps, earth flows).

**Matrix:** BLM-managed lands designated by Congress under the Northwest Forest Plan where most timber harvest and other silvicultural activities would be conducted.

**Mitigating Measures:** Constraints, requirements, or conditions imposed to reduce the significance of or eliminate an anticipated impact to environmental, socioeconomic, or other resource value from a proposed land use.

**Mixed-Conifer Forest:** A mix of tree species that include Douglas-fir, ponderosa pine, sugar pine, incense cedar, and white fir.

**Monitoring:** A process of collecting information to evaluate if objective and anticipated or assumed results of a management activity or plan are being realized, or if implementation is proceeding as planned.

**Morphology:** The study of the form and structure of organisms and their specific structure features, internal and external.

## N

**Nest Patch**: The 300-meter radius (70 acres) around a known or likely northern spotted owl nest site. Nest patch is included in the core and home range area (Swindle, et al. 1999) (Perkins 2000) (Miller 1989) (Meyer, Irwin and Boyce 1998).

**Nonpoint Source Pollution:** Pollution that arises from an ill-defined and diffuse source, such as runoff from cultivated fields, agricultural lands, urban areas, or forests and wildlands.

**Nonvascular:** Plants with specialized methods of transporting water and nutrients without xylem or phloem (e.g. mosses, hornworts, liverworts, algae).

**Northern Spotted Owl Site:** Any location where territorial northern spotted owls are known to be present, were historically present, or may be present in unsurveyed habitat. Northern spotted owl sites can be identified through surveys where northern spotted owls were detected. In cases where survey data are unavailable, northern spotted owl sites can be identified by (1) conducting surveys, or (2) using a modeling approach that uses habitat and landscape characteristics to identify areas with a high probability of being occupied by northern spotted owls (U.S. Fish and Wildlife Service 2011).

**Noxious Plants:** Those plants which are injurious to public health, agriculture, recreation, wildlife, or any public or private property.

## O

**O&C Lands:** Public lands managed by the BLM under the O&C Act of 1937 for permanent forest production, in accord with the principle of sustained yield. Lands administered under the O&C Act must also be managed in accordance with other environmental laws.

**Occupied Northern Spotted Owl Site:** A location with evidence of continued use by northern spotted owls. Evidence includes breeding, repeated location of a pair or single bird during a single season or over multiple years, presence of young before dispersal, or some other strong indication of continued occupation.

**Off-Highway Vehicles (OHV):** Any motorized vehicle designed for or capable of cross-country travel over land, water, sand, snow, ice, marsh, swampland, or other terrain.

**Organic Matter:** Plant and animal residues accumulated or deposited at the soil surface; the organic fraction of the soil that includes plant and animal residues at various stages of decomposition; cells and tissues of soil organisms, and the substances synthesized by the soil population.

## P

**Perennial Stream:** A stream that flows continuously. Perennial streams are generally associated with the water table in the localities through which they flow.

**Permeability:** The ease with which gases, liquids, or plant roots penetrate or pass through bulk mass of soil or a layer of soil.

**Planning Area:** All of the lands within the BLM management boundary addressed in a BLM resource management plan; however, planning decisions only apply to BLM-administered lands and mineral estate.

**Plant Community:** An association of plants of various species found growing together in different areas with similar site characteristics.

**Point Source Pollution:** Pollution that arises from a well-defined origin, such as discharge from an industrial plant or runoff from a feedlot.

**Pond Value:** The amount a mill will pay for a log delivered to the mill location.

**Preferred Alternative:** The alternative BLM believes would reasonably accomplish the purpose and need for the proposed action while fulfilling its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. This alternative may or may not be the same as the proposed action.

**Prescribed Fire:** Controlled application of fire to natural fuels under conditions of weather, fuel moisture, and soil moisture that will allow confinement of the fire to a predetermined area and, at the same time, will produce the intensity of heat and rate of spread required to accomplish certain planned benefits to one or more objectives for wildlife, livestock, and watershed values. The overall objectives are to employ fire scientifically to realize maximum net benefits at minimum environmental damage and acceptable cost.

**Prey Species:** An animal taken by a predator as food.

**Primary Constituent Elements:** Those physical and biological features of a landscape that a species needs to survive and reproduce (i.e., high amount of canopy cover; multilayered structure; large snags; large, deformed trees; large, down, woody debris).

**Project Area:** The overall area of consideration that was reviewed for the development of a particular Proposed Action (project level). The Project Area boundary was derived mainly using geographic features such as watershed boundaries and rivers, as well as some administrative boundaries (i.e. boundaries between BLM and other public or private lands).

**Proposed Action:** A proposal for BLM to authorize, recommend, or implement an action to address a clear purpose and need.

**Provincial Home Range:** The area annually traversed by northern spotted owls that provides important habitat elements. The Bieber Salt Project is located in the West Cascades Province. The provincial radius for the West Cascades Province is 1.2 miles (Thomas, et al. 1990) (Courtney, et al. 2004). The provincial home ranges of several owl pairs may overlap.

**Public Lands:** Any lands administered by a public entity, including (but not limited to) the Bureau of Land Management and the US Forest Service.

**Pyroclastic:** Composed chiefly of fragments of volcanic origin.

**R**

**Ravel:** Loose rock material on a hillslope, usually of gravel or cobble size.

**Record of Decision (ROD):** The decision document associated with an environmental impact statement.

**Recovery Action:** Recommendations to guide the activities needed to accomplish the recovery objectives and achieve the recovery criteria in the 2011 *Revised Recovery Plan for the Northern spotted owl*. The Revised Recovery Plan presents 33 actions that address overall recovery of the northern spotted owl.

**Refugia:** Locations and habitats that support populations of organisms that is limited to small fragments of their previous geographic range.

**Resource Management Plan (RMP):** A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act (FLPMA).

**Right-Of-Way (ROW):** Federal land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, pursuant to a ROW authorization.

**Riparian Area:** An area containing an aquatic ecosystem and adjacent upland areas that directly affects it.

**Riparian Habitat:** The living space for plants, animals, and insects provided by the unique character of a riparian area.

**Riparian Reserve (RR):** A federally designated buffer around streams, springs, ponds, lakes, reservoirs, fens, wetlands, and areas prone to slumping, on federal lands only. The Northwest Forest Plan's Aquatic Conservation Strategy defines riparian reserve widths for the above water bodies.

**S**

**Scope:** The extent of an analysis in a NEPA document.

**Scoping:** The process by which BLM solicits internal and external input on the issues and effects that will be addressed in planning, as well as the degree to which those issues and effects will be analyzed in the NEPA document.

**Sediment Yield:** The quantity of soil, rock particles, organic matter, or other dissolved or suspended debris which is transported through a cross-section of stream during a given period.

**Sensitive Species:** Those species that (1) have appeared in the Federal Register as proposed for classification and are under consideration for official listing as endangered or threatened species or (2) are on an official state list, or (3) are recognized by a land management agency as needing special management to prevent their being placed on Federal or state lists.

**Seral Stage:** A temporal or intermediate stage in the process of succession.

**Shelterwood:** The cutting of most trees, leaving those needed to produce a new age class in a moderated microenvironment.

**Silviculture:** The science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet diverse needs.

**Silvicultural System:** A planned sequence of treatments or prescriptions over the entire life of a forest stand needed to meet management objectives.

**Skid:** To drag a log from within a harvest unit to a collection point (landing).

**Slash:** The residual vegetation (e.g branches, bark, tops, cull logs, and broken or uprooted trees) left on the ground after logging.

**Snag:** Any standing dead, partially dead, or defective (cull) tree at least 10″ DBH (diameter at breast height) and at least 6 feet tall (USDI 1995, p. 114).

**Soil Series:** The lowest or most basic category of the U.S. system of soil classification.

**Species:** A group of related plants or animals that can interbreed to produce offspring.

**Special Status Species (SSS) include:**

**Proposed species** – species that have been officially proposed for listing as threatened or endangered by the Secretary of the Interior. A proposed rule has been published in the Federal Register.

**Listed Species** – species officially listed as threatened or endangered by the Secretary of the Interior under the provisions of the ESA. A final rule for the listing has been published in the Federal Register.

**Endangered Species** – any species which is in danger of extinction throughout all or a significant portion of its range.

**Threatened Species** – any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

**Candidate Species** – species designated as candidates for listing as threatened or endangered by the FWS and/or NMFS. A list has been published in the Federal Register.

**State Listed Species:** Species listed by a state in a category implying but not limited to potential endangerment or extinction. Listing is either by legislation or regulation.

**Stocking.** Related to the number and spacing of trees in a forest stand.

**Subwatershed:** The sixth level in the hydrologic unit hierarchy. A subwatershed is a subdivision within a fifth level watershed.

**Succession:** A series of dynamic changes by which one group of organisms succeeds another through stages leading to potential natural community or climax.

**Sustained Yield Forestry:** The yield that a forest can produce continuously at a given intensity of management; the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources without impairment of the productivity of the land.

## T

**Tier 1 Key Watershed:** areas that either provide, or are expected to provide, high-quality aquatic habitat. These watersheds are intended to serve as refugia for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species.

**Tiering:** Using the coverage of general matters in broader NEPA documents in subsequent, narrower NEPA documents, allowing the tiered NEPA document to narrow the range of alternatives and concentrate solely on the issues not already addressed.

**Topography:** The configuration of a surface area including its relief, or relative elevations, and position of its natural and anthropogenic features.

**Total Maximum Daily Loads (TMDLs):** Pollution load limits calculated by DEQ for each pollutant entering a water body. TMDLs describe the amount of each pollutant a waterway can receive and still not violate water quality standards. Both point and non-point source pollution are accounted for in TMDLs as well as a safety margin for uncertainty and growth that allows for future discharges to a water body without exceeding water quality standards.

**Transient Snow Zone (TSZ):** The area where a mixture of snow and rain occurs, sometimes referred to as the rain-on-snow zone. The snow level in this zone fluctuates throughout the winter in response to alternating warm and cold fronts. Rain-on-snow events originate in the transient snow zone.

**Treat and Maintain.** An action or activity occurs within northern spotted owl dispersal, nesting, or roosting/foraging habitat but will not change the conditions that would classify the stand as dispersal or nesting/roosting/foraging habitat post-treatment.

**Turbidity:** The cloudy condition caused by suspended solids, dissolved solids, natural or human-developed chemicals, algae, etc. in a liquid; a measurement of suspended solids in a liquid.

## U

**Understory:** That portion of trees or other woody vegetation which forms the lower layer in a forest stand which consists of more than one distinct layer.

## V

**Vascular:** Plants having phloem- and xylem-conducting elements that facilitate the moving of water and nutrients.

**Vertebrate Species:** Any animal with a backbone or spinal column.

## W

**Watershed:** All land and water within the confines of a drainage divide.

**Watershed Analysis:** A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis provides a basis for ecosystem management planning.

**Wetlands:** Lands including swamps, marshes, bogs, and similar areas, such as wet meadows, river overflows, mud flats, and natural ponds.

**Wildland-Urban Interface (WUI):** The area where structures and other human development meet or intermingle with undeveloped wildland.

**Windthrow:** A tree or trees uprooted or felled by the wind.

## Y

**Yarding:** The act or process of conveying logs or whole trees to a landing, particularly by cable, tractor, or helicopter.

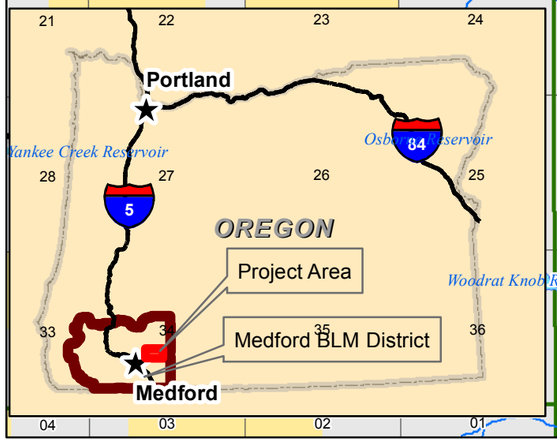
R1E R2E R3E

T 35 S

T 36 S

T 37 S

Star Lake Reservoir
Woolfolk Reservoir
Salt Creek Access
Stanley Reservoir
Wade Reservoir
Owens Reservoir
Owens Reservoir
Salt Creek Rd
Gardener Reservoir
Hwy 140 Lake Of The Woods
Lake Creek Loop
Wasson Cyn
S Fk Little Butte Crk
Butte Falls Fish Lake Rd
Willow Lake Rd
Willow Lake
Willow Lake




## Legend

- Timber Harvest Unit
- Pump Chance Restoration
- Temporary Route
- Pre-Designated Skid Trail
- Proposed Full Decommissioning
- Proposed Partial Decommissioning
- Roadside Vegetation Maintenance
- Haul Route network
- CHU
- Key Watershed
- Project Boundary
- Bureau of Land Management
- U.S. Forest Service
- Local Government
- Private Individual or Company
- Fish Bearing Stream
- Perennial Stream
- Quarry
- Highway
- Paved Road
- Existing Road

0 0.5 1 2 3
Miles

N W E S

# Map 1: Vicinity Map

**Bieber Salt Forest Management Project**
**Environmental Assessment**

**MEDFORD DISTRICT**
**May 2016**

# Bieber Salt Alternative 2
# Map 2

## Legend

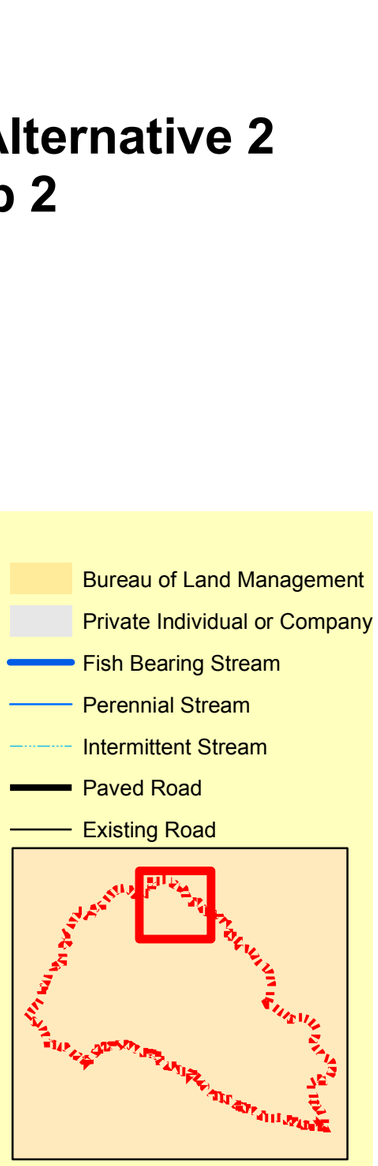
**Alt2 Treatment**

- Selective Thinning / MC
- Selective Thinning / WF

**Logging System**

- Skyline
- Tractor
- existing log landing
- proposed log landing
- Pre-Designated Skid Trail
- Pump Chance Restoration
- Proposed Partial Decommissioning
- Roadside Vegetation Maintenance
- Haul Route network
- CHU
- Project Boundary

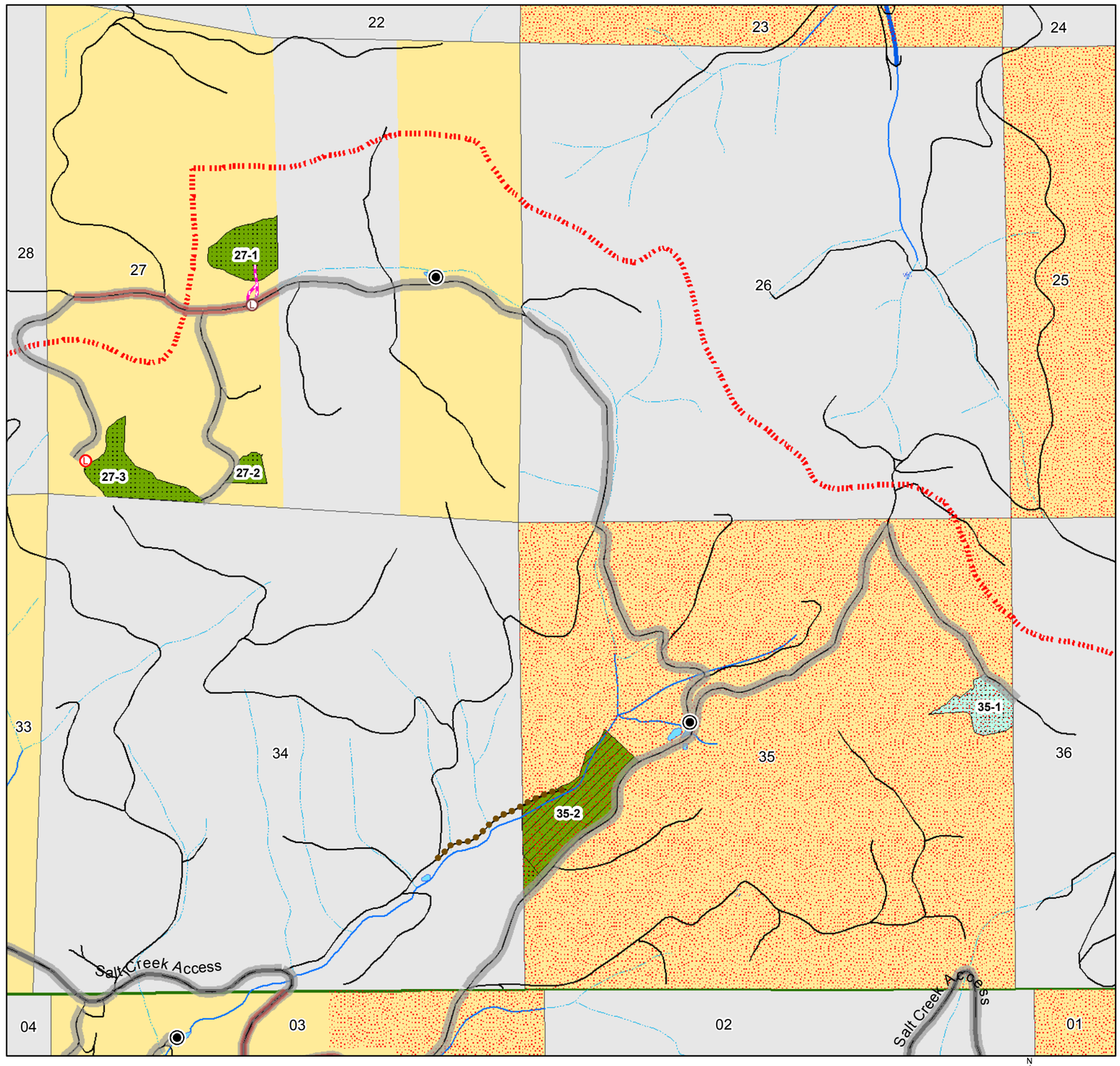
- Bureau of Land Management
- Private Individual or Company
- Fish Bearing Stream
- Perennial Stream
- Intermittent Stream
- Paved Road
- Existing Road




**Bieber Salt Forest Management Project**
**Environmental Assessment**

**MEDFORD DISTRICT**
**May 2016**





# Bieber Salt Alternative 2
# Map 3

## Legend

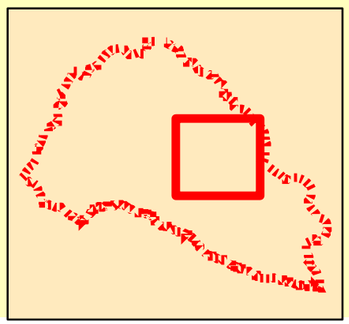
### Alt2 Treatment

- Density Management
- Selective Thinning / DF
- Selective Thinning / MC

### Logging System

- Skyline
- Tractor
- existing log landing
- proposed log landing
- Temporary Route
- Pre-Designated Skid Trail
- Pump Chance Restoration
- Proposed Full Decommissioning
- Proposed Partial Decommissioning
- Roadside Vegetation Maintenance
- Haul Route network
- CHU
- Key Watershed
- Project Boundary

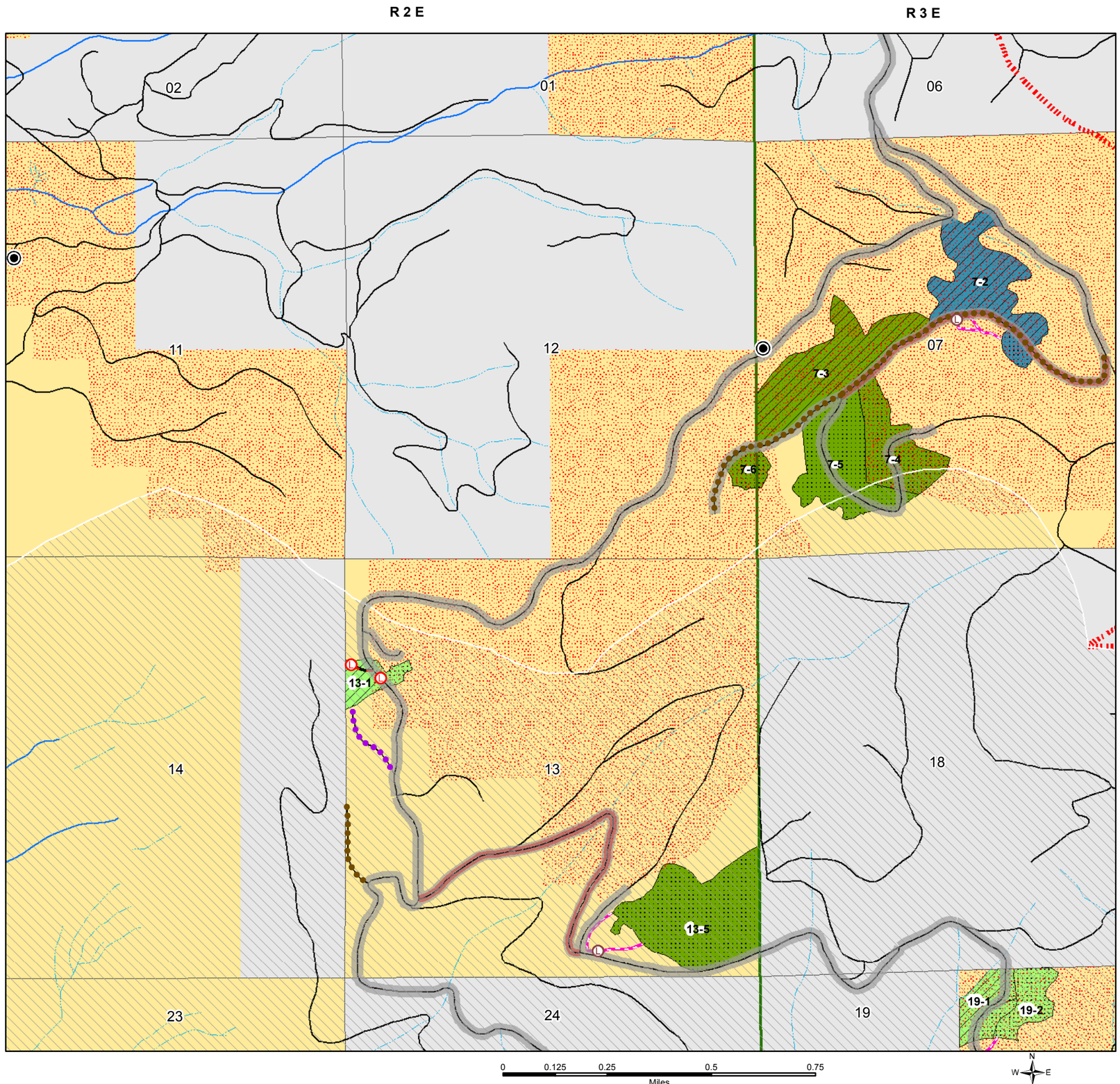
- Bureau of Land Management
- Private Individual or Company
- Perennial Stream
- Intermittent Stream
- Existing Road



**Bieber Salt Forest Management Project**
**Environmental Assessment**

**MEDFORD DISTRICT**
**May 2016**





# Bieber Salt Alternative 2
# Map 4

## Legend

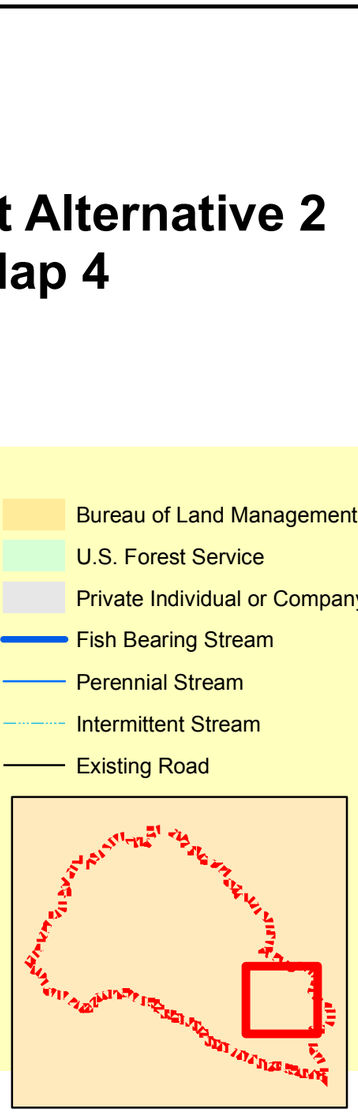
**Alt2 Treatment**

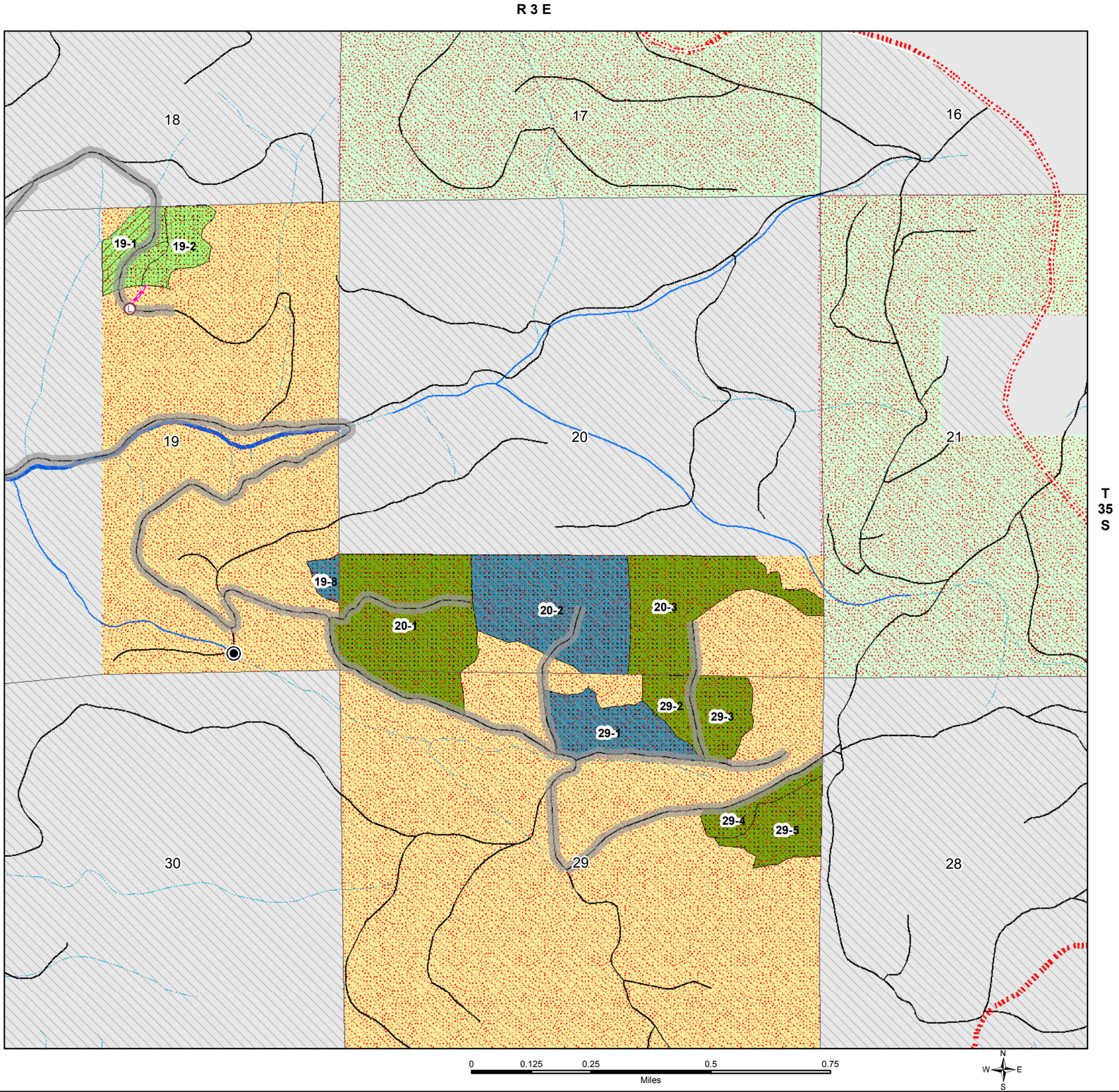
- Density Management
- Selective Thinning / DF
- Selective Thinning / MC

**Logging System**

- Skyline
- Tractor
- existing log landing
- Pre-Designated Skid Trail
- Pump Chance Restoration
- Haul Route network
- CHU
- Key Watershed
- Project Boundary

- Bureau of Land Management
- U.S. Forest Service
- Private Individual or Company
- Fish Bearing Stream
- Perennial Stream
- Intermittent Stream
- Existing Road






## Bieber Salt Forest Management Project
## Environmental Assessment

**MEDFORD DISTRICT**
**May 2016**