



# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
Glendale Resource Area  
2164 N.E. Spalding  
Grants Pass, Oregon 97526

IN REPLY REFER TO:

1792 (ORM080)  
OR-EA-118-08-014

MAR 31 2010

Dear Interested Party:

Attached is a CD of the Environmental Assessment (EA) and Finding of No Significant Impact for the Mini Mule Project (DOI-BLM-M080-2010-001-EA) prepared by the Glendale Resource Area, Medford District, Bureau of Land Management.

This EA discloses the predicted environmental effects of the Proposed Action and No Action Alternative. The Proposed Action includes thinning 286 acres of 40-80 year old previously entered stands on Matrix and riparian thinning in a portion of Riparian Reserves. To facilitate the transport of logs, there would be maintenance work on existing roads. Trees to be removed for harvest would be whole-tree yarded or yarded with tops attached to extract merchantable material. Non-merchantable material would be handpiled and burned on the immediate downhill side of existing roads. Slash remaining in units after yarding may be lopped-and-scattered.

The Mini Mule Project Planning Area is located approximately 18 miles west of the community of Glendale, and 20 miles west of Interstate 5. The legal description of the PA is Township (T) T.33S., Range (R) R.9W., Sections 15-23 and 27-33; and T.34S., R.9W., Sections 4-6 in Curry County, Willamette Meridian.

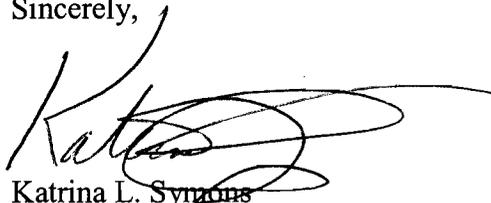
The EA and FONSI are available for review and comment March 31, 2010 in the Grants Pass Interagency Office, 2164 NE Spalding Avenue, 97526. The documents may also be accessed on the Medford District's internet site at <http://www.blm.gov/or/districts/medford/plans/index.php>. Office hours are Monday through Friday, 8:00 A.M. to 4:30 P.M., closed on holidays. Paper copies of these documents may also be obtained by contacting Michelle Calvert, (541) 471-6505. Written comments concerning the significance, as defined in 40 CFR 1508.27, of the environmental effects predicted for this action are requested to be submitted in writing to Glendale Field Manager, and received on or before April 29, 2010 at the address previously stated. Comments received will be considered in making the final decision.

Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored by the extent allowed by law. All submissions from organizations or businesses, and from

individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection on their entirety.

Thank you for your interest in public land management in the Glendale Resource Area.

Sincerely,

A handwritten signature in black ink, appearing to read "Katrina", with a large, sweeping flourish extending to the right.

Katrina L. Symons  
Field Manager  
Glendale Resource Area

Enclosure

1- Environmental Assessment and Finding of No Significant Impact for the Mini Mule Project (CD)

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# MINI MULE PROJECT ENVIRONMENTAL ASSESSMENT

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DOI-BLM-M080-2010-001-EA  
March 2010

United States Department of the Interior  
Bureau of Land Management  
Medford District  
Glendale Resource Area

**Lead Agency:** Bureau of Land Management

**Responsible Official:** Katrina Symons  
Glendale Field Manager  
2164 NE Spalding Avenue  
Grants Pass, OR 97526

**Abstract:**

The Mini Mule Project Environmental Assessment (EA) includes 286 acres of thinning managed forest stands 40 to 80 years old. This EA discloses the predicted environmental effects of thinning on Matrix and Riparian Reserve lands. Harvesting would be done by tractor yarding (244 acres) and cable yarding (42 acres) logging systems. Whole tree yarding would reduce the amount of limbs, branches and residual slash left on site. Associated harvest activities include 26 miles of existing road maintenance.

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## *FINDING OF NO SIGNIFICANT IMPACT*

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Based upon review of the EA (DOI-BLM-M080-2010-001-EA) and supporting project record, I have determined that Alternative 2 (Proposed Action) is not a major federal action and would not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. Therefore, an environmental impact statement is not needed. This finding is based on the following discussion:

**Context.** The Proposed Action is a site-specific action directly involving approximately 286 acres of BLM (Bureau of Land Management) administered land that by itself does not have international, national, region-wide, or state-wide importance. The Proposed Action is located within the Matrix (including a Connectivity/Diversity Block), and Riparian Reserve land use allocations and within the boundaries of the 6<sup>th</sup> field Hydrologic Unit Condition (HUC 6) boundaries of the Mule Creek and Missouri Creek sub-watersheds. The Planning Area contains Northern Spotted Owl Critical Habitat (CHU) OR#67 (1992 U.S. Fish and Wildlife Service designation). The Proposed Action does not occur within revised Critical Habitat (2008; [Federal Register \(73\): 47326-47522](#)), as designated by the U.S. Fish and Wildlife Service. The entire Planning Area is located in an Elk Management Area (RMP 1995).

The discussion of the significance criteria that follows applies to the intended actions and is within the context of local importance. Chapter 3 of the EA details the effects of the Alternatives. None of the effects identified, including direct, indirect and cumulative effects, are considered to be significant and do not exceed those effects described in the *Medford District Proposed Resource Management Plan/Environmental Impact Statement (1994 PRMP/EIS)*.

**Intensity.** The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27.

**1. Impacts may be both beneficial and adverse.** The predicted environmental effects of the Proposed Action, most noteworthy, include.

- a) Social and economic benefits by providing a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability;
- b) Under fire hazard, there would likely be a short term increase in fire hazard because the landing piles have the potential to produce flame lengths that exceed the fire behavior threshold to the extent of increased spotting distance.
- c) The Proposed Action would result in 27.1 acres of compacted/displaced soils over new and existing footprints. Under Best Management Practices (BMPs) in the 1995 RMP (p. 166) up to 12% skid trail compaction is allowed to remain within a unit until final entry. Total compaction/displacement associated with tractor skid trails and cable yarding

corridors would account for an average of 9.1% per unit. Alternative 2 would result in a 3.4% soil productivity loss within the proposed harvest units. Therefore, each proposed Mini Mule Project unit would be below 12% compaction and 5% productivity loss analyzed in the 1994 Medford District FEIS RMP.

d) Sediment from the Mini Mule Project would not result in more than a 10% increase in stream turbidity, and would not measurably increase these conditions for more than 25 feet from haul roads. Logically it can be concluded that negligible increases in sediment from these activities would contribute to the overall amount of sediment entering streams from past, present, and future impacts within these sub-watersheds, but sediment from this action would not be distinguishable above baseline levels or have any effect on aquatic organisms. Actions within this watershed would be consistent with the Clean Water Act, State of Oregon water quality standards, and ACS objectives (Appendix 6).

e) The effects of the Mini Mule Project on atmospheric greenhouse gas levels, when placed in the appropriate context, is negligible. As described in the EA, atmospheric greenhouse gas levels are related to global climate change. Because existing science is unable to identify a specific source of greenhouse gas emissions or sequestration and designate it as the cause of specific climate impacts at a specific location, the appropriate context for greenhouse gas impacts is the global, regional, and continental scale. Current global carbon dioxide emissions (total 25 billion metric tonnes of carbon dioxide (IPCC 2007, p. 513), and current U.S. emissions of carbon dioxide total 6 billion tonnes (EPA 2007, p 2-3). Section 3.6.5 of the EA shows that over the ten year analysis period the difference in overall atmospheric carbon levels between the No Action Alternative and the Proposed Action would constitute no more than 0.00000036% of total annual global carbon dioxide emissions and 0.0000015% of total annual U.S. carbon dioxide emissions. These percentages include both direct carbon dioxide emissions from the project as well as indirect effects caused by changes in carbon storage levels. The effects would be so small that it would not merit reporting under the EPA rule on mandatory reporting of greenhouse gases, which presents a reporting threshold of 25,000 metric tons of carbon dioxide equivalent for several industrial and agricultural sectors (40 CFR 98.2). While science related to carbon storage, greenhouse gases, and climate change continues to evolve and address the existing uncertainties, the impacts of this project are so small that even despite these uncertainties, there is not enough impact to suggest the projects impacts are significant enough to warrant an environmental impact statement.

f) See effects to ESA threatened and endangered species in criteria # 9 below.

**2. The degree to which the selected alternative will affect public health or safety.**

Public health and safety would not be affected. The Proposed Action is comparable to other timber harvest projects which have occurred within the Glendale Resource Area with no unusual health or safety concerns. Piles for burning would be limited to those placed on the immediate downhill side of existing roads. The BLM would schedule the burning of landing piles primarily from October to May during unstable atmospheric conditions (e.g., rain, snow, or storm events) when atmospheric mixing is occurring and pollutant concentrations would be reduced. Wet season conditions minimize the amount

of smoke emissions by burning when duff and dead woody fuel have the highest moisture content, which reduces the amount of material actually burned. Timing of landing piles would be dependent on weather and wind conditions to help reduce the amount of residual smoke to the local communities. If residual smoke impacts exceed limits set by the Oregon Smoke Management Plan and the Department of Environmental Quality's Air Quality and Visibility Protection Program, additional burning would be suspended until given the notice to proceed by the Oregon Department of Forestry.

The Planning Area is not located within a Class I designated airshed or non-attainment area. The impact of smoke on air quality is expected to be localized and of short duration. Particulate matter would not be of a magnitude to harm human health, affect the environment, or result in property damage.

Dust created from vehicle traffic on gravel or natural-surfaced roads and logging operations would be localized and of short duration. As such, the Proposed Action is consistent with the provisions of the Federal Clean Air Act.

**3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas.** There are no prime farm lands, wetlands, wild and scenic rivers, area of critical environmental concern or wildernesses located within the Planning Area. See Criteria #8 on cultural resources.

**4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.** The effects of the Proposed Action on the quality of the human environment are adequately understood by the interdisciplinary team to provide analysis for the decision. Substantive public comments were analyzed by the Mini Mule Project interdisciplinary team and the BLM responded to those comments under Appendix 3 of the Mini Mule Project EA. While comments, such as other scientific research, were mentioned by the public, the actions of the Mini Mule Project Proposed Action is within those identified in the 1995 Medford District RMP and the predicted effects are contained in Chapter 3 of the EA. None of the comments were considered controversial in respect to their context and intensity in determining significance.

**5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** The Proposed Action is not unique or unusual. The BLM has experience implementing similar actions in similar areas and have found effects to be reasonably predictable. The environmental effects to the human environment are fully analyzed in Chapter 3 of the EA. There are no predicted effects on the human environment which are considered to be highly uncertain or involve unique or unknown risks. Public scoping included a scoping letter mailed to a standard mailing list of individuals and organizations expressing interest in Glendale Resource Area projects within ¼ mile of proposed Mini Mule Project activities. Public comment was requested requesting public comment from November 25, 2009 to December 26, 2009. The BLM received approximately three public responses from either letters or emails during this

portion of scoping. All substantive comments were responded to in Appendix 3 of the Mini Mule Project EA. Comments were considered in the development of the project. No unique or unknown risks were identified in public comments.

**6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.**

The Proposed Action does not set a precedent for future actions that might have significant effects nor does it represent a decision in principle about future consideration. The Proposed Action would occur within the Matrix and Riparian Reserve land use allocations. Chapter 1 of the Mini Mule Project EA identifies how the Proposed Action would be consistent with the Purpose and Need and for compliance with higher level EIS documents. Chapter 3 evaluates the effects of the alternatives and the findings are that all projects proposed would be compliant with the effects anticipated under the 1995 Medford RMP. Any future projects, not identified in the Mini Mule Project EA would be evaluated through the NEPA (National Environmental Policy Act) process and would stand on their own as to environmental effects.

**7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.**

The interdisciplinary team evaluated the Proposed Action in context of past, present and reasonably foreseeable actions. Significant cumulative effects outside those already disclosed in the 1995 ROD/RMP are not predicted. Cumulative effects regarding carbon storage would not be outside those already disclosed in the 2008 Western Oregon Plan Revision FEIS. A complete disclosure of the effects of the Proposed Action is contained in Chapter 3 of the EA. The BLM anticipates that most projects' impacts on greenhouse gas levels and carbon storage will be a negligible when placed in the appropriate context for analysis of global, regional, and continental scale.

**8. The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.**

The Proposed Action would not adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor would the Proposed Action cause loss or destruction of significant scientific, cultural, or historical resources. Cultural surveys were completed for the Mini Mule Project Planning Area. There are no known cultural resource sites located within proposed units. If cultural resources are located during the implementation of an action, the project would be redesigned to protect the values present.

**9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.**

Thinning, yarding, road maintenance (including daylighting), hauling, and activity fuel treatments would have no effect on Southern Oregon/Northern California Coasts (SONCC) coho salmon (ESA-Threatened) and coho critical habitat (CCH). The closest coho presence and CCH in Mule Creek is approximately 350 feet

(0.06 mile) from any part of the proposed project (thinning unit). Sediment resulting from road maintenance and hauling activity would not be of a magnitude that would result in a measurable increase in the overall stream sediment deposition for more than 25 feet downstream within any of the stream channels.

The Proposed Action would maintain 286 acres of northern spotted owl dispersal habitat. The Connectivity/Diversity Block in T33S-R9W-Section17 would maintain habitat conditions in approximately 212 acres. Canopy opening from daylighting road maintenance would not deter owls from moving across small openings created due to the narrow linear nature of the clearing (approximately 20 to 40 feet) and existing openings. The function of owl habitat in each unit would be maintained. Foraging habitat would retain at least 40% canopy cover, and would retain ecologically valuable structure components such as down logs, snags, and large overstory trees with various deformation. Decadent woody material would be retained as either snags or down wood. No thinning or road maintenance would occur within any 70 acre nest patches (USDA/USDI 2008).

The Proposed Action would maintain approximately 286 acres of northern spotted owl dispersal habitat at the forest stand and Critical Habitat Unit (CHU OR-67) level. Denser canopy and vegetation would be maintained in thinning units where removal of trees would be lighter. In both cases, the openings would not be large enough to adversely affect roosting, foraging, or dispersal at the forest stand and Critical Habitat Unit level. No nesting or nest patches occur within proposed thinning units.

The Planning Area occurs within Survey Zone B for marbled murrelets, requiring surveys for disturbance and projects affecting suitable murrelet habitat. No suitable habitat is affected by the Proposed Action. The first year of surveys is completed with no detections for this species. Second year surveys will be completed August 2010. Should any detections be present from the second year, seasonal restrictions would be applied to occupied sites.

**10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.** The Proposed Action does not violate any known federal, state, or local law or requirement imposed for the protection of the environment. Furthermore, the Proposed Action is consistent with applicable land management plans, policies, and programs (see section 1.6 of the EA).

## **Chapter 1.0 Purpose and Need for the Action**

### **1.1 Introduction**

This environmental assessment (EA) will analyze the impacts of proposed forest management activities on the human environment in the Mini Mule Project Planning Area (PA). The EA will provide the decision maker, the Glendale 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 for the Medford District's Resource Management Plan and whether a supplement to that Environmental Impact Statement is needed or if a Finding of No Significant Impact is appropriate.

Chapter 1 discloses to the reader:

- what the BLM proposes to do (Proposed Action),
- the location and description of the Planning Area,
- why the BLM is proposing these forest management activities (Purpose and Need),
- what factors the decision maker will use for choosing the alternative (Chapter 2) that will best meet the purpose and need for this proposal,
- how the public has been involved in this project,
- the method for developing alternatives,
- what the decision maker will decide upon.

The analysis utilizes field data, ground verification by resource specialists and Geographical Information System (GIS) technology to estimate acres, road miles and produce reference maps. Estimates are intended to aid the reader in understanding the proposed actions. The reader should be aware that electronic technology can produce information that appears precise but is still dependent on further field work. During implementation, unit boundaries are posted and surveyed and unforeseen features, such as water sources, are appropriately buffered. It has been the experience for past Glendale Resource Area environmental assessments that estimates of treatment acres in the EA have been generally more than the actual acres treated on the ground.

### **1.2 Proposed Action**

The Mini Mule Proposed Action includes thinning 40 to 80 year old stands on approximately 286 acres of forest land in 17 units. Cut trees would be removed by the use of tractor or skyline cable. Trees to be removed would be whole-tree yarded or yarded with attached tops to extract merchantable material. Non-merchantable material would be handpiled and burned on the immediate downhill side of existing roads. Slash remaining in units after yarding may be lopped-and-scattered.

The proposed harvest units are within lands governed by the Oregon and California Railroad and Coos Bay Wagon Road Grant Lands Act (O&C Act). The timber sale is

planned to be offered for sale September 2010. BLM planning decisions and harvest activities would apply only to BLM-administered O&C lands.

### **1.3 Project Location**

The Planning Area (PA) is located approximately 18 miles west of the community of Glendale, and 20 miles west of Interstate 5. The PA is located within two sixth-field sub-watersheds, Mule Creek and Missouri Creek, which flows into the larger 104,224 acres Rogue River-Horseshoe Bend fifth-field watershed. The Proposed Action is located within the Matrix (including a Connectivity/Diversity Block in T33S-R9W-Section17) and Riparian Reserve land use allocations. The Planning Area includes Northern Spotted Owl Critical Habitat (CHU) OR#67 (1992 U.S. Fish and Wildlife Service designation). The Proposed Action does not occur within revised Critical Habitat (2008; [Federal Register \(73\): 47326-47522](#)), as designated by the U.S. Fish and Wildlife Service.

The BLM manages all the land within the 7,125 acre PA, which is a checkerboard pattern of public and private ownerships. The legal description of the PA is Township (T) T.33S., Range (R) R.9W., Sections 15-23 and 27-33; and (T) T.34S., Range (R) R.9W., Sections 4-6 in Curry County, Willamette Meridian (see Map 3 attached at the end of the EA for more detailed information).

### **1.4 Purpose and Need for the Proposal**

The BLM has a statutory obligation under the Federal Land and Policy Management Act (FLPMA) which directs that “[t]he Secretary shall manage the public lands . . . in accordance with the land use plans developed by him under section 202 of this Act when they are available . . .” The Medford District’s Record of Decision and Resource Management Plan (ROD/RMP, June 1995) guides and directs management on BLM lands.

One of the primary objectives identified in the RMP is implementing the O&C Act which requires the Secretary of the Interior to manage O&C lands for permanent forest production in accord with sustained yield principles.

The purpose and need of harvesting in the Mini Mule is to offer timber for sale from thinning harvest units that are economical and maintain northern spotted owl dispersal habitat.

Any action alternative to be given consideration as a reasonable alternative must meet the objectives provided in the RMP for projects to be implemented in the Planning Area. The RMP and statutes specify the following objectives to be accomplished in managing the lands in the Planning Area:

- Produce a sustainable supply of timber and other forest commodities on matrix lands to provide jobs and contribute to community stability.

- Control stand density, maintain stand vigor, and place or maintain stands on developmental paths so that desired stand characteristics result in the future.
- Reduce post-activity based fuel to reduce the fire hazard.
- Apply thinning to promote the development of large trees for an eventual source of large woody debris to stream channels.

## 1.5 Plan Conformance

This Proposed Action conforms to the:

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

The Mini Mule Project is consistent with court orders relating to the Survey and Manage mitigation measure of the Northwest Forest Plan, as incorporated into the Medford District Resource Management Plan.

On December 17, 2009, the U.S. District Court for the Western District of Washington issued an order in *Conservation Northwest, et al. v. Rey, et al.*, No. 08-1067 (W.D. Wash.) (Coughenour, J.), granting Plaintiffs' motion for partial summary judgment and finding a variety of NEPA violations in the BLM and USFS 2007 Record of Decision eliminating the Survey and Manage mitigation measure. Previously, in 2006, the District Court (Judge Pechman) had invalidated the agencies' 2004 RODs eliminating Survey and Manage due to NEPA violations. Following the District Court's 2006 ruling, parties to the litigation had entered into a stipulation exempting certain categories of activities from the Survey and Manage standard (hereinafter "Pechman exemptions").

Judge Pechman's Order from October 11, 2006 directs: "Defendants shall not authorize, allow, or permit to continue any logging or other ground-disturbing activities on projects to which the 2004 ROD applied unless such activities are in compliance with the 2001 ROD (as the 2001 ROD was amended or modified as of March 21, 2004), except that this order will not apply to:

Thinning projects in stands younger than 80 years old (emphasis added);

Replacing culverts on roads that are in use and part of the road system, and removing culverts if the road is temporary or to be decommissioned;

Riparian and stream improvement projects where the riparian work is riparian planting, obtaining material for placing in-stream, and road or trail decommissioning; and where the stream improvement work is the placement large wood, channel and floodplain reconstruction, or removal of channel diversions; and

The portions of project involving hazardous fuel treatments where prescribed fire is applied. Any portion of a hazardous fuel treatment project involving commercial logging will remain subject to the survey and management requirements except for thinning of stands younger than 80 years old under subparagraph a. of this paragraph.”

Following the Court’s December 17, 2009 ruling, the Pechman exemptions are still in place. Judge Coughenour deferred issuing a remedy in his December 17, 2009 order until further proceedings, and did not enjoin the BLM from proceeding with projects. Nevertheless, the Mini Mule Project has been reviewed by the Glendale Resource Area in consideration of both the December 17, 2009 and October 11, 2006 order. Because the Mini Mule Project entails no regeneration harvest and entails thinning in stands less than 80 years old, the project meets Exemption A of the Pechman Exemptions (October 11, 2006 Order), and therefore may be considered for sale offering even if the District Court sets aside or otherwise enjoins use of the 2007 Survey and Manage Record of Decision since the Pechman exemptions would remain valid in such case.

The *Wild Rogue North Watershed Analysis* is incorporated by reference. Watershed analysis is an analytical process and not a decision-making process as provided in the Record of Decision for the Northwest Forest Plan (p. B-20).

The Aquatic Conservation Strategy (ACS) consistency analysis (see Appendix 6) evaluated the Proposed Action and found the Proposed Action would not retard or prevent the attainment of the nine objectives or the four components of the ACS. Therefore, this project is consistent with the ACS of the Northwest Forest Plan (NWFP) Record of Decision (1994).

## **1.6 Permits and Approvals Required**

The following permits and approvals are required prior to project implementation:

- in compliance with the Oregon Smoke Management Plan, prescribed burning activities on the Medford District require pre-burn registration of all prescribed burn locations with the Oregon State Forester.

## **1.7 Public Scoping**

Public scoping included a scoping letter mailed to the list of individuals and organizations expressing interest in Glendale Resource Area projects and landowners within ¼ mile of proposed Mini Mule Project activities. Public comments were requested to be submitted from November 25, 2009 to December 26, 2009. The BLM received approximately three public responses from either letters or emails during this portion of scoping. All substantive comments were responded to in Appendix 3 of the Mini Mule Project EA. Comments were considered in the development of the project.

The Glendale Resource Area also accepts public comment of proposed forest management activities through the quarterly BLM Medford Messenger publication. A brief description of proposed projects, such as the Mini Mule Project, a legal location and general vicinity map are provided along with a comment sheet for public responses. The Mini Mule Project was included in these quarterly publications beginning in the winter of 2010.

Conflicts identified during scoping with the Proposed Action (May 2009) were considered to determine if an alternative action would be developed. Appendix 1 summarizes this alternative consideration and explains why some alternatives were considered but not analyzed in detail and eliminated from further study.

## **1.8 Decisions to be Made**

The Glendale Field Manager is the official responsible for deciding whether or not to prepare an Environmental Impact Statement (EIS), and whether to approve the treatments as proposed, not at all, or to some other extent.

### **Alternative Decision Factors**

In choosing the alternative that best meets the purpose and need, the Glendale Field Manager would evaluate alternatives on:

- silvicultural systems that are sustainable, economically practical, and capable of maintaining the long-term health and productivity of the forest ecosystem;
- providing timber resources and revenue to the government from the sale of those resources;
- providing for the establishment and growth of conifer species while retaining structural and habitat components, such as large trees, snags, and coarse woody debris;
- reducing activity based fuel hazards.

## Chapter 2.0      Alternative Ways of Accomplishing the Objectives

### 2.1      Introduction

This chapter presents the alternative ways of meeting the project objectives identified in Chapter 1, by describing and comparing Alternative 1 (No Action Alternative) and Alternative 2 (Proposed Action) as specified in 40 CFR (Code of Federal Regulations) § 1502.14. Descriptions summarize potential environmental consequences and focus on potential actions and outputs. Best Management Practices (BMPs), Project Design Features (PDFs), and Standard Operating Practices (SOP) are included to ensure project compliance with the federal Clean Water Act and higher-level National Environmental Policy Act (NEPA) documents, laws and BLM guidelines. For this document BMPs and PDFs are incorporated into the Proposed Action (see Section 2.3.2). BMPs are specifically required by the Federal Clean Water Act to reduce nonpoint source pollution. The BMPs are methods, measures, or practices selected from Appendix D of the 1995 ROD/ RMP to ensure that water quality will be maintained. Project design features (PDFs) are specific measures included in the site specific design of the Proposal to eliminate or minimize adverse impacts on the human environment. These PDFs were developed by the Mini Mule Project interdisciplinary team with guidance of the 1995 ROD/RMP and resource protection measures specific to the Planning Area. SOPs are those standard provisions applied to all timber sales and are in Appendix 10 (Standard Operating Practices).

### 2.2      Proposed Projects

#### 2.2.1      Description of Forest Management Treatments

***Thinning.** Thinning for this project is the removal of merchantable trees to encourage growth of the remaining trees.*

Thinning is a silvicultural practice generally applied to control stand density, maintain stand vigor, and place or maintain stands on developmental paths so that desired stand characteristics result in the future while providing an entry that is economical. This treatment would promote better stand health, as well as increased vigor and better crown development on retained trees. Mortality of remaining conifers would decrease. In 10-20 years, crowns of existing trees would become fuller and overall stand vigor and growth would be improved. Production of some wood volume at the present time and an increase/maintenance of growth rates for wood volume production in the future are primary objectives. Light to moderate thinning for the Mini Mule Project would occur across all diameter classes while retaining primary constituent elements for northern spotted owl habitat to retain its function. Primary constituent elements support the life requisites of nesting, roosting, foraging are uneven-aged, multilayered canopy; high canopy closure; a component of old growth trees; and some large trees with deformities such as broken tops, deformed limbs and heart rot (Forsman et al. 1984), which are also

sometimes referred to as “snags”. A “large” tree is defined as a tree > 21” dbh for habitat which can consistently support nesting, down to 11” dbh trees for stands that can provide for roosting and foraging.

***Visual Representations – Current conditions, Post-treatment, and Desired Conditions***



*The above photograph is Mini Mule Project unit 30-4, proposed for commercial thinning to retain the unit at 40% canopy closure in northern spotted owl dispersal habitat.*

*Understory tree growth and reduced spacing between upper canopy layer trees are creating within stand competition for resources (such as light, nutrients, water, space). If no thinning were to occur, these stands would remain in stand exclusion (loss of a developed understory and midstory, spindly trees exhibiting growth suppression and susceptible to disease, mortality, and windthrow).*

*The photograph at bottom-left, depicts a representative existing canopy closure for stands containing spotted owl dispersal habitat, in this project area. The photograph at bottom-right depicts a representative post treatment canopy closure. In 10-20 years, crowns of existing trees would become fuller and overall stand vigor and growth would be improved.*

***Riparian Thinning.*** *The objective of riparian thinning treatments is to create a stand that is on a trajectory to reach a late-successional condition.*

Many riparian areas are dominated by smaller diameter stands of Douglas-fir and some hardwoods. Most stands are lacking large wood debris, downed logs, and large tree structure. Treatment of these stands would reduce competition on the retained trees for light, nutrients, water and growing space. These trees would develop larger canopies, display better vigor and put on diameter growth faster than if left untreated. Treatments within Riparian Reserves would be outside the variable width Ecological Protection Zones and would maintain an average of 50% canopy closure per stream. Production of wood volume is a by-product of this treatment, but is not a primary objective.

Riparian thinning would be done within Riparian Reserves adjacent to streams in the Mini Mule Project Area where recommended to improve stand health, increase the source for large woody debris, species diversity, and to reduce the existing fire hazard. Such treatments would benefit perennial and intermittent fish and other aquatic species habitat. Riparian areas proposed for treatment were selected based on field stream survey information. Stands with conditions such as high density and number of canopy layers, or as a result of existing disease pockets or unnaturally low species diversity were selected for treatment. Treatments would occur in accordance with the following prescriptions to ensure protection of streams while restoring stand health.

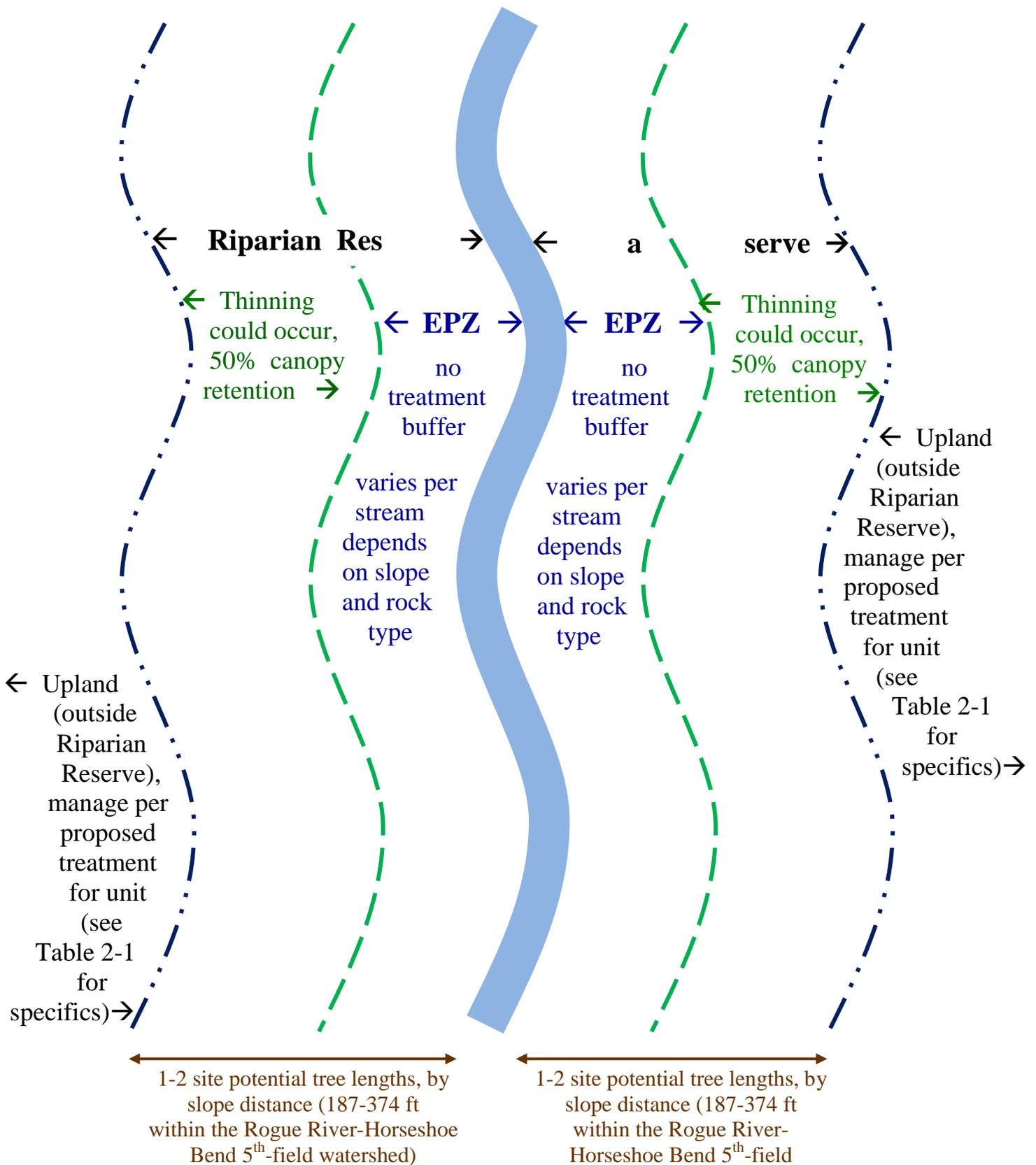
For all units, an Ecological Protection Zone (EPZ) ranging from 60 to 187 ft from the stream bankfull width (by slope distance) would be applied along streams to protect stream channel structure and water quality. For the Mini Mule Project the EPZ is a no treatment buffer. The specific EPZ distance per stream was developed using stated protection criteria<sup>1</sup> for individual elements of the Riparian Reserve including: bankfull and flood stage streambank stability; shade and temperature; surface erosion of streamside slopes; fluvial erosion of the stream channel; soil productivity; habitat for riparian-dependent species; the ability of streams to transmit damage downstream; the role of streams in the distribution of large wood to downstream fish bearing waters; and riparian microclimate. The Ecological Protection Width Needs chart is based on slope and rock type, and takes into account protection of streams from “surface erosion of streamside slopes, fluvial erosion of the stream channel, soil productivity, habitat for riparian-dependent species, the ability of streams to transmit damage downstream, and the role of streams in the distribution of large wood to downstream fish bearing waters”.

Species diversity would be maintained. Projects within this area would be designed to ensure that habitat conditions for the wildlife and plant species that use this zone are not degraded.

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<sup>1</sup> Ecological Protection Width Needs chart (Northwest Forest Plan Record of Decision, p. B-15); Forest Ecosystem Management Assessment Team (FEMAT) 1993; and the Northwest Forest Plan Temperature Total Maximum Daily Load (TMDL) Implementation Strategies, U.S. Forest Service and BLM, 2005).

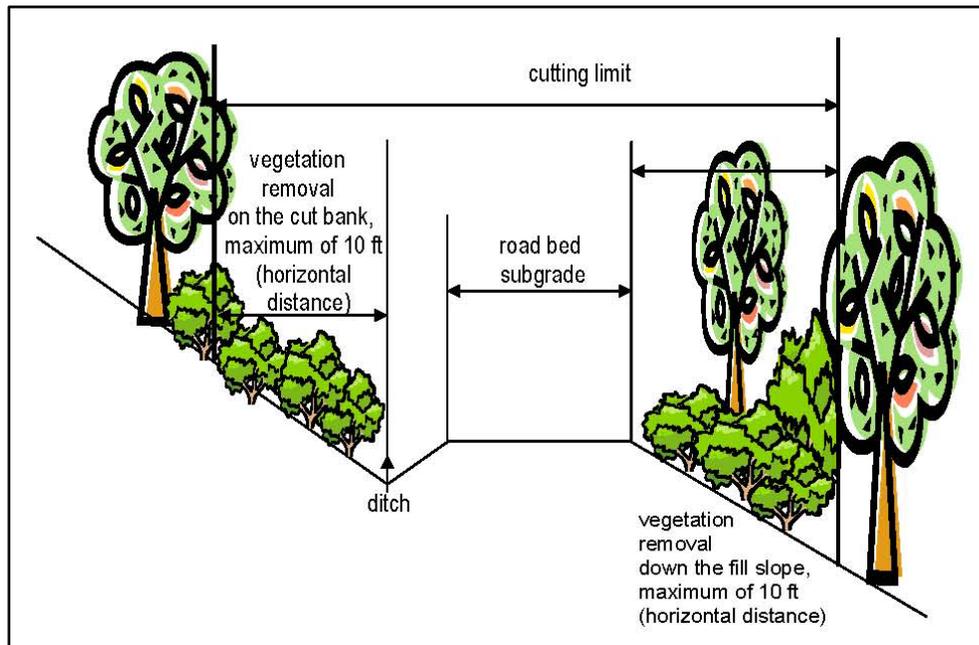
## *Riparian Thinning Adjacent to Streams within the Mini Mule Project, Illustrated*



**Activity fuel treatments.** Slash generated from whole-tree yarding would be placed on the immediate downhill side of existing roads from landings. There it would be piled and burned or otherwise removed from the site. Slash remaining in units after yarding may be lopped-and-scattered.

**Road Maintenance** - Activities on an existing road to keep a road at its original design standard. Typical maintenance would include, but is not limited to: 1/ blading and shaping; 2/ cleaning of ditches, catch basins and culverts; 3/ brush cutting and vegetation removal from roadway; 4/ surface patching and pot hole repair; 5/ surface replacement; 6/ culvert replacement; 7/ slide removal; and 8/ daylighting where road segments traverse proposed Mini Mule units.

Daylighting Road Maintenance – Would occur only where a road overlaps a proposed unit. Trees limiting sunlight drying out the road surface would be removed up to 10 ft from the center line of the ditch up the cutbank and up to 10 ft from the road shoulder, down the fill slope. Ecological Protection Zones would be applied where these road segments overlap intermittent or perennial streams. Removal of these trees would minimize road surface damage and reduce sediment displacement. To minimize disturbance to cutslopes, shrubs and grass may be cut but the root systems would be retained to maintain cutslope stability.



**Figure 2-1. Daylighting Road Maintenance**

## **2.3 Description of the Action Alternative**

### **2.3.1 Alternative 1 (No Action)**

The No Action Alternative provides a baseline for the comparison of the alternatives and describes the existing condition and the continuing trends within the Planning Area. Under the RMP, the majority of harvest and silvicultural activities are scheduled to occur within the Matrix allocation. Selection of this alternative would not meet the purpose and need of the project (described in Chapter 1) of harvesting timber and implementing the Medford RMP at this time. Consideration of this alternative provides the answer to the question of what it would mean for the objectives not to be achieved. Selection of this alternative would not constitute a decision to reallocate these lands to non-commodity uses.

Future harvesting in this area would not be precluded and could be analyzed under a subsequent environmental analysis. Road maintenance and renovation/improvement would be dependent on funding and reciprocal right-of-way agreements.

### **2.3.2 Proposed Action**

The Proposed Action would maintain northern spotted owl dispersal habitat while offering a viable timber sale for permanent forest production.

#### **2.3.2.1 Forest Management**

The Proposed Action is approximately 286 acres within 17 units would be thinned and would maintain approximately 40% canopy closure in spotted owl dispersal habitat. See Table 2-3 for specific unit proposals.

Project Design Criteria included in the U.S. Fish and Wildlife Service's written concurrence with the Medford District of the Bureau of Land Management's (District) determination that the District's proposed forest management activities may affect, but are not likely to adversely affect, the threatened northern spotted owl (*Strix occidentalis caurina*) (spotted owl) and its designated critical habitat; or the threatened marbled murrelet (*Brachyramphus marmoratus*) (murrelet) would be applied to the Mini Mule Project (see below).

- Any of the following measures may be waived in a particular year if nesting or reproductive success surveys conducted according to the U.S. Fish and Wildlife Service (USFWS) - endorsed survey guidelines reveal that spotted owls are non-nesting or that no young are present that year. Waivers are valid only until March 1 of the following year. Previously known well established sites/activity centers are assumed occupied unless protocol surveys indicate otherwise.

**Northern Spotted Owl**

- Work activities (such as tree felling, yarding, hauling on roads not generally used by the public, and prescribed fire) would not be permitted within specified distances (see table 2-1 below), of any nest site or activity center of known pairs and resident singles between March 1 and June 30 (or until two weeks after the fledging period) – unless protocol surveys have determined the activity center to be not occupied, non-nesting, or failed in their nesting attempt. March 1 – June 30 is considered the critical early nesting period; the restricted season may be extended during the year of harvest, based on site-specific knowledge (such as a late or recycle nesting attempt). The boundary of the prescribed area may be modified by the action agency biologist using topographic features or other site-specific information. The restricted area is calculated as a radius from the assumed nest site (point).

**Table 2-1. Harassment distances from various activities for Northern Spotted Owls (BLM 2009a)**

Activity	Buffer Distance around Owl Sites
Heavy Equipment	105 feet
Chain saws	195 feet
Prescribed fire	0.25 miles

**Marbled Murrelet**

- Work activities which produce noises above ambient levels would not occur within specified distances (see Table 2-2) of any occupied stand or unsurveyed suitable habitat from April 1 through August 5. Work activities would be confined to the time period between 2 hours after sunrise to 2 hours before sunset from August 6 through September 15.
- Burning would not occur within 0.25 miles of known occupied marbled murrelet sites or unsurveyed marbled murrelet habitat from April 1 through August 6 unless smoke would not drift into the occupied site or unsurveyed suitable habitat.
- Minimize noise disturbance resulting from projects in occupied stands or unsurveyed suitable habitat and within 0.25 mile of the edge of these stands from April 1 through August 5.

**Table 2-2. Harassment distances from various activities for Marbled Murrelet (BLM 2009a)**

Activity	Buffer Distance around Murrelet Sites
Heavy equipment	120 yards
Chainsaws (hazard trees, tree harvest, etc.)	120 yards
Prescribed Fire (unless smoke will not drift into the occupied site)	0.25 miles

## Special Status Plant Species

- Bureau Sensitive and Federally Threatened/Endangered plant sites in hazardous fuels reduction treatments would receive a 25-100 ft diameter no treatment buffer.

**Table 2-3. Mini Mule Project Forest Management Units**

Township-Range-Section	Unit Number	Acres	Harvest System	Proposed Treatment	Canopy Closure retention	Existing Northern Spotted Owl Habitat
32-9-16	16-1	16	tractor	Thinning and Riparian Thinning (outside the EPZ)	40% for uplands and 50% for riparian thinning (outside the EPZ)	dispersal
32-9-17	17-1	11	tractor			
	17-2	6	tractor			
32-9-19	19-3	25	tractor			
32-9-20	20-2	22	tractor			
	20-3	4	cable			
	20-4	3	tractor			
32-9-21	21-2	37	tractor/cable			
	21-3	17	tractor/cable			
	21-4	6	cable			
32-9-28	28-3	16	tractor/cable			
32-9-29	29-1	21	tractor/cable			
	29-2	17	tractor			
32-9-30	30-1	23	tractor			
	30-2	16	tractor			
	30-4	10	tractor/cable			
32-9-32	32-2	37	tractor			

### 2.3.2.2 Timber Yarding

Harvest yarding systems for the Proposed Action are the use of skyline cable and tractor yarding. Trees to be removed for harvest would be whole-tree yarded or yarded with the tops attached to minimize impacts. See Table 2-3 for individual unit harvesting methods proposed. Tractor yarding would generally be limited to slopes less than 35%.

Units 29-2, 30-1, 30-2, 30-4, and 20-2 would have the following restrictions due to high ground water levels:

- limit logging operations to May 15 thru Oct 15 of the same calendar year
- use existing skid trails
- rip and waterbar operational skid trails determined to be blocking natural drainage

Tractor logging on all other units would not occur when soil moisture at a depth of 4-6 inches is wet enough to maintain form when compressed, or when soil moisture at the

surface would readily displace, causing ribbons and ruts along equipment tracks. These conditions are generally found when soil moisture, at a depth of 4-10 inches, and is between 15-25% depending on soil type.

Cable yarding outside of the above listed units would occur year round.

Within Riparian Reserves, skid trails would be discontinuously subsoiled with winged ripper teeth. Subsoiling would occur on the full width of the skid trail, rips would be no more than 36 inches apart, and would be to a depth of 18 inches or to bedrock, whichever is shallower, seeded, water-barred, mulched, and blocked during dry soil conditions, upon completion of current harvest. Water bars would be installed, as needed, at the same time as subsoiling.

All non-hazardous snags would be retained in all harvest units. If it is necessary to fall snags for safety reasons, they would remain on site as down wood. All existing naturally occurring dead and down woody debris would remain on site.

Hardwood species would remain following treatment to retain species diversity.

### 2.3.2.3 Road Work

Proposed road work associated with timber harvesting for the Proposed Action is road road maintenance (standard and daylighting).

Where hydrologically connected, log haul on rocked roads would not occur under wet conditions to protect water quality. There are no natural surface roads proposed for haul for the Mini Mule Project. Wet road conditions are considered to result in: continuous mud splash or tire slide, fines being pumped through road surfacing from the subgrade, road drainage causing a visible increase in stream turbidities, surface rutting, or any condition that would result in being chronically routed into tire tracks or away from designed road drainage during precipitation events.

**Table 2-3. Summary of Standard Road Maintenance and Haul**

Road Number	Road Name	Miles	Control	Surfacing	Haul Timing	Hydrologically connected
32-9-18	August Knob	1.27	BLM	ASC	dry condition haul	yes
32-9-16 A	Arrasta Fork	4.03	BLM	ASC	dry condition haul	yes
32-9-30	Arrasta Tie	0.90	BLM	ASC	dry condition haul	yes

Road Number	Road Name	Miles	Control	Surfacing	Haul Timing	Hydrologically connected
32-9-20.3	Switchback Mule P1	0.80	BLM	ASC	dry condition haul	yes
32-9-15.2 A	Lower Mule Creek	4.82	BLM	ASC	dry condition haul	yes
32-9-15.2 C	Lower Mule Creek	1.16	BLM	ASC	dry condition haul	yes
32-9-21	Middle North Fork Mule Creek	1.12	BLM	ASC	dry condition haul	yes
32-8-31.0 B	Kelsey Mule	5.30	BLM	BST	All season	yes
32-8-31 C1	Kelsey Mule	1.75	BLM	BST	All season	yes
32-9-14.1 B	Marial Jeep	0.10	BLM	ASC	dry condition haul	no*
32-9-14.2 B	Marial	2.90	BLM	ASC	dry condition haul	yes
32-9-14.2 C	Marial	0.10	BLM	ASC	dry condition haul	no*
32-9-33	Bruin Relog	0.90	BLM	ASC	dry condition haul	yes
32-9-32.2	Jeep Ridge	0.50	BLM	ASC	dry condition haul	no*
32-9-32	Four mile Saddle	0.40	BLM	ASC	dry condition haul	yes

**Legend**

BST = Bituminous Surface Treatment (paved)

ASC = Aggregate Surface Course (rocked)

Dry condition haul = hauling would not occur during wet road conditions, which are considered to result in: continuous mud splash or tire slide, fines being pumped through road surfacing from the subgrade, road drainage causing a visible increase in stream turbidities, surface rutting, or any condition that would result in being chronically routed into tire tracks or away from designed road drainage during precipitation events.

\* access to these roads requires travel on hydrologically connected roads, therefore haul timing would match that for hydrologically connected roads

#### **2.3.2.4 Activity Fuels Treatments**

Slash generated from whole-tree yarding would be placed on the immediate downhill side of existing roads from landings. The estimated 73 landing piles created from this activity would be piled and burned at these locations. Slash remaining in units after yarding may be lopped-and-scattered.

## Chapter 3.0      **Affected Environment and Environmental Consequences**

### **3.1 Introduction**

In accordance with law, regulation, executive order, policy and direction an interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the alternatives described in Chapter 2.0. Those elements of the human environment that were determined to be affected define the scope of environmental concern (**see Environmental Elements in Appendix 2 for full list of elements considered**). The Affected Environment portion of this chapter describes the current conditions in the Mini Mule Project Planning Area. The relevant resources that could be potentially impacted are: fire hazard; soil compaction and productivity; water resources and erosion; the northern spotted owl and its critical habitat; and greenhouse gases and carbon storage.

#### Greenhouse Gases and Carbon Storage

Current Oregon/Washington BLM Information Memorandum (IM-OR-2010-012) directs Districts to consider, under standard NEPA principles, whether greenhouse gas levels and carbon storage is an issue requiring analysis for a project. The BLM anticipates most projects' impact on greenhouse gas levels and carbon storage will be a negligible when placed in the appropriate context for analysis, at the global, regional, and continental scale. However, because of the relative newness of this issue, and the continuously and rapidly developing science, and the lack of an approved Environmental Impact Statement to which the Medford BLM can tier, a cautious approach, a cautious approach is being taken with the Mini Mule Project. As the BLM analyses other projects for greenhouse gas and carbon storage impacts, the agency will accumulate a quantitative dataset that may allow the BLM to establish with better clarity whether greenhouse gases and carbon storage should to continue to be an issue for analysis in individual projects such as this.

The Environmental Effects portion of this chapter provides the analytical basis for the comparisons of the alternatives (40 CFR § 1502.16) and the reasonably foreseeable environmental consequences to the human environment that each alternative would have on the relevant resources. Impacts can be beneficial, neutral or detrimental. This analysis considers the direct impacts (effects caused by the action and occurring at the same place and time), indirect impacts (effects caused by the action but occurring later in time and farther removed in distance but are reasonably foreseeable) and cumulative impacts (effects caused by the action when added to other past, present and reasonably foreseeable future actions on all land ownerships). The temporal and spatial scales used in this analysis may vary depending on the resource being affected.

Under 43 CFR § 46.115 it states that when considering cumulative effects analysis, it must analyze the effects in accordance with relevant guidance issued by the Council on Environmental Quality (CEQ). As the CEQ, in guidance issued on June 24, 2005, points out, the "environmental analysis required under NEPA is forward-looking," and review

of past actions is required only “to the extent that this review informs agency decision-making regarding the proposed action.” Use of information on the effects on past action may be useful in two ways according to the CEQ guidance. One is for consideration of the proposed action’s cumulative effects, and secondly 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.” Our information on the current environmental condition is more comprehensive and more accurate for establishing a useful starting point for a cumulative effects analysis, than attempting to establish such a starting point by adding up the described effects of individual past actions to some environmental baseline condition in the past that, unlike current conditions, can no longer be verified by direct examination.

The second area in which the CEQ guidance states that information on past actions may be useful is in “illuminating or predicting the direct and indirect effects of a proposed action.” The usefulness of such information is limited by the fact that it is anecdotal only, and extrapolation of data from such singular experiences is not generally accepted as a reliable predictor of effects.

Scoping for this project did not identify any need to exhaustively list individual past actions or analyze, compare, or describe the environmental effects of individual past actions in order to complete an analysis which would be useful for illuminating or predicting the effects of the proposed action.

When encountering a gap in information, the question implicit in the Council on Environmental Quality regulations on incomplete and unavailable information was posed: is this information “essential to a reasoned choice among the alternatives?” (40 CFR §1502.22[a]). While additional information would often add precision to estimates or better specify a relationship, the basic data and central relationships are sufficiently well established that any new information would not likely reverse or nullify understood relationships. Although new information would be welcome, no missing information was determined as essential for the decision maker to make a reasoned choice among the alternatives.

## **3.2 Fire Hazard**

### **3.2.1 Affected Environment for Fire Hazard**

The scale of this section of the fire hazard analysis will be conducted within the 17 Mini Mule Project units. The current condition of each unit influences the proposed activities’

effect on fire behavior, making a before-and-after comparison on a unit level an effective scale at which to analyze changes in fire hazard.

Fire hazard is the ability of a fire to spread once ignition has occurred. Fire behavior dictates which fire suppression strategy may be effectively employed, and therefore the extent to which a fire may grow and the subsequent damage it may cause. Because fire behavior is critical in fire suppression strategy selection, flame length is the unit of measure used for this fire hazard analysis. Flame lengths less than four feet can generally be effectively managed by fire suppression personnel, such as hand crews, using the direct attack method. Flame lengths greater than four feet generally require specialized equipment and indirect attack methods, which are inherently more expensive and dangerous due to their complexity.

**Table 3-1. Suppression Activities Dictated by Flame Length**

Flame Length (in feet)	Fire Suppression Strategy	Fire Suppression Tactics
0-4	Direct Attack	Hand crews
4-8	Direct Attack	Dozers, engines, aircraft
8-11	Indirect Attack	Backfiring operations
11+	Indirect Attack	Backfiring operations

Fire behavior fuel models are a tool used to predict fire behavior, including flame length. The current conditions of the proposed Mini Mule Project in terms of fuel model and associated flame lengths are outlined in Table 3-2 below. This data was collected by field reconnaissance using the Standard Fire Behavior Fuel Models as a reference (Scott and Burgan, 2005).

**Table 3-2. Fire Behavior Fuel Models with Flame Lengths**

Fire Behavior Fuel Model	Fuel Model Group	Acres	Flame Length (in feet)
TU1	Timber Understory	67	1-4
TL3	Timber Litter	44	1-4
TU5	Timber Understory	153	4-8

The types of activities associated with the Mini Mule Project may have direct or indirect effects on fire behavior.

A direct effect may be an increase in fire hazard associated with logging slash at the landing sites. The trees to be removed from each thinning unit would be whole-tree yarded to landing sites where the tops and limbs would be concentrated into piles. The piles are to be burned under conditions that maximize consumption while minimizing potential escaped prescribed fire. The piles would need to cure (dry out) to burn thoroughly enough to achieve these conditions. This curing process generally takes over a year, during which time there would likely be a short-term increase in fire hazard because

the piles have the potential to produce flame lengths that exceed the fire behavior threshold to the extent of increased spotting distance.

An indirect effect may be a decrease in fire behavior due to the removal of some of the existing fuel loading during thinning. For example, the current condition of a stand in a fuel model TU5 has the potential to produce flame lengths up to 8 feet, which exceeds the fire behavior threshold. Some of the existing fuels would be removed during the thinning process, which could transition the stand into a fuel model TU1 which has a flame length below the threshold. This type of scenario would be considered a long-term decrease in fire behavior.

### **3.2.2 Environmental Effects on Fire Hazard**

#### **3.2.2.1 Alternative 1 (No Action) – Direct and Indirect Effects on Fire Hazard**

Alternative 1 would not result in a direct increase in fire hazard associated with landing piles because no slash would be generated from logging.

Alternative 1 would not result in a decrease in fire hazard associated with removing any of the existing fuel loading because no thinning would occur.

#### **3.2.2.2 Alternative 2 (Proposed Action) – Direct and Indirect Effects on Fire Hazard**

Alternative 2 would result in a short-term increase in fire hazard due to the presence of 73 landing piles which have the potential to produce flame lengths that exceed the fire behavior threshold to the extent of increased spotting distance.

Alternative 2 would result in a negligible indirect effect of decreased fire behavior due to the removal of existing fuels during the thinning process. The effect is expected to be negligible because the prescriptions are not designed to remove the smaller diameter conifers or the brushy hardwoods in the understory that would cause a stand to transition from a fuel model with flame lengths that exceed the threshold to a fuel model with flame lengths within the threshold.

#### **3.2.2.3 Alternative 2 (Proposed Action) - Cumulative Effects on Fire Hazard**

The scale of cumulative effects analysis for fire hazard is the Mule Creek HUC 6 watershed. The Mini Mule Project units are almost entirely contained within the Mule Creek HUC 6 watershed, with approximately 7 acres of unit 32-2 located within the Missouri Creek HUC 6 along the ridgeline that separates the two watersheds. Watersheds are defined by ridgelines, which serve as strategic locations to construct firelines. In the event of a wildfire, these strategic locations may be utilized to contain a fire within a drainage, or conversely, to prevent a fire from entering it. As such, the Mule Creek HUC 6 lends itself to a logical scale from which to conduct this cumulative effects fire hazard analysis.

The Anaktuvuk Thin project is a current or foreseeable activity within the Mini Mule fire hazard analysis area and is included in this cumulative effects analysis because it has the potential to effect fire hazard due to the presence of landing piles. The total number of landing piles associated with the Anaktuvuk Thin project and the Mini Mule project will likely exceed one hundred. The cumulative effect of this increase in fire hazard is short term because the landing piles would be expected to be burned, chipped, or otherwise removed from the site within the timeframe of the timber sale contract.

### **3.3 Soil Compaction and Productivity**

#### **3.3.1 Affected Environment for Soil Compaction and Productivity**

Physical, chemical, and biological properties of soils determine the natural level of productivity of a soil. These properties also determine how different soils will respond to natural and anthropogenic disturbances. For soils to be productive for timber management, soils must be able to acquire, maintain, and release water and nutrients needed by trees during the growing season. Soils also must be able to support the microorganisms necessary to maintain proper nutrient cycling and plant nutrition. Forest management activities can affect these soil properties by displacing and compacting soils and removing topsoil organics.

Soil compaction is defined as the packing together of soil particles by physical pressure at the soil surface that results in an increase in soil density and a decrease in pore space. A decrease in soil pore space results in restricted movement of water, nutrients, air, and plant roots, and as such generally decreases site productivity in most soil types.

Soil productivity, in a forested setting, is primarily the soil's capacity to support plant growth over time as reflected by some index of biomass accumulation. Losing a soil's plant growth capacity also means losing the site's ability to sustain timber production and other important ecological values. Soil productivity is affected by soil bulk compaction, soil displacement, and by changes and reductions in soil nutrients. Litter, humus, soil wood, and certain key properties of the surface mineral layers of forest soils are most easily and commonly disturbed by yarding activities, yet they are crucial to forest productivity. Minimizing the amount of soil displacement, compaction, and topsoil loss will generally improve stand development. The most common types of disturbances effecting soils and associated long term productivity are displacement and compaction. Soil compaction and displacement, which effects growth, is a combined effect which cannot be separated (1994 Medford District EIS, Vol. 1, p. 4-13).

The amount of soil compaction and productivity loss will be based on percentages per unit. The scale of analysis is per harvest unit, as it is the affected area for soils to support tree establishment and growth on BLM managed land. Specifically, soil productivity calculations are based on acres of compaction/displacement representing a 35% growth/productivity loss per acre (\*Productivity losses of 30 and 40% for disturbed and compacted acres respectively, are based on the Medford District PRMP vol.3 calculations, p.18-20). These two productivity losses were combined at 38% for this

analysis, based on percentages of disturbance and compaction within each cable yarding corridor and tractor skid trail (20% of the Mini Mule Project would be cable and 80% would be tractor). The acres of compaction/ displacement will be multiplied by the inherent loss of 38% growth divided by the unit area to determine the reduction in productivity. The calculations take into account all new and existing compaction/displacement associated with landings, skid trails, and cable yarding corridors.

#### Timber Production Capacity Classification

Five proposed units in the Mini Mule Project are in a fragile suitable restricted groundwater classification area, Unit 29-2, 30-1, 30-2, 30-4, and 20-2. These soils contain water at or near the soil surface for sufficient periods of time that vegetation survival and growth are affected. When disturbed, groundwater usually is altered but the resulting productivity losses are acceptable. The selection of proper Best Management Practices (BMPs) and Project Design Features (PDFs) that have been incorporated into the Proposed Action are based on these characteristics and management limitations.

All the Mini Mule Project units are in a reforestation suitable restricted classification area. These include Reforestation-Temperature-Suitable, Reforestation-Moisture-Suitable, and Reforestation-Surface Rock-Suitable. These sites have environmental factors with the potential to reduce seedling survival. Sites that are suitable for commercial harvest, but that are classified as having temperature related reforestation problems generally have high solar radiation loads combined with low available soil moisture. Sites classified as having moisture related reforestation difficulties have low soil moisture combined with competing vegetation and/or a short growing season. Sites with surface rock reforestation issues have high surface course fragments that limit spot access or reduce seedling survival. Since all harvest treatments under the Mini Mule Project are thinning actions, leave trees and natural reforestation would meet the minimum restocking guidelines under the NWFP, and tree planting on these sites would not be needed. "These sites will meet or exceed minimum stocking levels of commercial species within 5 years of harvest using operational practices," (BLM 1986).

### **3.3.2 Environmental Effects on Soil Compaction and Productivity**

#### **3.3.2.1 Alternative 1 (No Action) - Direct and Indirect Effects on Soil Compaction and Productivity**

Alternative 1 would result in negligible increased productivity of the soil. Existing compaction/displacement within the harvest units proposed for the Mini Mule Project would continue amelioration of prior compaction, towards pre-disturbance conditions. Fine roots of current vegetation would continue to loosen compacted soil. Leaf fall and other litter from the vegetation would continue to add organic material to the soil. Soil productivity in areas not affected by past disturbance would continue along natural productivity patterns.

### **3.3.2.2 Alternative 2 (Proposed Action) - Direct and Indirect Effects on Soil Compaction and Productivity**

Alternative 2 would result in 27.1 acres of soil compaction and displacement over new and existing footprints that would reduce soil productivity by 3.4%, from 295 acres of proposed thinning units. Under Best Management Practices in the 1995 RMP (p. 166) up to 12% skid trail compaction is allowed to remain within a unit until final entry. The analysis of skid trail compaction/disturbance was determined to average 10% compaction per unit. Total compaction/displacement associated with tractor skid trails, landings and cable yarding corridors would account for an average of 9.1% per unit. Therefore, each proposed Mini Mule Project harvest units would be below 12% compaction and 5% productivity loss as analyzed in the 1994 Medford District FEIS RMP.

The specific actions of the Proposed Action (Section 2.2) that would affect the physical, chemical, or biological properties of soils in proposed harvest units are described below.

#### Soil Compaction/Displacement

- Roads  
No permanent or temporary routes are proposed.
  
- Landings, Skid Trails, and Cable Yarding Corridors  
Soil compaction from landings would be limited to those along existing roads; therefore, there would be no new compaction from landings for this project.

Soil compaction from skid trails would account for 10% soil compaction per unit or 23.1 acres, therefore; soil compaction would be less than 12 percent. Skid trail density is determined by dividing the skid trail width (ft) by the skid trail spacing (ft) multiplied by 100 to yield the percent area in skid trails. Units will have a designated 10 feet wide skid trail with 100 feet spacing between skid trails. For stands previously logged with tractors, existing skid roads would be used where practical (RMP, P. 166).

Soil compaction from cable yarding corridors would account for 6.25% soil compaction or 4 acres of compaction /disturbance for the entire Mini Mule Project. Soil compaction from cable yarding corridors is determined base on the amount of compaction in the corridor in reference to the total acreage in these units. Units will have designated 12 feet wide corridors with 150 feet separation at the tail end.

#### Soil Productivity

Thinning would also benefit stand productivity by effectively increasing water and nutrient availability. The dense stands in the Mini Mule Project Area are a product of past timber management activities and aggressive fire suppression activities. Many of these stands are currently showing reduced growth rates as a result of overstocked conditions that are causing competition for soil nutrients and water. The Proposed Action would reduce competition on the retained trees for light, nutrients, water and growing space.

Forest management activities would not reduce site productivity below the threshold of commercial forest land or cause noncommercial forest land to be converted to non-forest land (BLM Handbook 5251-1, p. 1-14).

### **3.3.3.3 Alternative 2 (Proposed Action) - Cumulative Effects on Soil Compaction and Productivity**

There are no foreseeable projects within the Mini Mule Project Area units that would increase compaction and decrease soil productivity.

## **3.4 Water Resources and Erosion**

### **3.4.1 Affected Environment for Water Resources and Erosion**

#### **3.4.1.1 General Watershed Information**

The boundary of the Mule Creek HUC 6 sub-watershed and smaller will serve as the scope of analysis for water resources and erosion, because erosion is anticipated to be localized within 25 ft of haul routes and within unit boundaries, and impacts to water quality would not be of a magnitude to travel outside the Planning Area. This assumption is based on recent projects of this scale and scope,. Providing an analysis larger than HUC 6 scale would not be measurable and would eliminate any meaningful discussion of the effects.

The 7,125 acre Planning Area for this proposed project is located primarily within three adjacent HUC 7 drainages<sup>2</sup>. These drainages cover approximately 43% of the 19,539 acre Mule Creek HUC 6 subwatershed. The Mule Creek HUC 6 sub-watershed is one of 8 sub-watersheds within the 104,162 acre Rogue River-Horseshoe Bend (RRHB) HUC 5 watershed. The proposed units in this Planning Area total approximately 286 acres.

Management of BLM lands within the RRHB HUC 5 watershed is divided between the Glendale and Grants Pass Resource Areas (RA) of the Medford District BLM. This Project is within the Glendale RA portion of the watershed, which is limited to lands north of the Rogue River. The Wild Rogue North Watershed Analysis (WA) covers this

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<sup>2</sup> There are two additional HUC 7 drainages that are within this Planning Area. There is approximately 6.5 acres located on and just over the ridge boundary between the Mule Creek HUC 6 sub-watershed and the Missouri Creek-Rogue River HUC 6 sub-watershed. These acres are located within 250 feet of the ridge break on slopes less than 35%. It is over 450 feet to the closest stream, and there would be no road construction. As such, it has been determined that this unit will have no effect on water quality or offsite erosion within the Missouri Creek-Rogue River watershed. As such, the current condition and cumulative effects to the Missouri Creek-Rogue River watershed will not be discussed any further in this section. The second watershed overlap is a result of the western edge of the Planning Area following a township break instead of a HUC 7 drainage boundary. This drainage, located in the NW corner of the Planning Area, would not be entered for hauling or any actions associated with this EA. This drainage is not hydrologically connected to the project action areas, and as such will be excluded from further description or analysis.

portion of the HUC 5 watershed, and the entire Mule Creek HUC 6 sub-watershed where this Planning Area is located. The Rogue River–Horseshoe Bend Water Quality Restoration Plan (WQRP) for this HUC 5 watershed is scheduled for completion in calendar year 2010.

Ownership within the RRHB HUC 5 watershed is 95.5% Medford BLM and 99.8% federal lands. Within the Mule Creek HUC 6 sub-watershed 97.7% of lands are managed by the Medford BLM. In the western portion of this sub-watershed, approximately 8,000 acres (41%) of these acres are a Congressional Designated Reserve. The 7,125 acre Mini Mule Planning Area is in the eastern portion of the sub-watershed and is under the Matrix land use allocation of the NWFP. Approximately 3,800 acres of Riparian Reserves overlap these land use allocations.

Designated beneficial uses for the RRHB HUC 5 watershed include; public and private domestic water supply; industrial water supply; irrigation; livestock watering; anadromous fish passage, rearing, and spawning; resident fish and aquatic life; wildlife and hunting; fishing; boating; aesthetic quality; water contact recreation; and commercial navigation and transportation.

#### **3.4.1.2 Sediment and Stream Condition**

The Department of Environmental Quality (DEQ) is responsible for establishing water quality standards to protect beneficial uses and aquatic life in Oregon streams. Currently DEQ does not have established criteria for measuring sediment. The current water quality standards instead address turbidity, a measure of water clarity. These standards are primarily based on an Environmental Protection Agency (EPA) recommendation from 1976. ODEQ is in the process of revising the water quality standards for turbidity based on the best available science regarding the effects of turbidity on beneficial uses, in particular aquatic life (<http://www.deq.state.or.us>).

In addition to turbidity standards, the health of aquatic macroinvertebrate communities has been used as an indicator of sedimentation effects and overall water quality conditions in aquatic systems. The Glendale Resource Area has monitored aquatic macroinvertebrates within the Mule Creek HUC 6 sub-watershed since 1993. The results of those surveys indicate sediment may be limiting aquatic productivity in a handful of locations. These locations correlate with areas of the watershed that have high road densities. Overall, the RRHB watershed has some of the best water quality and riparian habitat in the Medford District (BLM 1999).

Overall, stream bed quality within the RRHB HUC 5 watershed is in good condition. Aquatic habitat within these streams is rated as properly functioning relative to their natural potential with the exception of the tributary and mainstem reaches of upper Mule Creek, which has been impacted by high road densities and past harvest practices. These assessments are based on the macroinvertebrate surveys discussed above, and on past stream surveys that used the National Marine Fisheries Service Matrix of Factors and Indicators (BLM 1999). These assessments take into account stream condition factors

such as water temperature, aquatic insect habitat, streambed gravels, large woody debris (LWD), pool quantity and quality, off channel habitat, refugia, stream width to depth ratio, active erosion, floodplain connectivity, road density and location, riparian vegetation condition and type, and disturbance history.

There are approximately 600 miles of streams within the RRHB HUC 5 watershed. These streams flow in a south-westerly direction through steep, mountainous canyons that drain into the Rogue River Canyon. Approximately 90% of the streams in this watershed have natural barriers such as steep gradient stream channels, low summer flows, streamside landslides and bedrock falls, and a lack of spawning gravel that limit fish distribution and spawning habitat. Stream density in this watershed is high due to the steep, dissected terrain. Streams are generally confined channels that are quite steep, with gradients in excess of 20% (BLM 1999).

The major streams in the Mule Creek HUC 6 sub-watershed are West Fork Mule Creek, Arrastra Fork Mule Creek, North Fork Mule Creek, and the mainstem Mule Creek. These are 3<sup>rd</sup> order to 6<sup>th</sup> order stream channels, and generally contain some fish habitat in the lower reaches (See Appendix 2 regarding the presence of managed fish habitat and species). The mainstem reaches of these streams total approximately 34 of the 315 miles of perennial and intermittent stream channels within this sub-watershed. Approximately 81% of the stream miles in this sub-watershed are first and second order tributary streams. Substrate within these channels is primarily bedrock and boulder dominated with high to moderate levels of active streamside erosion.

Stream surveys completed for this project indicate that water quality and aquatic habitat in streams within harvest units in this Planning Area are in good condition. Tributary streams within this Planning Area are generally steep, narrow, and confined, with low or no flow by late summer. During the winter months flows within these streams typically becomes fast moving and scouring. Channel roughness in the upper reaches of all streams within this HUC 6 sub-watershed is generally high. Though many riparian areas in the Mini Mule Planning Area are dominated by smaller diameter stands of Douglas-fir and hardwoods, and are lacking large wood debris, downed logs, and large tree structure, most riparian areas have sufficient streamside vegetation in the form of brush, ground cover, and riparian hardwoods to protect water quality. Data from surveys are available in the Glendale Resource Area files in the Fish/Hydrology work areas. The greatest factors reducing water quality within streams in this Planning Area are sediment from roads, tractor skid trails, and naturally unstable areas, that are hydrologically connected.

### **3.4.1.3 Soils and Soil Complexes**

This watershed is located within the Klamath Mountain Province. The Klamath Mountains were formed from Mesozoic-Jurassic geologic formations which are folded and faulted, and intruded by the collision of the North American and Farallon Plates. The level IV ecoregion for this project is the Coastal Siskiyou. This ecoregion is characterized by highly dissected mountains with high gradient streams. The surface and bedrock geology is generally Quaternary colluvium, Cretaceous and Jurassic

conglomerate, sandstone, and siltstone.

The Planning Area is within the Dothan Formation, which is composed of oceanic continental slope rocks of turbidite sands, silts, and muds (Orr et al 1992). The Dothan Formation has some areas where translational and rotational slides have occurred. In general these slides are related to mudstone and siltstone layers, not sandstone. Soils derived from metasedimentary rock within this formation tend to be deeper and have more nutrients, whereas the metavolcanic tend to be shallower, with fewer nutrients and a lower water holding capacity. Metasedimentary soils in this formation tend to be more developed, have a higher nutrient availability, and are generally relatively stable when dry.

The following describes some of the important characteristics and management limitations of the soils and soil complexes found within the Planning Area. The selection of proper Best Management Practices (BMPs) and Project Design Features (PDFs) that have been incorporated into the Proposed Action are based on these characteristics and management limitations.

Based on information obtained in the Soil Survey of Curry County, OR (1995), soil types found within proposed harvest units and adjacent to haul routes for the Mini Mule Project include the following.

**Table 3-3. Soil Types in the Mini Mule Project Area**

Soil Name	Parent Material	Landscape location & Aspect	Surface Soil Texture	Soil Texture at Depth	Depth to Bedrock (inches)	Soil drainage	soil permeability	Soil Water Holding Capacity	Identified Management Limitations **
Acker-Norling complex	meta-sedimentary rock	concave & convex areas 30-60% S	gravelly to very gravelly loam	gravelly clay loam & weathered mudstone	20-60	well drained	moderately slow	4" – 9"	1, 2, 3, 5, 6, 7
Atring-Kanid-Vermisa complex	meta-sedimentary rock	concave & convex areas, narrow shoulders & summits 30-60% S	very gravelly loam	weathered sandstone	20-60 10-20 on shoulder & summits	well drained-somewhat excessive on shoulders & summit	moderately rapid	1" – 4"	1 - 6
Bearcamp-Brandypeak complex	meta-sedimentary or meta-volcanic rock	concave & convex areas 0-30% N,S,E,W	very gravelly to very cobbly loam	meta-sedimentary rock	20-60	well drained	moderate	3" - 4"	1, 3, 6, 7, 8, 9
Bobsgarden-Rilea-Euchrand complex	meta-sedimentary or meta-volcanic rock	concave & convex areas, narrow shoulders & summits 30-60% cool S	gravelly to very gravelly loam	very gravelly loam, meta-sedimentary rock, and sandstone	20-60+ 10-20 on shoulder & summits	well drained	moderately slow	1" – 6"	1 - 9

Soil Name	Parent Material	Landscape location & Aspect	Surface Soil Texture	Soil Texture at Depth	Depth to Bedrock (inches)	Soil drainage	soil permeability	Soil Water Holding Capacity	Identified Management Limitations **
Bobsgarden-Rilea-Yorel complex	meta-sedimentary or meta-volcanic rock	concave & convex areas 0-30% cool N,S,E,W	gravelly to very gravelly loam	very gravelly loam, meta-sedimentary rock, and sandstone	20-60+	well drained	moderately slow	3" – 6"	1, 2, 3, 4, 6, 7, 8, 9
Digger-Preacher-Bohannon complex	sedimentary rock	concave & convex areas, footslopes 30-60% warm S	gravelly to very gravelly loam	weathered sandstone or loam	20-60+	well drained	moderate to moderately rapid	3" – 10"	1 - 7
Dumont-Acker-Kanid complex	mudstone and meta-sedimentary rock	concave & convex areas, gently sloped summits 0-30% N,S,E,W	gravelly to very gravelly loam	clay to gravelly clay loam, or weathered sandstone	40-60+	well drained	moderately slow to moderately rapid	4" – 15"	2, 3, 5, 6
Kanid-Acker-Atring complex	meta-sedimentary rock	concave & convex areas, footslopes 30-60% S	gravelly to very gravelly loam	gravelly clay loam or weathered sandstone	20-60+	well drained	moderately slow to moderately rapid	3" – 9"	1 - 7
Preacher-Blachly-Digger complex	sedimentary rock	concave & convex areas of summits, shoulders& knobs 0-30% N,S,E,W	silty clay to gravelly clay loam	Silty clay to gravelly clay loam, or weathered sandstone	20-60+	well drained	moderately slow to moderately rapid	3" – 10"	1, 2, 3, 4, 6, 7
Stackyards-Rilea-Yorel complex	meta-sedimentary or meta-volcanic rock	concave & convex areas, footslopes 30-60% N	gravelly to extremely gravelly loam	meta-sedimentary rock or sandstone	20-60	well drained	moderately slow	3" – 4"	1, 2, 3, 4, 6, 8, 9
Zelea-Pyrady-Yorel complex	meta-sedimentary, meta-volcanic rock, or mudstone	concave & convex areas of summits, shoulders& knobs 0-30% All	clay to gravelly clay loam	Siltstone, sandstone, or gravelly clay loam	20-60+	moderate to well drained	moderately slow to slow	4" – 9"	1, 2, 3, 4, 6, 8, 9

\*\* These management limitations were identified by Natural Resource Conservation Service (NRCS) based on the physical, chemical, and biological properties of the soil

**The below management limitations correspond to representative numbers in the above table**

- 1- Susceptibility of surface layer to water erosion    2- Susceptibility of surface layer to displacement and accelerated erosion  
3- Susceptibility of surface layer to compaction when wet    4- Slope stability    5- South aspects/Droughtiness in summer  
6- Low available water capacity    7- Shallow depth of soil in some areas    8- Duration of snow cover/short growing season  
9- Frost heave

**Table 3-4. Soils by Mini Mule Project Unit**

<b>Unit #</b>	<b>Soil Types</b>
<b>16-1</b>	Bobsgarden-Rilea-Euchrand complex- E (85%)/ Dumont-Acker-Kanid complex- W (15%)
<b>17-1</b>	Acker-Norling complex-S (50%)/ Bobsgarden-Rilea-Euchrand complex- N (50%)
<b>17-2</b>	Bobsgarden-Rilea-Euchrand complex- N (70%)/ Kanid-Acker-Atring complex- SW (25%)/ Acker-Norling complex- NE (5%)
<b>19-3</b>	Zelea-Pyrady-Yorel complex- E (60%)/ Atring-Kanid-Vermisa complex- W (40%)
<b>20-2</b>	Zelea-Pyrady-Yorel complex- W (90%)/ Acker-Norling complex- E (10%)
<b>20-3</b>	Kanid-Acker-Atring complex- SW (90%)/ Zelea-Pyrady-Yorel complex- NE (25%)
<b>20-4</b>	Atring-Kanid-Vermisa complex- E (95%)/ Kanid-Acker-Atring complex- W (5%)
<b>21-2</b>	Bobsgarden-Rilea-Yorel complex- N (50%)/ Digger-Preacher-Bohannon complex- S (50%)
<b>21-3</b>	Digger-Preacher-Bohannon complex- SE (60%)/ Zelea-Pyrady-Yorel complex- NW (25%)/ Bobsgarden-Rilea-Yorel complex- NE (10%)
<b>21-4</b>	Preacher-Blachly-Digger complex (100%)
<b>28-3</b>	Preacher-Blachly-Digger complex- S (90%)/ Zelea-Pyrady-Yorel complex- N (10%)
<b>29-1</b>	Preacher-Blachly-Digger complex- S (95%)/ Digger-Preacher-Bohannon complex- SE (5%)
<b>29-2</b>	Dumont-Acker-Kanid complex- N (95%)/ Preacher-Blachly-Digger complex- SE (5%)
<b>30-1</b>	Zelea-Pyrady-Yorel complex- E (60%)/ Acker-Norling complex- W (35%)/ Dumont-Acker-Kanid complex- SW (5%)
<b>30-2</b>	Dumont-Acker-Kanid complex- N (80%)/ Digger-Preacher-Bohannon complex- S (20%)
<b>30-4</b>	Dumont-Acker-Kanid complex- NE (80%)/ Acker-Norling complex- SW (20%)
<b>32-2</b>	Bearcamp-Brandypeak complex- S (80%)/ Bobsgarden-Rilea-Yorel complex- NW (10%)/ Stackyards-Rilea-Yorel complex- NE (10%)

**3.4.1.4 Fragile Soils**

Portions of the Mule Creek HUC 6 sub-watershed are classified as having fragile soils under the Timber Production Capability Classification (TPCC) Handbook (BLM 1986). Map 21 of the Wild Rogue Watershed Analysis (WA) displays areas withdrawn from timber harvest. Proposed Mini Mule Project units do not overlap withdrawn areas. Map 2 of the Wild Rogue WA identifies more widespread areas with ancient slump blocks and/or unstable areas that overlap the Planning Area. The Watershed Analysis notes there is not a field inventory of landslide sites in the watershed. As such, information is collected on a project basis to identify the specific areas where timber management is suitable (BLM 1999, pp.28). The TPCC classification layer, shown in Map 1 (p. 40 of the

EA) identifies “Commercial Forest Land-Suitable” soils in units proposed for this project. These soils require harvest or reforestation, techniques or timing to be altered, or protection measures to be implemented to be capable of meeting minimum stocking and to minimize productivity loss from erosion, mass wasting, nutrient loss, a reduction in moisture supplying capability, or a rise in water table (BLM 1986).

Within this Planning Area fragile classifications include Fragile-Slope Gradient-Suitable and Fragile-Groundwater-Suitable. Sites that are suitable for commercial harvest, but that are classified as fragile due to slope gradient are considered suitable for commercial harvest actions but have higher instances of debris type landslides and unacceptable levels of surface erosion if implemented without site specific PDFs. Sites that are suitable for commercial harvest, but that are classified as fragile due to groundwater contain water at or near the surface for sufficient durations to result in vegetative growth and survival affects. Without the application of specific protection measures, these sites can be prone to excessive soil displacement, compaction, and where hydrologically connected, stream sedimentation.

Additional TPCC classifications that overlap units in this Planning Area are framed around reforestation difficulties rather than impacts to the physical structure and stability of the soils. These include Reforestation-Temperature-Suitable, Reforestation-Moisture-Suitable, and Reforestation-Surface Rock-Suitable. Section 3.3.1 describes the specific limiting factors for each of these classifications. Since all harvest treatments under the Mini Mule Project are thinning actions, leave trees and natural reforestation would meet the minimum restocking guidelines under the NWFP, and tree planting on these sites would not be needed. “These sites will meet or exceed minimum stocking levels of commercial species within 5 years of harvest using operational practices,” (BLM 1986).

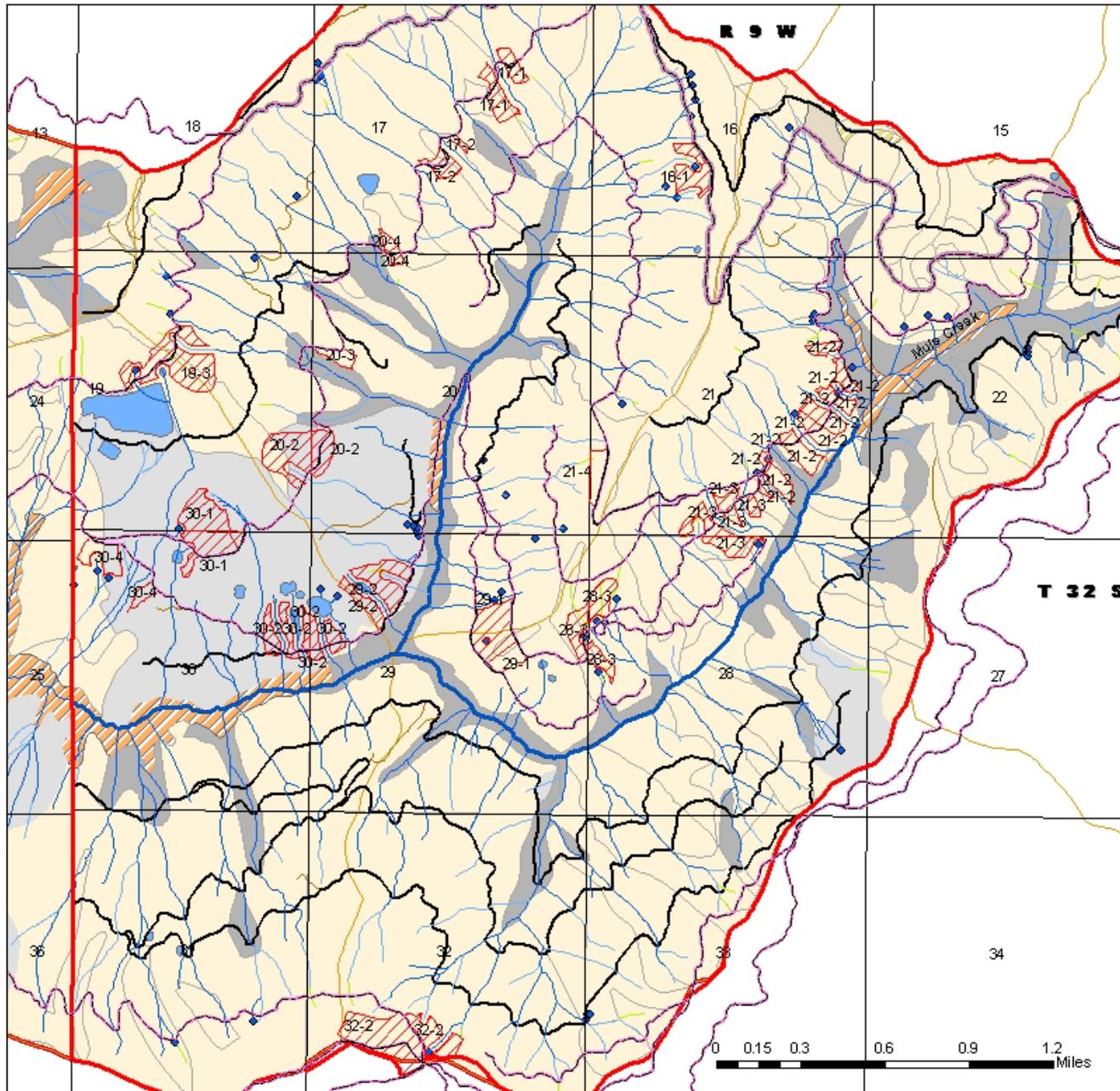
**Table 3-5. Timber Productivity Capacity Classification (TPCC) in the Mini Mule Project**

<b>Unit #</b>	<b>TPCC Classification</b>
16-1	Reforestation-Temperature-Suitable
17-1	Reforestation-Temperature-Suitable and Reforestation-Moisture-Suitable
17-2	Reforestation-Moisture-Suitable
19-3	Reforestation-Temperature-Suitable and Reforestation-Moisture-Suitable
20-2*	Fragile-Groundwater-Suitable, Reforestation-Temperature-Suitable, and Reforestation-Moisture-Suitable
20-3	Fragile-Slope Gradient-Suitable (In draw-Buffered out of unit) and Reforestation-Moisture-Suitable
20-4	Fragile-Slope Gradient-Suitable (In draw-Buffered out of unit) and Reforestation-Moisture-Suitable

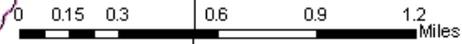
<b>Unit #</b>	<b>TPCC Classification</b>
21-2	Fragile-Slope Gradient-Suitable (In multiple draws-Buffered out of unit), Reforestation-Moisture-Suitable, and Reforestation-Temperature-Suitable
21-3	Reforestation-Temperature-Suitable and Reforestation-Moisture-Suitable
21-4	Reforestation-Temperature-Suitable
28-3	Reforestation-Temperature-Suitable and Reforestation-Moisture-Suitable
29-1	Reforestation-Temperature-Suitable and Reforestation-Surface Rock-Suitable
29-2*	Fragile-Groundwater-Suitable and Reforestation-Moisture-Suitable
30-1*	Fragile-Groundwater-Suitable and Reforestation-Temperature-Suitable
30-2*	Fragile-Groundwater-Suitable and Reforestation-Temperature-Suitable
30-4*	Fragile-Groundwater-Suitable and Reforestation-Temperature-Suitable
32-2	Reforestation-Moisture-Suitable

\* These units have been designed with special protection measures

**Map 1. Unit Proximity to Timber Classification Capability Classifications within Mini Mule Planning Area**



- Mini Mule Units**
- method**
- cable
  - tractor
  - Planning Area Boundary
- Streams and Wet Areas**
- planflow**
- Intermittent
  - Ephemeral
  - Perennial
  - Fish Streams
- Roads**
- SurfaceType**
- Aggregate
  - Bituminous
  - Grid Rolled
  - Hard Surface
  - Natural (Graded & Drained)
  - Natural Unimproved
  - Not Known
  - Pit Run
- Springs/Seeps
  - Wet Area
  - HUC 7 drainages
- Mini Mule\_TPCC Classifications**
- SYMBOL**
- Withdrawn-Fragile Soil
  - Fragile Gradient-Suitable
  - Fragile Gradient-Suitable
  - Fragile Groundwater-Suitable
  - Fragile Groundwater-Suitable
  - Non-Commercial- Low site
  - Non-Forest
  - Rockland
  - Lower Reforestation Moisture- Suitable
  - Lower Reforestation Moist/Rock- Suitable
  - Lower Reforestation Temp/Rock- Suitable
  - Withdrawn Reforestation
  - Lower Reforestation Temp- Suitable



### 3.4.1.5 Soil Erosion and Stream Sedimentation

Soil displacement refers to the moving of the surface soils as a result of some applied force. When soil displacement occurs soil horizons may become mixed, essential soil nutrients, water, and soil organisms may be rearranged or removed, and topsoil may become rutted. These alterations to the soil profile or soil characteristics may result in accelerated erosion. Soil compaction is the packing together of soil particles by physical pressure at the soil surface that results in an increase in soil density and a decrease in pore space. A decrease in soil pore space results in restricted movement of water, nutrients, air, and plant roots, and as such generally decreases site productivity in most soil types. Reduced pore space also reduces infiltration, causing an increase in surface runoff that can result in accelerated erosion rates.

Soil displacement and compaction can occur during forest management activities when mechanized harvesting or yarding equipment drives over or yards timber across poorly vegetated, bare, or wet soils. Where logging or prescribed burning operations result in exposed soil, surface erosion can occur when rain splash or overland flow causes the detachment of soil particles during wet conditions, or when gravitational and wind movement causes detachment of particles during dry weather conditions. Vegetative cover reduces the particle detachment rate, and through the binding capacity of root masses, the sediment transport rate (NOAA Fisheries, 2004, (Larson and Sidle, 1981; Harvey et al. 1994)). Therefore surface erosion, from disturbed soils that are not compacted, is normally greatly diminished within 3-5 years, following the regrowth of vegetation.

Erosion can also occur as a result of the blading of road surfaces, the use of inadequately rocked and natural surface roads, wet weather road haul, ditchline maintenance, an insufficient number of road cross drain culverts, undersized or poorly placed cross drain culverts, and in areas of exposed soil such as yarding corridors, skid trails, landings, and road construction sites. Poorly located roads can cause increased channelization of hillslopes and mass wasting (Wemple and Jones, 2003). Where hydrologically connected, un-vegetated ditchlines, road surfaces, and cross drains all mobilize eroded soils to streams.

Based on field surveys, historic aerial photos (circa 1965), and current satellite imagery (2009), the three HUC 7 watersheds in the Mini Mule Planning Area currently have compaction and accelerated surface erosion as a result of timber management, and the preserving of public access routes.

- Roads  
Currently water quality within this HUC 6 sub-watershed has been altered by past timber management and road construction activities. Roads in close proximity to streams, un-maintained or poorly maintained roads, native surface roads used for winter haul, and roads open to year round for public motor vehicle use are the major ongoing sediment sources in this sub-watershed (BLM 1999). Roads constructed within riparian zones along streams contribute sediment to the adjacent stream,

reduce riparian habitat quality, and remove potential sources of large woody debris from streams. Un-vegetated ditchlines, road surfaces, and cross drains can all transport sediment. Oregon Department of Forestry (ODF) monitoring data shows approximately one-third of private and state roads deliver sediment to streams via ditchlines, especially when used during winter hauling operations. A number of issues were identified by ODF and DEQ to be contributing to the problem of sediment delivery to streams from these roads including; a lack of filtering prior to road drainage entering streams; too wide of spacing between, or poor placement of cross drainage structures; and a “lack of rules that specifically address minimizing turbidity caused by wet-weather hauling” (ODF/DEQ, 2002). Approximately 10% of roads in this Planning Area are Bituminous Surface Treatment (BST) surfaced. Rocked roads account for approximately 83% of the roads, and when used for wet condition haul, are generally upgraded where needed to provide adequate surfacing to prevent excessive erosion and road damage. Unless upgraded, rocked and natural surface roads on hydrologically connected BLM lands are only used for log hauling during dry conditions.

Road densities within this HUC 6 sub-watershed are 2.8 mi/mi<sup>2</sup>. This is currently just below the 3 mi/mi<sup>2</sup> considered to be not functioning properly by the National Marine Fisheries Service (NMFS) (USFWS/NOAA Fisheries Table of Population and Habitat Indicators, USDA et al. 2004b). The NMFS target established for proper functioning condition is 2 mi/mi<sup>2</sup>, which makes the classification for this element of the watershed “functioning, at risk”. Approximately 7% of the roads within the Mule Creek HUC 6 sub-watershed are unsurfaced. These roads are generally the largest sediment sources, especially if they are open to year round public motor vehicle use. Within the Rogue River-Horseshoe Bend HUC 5 watershed, 14% of all streams are within one tree length of a road (BLM 1999).

Within the Planning Area, there are approximately 56 miles of rocked and natural surface system roads that are currently used and maintained as needed. About 7% of the roads in this Planning Area are unsurfaced. These roads are open to the public and are periodically used and maintained as haul routes for forest management operations. All hydrologically connected roads contribute to accelerated erosion and stream sedimentation within the watershed at different levels depending on the surface type, type of use, location, maintenance frequency, and moisture levels of the road surface during use. The federal government limits its use of rocked and natural surface roads to dry conditions to reduce erosion and protect road surface integrity. A majority of roads within the Planning Area are hydrologically connected to streams through tributary stream crossings. There are approximately 72 perennial and 30 intermittent stream crossings along rocked haul routes within this Planning Area. Of these stream crossings, approximately 98% cross first and second order headwater streams.

In addition to the standard maintenance of ditchlines and running surfaces implemented on the 56 miles of rocked and surface roads, ditchline maintenance on BST (bituminous surface type) and paved roads currently occurs as needed on

another approximately 6 miles of road within the Planning Area. Ditchline maintenance includes the removal of debris and vegetation where it is impeding water flow, and the digging out or “pulling” of ditchlines where they are lacking the ability to carry the volume of water that is entering them without spilling out across the road surface. This maintenance results in an increase in erosion within ditchlines for the first season until protective vegetation re-grows and bare soils regain stability. Where these ditchlines are hydrologically connected to streams, ditchline maintenance can result in chronic sediment delivery to streams through the first winter, unless Best Management Practices require a sediment filter to be in place prior to stream culverts. Following the first season, ditchline maintenance results in an overall reduction in chronic erosion of the road surface and where hydrologically connected, subsequent stream sedimentation. Proper cross drain spacing and vegetated ditchlines can greatly reduce the amount of sediment that enters streams as a result of roads. In this sub-watershed, cross drain spacing is generally adequate except during high flow events. Ditchlines are only “pulled” as necessary to protect road integrity. As a result most ditchlines in this sub-watershed have sufficient vegetation within the ditchlines to slow erosion and filter a portion of the sediment.

Cross drain culverts on road systems in the Planning Area are generally spaced further apart than recommended under the Oregon Administrative Rules for forest roads (OAR 629-625-0330). However, upgrading this spacing is only necessary to prevent exceeding water quality standards. Roads proposed for haul and maintenance have been inventoried and currently are not in need of additional cross drains to prevent accelerated erosion or exceeding water quality standards. For the most part, ditchlines appear to be functioning properly, having adequate movement of water, and little scour. In isolated areas where ditchlines are not properly functioning, the pulling of the ditch would be adequate to correct these problems. Downspouts of some cross drains and stream culverts could be upgraded by installing splash pads or downspouts to reduce existing stream draw erosion.

- Skid Trails, Landings, and Yarding Corridors

It was calculated that approximately 244 acres (3.4%) within this Planning Area have had soil compaction and displacement that has led to subsequent erosion as a result of the construction and use of landings, skid trails, and yarding corridors during timber management operations within the past 44 years<sup>3</sup>. Many of these

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<sup>3</sup> Medford Change Detection (2002), 1965 aerial photography, and 2009 satellite imagery was used to estimate units that have been harvested in the past 44 years. Though this does not account for all potentially affected soils, it is the extent of the data that is presently available. This lack of data is not considered to be a measurable source of error since compaction recovers naturally over time, and it is expected that those soils that may have been unaccounted for during this analysis (as a result having been harvested prior to the first available year of data) would be in an advanced stage of recovery. This is based on average natural recovery for the soil types, climate, and elevation of this watershed, and on the skid trail conditions observed during field visits to units within these drainages that are known to have been harvested 30-50 years ago. Yarding systems were identified based on known data, visible landscape scar patterns, or slope steepness. Tractor yarding on slopes over 35% has not been permitted on federal lands since the implementation of the Northwest Forest Plan in 1994. Units identified as having been tractor yarded prior to NWFP BMPs are calculated at 25% compaction, and at 12% following the implementation of the NWFP. All cable yarded units are calculated at 7% compaction. These compaction percentages are based on research by Adams and Froehlich, 1981, Dryness, 1967, and Clayton, 1981.

disturbed acres are no longer visible on the ground and appear to have recovered as a result of the re-growth of vegetation. Within previously harvested units in the Planning Area, evidence of past compaction is still present along tractor skid trails, and within stream channels intersected or bordered by these trails. Where poorly rehabilitated skid trails, landings, and yarding corridors are hydrologically connected to the streams through road systems, or are adjacent to streams that have little or no riparian buffer, these areas have become sources of stream sediment that are contributing to the current aquatic conditions discussed above. By adding together the acres of existing skid trail compaction that is still visible on the ground, or known to have occurred in the past 44 years, with the known acres of soil displacement and disturbance that has occurred over the past 10 years as a result of landings and yarding corridors it was determined that up to 207 acres (2.9%) may still be compacted or lacking protective vegetation, and as such may still be exhibiting accelerated erosion within this Planning Area. At the HUC 6 scale, it is estimated that accelerated erosion is still evident on 324 acres (1.7%) within the Mule Creek sub-watershed.

- Wildfire and Prescribed Fuels Reduction

There are approximately 845 acres of hazardous fuel reduction treatments that have occurred in the past five years within the Mule Creek HUC 6 sub-watershed. These treatments were designed to limit the extent and magnitude of onsite erosion (retained within the vegetation of each unit and would not be transported to streams), and to protect from offsite erosion. These treatments help to reduce the probability of an intense, large scale wildfire occurring by reducing fuel loading and horizontal continuity within the stand.

Heat resulting from large scale and intense fires can damage soil biology such as mycorrhizae, nitrifying bacteria, and other soil organisms in proportion to burn intensity, adversely affecting soils for up to 10 years (Barnett, 1989). GIS data indicates that there have been two fires within this Planning Area in the last 10 years. One fire was a Class A fire less than 0.1 acres in size. The other was the 2005 Blossom Fire. This was a class F fire that burned over 14,800 acres, 90 acres of which burned within this Planning Area.

The extent of offsite erosion from the small fire, though expected to be negligible, has not been measured. Water quality monitoring has been conducted for the last 4 years at 4 sites within Mule Creek to evaluate the effects of constructed firelines and burned areas from the 2005 Blossom Fire. Parameters monitored include temperature, turbidity, dissolved oxygen, conductivity, and pH. Though data has not been collected long enough to develop a trend analysis, initial evaluation of the data, based on long term monitoring at the mouth of Mule Creek downstream, indicates that there has been no statistical variations for any of the parameters monitored.

The Blossom Fire burned with mixed severity within the Mule Creek HUC 6 sub-watershed. In areas of low burn intensity it would be expected that the reduction in understory vegetation is improving stand productivity, and that erosion rates have

generally returned to pre-burn conditions with the regrowth of ground vegetation and brush. On the approximately 200 acres of high intensity burn sites, ground litter, understory vegetation, and overstory canopy closure losses have increased water availability and surface runoff, and reduced surface layer protection resulting in increased erosion rates. Areas where canopy closure is absent would also be experiencing increased erosion as a result of rainsplash detachment of soil particles, and surface runoff resulting from rain on snow events. In areas of moderate burn severity, erosion rates would be expected to be recovered due to the regrowth of vegetation.

Approximately 8 miles of dozer firelines constructed within this sub-watershed during the Blossom Fire were rehabilitated through subsoiling, water-barring, placement of slash, and planting of conifers, which is greatly reducing the amount of surface erosion and compaction on these lines. A majority of the bare soils along these firelines now have adequate ground cover to protect soils from excessive erosion.

- Existing Condition of Proposed Units

Within proposed units, evidence of past logging operations is still present on the ground. In units proposed for both cable and ground based harvest, skid trail compaction is common and presently extends through riparian areas and across small stream channels. Wet areas have developed or expanded in areas where subsurface flows have been restricted or rerouted as a result of skid trail compaction. In areas directly downslope of where skid trails cross small stream draws, streams show evidence of past erosion that has resulted in streambed downcutting. As evidenced by the moderate to deeply cut stream draws and stream side draw instability that can be viewed without leaving many of the roads within this watershed, soils within this Planning Area are prone to surface water erosion. Though these conditions do occur as part of naturally occurring events, it is not unexpected that past harvesting practices that created extensive compaction have resulted in increased surface water and altered stream channels. Though active erosion still appears to be ongoing in small streams within proposed Mini Mule Project units, widespread instances of excessive erosion that would result in widespread impacts to aquatic habitat or macroinvertebrates is not currently taking place. An onsite evaluation of current conditions within proposed units indicates that subsoiling of skid trails would assist in stream channel and subsurface flow pattern recovery.

Table 3-6 notes conditions in units necessitating substantial changes for unit proposals found during field review. Where BMPs or PDFs were able to provide acceptable solutions to ensure water flows, water quality, and soils stability could be protected units remained as proposed. Where BMPs and PDFs could not provide adequate protection, units were deferred or altered to ensure water flows, water quality, and soils stability could be maintained or improved as a result of this project.

**Table 3-6. Major Unit Changes Based on Field Surveys**

<b>Unit #</b>	<b>In Unit Channel Stability Rating</b>	<b>Conditions Unique to Unit</b>	<b>Actions Taken During Planning</b>
16-1	Fair	lower portion of unit-extensive water	unit size decreased-Lower portion of unit deferred
17-1	Fair/Good-east stream & Poor-west stream*	instability found within northern draw	unit split into 2 parts excluding entire draw- Deferred northern portion of unit
17-2	Fair	100% slopes found in SW corner within draw	unit size decreased-Deferred western portion of unit & SW corner
19-3	Fair/Good	Blossom Fireline splits southern portion of unit	BMPs <sup>4</sup> requiring reconnection of existing waterbars, and winterization following actions
20-2	Good	unit located on fragile for groundwater- restricted not withdrawn	specific BMPs required during implementation
20-3	*Poor	slumps found along west stream in draw	unit reduced to approx. 1/3 original size- deferring entire western portion of unit and excluding entire draw
20-4	*Poor	slumps found in lower portion of stream draw in southern portion of unit	unit size reduced- All except NE corner of unit deferred, all draws excluded from unit
21-2	*Fair	fragile soils due to gradient mapped within two of six draws in unit	unit split into 5 parts excluding all major draws and fragile soils from harvest
21-3	*Poor	skid roads through draws have resulted in high active erosion within draws and stream downcutting	unit size reduced & split into 3 parts excluding draw areas. Operational skid trails within 1 tree length of streams would be subsoiled to improve subsurface water flow
21-4	N/A	none	none
28-3	Fair	extensive seeps and springs found during ground truthing	unit size reduced by approx. 1/2- SE portion of unit deferred to exclude draws and wet areas
29-1	*Fair	none	none
29-2	*Good	large spring fed wet area identified- Unit located on fragile for groundwater ,restricted not withdrawn	unit size reduced, westerner portion of unit deferred- Specific BMPs required during implementation of remaining acres

\*stream and stream draw excluded entirely from unit

<sup>4</sup> Best Management Practices are incorporated into the Proposed Action (Section 2.2.1) and Standard Operating Practices (Appendix 10).

Unit #	In Unit Channel Stability Rating	Conditions Unique to Unit	Actions Taken During Planning
30-1	Good	large wet area found in southern portion of unit- Unit located on fragile for groundwater, restricted not withdrawn	southern portion of unit deferred- Specific BMPs required during implementation of remaining acres
30-2	Good	Multiple wet areas located- Unit located on fragile for groundwater, restricted not withdrawn	Unit size reduced and unit split into 4 small parts to avoid wet draw areas- Specific BMPs required during implementation of remaining acres
30-4	*Poor – center streams & Fair- west stream	Multiple wet areas and small draw slumps located in center and south portion of unit- Unit located on fragile for groundwater, restricted not withdrawn	South and center portion of unit deferred- Unit approx 1/3 original size and split into 2 parts excluding center draw areas- Specific BMPs required during implementation of remaining acres
32-2	Good	None	None

Table 3-6 is not an all inclusive list of unit characteristics or features located during ground truthing. It is intended to portray unique situations or where major changes were made to unit boundaries as a result of on the ground findings related to hydrologic or soil concerns.

### 3.4.2 Environmental Effects on Water Resources and Erosion

#### 3.4.2.1 Alternative 1 (No Action) - Direct and Indirect Effects on Water Resources and Erosion

Under Alternative 1, soil and water resources within this Planning Area would not be impacted by actions associated with this analysis. Any landscape alterations that have caused alterations to the physical, chemical, and biological properties of the soils would remain in their present condition. In the case of compacted acres that are not associated with actively maintained road systems within the Mule Creek HUC 6 sub-watershed, soil impacts would continue to improve slowly over time as tree roots and other natural processes begin to break apart soil particles, eventually resulting in a reduction in compaction on these acres. Watershed processes, such as runoff timing and subsurface flow patterns affected by existing compaction, would also slowly improve. These acres would likely reestablish full hydrologic and soil functions within 40-80 years, depending on the year the impact occurred (Wert and Thomas, 1981).

On sites currently experiencing natural and accelerated rates of erosion within this sub-watershed, erosion would be expected to continue to actively erode stream channels at present rates. Perched culverts within draws combined with naturally erosive soils will continue to result in stream draw erosion during high flow events. As funding is available for installing downspouts, splash pads, or reinstalling culverts, these problems will be corrected during annual road maintenance actions. Currently, there does not appear to be any substantial areas of accelerated erosion outside draw areas that would be outside the range of natural variability for this sub-watershed.

Road related impacts to soils and hydrologic processes within this sub-watershed would be expected to remain unchanged. Periodic use of these road systems for access to public lands would be expected to continue by both government employees and the public. Stream sedimentation associated with this road use would continue to occur at current rates on frequently maintained roads, and would slowly increase where road maintenance is irregular due to funding constraints. Since the RRHB HUC 5 watershed is 99.8% federal lands, timber hauling actions on these road systems would be predominately associated with federal harvest, and as such the effects of this type of use would be analyzed in appropriate planning documents. Currently, aquatic habitat and streambed condition in this sub-watershed are rated a properly functioning relative to their natural potential with the exception of the tributary and mainstem reaches of upper Mule Creek. These reaches have been impacted by high road densities and past harvest practices. All major tributary and mainstem streams within this sub-watershed are still currently rated as functioning at risk to properly functioning for all aquatic habitat rating components, except within the East Fork Mule Creek where the road density and location component is rated as not properly functioning for aquatic habitat (BLM 1999).

Within the Mule Creek HUC 6 sub-watershed there are several projects that would still take place independent of this decision that would affect localized soil conditions, water resources, or water quality. These projects include: maintenance to the Anaktuvuk Helipond and Bobby Pond, analyzed under separate Categorical Exclusions (CEs); a Secure Rural Schools Act Title II culvert replacement project on BLM roads 32-8-31 and 32-9-14.2, analyzed in the 2009 Medford District Road and Recreation Maintenance CE; and the activities analyzed in the Anaktuvuk Thin EA. There are also 61 acres of ongoing hazardous fuels reduction treatments that would continue to occur in this sub-watershed, independent of this EA, analyzed in the Kelsey Whisky Final Landscape Management Plan Amendments and Final Environmental Impact Statement (EIS). Fuels reduction treatments would result in minor increases in onsite soil erosion that will be retained within the vegetation of each unit. PDFs and BMPs will be implemented to protect water quality and quantity, and to keep soil impacts within Medford RMP standards. These actions would not result in measurable impacts to water resources, or exceed water quality standards under the Clean Water Act.

Actions with the potential to result in offsite erosion or impacts to water quality, such as non-federal timber harvest and road building, would be expected to be minimal due to the limited number of non-federal lands within this sub-watershed.

#### **3.4.2.2 Alternative 2 (Proposed Action) - Direct and Indirect Effects on Water Resources and Erosion**

The analysis for direct and indirect impacts for the Mini Mule Project was done using the Planning Area scale because the impacts to water quality and erosion would be site specific and localized within 25 ft of haul routes and unit boundaries. Providing an analysis at the larger HUC 6 scale would remove all measurable impacts, and eliminate any meaningful discussion of the effects.

Management actions proposed under Alternative 2 would result in soil displacement and erosion in the Mule Creek HUC 6 sub-watershed. Field surveys were used to identify and defer all areas that have the potential to result in chronic erosion, excessive soil displacement, or landslide. BMPs and PDFs were then identified and incorporated into the Mini Mule Proposed Action to address the remaining general management concerns identified for each soil type in this sub-watershed. Following incorporation of these BMPs and PDFs, offsite erosion and stream sedimentation would only occur during hauling and maintenance activities on roads that are hydrologically connected to streams. Road maintenance and timber haul on existing roads proposed under Alternative 2 would result in localized stream sedimentation in areas where accelerated erosion would not remain onsite due to ditchline transport and stream crossings. All other road use, skid trail construction and decommissioning, yarding operations, and slash burning proposed under this project, would be hydrologically disconnected using PDFs, BMPs, or Standard Operating Practices (SOPs), ensuring the protection of all water resources. Critical environmental elements not affected by this project are addressed within Appendix 2 of the EA.

#### Roads: Timber Haul and Maintenance

A total of 25.6 miles of roads would be maintained and used for haul in the Mini Mule Project. Approximately, 22.6 miles of these roads would be used for timber hauling within the Planning Area. Of these, approximately 16.8 miles are rocked, and would receive road surface and ditchline maintenance as necessary to protect the integrity and drainage of the roads during use. The remaining 5.8 miles of roads in this Planning Area are BST surfaced (paved), and would not receive any scheduled road or ditchline maintenance. Natural surface roads would not be used for haul in this project. The proposed haul and road maintenance on rocked roads would contribute to accelerated erosion within this sub-watershed at different levels depending on the moisture levels of the road surface during haul, and the type of maintenance applied. All roads would be maintained as necessary to prevent road damage, excessive erosion, or exceeding State turbidity standards for water quality.

Hauling and maintenance activities would also occur on the mainline Marial road (32-9-14.2) as part of this project. This road is located outside the Planning Area and would be used to access Unit 32-2. The rocked portion of this road totals 3.0 miles and is located in the Kelsey Creek and Missouri Creek-Rogue River HUC 6 sub-watersheds. The Marial road receives regular standard maintenance as it is the main access to the BLM Rogue River Ranch (Marial) and a regularly used river access point for the Wild and Scenic portion of the Rogue River. As such, surface conditions on this road are generally very good.

All but 1.5 miles of roads in this Planning Area are hydrologically connected to streams. Where these hydrologically connected roads cross intermittent or perennial stream channels, maintenance and hauling activities would result in localized instances of offsite erosion. There are approximately 72 perennial and 30 intermittent stream crossings located across this Planning Area. Maintenance activities on these roads would include

periodic instances of roadside brushing, spot rocking, culvert cleaning, surface blading and shaping, and ditchline maintenance. All hauling and maintenance actions would occur during dry conditions only. This restriction would considerably reduce the amount of erosion that would occur during hauling and maintenance activities on hydrologically connected roads.

In addition to general blading, spot rocking, culvert cleaning, and ditchline maintenance activities that would take place, roadside daylighting maintenance would occur where a road overlaps a thinning unit. There is a total of 3.9 miles proposed for roadside daylighting on 11 road segments within this Planning Area. All roadside daylighting maintenance would occur outside of stream EPZs. This activity would result in an increase in periodic instances of upslope erosion within this sub-watershed on up to 21.1 acres, instead of the 15.4 acres that would be periodically affected during typical roadside brushing maintenance. This erosion would remain onsite within the hillslope vegetation, and would only result in an impact to water quality where roadside ditches connect cutbank actions to streams. The Proposed Action includes BMPs that would minimize impacts to water quality and sediment input would not exceed other road maintenance and hauling actions.

All haul roads for the Mini Mule Project have rock or BST surfacing, and all hauling and maintenance on these roads would be restricted to dry conditions. As such, sediment entering stream channels at crossing locations on haul roads would not be of a magnitude to result in a visible increase in stream turbidity, or a measurable increase in the overall stream sediment deposition for more than 25 ft downstream within any stream channels. Any sediment entering streams would be redistributed and immeasurable within all reaches of the channel following the first bankfull event of the winter season. Hauling and road maintenance activities would therefore not exceed State of Oregon water quality standards and would not result in any measurable effects on macroinvertebrate communities or aquatic habitat. This action is also consistent with the standards and guidelines set forth under the 1994 Medford RMP EIS. Although the Proposed Action on BLM land would create a small localized effect to water quality, within 25 ft of haul roads, these sediment inputs are not of a magnitude or close enough in proximity to one another to become detectable at the Planning Area or larger scale.

#### Timber Harvest: Yarding Corridors, Skid Trails, and Landings

Timber harvest actions can remove ground litter and topsoil, cause displacement, and compact soils. Where logging operations result in exposed soil, surface erosion can occur when rain splash or overland flow causes the detachment of soil particles during wet conditions (sheet erosion), or when gravitational and wind movement causes detachment of particles during dry weather conditions (dry ravel). These processes typically result in soil being detached uniformly over the entire exposed area (NOAA Tech. Manual, 1996). Vegetative cover reduces the particle detachment rate, and through the binding capacity of root masses, the sediment transport rate (NOAA Tech. Manual, 1996, Larson and Sidle, 1981; Harvey et al. 1994). Therefore surface erosion, from disturbed soils that are not compacted, is normally greatly diminished within 3-5 years, following the re-growth

of vegetation. Where soils are compacted, subsurface flow patterns and water infiltration rates are impacted, often resulting in increased surface flows. Where subsurface flows are forced to the surface and contained in low areas on the landscape, new wetlands or seeps can form upslope of compaction. Where increased surface water is confined to the compacted area on slopes, increased runoff often results in gullying and rilling in the unit. If not physically decompacted, compaction of the type of soils found in this watershed can persist on the ground for 50-80 years before natural processes are successful in alleviating the impacts (Wert and Thomas, 1981). Management techniques for this project would be implemented to greatly reduce the amount of compaction and erosion that would occur as a result of timber management. Soils protected by litter are also less prone to erosion (SOLO, 2006; Rothacher and Lopushinsky 1974). Therefore, by limiting the amount of surface disturbance and the amount of exposed soil, surface erosion can be reduced.

Under Alternative 2, the construction and use of landings, skid trails, and whole tree and cable yarding corridors would result in up to 27.1 acres of compaction and up to 39.6 acres of accelerated on-site erosion within this Planning Area. There are a total of 286 acres within 17 harvest units that would be thinned under Alternative 2.

Of these units, portions of 5 units occur on soils that have been identified under the Timber Production Capability Classification (TPCC) as needing project design features during harvesting actions (see Section 3.4.1.4 Fragile soils). Fragile classifications in this Planning Area include Fragile-Slope Gradient-Suitable and Fragile-Groundwater-Suitable. Sites that are suitable for commercial harvest, but are classified as fragile due to slope gradient have been deferred from harvest under this action. These sites are considered suitable for commercial harvest actions but have higher instances of debris type landslides and unacceptable levels of surface erosion. Sites that are suitable for commercial harvest, but are classified as fragile due to groundwater would be thinned under the Mini Mule Project using special protection measures (Section 2.3.2.2). Specifically, thinning 87 acres in units 20-2, 29-2, 30-1, 30-2, and 30-4 would have the following restrictions due to high ground water levels:

- logging operations would be limited to the dry season (May 15-Oct 15);
- tractor harvest would be limited to the use of existing skid trails; and
- operational skid trails determined to be blocking natural sub-surface or surface drainage would be subsoiled with a winged ripper and waterbarred to minimize erosion and soil displacement.

Use of these BMPs would minimize erosion and soil displacement. Following harvest activities, subsoiling on existing skid trails would allow for the reestablishment of a hydrologic connection for subsurface flows that are currently rerouted due to existing skid trail compaction. Reestablishing this connection would reduce existing instances of accelerated surface and streambed erosion.

Sites classified as Fragile-Groundwater-Suitable contain water at or near the surface for sufficient durations to affect vegetative growth and survival. Application of these specific protection measures would minimize soil displacement, compaction, and where

hydrologically connected, stream sedimentation that could otherwise be prone at these sites.

There are a total of 14 units that would use skid trails and cable yarding corridors within Riparian Reserves. Of these, 4 units would be implemented with the specific protection measures, discussed above. There is one other unit that would need yarding corridors to be located in a Riparian Reserve. This unit is in an area of TPCC restricted soils, and would also be implemented with the seasonal protection measures discussed above. Within Riparian Reserves, approximately 101 acres would be thinned outside the EPZ, leaving a canopy closure of 50%. In addition, up to 24 landing expansions could occur in Riparian Reserves in conjunction with continuous landings on roads. Expansion of these landings would not remove ground level vegetation, or result in detrimental soil compaction. To protect streams and wet areas in and adjacent to units proposed for riparian thinning, there would be no landings, skid trails, or yarding corridors constructed in the Ecological Protection Zone (EPZ) portion of the Riparian Reserve. This would provide protection for all components of water quality, as the EPZ is designed to filter out any accelerated erosion from upslope practices that are implemented using Project Design Features (PDFs) and BMPs (see discussion of Riparian Thinning and EPZs in Section 2.2.1).

Riparian Reserves within the proposed units are dominated by smaller diameter stands of Douglas-fir and some hardwoods. Most riparian stands are lacking large wood debris, downed logs, and large tree structure. Thinning of dense Riparian Reserves would reduce competition on the retained trees for light, nutrients, water and growing space, allowing trees would develop larger canopies, display better vigor and put on diameter growth faster than if left untreated. Canopy closure per stream would average 50% after the treatment. Production of wood volume is a by-product of this treatment, not a primary objective. These treatments would be specifically designed to promote the development of future large woody debris and multi-story canopies. Despite minor increases in soil disturbance during yarding operations, treatments would improve the overall riparian quality in approximately 20-30 years.

Units 20-3 and 21-4 occur completely in the uplands and do not occur on TPCC limited soils. These units have no streams, springs, seeps, or water sources identified during on the ground surveys. As with all units harvested under this project, these units would be impacted by an increase in onsite erosion that could lead to reductions in productivity (discussed in Section 3.3.2.2).

In addition to the specific PDFs/BMPs, discussed above, for implementation on TPCC restricted soils, the amount of onsite erosion within all proposed thinning units would be measurably reduced, and kept within the guidelines of the NWFP and Medford RMP through the use of project wide PDFs and SOPs. These protection measures are designed to reduce the magnitude and total amount of ground disturbance during timber management activities. One of the management practices to be employed on this project is limiting the amount of compaction within a unit to less than 12%, and the amount of combined soil productivity loss from compaction and disturbance to less than 5%. This

would reduce the total amount of ground that would experience topsoil loss or detrimental disturbance to less than 15% of the unit, thus minimizing the initial source of erosion from timber harvest activities. Timber yarding would be required to be done using a minimum of partial suspension, limiting the magnitude of the yarding impacts. Furthermore, skid trail construction, timber yarding, and landing construction would all be limited to dry conditions. This would increase the resistance of the soils to disturbance, compaction, and erosion. It would also limit the movement of detached soil particles, allowing them to become trapped within the existing ground cover of the thinning unit instead of entering streams, springs, and seeps.

BMPs would additionally be employed as necessary during timber harvest activities to provide further protection of water resources including streams, springs, and seeps from upslope erosion. For instance, all yarding corridors that are constructed upslope of, or in Riparian Reserves, or upslope of hydrologically connected roads, would be waterbarred prior to rain events. These waterbars would filter surface water runoff from yarding corridors away from stream EPZs and hydrologically connected road ditchlines, and into vegetation that is adequate to slow surface water and allow for deposition of detached soil particles. Silt fencing or other sediment control measures would be in place where hydrologically connected landings are in use during dry conditions of the wet season (October through May) that have the potential to transport erosion and result in stream sedimentation. These PDFs and BMPs would reduce erosion and break the hydrologic connection, keeping erosion from upslope activities onsite, and preventing stream sedimentation during and following implementation of these activities. Accelerated onsite erosion from landings, skid trails, and whole tree yarding corridors would not be expected to be measurable beyond the third year following the implementation of this action due to the considerable amount of remaining ground cover vegetation that would still be present in each unit.

#### Activity Fuels Treatments

The need for activity fuel treatments in the unit would be minimized due to whole tree yarding with tree tops attached. Following harvest, slash generated from whole-tree yarding would be piled and burned. Pile and burning would occur on the immediate downhill side of existing roads on up to 18 acres. All impacted acres would be within the existing roadway. To limit the extent and magnitude of onsite erosion, and to protect from offsite erosion, landing piles would be placed outside of EPZs and in locations that are not hydrologically connected to the ditchlines of roads. Due to the implementation of PDFs and the use of EPZs on all streams, any erosion from activity fuel treatments would remain onsite and would have no effect on water quality. Slash remaining in units after yarding may be lopped-and-scattered (See Section 2.3.2.4).

#### **3.4.2.3 Alternative 2 (Proposed Action) - Cumulative Effects on Water Quality and Erosion**

In compliance with the 1995 Medford RMP, a cumulative effects analysis for this project was completed at the HUC 6 sub-watershed scale. The 1995 RMP guidance to “minimize detrimental impacts on water and soil resources resulting from the cumulative impact of

land management activities within a watershed” is to delineate watersheds for cumulative effects analyses using natural drainage boundaries and third to fifth order drainages (approximately 500 to 10,000 acres),” (RMP, p.153). Cumulative effects should therefore be written using a watershed delineated boundary that, as defined by acreage and stream order in the 1995 RMP, at the HUC 7 or HUC 6 scale.

Aquatic Conservation Strategy (ACS) objectives, which are measured at the HUC 5 scale, are analyzed to ensure the Mini Mule Project would not cumulatively elevate effects occurring in this HUC 5 watershed to a level that would result in the degradation of aquatic and riparian habitat or species. However, if there are no detectable effects found to be occurring at the HUC 7 scale, then there would also be no detectable effects from this project on aquatic species at the HUC 6, and similarly if effects are not detectable at the HUC 6 scale they would also not be detectable at a larger HUC 5 scale.

#### Water Quality and Erosion

Past timber management, landing and road construction, and road maintenance and use are all contributing to soil disturbance and erosion within this sub-watershed. Harvest activities using BMPs or PDFs generally only result in onsite erosion. This is true with the exception of areas that were harvested prior to the implementation of the Northwest Forest Plan or in areas of non-federal harvest, where riparian buffers are absent or limited. In these instances, erosion from upslope activities may be hydrologically connected to streams and would contribute to offsite sedimentation of streams.

There are five projects that will be occurring in the Mini Mule Project Planning Area that will contribute to accelerated erosion or stream sedimentation. These projects include the Anaktuvuk Thin Timber Sale, Anaktuvuk Pond Maintenance, Bobby Pond maintenance, Kelsey Whisky hazardous fuels reduction, and a Secure Rural Schools Act Title II culvert replacement project.

The activities analyzed in the Anaktuvuk Project EA are located partially in the Mini Mule Planning Area. Projects under this EA will commercial thin approximately 180 acres in this sub-watershed using ground based and skyline yarding. There will be three hydrologically disconnected roads re-constructed over existing footprints to be decommissioned after harvest. Hauling will occur on 3.9 miles of roads within this sub-watershed. Of these, 2.8 miles is BST surfaced and 1.1 miles is rocked and natural surface. Rocked and natural surface roads would receive dry season maintenance as necessary to protect the integrity of the road and limit the amount of offsite erosion. Landing piles will be burned, and all other activity fuels will be lop-and-scattered within the unit as necessary.

Anaktuvuk Pond Maintenance entails the removal and replacement of spring box, removing sediment from the source spring, brushing around a spring and along the water pipeline, replacing and reburying existing damaged water pipeline, increasing the pond diameter, and inserting a new liner.

The Bobby Pond Maintenance will include draining of existing pond, relocating an outlet pipe, and replacing the liner.

The Kelsey Whisky hazardous fuels reduction project will implement handpile and burning on approximately 62 acres within this sub-watershed.

The Title II culvert replacement will occur on the 32-8-31.0 and 32-9-14.2 roads within this subwatershed. This project will replace and upgrade existing cross drain and small instream culverts along these roads.

- Roads

Past actions that resulted in road construction, maintenance, and use have contributed to localized areas of accelerated erosion, and where hydrologically connected stream sedimentation within the Mule Creek HUC 6 sub-watershed. Road densities of 2.8 mi/mi<sup>2</sup> are above the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) target of 2 mi/mi<sup>2</sup> for streams to be considered in properly functioning condition (BLM 1999), but are just below not properly functioning (3 mi/mi<sup>2</sup>). Currently there is approximately 85 miles of roads open for public and land management use in this sub-watershed. A majority of the roads in this sub-watershed are paved or rocked, and due to over 97% federal ownership, most roads are only used for hauling activities during dry road conditions. These two factors greatly reduce the amount of sediment that would result from road use.

Road Construction

Since there is no proposed road or temporary route construction for the Mini Mule Project, there would no increase in the road densities under this project.

The Anaktuvuk Timber Sale is the only federal project occurring within the Mini Mule HUC 6 subwatershed that would result in road construction and decommissioning. There will be three routes re-constructed under this project, totaling 0.43 miles. Reconstruction, use, and road decommissioning in this sub-watershed will result in an increase in erosion; but due to the lack of stream crossings, low slopes, and sufficient ground cover, sediment will remain onsite. The accelerated onsite erosion is expected to become undetectable within 3-5 years as the vegetation re-establishes. Since these routes would be subsoiled and winterized following use, none of these roads would cause any instability or long term impacts to this sub-watershed.

Timber Haul, Road Use, and Maintenance

Timber haul, road use, and road maintenance activities associated with past projects have caused an increase in erosion on all rocked and natural surfaced roads in this sub-watershed. Where these roads are hydrologically connected, road use and hauling has also resulted in increased sedimentation to streams. The magnitude of these effects is less than most watersheds on the Medford District due to lower road densities, a higher number of unroaded areas, and the predominately federal

ownership that restricts hauling to dry conditions and uses other BMPs to protect water quality during actions. Additionally over 90% of the roads in this sub-watershed are rocked or BST surfaced.

Combined, hauling and standard road maintenance would occur on 26.0 miles of roads within this sub-watershed. Of these, approximately 16.9 miles are rocked and 0.5 miles are natural surface. The approximately 0.5 miles of natural surfaced haul roads associated with the Anaktuvuk Thin Timber Sale are hydrologically disconnected from streams. All rocked and natural surface roads would receive road surface and ditchline maintenance as necessary to protect the integrity of the road surface and drainage during use, and to prevent excessive erosion and exceeding state turbidity standards for water quality. The remaining 8.6 miles of roads in this Planning Area are BST surfaced, and would not receive only scheduled road or ditchline maintenance. Proposed activities along rocked and natural surface roads would contribute to accelerated erosion within this sub-watershed at different levels depending on the moisture levels of the road surface during haul, and the type of maintenance needed. Though the Mini Mule Project and activities analyzed in the Anaktuvuk Project EA occur partially in the same sub-watershed, there is only one road that is not BST surfaced that would be used by both sales. This road is the 32-9-16.0. Approximately 0.4 miles of this road would be utilized by both sales. This is a rocked road and, as with the Mini Mule Project, will only be used for hauling during dry conditions, and would be maintained as needed to protect the road integrity and designed drainage patterns. Therefore the use of this road for these two sales would not exceed those impacts that which has been described for each sale individually.

Where hydrologically connected roads cross stream channels, in approximately 77 perennial and 33 intermittent locations, maintenance and hauling activities would result in localized instances of offsite erosion. Maintenance activities on these roads would include periodic instances of roadside brushing, spot rocking, culvert cleaning, surface blading and shaping, and ditchline maintenance. All hauling and maintenance actions would occur during dry conditions only. This restriction would considerably reduce the amount of erosion that would occur during hauling and maintenance activities on hydrologically connected roads.

In addition to standard maintenance activities on these roads, there would also be a total of 3.9 miles where roadside daylighting would be implemented on 11 road segments as part of the Mini Mule Project. All roadside daylighting maintenance would occur outside of stream EPZs where a road overlaps a thinning unit. Effects specific to the Mini Mule Project are described in Section 3.4.2.2.

Hauling and maintenance activities would also occur just outside the Mini Mule HUC 6 sub-watershed on the mainline Marial road as part of the Mini Mule Project. These actions would result in localized increases in erosion and water quality impacts within 25 feet of stream crossings. Effects specific to the Mini Mule Project are described in Section 3.4.2.2.

There is no other federal or non-federal road maintenance or hauling planned in the Mule Creek sub-watershed, beyond the Mini Mule Project and the activities analyzed in the Anaktuvuk Project EA. As described in the direct and indirect water and erosion effects analysis in the EA, sediment entering stream channels at crossing locations along haul roads would not be of a magnitude to result in a visible increase in stream turbidity, or a measurable increase in the overall stream sediment deposition for more than 25 feet downstream within any stream channels. Any sediment entering streams would be redistributed and immeasurable within all reaches of the channel following the first bankfull event of the winter season. Inputs of sediment from all projects combined would not be of the magnitude, or close enough in proximity to one another to become detectable at the Planning Area or larger scale. Hauling and road maintenance activities would not exceed State of Oregon water quality standards and would not result in any measurable effects on macroinvertebrates communities or aquatic habitat. This action is also consistent with the standards and guidelines set forth under the 1994 Medford RMP EIS.

Separate from this project, ditchline maintenance in this HUC 6 sub-watershed would only occur on federally maintained roads as scheduled under routine maintenance, or as necessary to ensure proper drainage. Where ditchlines are hydrologically connected to streams, ditchline maintenance can result in sediment delivery to streams through the first winter. Best Management Practices would require a sediment filter to be in place prior to stream culverts if ditchline maintenance would result in exceeding water quality standards, or cause an effect to fish habitat. Following the first season, ditchline maintenance results in an overall reduction in chronic erosion of the road surface and where hydrologically connected, subsequent stream sedimentation. Due to the implementation of BMPs and PDFs hauling and road maintenance activities would not exceed State of Oregon water quality standards and would not result in any measurable effects on macroinvertebrates or aquatic habitat.

Future road building, timber haul, and road maintenance activities would be unlikely on non-federal lands due to the type and extent of non-federal ownership found in this watershed. If road construction were to occur on private land, it would be expected that total road miles would be less than 1 mile, adding up to approximately 0.04 mi/mi<sup>2</sup> to the current road densities. Continued public use of these road systems will additionally add to the amount of sediment entering streams in this sub-watershed.

- Skid Trails, Landings, and Yarding Corridors  
Many of the acres previously disturbed by the construction and use of yarding corridors and landings are no longer visible on the ground and appear to have recovered as a result of the re-growth of vegetation. Within previously harvested units in this sub-watershed, evidence of past compaction is still present along many tractor skid trails, and in stream channels intersected or bordered by these trails. Where poorly rehabilitated skid trails, landings, and yarding corridors are hydrologically connected to the streams through road systems, or are adjacent to

streams that have little or no riparian buffer, these areas have become sources of stream sediment that are contributing to the current aquatic conditions. By adding together the acres of existing skid trail compaction that is still visible on the ground, or known to have occurred in the past 36 years, with the known acres of soil displacement and disturbance that has occurred over the past 10 years as a result of landings and yarding corridors it was determined that up to 324 acres (1.7%) may still be compacted or lacking protective vegetation, and as such may still be exhibiting accelerated erosion within the Mule Creek sub-watershed.

The implementation of both the Mini Mule Project and the activities analyzed in the Anaktuvuk Project EA would result in up to 46.6 acres of compaction and up to 59.1 acres of accelerated on-site erosion within this sub-watershed. Of these acres, 82 acres would occur on sites that are classified as fragile due to groundwater but suitable for commercial harvest. These units would be thinned using the following restrictions due to high ground water levels. All logging operations would be limited to the dry season (May 15-Oct 15), all tractor harvest would be limited to the use of existing skid trails, and all operational skid trails determined to be blocking natural sub-surface or surface drainage would be subsoiled with a winged ripper and waterbarred. Use of these BMPs would minimize erosion and soil displacement, and upon completion of harvest, subsoiling would allow for the reestablishment of a hydrologic connection for subsurface flows that have been rerouted due to existing skid trail compaction. Reestablishing this connection would reduce existing instances of accelerated surface and streambed erosion.

Within the Riparian Reserve approximately 126 acres would be thinned between the activities analyzed in the Anaktuvuk Project EA and Mini Mule Project. Thinning in the Riparian Reserve will occur outside the EPZ and primary shade zone, and will leave a canopy closure of 50%. This provides protection for all components of water quality. In addition, up to 24 landing expansions could occur within the Riparian Reserve in conjunction with continuous landings on roads. Expansion of these landings would not involve removing the low lying ground vegetation, or result in detrimental compaction. To protect streams and wet areas in and adjacent to units proposed for Riparian Reserve thinning, there would be no landings, skid trails, or yarding corridors constructed within the Ecological Protection Zone (EPZ). The EPZ is designed to filter out any accelerated erosion from upslope practices that are implemented using Project Design Features (PDFs) and BMPs (see discussion of Riparian Thinning and EPZs in Section 2.2.1). Thinning in the Riparian Reserves is designed to expedite the development of late successional, multi-story habitat conditions and to restore the species composition and structural diversity of the plant communities, needed to achieve ACS and Riparian Reserve objectives (Medford RMP, pp. 22, 26).

Both projects would be implemented using BMPs and PDFs that would reduce erosion and break the hydrologic connection between the upland harvest actions and the streams and wet areas. As a result, harvesting of the Mini Mule and Anaktuvuk Timber Sales would result in a small increase in the upslope onsite erosion but

would not contribute to the degradation of streambed conditions or aquatic habitat. There are no other reasonably foreseeable commercial timber management projects proposed within this HUC 6 sub-watershed that would affect watershed erosion.

- Wildfire and Prescribed Fuels Reduction

Erosion has also been affected by at least 2 uncontrolled fires totaling approximately 9,807 acres within the Mule Creek HUC 6 sub-watershed in the last 10 years. The extent of offsite erosion from the small fire, though expected to be negligible, has not been measured. Water quality monitoring has been conducted for the last 4 years at 4 sites in Mule Creek to evaluate the effects of constructed firelines and burned areas from the 2005 Blossom Fire. This data has not been collected long enough to develop a trend analysis, however, initial evaluation of the data, based on long term monitoring downstream, indicates that there has been no statistical variations for any of the parameters monitored. In areas of moderate burn severity, erosion rates would be expected to be recovered due to the regrowth of vegetation. On the approximately 200 acres of high intensity burn sites, ground litter, understory vegetation, and overstory canopy closure losses initially increased water availability and surface runoff, and reduced surface layer protection resulting in increased erosion rates. The regrowth of vegetation on these sites has reduced these impacts incrementally over the past 4<sup>+</sup> years. Approximately 8 miles of dozer firelines constructed within this sub-watershed during the Blossom Fire were rehabilitated through subsoiling, water-barring, placement of slash, and planting of conifers, which is greatly reducing the amount of surface erosion and compaction on these lines. A majority of the bare soils along these firelines now have adequate ground cover to protect soils from excessive erosion.

Short term soil erosion has also been affected by activity fuels reduction and handpile and burning projects that were implemented within the past five years. There are approximately 845 acres of hazardous fuel reduction treatments that have occurred in the past five years within the Mule Creek HUC 6 sub-watershed. Approximately 61 acres would be treated for fuels as a part of the Kelsey Whisky hazardous fuel reduction treatments in this watershed. These treatments are designed to limit the extent and magnitude of onsite erosion, and to protect from offsite erosion and stream sedimentation. These treatments help to reduce the probability of an intense, large scale wildfire occurring by reducing fuel loading and horizontal continuity within the stand.

Under the Mini Mule Project and the activities analyzed in the Anaktuvuk Project EA, activity slash piles may be burned on landings located on the immediate downhill side of existing roads. This would occur on up to approximately 30 acres of currently disturbed areas within the roadway, and would be dispersed throughout this sub-watershed. To limit the extent and magnitude of onsite erosion, and to protect from offsite erosion, slash piles would be placed outside of EPZs and in locations that are not hydrologically connected to the ditchlines of roads. Due to the implementation of PDFs and the use of EPZs on all streams, any erosion from activity fuels treatments would remain onsite and would have no effect on water quality. Slash remaining in units after yarding may be lopped-and-scattered (See Section 2.3.2.4).

Because BMPs would be followed, short term impacts would be within the scope of the 1994 Medford District EIS, and erosion would not be expected to move off-site because large organic ground cover would remain on site and soils would not be excessively heated, thus maintaining much of their adhesive properties.

- Maintenance Projects

The Anaktuvuk Helipond Maintenance Project would result in onsite erosion and localized impacts to water quality in the Anaktuvuk feeder spring and pond. Instream work such as replacing the spring box and removing sediment from the spring would be done between July 1<sup>st</sup> and September 15<sup>th</sup> of the same calendar year, and sediment control devices would be placed as needed to minimize water quality impacts, and keep them localized. Impacts to water quality from this project would be within ODFW, ODEQ, and Medford RMP standards. Given the magnitude and proximity of the water quality effects that will occur as a result of this project, the Anaktuvuk Pond Maintenance Project is not be close enough to either the Mini Mule or Anaktuvuk Thin timber sales for any impacts to overlap.

The Title II culvert replacement project will be implemented as funds allow during 2010 and 2011. This project will be done using the standard PDFs and BMPs that are used during all road maintenance activities. These protection measures include maintaining all ODEQ water quality standards and the de-watering of flowing streams around work sites with sediment control devices required to be used and removed prior to the reconnection of stream flow. The 32-9-14.2 road is located below the Mini Mule and Anaktuvuk Thin project areas. Actions associated with this project on the 32-8-31.0 road would be consistent with the maintenance actions addressed for Mini Mule road maintenance activities.

The Bobby Pond Maintenance Project is located on the ridge between Mule Creek and West Fork Cow Creek HUC 6 sub-watersheds. The only action associated with this project that will result in an increase in onsite erosion is the removal and installation of the drainage culvert for the pond. This culvert will be replaced using standard Medford RMP BMPs to protect from any offsite erosion or stream sedimentation. The outlet of this culvert flows under a series of roads and terminates in a natural pond. This pond does not have a surface flow outlet, and would act to filter any additional sediment that remains within Bobby Pond following the culvert replacement. As such, effects from this project would not combine with effects from either the Mini Mule or Anaktuvuk Thin timber sales.

Water quality in the Mule Creek HUC 6 sub-watershed is currently in good condition (BLM, 1999). Overall, the RRHB watershed has some of the best water quality and riparian habitat in the Medford District (BLM 1999). Sediment from road maintenance and hauling associated with the Mule Creek and Anaktuvuk Timber Sales would not result in more than a 10% increase in stream turbidity, and would not measurably increase sediment deposits for more than 25 feet downstream of haul roads. Given the magnitude, dispersed locations, extent, and short term

nature of each of the water quality impacts that would occur during these projects, having multiple projects occur within the same watershed during the same time period will not cumulatively change the magnitude of these impacts, or the extent that was analyzed for the direct and indirect effects of each individual project. Logically it can be concluded that negligible increases in sediment from these activities would contribute to the overall amount of sediment entering streams from past, present, and future impacts within this sub-watershed, but sediment from these actions would be within ODEQ water quality standards and would not be distinguishable above baseline levels or have any effect on aquatic organisms. Since implementation of these projects would only result in localized impacts to water quality that would not be distinguishable at the Planning Area, HUC 6, or higher scale, actions within this HUC 5 watershed would be consistent with the Clean Water Act, State of Oregon water quality standards, and ACS objectives.

### **3.5 Northern Spotted Owl (Threatened) and its Critical Habitat**

#### **3.5.1 Affected Environment for Northern Spotted Owl and its Habitat**

##### **Nest Patch**

Nest area arrangement and nest patch size have been shown to be an important attribute for site selection by spotted owls. More specifically, when using nesting habitat, models developed by Swindle et al. (1997, p.52) and Perkins et al. (2000) showed that the 200-300 meter radius (and sometimes greater), encompassing approximately up to 75 acres, around a nest is important to spotted owls and having as much of the 300-meter radius area in suitable habitat was critical to nest position on the landscape. Coincidentally, Miller et al. (1989) found that on average, the extent of forested area used by juvenile owls prior to dispersal averaged approximately 70 acres.

Lastly, Meyer et al. (1998) found that old-growth patch size (i.e., larger patches) was strongly related to spotted owl site selection in Oregon. Based on the above information, the nest patch is defined herein as the 300-meter radius area around a known or likely nest site (USDA/USDI 2008).

##### **Core Area**

Habitat composition within a core area is also important to spotted owls and helps define the core area size mentioned above. Bingham and Noon (1997) reported that a spotted owl core area is the area that provides the important habitat elements of nest sites, roost sites, and access to prey, benefiting spotted owl survival and reproduction. Rosenberg and McKelvey (1999) reported that spotted owls are “central place” animals with the core area (the area closest to the nest) being the focal area. Results from Bingham and Noon (1997) showed that spotted owls typically used 20-21 percent of their home range as core

area habitat, which generally included 60-70 percent of the sites within their home range used during the breeding season (USDA/USDI 2008).

Recently developed habitat-fitness and landscape models have demonstrated the importance of habitat amount within core areas. For example, Meyer et al. (1998) examined landscape indices associated within spotted owl sites versus random plots on BLM lands throughout Oregon. Across provinces, landscape indices highly correlated with the probability of spotted owl occupancy included the percent older forest (30 percent) within the 500 acres surrounding the site. Zabel et al. (2003) found for their northwest California study that the highest probability of owl occupancy occurred when the core area was composed of 69 percent nest/roosting habitat. Bart (1995) found that core areas should contain 30-50 percent mature and old growth forest. Franklin (pers. comm.) found that the proportion of good to medium to lesser quality habitat for owl cores in northwest California was approximately 60:30:10 percent. Lastly, Dugger et al. (2005) showed that when owl core areas in their southern Oregon study area had at least 50-60 percent older forest habitat, spotted owl fitness (i.e., survival and reproduction) was relatively higher than in core areas with lesser amounts.

In summary, habitat composition in owl core areas varies by region and study, ranging from a low of 27 percent to a high of 78 percent (mean 43%, 14 SD). Based on the above studies, 50 percent or higher cover of suitable habitat within a 0.5 mile radius should be considered as necessary to maintain spotted owl life history functions. We chose 50 percent because this lower value is where an effect of significant impairment of spotted owl life history functions is most likely to occur. We relied largely on the research conducted by Dugger et al. (2005), including unpublished habitat-fitness models, to ascertain this value.

### **Provincial Home Range**

The provincial home range is defined as the circle around an activity center and represents the area owls are assumed to use for nesting and foraging in any given year. The home ranges of several owl pairs may overlap. Provincial home range radius for the Klamath Mountains physiographic province is 1.3 miles. The BLM/FS/FWS team that developed this methodology reviewed the available literature and concur with Courtney et al. (2004) that spotted owl home range values reported in more recent studies are similar to home range values presented in Thomas et al. (1990).

The available science (Bart and Forsman 1992, Bart 1995) suggests that as the amount of suitable habitat in an owl's home range decreases, so does site occupancy, reproduction, and survival. Based on these studies, suitable habitat coverage of at least 40 percent or higher at the home range scale is likely necessary for maintaining spotted owl life history functions, although site-specific conditions may warrant deviations from this guideline. (USDA/USDI 2008).

Habitat suitability for spotted owls includes a composition of multiple habitat elements such as canopy closure, canopy layering, trees with nesting structure such as platforms,

cavities and snags, flying space, prey items, and components supporting prey such as snags, down wood, and shrub and forb ground cover. Habitat suitability for each unit is determined by field review.

Northern spotted owl suitable habitat includes stands suitable for nesting, roosting, and foraging. There are two categories of suitable habitat. Habitat 1 conifer stands satisfy the daily and annual needs of the owl for nesting, roosting and foraging. These stands generally have a multilayered canopy with large trees in the overstory and an understory of shade tolerant conifers and hardwoods. Canopy closure generally exceeds 70%, and average DBH is generally 21 inches or greater. Habitat 2 suitable habitat includes conifer stands with understory vegetation or coarse woody debris which provide roosting and foraging opportunities but lack the necessary structure for consistent nesting. These stands have less diversity in the vertical structure and canopy closure generally exceeds 70% and average DBH is 11- 21 inches. Units were field-reviewed to determine if they met the definition of suitable habitat. Dispersal (non-suitable) habitat generally includes conifer stands with trees greater than or equal to 11 inches dbh and canopy closure of 40-60%, but may have higher canopy cover and lack other habitat components to adequately support residential occupation.

Four known spotted owl centers (Mule Creek, Mule West, Stubborn Mule and Mule East) have approximate home ranges that overlap proposed Mini Mule Project units, three core areas (Mule Creek, Mule East and Stubborn Mule) are affected by the proposed action, and no nest patch areas are affected. One-hundred acre Residual Habitat Areas (owl cores) were designated for two of these owl sites (Mule Creek and Mule West) under the NWFP and are not affected by the Proposed Action. Table 3-5 shows visit effort and owl status determination for 2003-2009.

**Table 3-5. Northern Spotted Owl Site Occupation Status for 2003-2009**

Owl Site	year							
	2002	2003	2004	2005	2006	2007	2008	2009
Stubborn Mule	-----							(New Site) pair
Mule East	not surveyed	pair						
Mule Creek	pair	not surveyed	not surveyed	not surveyed	not surveyed	pair	not surveyed	single owl
Mule West	pair	not surveyed	not surveyed	not surveyed	single owl	single owl	not surveyed	not surveyed

One of the functions of Matrix lands is to serve as connectivity between late-successional reserves (USDA/USDI, 1994b, p. B-43). One section (T32S-R9W-Section 17) is designated as a Connectivity/Diversity Block (C/DB) within the Matrix land use allocation. The Medford RMP management recommendation for C/DB is to maintain at least 25 to 30% of each block in late-successional forest. Currently the C/DB in the Mini

Mule Planning Area is 65% late-successional forest or older (GIS FOI data, March 2010.). Owl sites found after January 1994 receive no mandatory protection, except for the nest site and seasonal restriction.

### **Status and Trend of Northern Spotted Owl Populations**

Demographic data from northern spotted owls in the Klamath Demographic Study Area collected from 1985 – 2003 indicated that populations appeared to be stable in the Klamath study area as a result of high survival and number of young produced by territorial females, which were stable over the period of the study (Anthony et al. 2004).

The Bureau of Land Management (BLM), Forest Service (FS), and US Fish and Wildlife Service (USFWS) have conducted a coordinated review of four recently completed reports containing information on the northern spotted owl (NSO). The reviewed reports include the following:

- *Scientific Evaluation of the Status of the Northern Spotted Owl* (Sustainable Ecosystems Institute, Courtney et al. 2004);
- *Status and Trends in Demography of Northern Spotted Owls, 1985-2003* (Anthony et al. 2004);
- *Northern Spotted Owl Five Year Review: Summary and Evaluation* (USFWS 2004); and
- *Northwest Forest Plan – The First Ten Years (1994-2003): Status and trend of northern spotted owl populations and habitat, PNW Station Edit Draft* (Lint 2005).

Anthony et al. (2004, 2006) is the most recent meta-analysis of owl demographic data collected in 14 demographic study areas across the range of the northern spotted owl. Four of the study areas are in western Washington, six are in western Oregon, and four are in northwestern California. Although the agencies anticipated a decline of NSO populations under land and resource management plans during the past decade, the reports identified greater than expected NSO population declines in Washington and northern portions of Oregon, and more stationary populations in southern Oregon and northern California.

Summarizing Anthony et. al., between 1985-2003:

- The northern spotted owl population declined over its entire range, and varied from the most pronounced in Washington (7.3% year per) to the least pronounced in California (2.2%)
- Within Oregon, the northern demographic study areas averaged 4.9% population decline, and the southern study areas decline averaged less than 1% per year and were statistically stable, with a western Oregon average of 2.8% decline per year.
- Range-wide, adult survival rates declined in 5 of 14 study areas (western Washington and northwestern California) and western Oregon was stable in all six study areas.

The reports did not find a direct correlation between habitat conditions and changes in NSO populations, and they were inconclusive as to the cause of the declines. Even though some risk factors had declined (such as habitat loss due to harvesting) other factors had continued such as habitat loss due to wildfire, potential competition with the barred owl, West Nile virus, and sudden oak death (USFWS 2004, Lint 2005). The barred owl is present throughout the range of the spotted owl, so the likelihood of competitive interactions between the species raises concerns as to the future of the spotted owl (Lint 2005). Lint (2005) also found that between 1994-2003, federal lands in the Klamath Province lost 6.6% of spotted owl nesting habitat to stand-replacement fire, mainly to the Biscuit Fire (almost 500,000 acres).

However, the findings by Anthony et al. (2004) are now five years old, and there is a lag time between when a population change occurs and when it statistically is verified. For this reason, the analysis regarding significant population decline, addresses all of western Oregon (BLM 2008b, p.3-298). The role of critical habitat to provide nesting, roosting, foraging, and dispersal would remain unchanged; however, the effectiveness of critical habitat and the rate of population decline beyond the most recent meta-data analysis (Anthony et al. 2004) would be uncertain.

Collected information indicates that encounters between spotted owls and barred owls tend to be agonistic in nature, and that the outcome is unlikely to favor the spotted owl (Courtney et al. 2004). Olson et al. (2005) suggests that further declines in the proportion of sites occupied by northern spotted owls are likely. Olson et al. (2005) showed that barred owl presence had a negative effect on northern spotted owl detection probabilities, and it had either a positive effect on local extinction probabilities (at the territory scale) or a negative effect on colonization probabilities for three study areas in Oregon. Although the barred owl currently constitutes a greater threat to the northern spotted owl than originally thought at the time of the listing (Courtney et al. 2004), at present it is unclear whether forest management influences the outcome of interactions between barred and northern spotted owls (Courtney et al. 2004; summarized by Lint 2005).

The decrease in spotted owl detections since 2002 corresponds to an increase in barred owl presence (Davis et al. 2010; Forsman et al 2009). It has been shown (Bailey et al. 2009, Crozier et al. 2006) that the presence of barred owls negatively affects the detection probabilities of spotted owls. This may account for some of the decrease in spotted owl detections; however, it is quite possible the barred owl is actually having an impact on the population and the population on the Klamath Study Area (KSA) may be experiencing these effects (Davis et al. 2010).

There is mounting evidence that barred owls are having a negative impact on the spotted owl population within the KSA. This is illustrated by several population trends beginning about 2003 which is when barred owl detections at sites within the KSA exceed 10%. Spotted owl detections have been steadily decreasing since 2002 and reached the lowest point in 2009, the same year barred owl detections reached their highest level (Davis et al. 2010).

### **3.5.2 Environmental Effects on Northern Spotted Owl and its Habitat**

#### **3.5.2.1 Alternative 1 (No Action) - Direct and Indirect Effects on Spotted Owl and its Habitat**

Under the No Action Alternative, no thinning would occur under this project. No change would occur to the amount, structure, or function of dispersal, roosting and foraging, and nesting habitat. No disturbance would occur to spotted owls.

#### **3.5.2.2 Alternative 2 (Proposed Action) - Direct and Indirect Effects on Spotted Owl and its Habitat**

Under the Proposed Action, no nesting, roosting, and foraging (NRF) habitat would be treated. Dispersal habitat would be treated and function maintained on approximately 286 acres in the Proposed Action units. The treated units would continue to function as dispersal habitat, since proposed units would be reduced to approximately 40% canopy closure in each unit, retaining approximately 11 inches or greater average diameter. Treated units would accelerate the growth of the dispersal stands which retain dominant vigorous trees, producing a stand with larger diameter trees with fuller crowns. Roadside trees removed for daylighting road maintenance would not deter owls from moving across the roads as owls are known to cross roads, highways, and other large areas of unsuitable habitat. Trees removed from the roadside are second-growth trees established after construction of the original road and are not suitable as potential nest trees. No disturbance, or change to occupancy or productivity to known owl sites would occur. Unoccupied suitable spotted owl habitat beyond known cores areas and adjacent to proposed units would be surveyed to protocol and buffering disturbance distances would be applied if nesting owls are located in adjacent suitable owl habitat.

Units 17-1, 17-2, 17-3, and 20-4 would treat and maintain habitat conditions in the Connectivity/Diversity Block (CD/B) in T32S-R9W-Section 17. No late-successional habitat would be removed or downgraded from this section. Therefore, the C/DB would remain at 65% late-successional or older after implementation of the Proposed Action. These four in CD/B units support dispersal habitat. The proposed thinning would maintain dispersal habitat.

#### **3.5.2.3 Cumulative Effects on Spotted Owl and its Habitat**

Cumulative effects to spotted owls result from the incremental impact of the Proposed Action, added to other past, present, and reasonably foreseeable actions.

The cumulative effects are the combination of the Proposed Action (maintaining owl habitat conditions on approximately 286 acres through moderate thinning and daylighting road maintenance adjacent to units) combined with other recent and foreseeable projects.

The activities analyzed in the Anaktuvuk Thin Project EA occur in the home range of Stubborn Mule owl site. These activities maintain dispersal habitat conditions on

approximately 111 acres of dispersal habitat. The thinning was designed to retain a minimum of 40% canopy cover, snags, hardwoods, large down wood, and dominant trees. Approximately 65 acres of dispersal habitat would be treated within the home range of the owl site. The thinning will create more open conditions and accelerate tree growth within the dispersal habitat that without treatment may become overly dense with limited flying space. Nesting, roosting and foraging habitat will not be affected, and dispersal conditions will remain suitable. There are no other foreseeable projects that would remove, downgrade, or treat and maintain owl habitat in owl sites also affected by the Mini Mule project.

The foreseeable activities combined with the Mini Mule Project would not contribute to reduced viability of the owl sites through reduction of available habitat utilized for breeding, nesting, feeding, sheltering, or dispersing. The ultimate fate of individual owls (see Table 3-5) as a result of the combined effects of the projects is unknown due to the variability in individual owl response to habitat modification, the unknown actual home range and habitat use of individual owl sites, and unmeasurable or unknown effects and complications that other influences (e.g. disease, weather changes, barred owls).

The combined consequences of these projects, including the reduced viability of owl sites on Matrix lands from federal and private harvesting, were anticipated in the NWFP (USDA/USDI. 1994 3&4-241). The function of Matrix lands is to serve as connectivity between Late-Successional Reserves (USDA/USDI. 1994b vol 2, p. B-43).

### **3.5.3 Affected Environment for Northern Spotted Owls and its Critical Habitat**

The Planning Area includes Northern Spotted Owl Critical Habitat (CHU) #OR-67 designated in 1992 (Federal Register Vol. 57, No. 10 p.1796-1838) by the Fish and Wildlife Service. The Proposed Action does not occur within revised Critical Habitat (2008; [Federal Register \(73\): 47326-47522](#)), as designated by the U.S. Fish and Wildlife Service. CHU #OR-67 contains approximately 19,611 federal (BLM) acres, 10,074 acres of NRF habitat and 1,981 acres of dispersal habitat (Summer 09 NLAA BA).

The 1992 CHU#OR-67 is located on the Medford District BLM and the Siskiyou National Forest. Sixty-eight percent of this CHU is located within the Northwest Coast and Fish Hook/Galice Late Successional Reserves. This CHU provides a portion of the link from the Klamath Mountains Province to the southern end of the Oregon Coast Ranges Province. It helps support the western end of the Rogue-Umpqua portion of the I-5 Area of Concern which connects the southwest edge of the Oregon Cascades Province to the Klamath Mountains Province. Lands immediately north of this unit are non-federal and lack suitable owl habitat. This unit also encompasses the Wild Rogue Wilderness, which supports suitable habitat in its lower elevations.

Units 16-1, 17-1, 17-2, 20-2, 20-3, 20-4, 21-2, 21-3, 21-4 occur in Matrix land Allocation within 1992 designated spotted owl CHU #OR-67. This CHU provides an integral portion of the east-west link between the southern end of the Coast Range Province and the Klamath Mountains Province.

### **3.5.4 Environmental Effects on Northern Spotted Owl and its Critical Habitat**

#### **3.5.4.1 Alternative 1 (No Action) - Direct and Indirect Effects on Spotted Owl and its Critical Habitat**

Under the No Action Alternative, no thinning would occur in 1992 northern spotted owl critical habitat. The Project Area is not located in the 2008 revised Critical Habitat. The proposed units would continue to function as dispersal habitat. With no thinning, the trajectory of the stands to grow into better suitable habitat would continue at a slower rate than if stands were thinned. With crown closure exceeding 80% in most of the stands and increasing, the greatest risk threatening the habitat would be the risk of stand replacement fire. Such a fire would reduce the amount of dispersal owl habitat, depending on the extent and intensity of the fire.

#### **3.5.4.2 Alternative 2 (Proposed Action) - Direct and Indirect Effects on Spotted Owl and its Critical Habitat**

Critical habitat unit #OR-67 (designated in 1992) contains approximately 66,355 acres of dispersal and NRF habitat capable of supporting owl dispersal, (USDI BLM 2008).

Units 16-1, 17-1, 17-2, 20-2, 20-3, 20-4, 21-2, 21-3, 21-4 contain 122 total acres of dispersal habitat within designated spotted owl CHU #OR-67. Thinning would treat and maintain dispersal function by retaining at least 40% canopy cover within the units. No primary constituent elements would be removed. Snags, down wood, hardwoods, and dominant trees would be retained. The Proposed Action would treat approximately 0.18% of habitat providing dispersal function within CHU #OR-67 and would not alter the primary constituent elements. This CHU would continue to function as an integral portion of the east-west link between the southern end of the Coast Range Province and the Klamath Mountains Province, providing nesting, roosting, and foraging, and dispersal habitat.

#### **3.5.4.3 Cumulative Effects on Spotted Owl and its Critical Habitat**

Anaktuvuk Thin project (EA OR-118-06-101) thins and maintains dispersal quality habitat on 111 acres within 1992 designated CHU #OR-67. The cumulative effects of Anaktuvuk Thin and Mini Mule Project would treat and maintain dispersal function on 223 acres (0.35%) of the 66,355 acres of habitat providing dispersal function within CHU #OR-67. Thinning would treat and maintain dispersal function by retaining at least 40% canopy cover within the units. No primary constituent elements would be removed. Snags, down wood, hardwoods, and dominant trees would be retained. This CHU would

continue to function as an integral portion of the east-west link between the southern end of the Coast Range Province and the Klamath Mountains Province, providing nesting, roosting, and foraging, and dispersal habitat.

## **3.6 Greenhouse Gases and Carbon Storage**

### **3.6.1 Context and Background of Greenhouse Gases and Carbon Storage**

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

Scientific knowledge on the interrelationship between greenhouse gas levels and climate change is rapidly changing, and substantial uncertainties and several key limitations remain. One limitation is the inability of current science to identify a specific source of greenhouse gas emissions or sequestration and designate it as the cause of specific climate impacts at a specific location. This limitation was identified by the U.S. Geological Survey in a May 14, 2008 memorandum to the U.S. Fish and Wildlife Service, which summarized the latest science on greenhouse gases. That memorandum is incorporated here by reference.

### **3.6.2 Spatial Scale of Analysis of Greenhouse Gases and Carbon Storage**

Because specific sources of greenhouse gas emissions or sequestration cannot be designated as the cause of specific climate impacts at a specific location, the appropriate scale for analysis is global, not local, regional, or continental. However, due to the increased level of public concern regarding anthropogenic contributions of greenhouse gas emissions to climate change, the BLM is estimating greenhouse gas production and carbon storage on at the project scale to determine the potential for this project to significantly impact the human environment.

### **3.6.3 Temporal Scale of Analysis of Greenhouse Gases and Carbon Storage**

The BLM has selected 10 years as the analysis period of greenhouse gas and carbon storage impacts for this project. Within 10 years following the proposed thinning, net carbon storage would equal or exceed the carbon storage prior to thinning; therefore this period would be expected to encompass the duration of the direct and indirect effects on greenhouse gas and carbon storage levels from thinning in the Mini Mule Project Area.

### **3.6.4 Methodology and Assumptions of Greenhouse Gases and Carbon Storage**

On July 16, 2009, the U.S. Department of the Interior withdrew the Records of Decision (2008 ROD) for the Western Oregon Plan Revision. Despite this withdrawal, information contained in the Final Environmental Impact Statement for the Revision of the Resource Management Plans of the Western Oregon Bureau of Land Management (2008 FEIS) is relevant since it examined recent and applicable science regarding climate change and carbon storage. That analysis concluded that effects of forest management on carbon storage could be analyzed by quantifying the change in carbon storage in three “pools”: *in live trees* (foliage, branches, stems, bark and live roots of trees), storage in forests *other than live trees* (dead wood and roots, non-tree vegetation, litter and soil organic matter), and storage in *harvested wood* products. The discussion in Volume I, Pages 220-224; Volume II, Pages 537-543, and Volume III, Appendices, Pages 28-30 are relevant to the effects analysis for this project and are incorporated by reference.

Carbon calculations in analysis for this EA were based on the assumptions in the 2008 FEIS (USDI/BLM 2008 Appendix C) and subsequent improvements to those assumptions, as set forth in R. Hardt, personal communication, November 6, 2009 (on file in the Medford District BLM Office, and incorporated here by reference). Change in forest ecosystem carbon over time was calculated based on predicted forest growth, which was calculated using the ORGANON Growth Model (Hann et al. 2007) with site specific data from stand exams as input into the model.

Greenhouse gas emissions from harvest operations were estimated based on equipment fuel consumption and production rates used in BLM appraisal software (World Forest Institute 1997) and the expertise of BLM Cruiser/Appraisers and Contract Administrators.

Greenhouse gas release due to post-harvest fuels reduction treatments (landing pile burning) was calculated using the predicted tons of biomass consumed per acre (see Section 2.3.2.4, p. 24), assuming a rate of 90% consumption (based on fuels specialist experience on similar projects).

### **3.6.5 Affected Environment for Greenhouse Gases and Carbon Storage**

The 2008 FEIS described current information on predicted changes in regional climate (pp. 488-490), and is incorporated here by reference. That description concluded that the regional climate has become warmer and wetter with reduced snowpack, and continued change is likely. That description also concluded that changes in resource impacts as a result of climate change would be highly sensitive to specific changes in the amount and timing of precipitation, but specific changes in the amount and timing of precipitation are too uncertain to predict at this time. Because of this uncertainty about changes in precipitation, it is not possible to predict changes in vegetation types and condition, wildfire frequency and intensity, streamflow, and wildlife habitat. The analysis in this EA therefore does not attempt to predict changes in the project area due to existing or

potential future changes in regional climate.

**Table 3-6.** Current Estimated Quantities of Carbon Storage in Forest Ecosystem Vegetation<sup>5</sup> at the Relevant Spatial Scales

<b>Total Carbon Storage, Forest Ecosystem Vegetation</b>	<b>Gigatonnes (Gt)<sup>6</sup></b>
Worldwide (Matthews et al, 2000, p. 58)	487-956 Gt
United States (US EPA 2009)	27 Gt
BLM Mini Mule Project	0.000020 Gt

**Table 3-7.** Current Estimated Quantities of Carbon Dioxide Emissions at the Relevant Spatial Scales

<b>Total Carbon Dioxide Emissions</b>	<b>Gigatonnes (Gt)</b>
Worldwide (Denman et al, 2007)	25 Gt
United States (US EPA 2009)	6 Gt
BLM Mini Mule Project	0.000009 Gt

### **3.6.6 Environmental Effects on Greenhouse Gases and Carbon Storage**

#### **3.6.6.1 Alternative 1 (No Action Alternative) – Direct and Indirect Effects on Greenhouse Gases and Carbon Storage**

Under the No Action alternative, continued forest growth would result in an increase in stand volume of approximately 2,300 cubic feet<sup>7</sup> per acre for the first decade or 446,200 cubic feet for areas proposed for thinning under Alternative 2. This forest growth equates to an increase in storage of approximately 6,600 tonnes of carbon compared to current conditions. This would equate to the sequestration of approximately 24,200 tonnes of carbon dioxide over 10 years.

#### **3.6.6.2 Alternative 2 (Proposed Action) – Direct and Indirect Effects on Greenhouse Gases and Carbon Storage**

The Proposed Action would result in carbon dioxide emissions as a result of timber harvest and activity fuel treatments, after which forest growth would result in storage of carbon. This analysis considers net changes in carbon storage (immediately after timber harvest and fuels treatments) and over 10 years.

<sup>5</sup> Carbon contained in both above ground and below ground parts of trees and forest vegetation, and downed wood, litter and duff. It does not include mineral carbon in soil, nor fossil fuels.

<sup>6</sup> A Giga-tonne (Gt) is one billion metric tonnes

<sup>7</sup> Cubic feet is used as an estimate to calculate carbon storage and carbon emissions but not for site specific effects for other resources. See Chapter 3 for indicators and units of measure per affected resource to determine environmental effects.

The Proposed Action would harvest an estimated 1,788 cubic feet of timber per acre, (346,900 cubic feet for the project). There would be approximately 5,160 tonnes of carbon storage in the harvested material. Of this carbon in the harvested wood, 501 tonnes would be emitted over a 10 year span, for a total of 1,837 tonnes of carbon dioxide emitted.

Landing pile burning to dispose of slash after timber harvest would result in the consumption of 2.79 tonnes of biomass per acre, or 541 tonnes for the entire project area, which would emit 1,984 tonnes of carbon after treatment. All hand pile and burning would occur along existing roads. Of this carbon stored in the slash, 7, 275 tonnes of carbon dioxide would be emitted.

Fuel consumption associated with the Proposed Action would also result in carbon dioxide emissions. Yarding equipment and other on-site equipment use would consume approximately 0.36 gallons of fuel per cubic foot of timber. The Proposed Action would require a total of approximately 12,500 gallons of fuel, which would result in the emission of an estimated 34 tonnes of carbon, equivalent to 125 tonnes of carbon dioxide.

Continued forest growth following harvest would result in an increase in stand volume of approximately 1,610 cubic feet per acre over ten years, or 312,300 cubic feet for areas proposed for thinning. The forest growth equates to an increase in storage of approximately 4,625 tonnes of carbon. This would equate to the sequestration of approximately 16,958 tonnes of carbon dioxide.

In total, the Proposed Action would result in carbon emissions of 1,076 tonnes over ten years. This would equate to the emission of approximately 3,945 tonnes of carbon dioxide. Table 3-6 lists estimated carbon, carbon emissions and net carbon balances during the 10 year analysis period.

**Table 3-6. Stored Carbon, Carbon Emissions, and Net Carbon Balance by Alternative**

	Carbon Stored			Carbon Emitted		Net Carbon Storage
	Standing, Live Carbon (Gt)	Other than Live Trees (Gt)	Wood Products (Gt)	Operational Emissions (Gt)	Landing Pile Burning (Gt)	Net Carbon Balance (Gt)
<b>Alternative 1 (No Action Alternative)</b>						
Current Condition	0.000012148	0.000008148	-	-	-	0.000020296
Harvest-Time	0.000018624	0.000006810	-	-	-	0.000025434
<b>Alternative 2 (Proposed Action)</b>						
Current Condition	0.000012148	0.000008148	-	-	-	0.000020296
After Harvest	0.000006988	0.000008168	0.000005140	0.000000034	0.000000541	0.000019721
After 10 Years	0.000011613	0.000006810	0.000005140	0.000000501	-	0.000023062

In conclusion, forest growth within ten years following harvest would result in carbon storage which would exceed the carbon directly and indirectly emitted from harvest, resulting in a net storage of carbon compared to current conditions.

## Chapter 4.0 List of Preparers

The following individuals participated on the interdisciplinary team or were consulted in the preparation of this EA:

<u>Name</u>	<u>Title</u>	<u>Primary Responsibility</u>
Laura Schaeffer	Forester	Logging Systems
Grant Cannon	Forester	Logging Systems
Brian Bickford	Forester	Compaction/Productivity, Silviculture
Michelle Calvert	Ecosystem Planner	Team Leader, NEPA coordinator, writer
Mike Crawford	Fish Biologist	Essential Fish Habitat and Fisheries
Colleen Dulin	Hydrologist	Soils (Erosion), Hydrology
Del Longbrake	Engineer	Transportation
Marlin Pose	Wildlife Biologist	Wildlife, T/E Animals
Rachel Showalter	Botanist	Botany, Noxious Weeds, T/E Plants
Donni Vogel	Fuels Specialist	Fire Risk and Hazard, Air Quality
Lisa Brennan	Archaeologist	Cultural Resources

## **Chapter 5.0 Public Involvement and Consultation**

### **5.1 Public Scoping and Notification**

Initial contact was made with individuals, groups or agencies that have expressed interest in forest management and other types of projects through quarterly mailings of the *Medford Messenger* publication. A brief description of proposed projects, such as Mini Mule Project, a legal location and general vicinity map are provided along with a comment sheet for public responses. The Mini Mule Project was included in these quarterly publications beginning in the winter of 2010.

Public scoping included a scoping letter mailed to the standard mailing list of individuals and organizations expressing interest in Glendale Resource Area projects and landowners within ¼ mile of proposed Mini Mule Project activities. Public comment was requested from November 25, 2009 to December 26, 2009. The BLM received approximately three public responses from either letters or emails during this portion of scoping. All substantive comments were responded to in Appendix 3 of the Mini Mule Project EA. Comments were considered in the development of the project.

### **5.2 30-Day Public Comment Period**

The Environmental Assessment will be made available for a 30-day public review period. Notification of the comment period will include: the publication of a legal notice in the Daily Courier, newspaper of Grants Pass, Oregon; and a letter to be mailed to those individuals, organizations, and agencies that have requested to be involved in the environmental planning and decision making processes for activities addressed in this EA. Comments received in the Glendale Resource Area Office, 2164 NE Spalding Ave. Grants Pass, Oregon 97526 on or before the end of the 30-day comment period will be considered in making the final decision for this project.

### **5.3 Consultation**

#### **5.3.1 United States Fish and Wildlife Service**

Medford BLM submitted a Biological Assessment (09 NLAA DA BA FH) to the Fish and Wildlife Service and received a Letter of Concurrence (MedfordBLM\_FY2009-LOC\_13420-2009-I-0045) stating proposed treatments are “not likely to adversely affect the spotted owl”. Although the Proposed Action does not occur in any Revised (2008) Critical Habitat Units, the Service concurred that the proposed treatments within the biological assessment “may affect, are not likely to adversely affect spotted owl NRF habitat within designated critical habitat.” The same effects to spotted owls and primary constituent elements of critical habitat in the (1992) CHU OR-67 would also apply.

### **5.3.2 National Marine Fisheries Service (NMFS)**

The thinning, activity fuels treatments, road maintenance, and hauling activities that are proposed within Rogue Basin and the range of the federally threatened Southern Oregon/Northern California Coasts coho salmon, would have no effect on coho or critical habitat.

Consultation for the Endangered Species Act with NMFS is not needed as the Proposed Action would not affect listed species or their habitat. No consultation is needed under the Magnuson-Stevens Fishery Conservation and Management Act as there is no adverse affect to Essential Fish Habitat for coho and chinook within Rogue Basin.

### **5.3.3 State Historical Preservation Office**

Required cultural surveys were completed for the Mini Mule Project. The State Historical Preservation Office approved the clearance/tracking form for this project. The form is contained within the Mini Mule Project Analysis file. There are no known cultural resource sites located within proposed units.

### **5.3.4 Native American Tribal Consultation**

A Mini Mule scoping letter was sent to local federally recognized Native American tribes interested in Medford District Bureau of Land Management proposed projects. The tribes were provided with a description and location of proposed project activities for the Mini Mule Project. Concerns were not identified with the proposed activities by any tribe about this project.

# APPENDIX 1 - ALTERNATIVE DEVELOPMENT SUMMARY

DOI-BLM-M080-2010-001-EA

Pursuant to Section 102 (2) (E) of NEPA (National Environmental Policy Act of 1969, as amended), Federal agencies shall “Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” The CEQ (Council on Environmental Quality) regulations for implementing the procedural provisions of NEPA states, alternatives should be “reasonable” and “provide a clear basis for choice” (40 CFR 1502.14).

In light of the direction contained in both NEPA and the CEQ Regulations, the following questions were used to 1/ identify the alternatives to be analyzed in detail in this environmental assessment that are in addition to the “Proposed Action” and “No Action” alternatives, and 2/ document the rationale for eliminating alternatives from detailed study.

- 1. Are there any unresolved conflicts concerning alternative uses of available resources? If yes, document and go to Question #2. If no, document rationale and stop evaluation.**

**Yes.** The following is a summary of proposed action requests made in public comments for the Mini Mule Scoping Letter (November 2009):

- decommission roads
- implement hazardous fuel reduction and watershed restoration projects
- apply variable density management
- retain all nests (raptor)
- create and retain all coarse woody debris
- do not haul logs on roads during the wet season
- top a portion of trees and leave the greens in stands to retain nutrients on site

- 2. What alternatives should be considered that would lessen or eliminate the “unresolved conflicts concerning alternative uses of available resources”?**  
*List alternatives and go to Question #3. If no alternative is identified other than the “no action” alternative, document and stop evaluation.*

The land use allocations in the Mini Mule Project are Matrix and Riparian Reserves in O&C lands. One of the primary objectives identified in the RMP is implementing the O&C Act which requires the Secretary of the Interior to manage O&C lands for permanent forest production in accord with sustained yield principles.

The purpose and need of harvesting in the Mini Mule is to offer timber for sale from thinning harvest units that are economical and maintain northern spotted owl dispersal habitat.

Several of the above requested actions are incorporated into the Mini Mule Project or other projects on the Medford District. Some of the requested actions would not meet the purpose and need for the Mini Mule Project and would be augmentation of timber receipts. Please see below for further details.

### **Road Decommissioning**

Since the Mini Mule Project is a timber sale and does not entail the construction of roads (permanent or temporary) decommissioning roads would be augmentation of timber receipts. Without specific statutory authority, the bartering of Government property (the value of timber) for services is prohibited because it would result in an unlawful augmentation of an Agency's appropriations. Timber sale contract requirements must enable the harvest of timber and the associated mitigation must be directly related to the harvest of timber related to the individual project. Currently the Glendale Resource Area is conducting a road condition assessment within the Mule Creek area to determine the appropriate management actions, such as standard road maintenance, improvement, and/or closure.

### **Implement Hazardous Fuel Reduction and Watershed Restoration Projects**

Since the purpose of the Mini Mule Project is as a timber sale, inclusion of hazardous fuel reduction and watershed restoration would be augmentation of timber receipts. The treatment of post-harvest (activity) fuels would be treated as a part of this project. Fire risk would not be increased in the Mini Mule Project since there is no permanent road construction proposed for this project. (Road construction has the potential to increase fire risk because new roads allow for an increase in human presence, and as a result an increased likelihood of fire ignition by providing easier access into previously inaccessible areas). Future consideration of hazardous fuel reduction could occur outside of the Mini Mule Project.

A categorical exclusion for pre-commercial thinning throughout the Glendale Resource Area allows for thinning (trees less than 8 inches dbh) over-stocked young plantations. The Medford District's Programmatic Aquatic and Riparian Habitat Enhancement Environmental Assessment addresses water restoration activities such as restoring fish passage and reducing impacts from roads that would benefit aquatic species.

### **Apply Variable Density Management**

Variable density thinning is a silvicultural treatment tool to meet specific management objectives and is not a one size fits all approach. The Mini Mule Project contains both the Matrix and Riparian Reserve land use allocations. A variable density thinning alternative may meet the objectives of Riparian

Reserves, but would not be appropriate for the Matrix land use allocation. The commercial thinning silvicultural prescription for Matrix land is designed to best increase stand and tree vigor, and develop larger crowns and girth of retained trees within these previously managed stands consistent with the Matrix land use objectives. Thinning in the Riparian Reserve is to improve stand health, increase the source for large woody debris, species diversity, and to reduce the existing fire hazard to attain Aquatic Conservation Strategy and Riparian Reserve land use objectives.

#### **Create and Retain all Coarse Woody Debris**

All decadent woody material would be retained as either snags or down wood under the Proposed Action. Snag creation under a timber sale would be augmentation of timber receipts.

#### **Retain All Nests (Raptor)**

There are no known raptor nests in the Project Area, including threatened and endangered, Bureau Sensitive, or Migratory Birds of Concern (see Appendix 9 for further details). There is no NWFP or Medford RMP management guideline to avoid cutting trees with nests of all species or trees with defects in the Matrix land use allocation. The Mini Mule Planning Area contains a wide range of habitat to support prey species.

#### **Do Not Haul Logs on Roads During the Wet Season**

Road hauling would be limited to dry conditions. Hauling would not occur during wet road conditions, which are considered to result in: continuous mud splash or tire slide, fines being pumped through road surfacing from the subgrade, road drainage causing a visible increase in stream turbidities, surface rutting, or any condition that would result in being chronically routed into tire tracks or away from designed road drainage during precipitation events.

#### **Top a portion of Trees and Leave the Greens in Stands to Retain Nutrients on Site**

Leaving all the tops of trees in units would increase the fuel loading in units, and could increase the risk of fire ignition and spread should a fire enter the Project Area. Approximately 80% of fir branches from whole tree yarding would remain in the unit. The needles contain most of the fir nutrients which would be allowed to break down as this material would be lop & scattered in the unit.

- 3. Of those alternatives identified in Question #2, are there reasonable alternatives for wholly or partially satisfying the need for the Proposed Action? If so, briefly describe alternatives and go to question #4. If no, document rational and stop evaluation.**

Variable density management in Riparian Reserves may partially satisfy the need for the Proposed Action.

The environmental effects of taking no action are analyzed in the Mini Mule Project Environmental Assessment.

**4. Of those alternatives identified in Question #3, will such alternatives have meaningful differences in environmental effects?**

Variable density in Riparian Reserves was not developed as an alternative action since there was concern that the creation of small gaps would adversely affect water quality as a 50% canopy closure would not be maintained in the secondary shade zone. Additionally, variable spacing is already present in stands including Riparian Reserves at the Planning Area scale (HUC 6 watershed). Sixty-five percent of the Mule Creek drainage in Riparian Reserves is late successional forest or older. Almost half of the Mule Creek sub-watershed is located in the Wilderness and Wild and Scenic River Congressional Designate Reserve.

A variable density thinning in Riparian Reserves alternative would not have a meaningful difference in environmental effects from the Proposed Action.

## APPENDIX 2 - ENVIRONMENTAL ELEMENTS

DOI-BLM-M080-2010-001-EA

In accordance with law, regulation, executive order and policy, the interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the Proposed Action described in Chapter 2 of the EA (environmental assessment). The following three tables summarize the results of that review. Those elements that are determined to be “affected” will define the scope of environmental concern, Chapter 3 of the EA.

<b>Table 1. Supplemental Authorities to be Considered (BLM Handbook 1790-1 Appendix 1).</b> This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.		
<b>Critical Element of the Human Environment</b>	<b>Status</b> 1/ Not Present 2/ Not Affected 3/ Affected	<b>Interdisciplinary Team Remarks</b> 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the 1995 RMP to reduce or avoid environmental harm
Air Quality (Clean Air Act)	Not Affected	Prescribed burning would be administered in accordance with the Oregon Smoke Management Plan administered by the Oregon Department of Forestry and the regulations established by the Oregon Department of Environmental Quality. The Planning Area is not located within a Class I designated airshed or non-attainment area. The impact of smoke on air quality is expected to be localized and of short duration. Particulate matter would not be of a magnitude to harm human health, affect the environment, or result in property damage. The temporal and spatial small scale of the project would not involve enough traffic or ground disturbance to generate road dust. As such, the Proposed Action is consistent with the provisions of the Federal Clean Air Act.
Areas of Critical Environmental Concern	Not Present	There are no Areas of Critical Environmental Concern located within the Planning Area.
Cultural, Historic, Paleontological	Not Affected	Cultural resource surveys were completed for the project in 2009. Guidelines for the survey followed compliance procedures for cultural resource survey set forth by Section 106 National Historic Preservation Act (NHPA). Surveys were conducted using Oregon State Historical Preservation Office (SHPO) standards protocol.

**Table 1. Supplemental Authorities to be Considered (BLM Handbook 1790-1 Appendix 1).** This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.

Critical Element of the Human Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the 1995 RMP to reduce or avoid environmental harm
Cultural, Historic, Paleontological	Not Affected	Cultural sites are any location that includes prehistoric and/or historic evidence of human use or that has important socio-cultural value. There are no known cultural resource sites located within proposed Mini Mule Project units. If cultural resources are located during the implementation of an action, the project would be redesigned to protect the values present or until an evaluation can occur based on recommendations from the Glendale Resource Area archaeologist with concurrence from the Glendale Field Manager and State Historic Preservation Office. All such sites would be evaluated and protected by the BLM under the following Federal laws: Federal Land Policy and Management Act of 1976, National Historic Preservation Act (Section 106) of 1966, Antiquities Act of 1906, Archaeological Resource Protection Act of 1979, Reservoir Salvage Act of 1960, American Indian Religious Freedom Act of 1978, National Environmental Policy Act of 1969, and Native American Graves Protection and Repatriation Act of 1990.
Energy (Executive Order 13212)	Not Affected	The Proposed Action would have no effect on energy development, production, supply and/or distribution.
Environmental Justice (Executive Order 12898)	Not Affected	The Proposed Action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.
Prime or Unique Farm Lands	Not Present	There are no prime or unique farmlands within the Planning Area.
Flood Plains (Executive Order 11988)	Not Affected	The Proposed Action does not involve occupancy and modification of floodplains, and would not increase the risk of flood loss. As such, the Proposed Action is consistent with Executive Order 11988.
Hazardous or Solid Wastes	Not Affected	There would be no environmental effects associated with this element due to the implementation of the Best Management Practices contained in the Medford RMP and the terms/conditions of the timber sale contract.

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Invasive, Nonnative Species (Executive Order 13112)	Not Affected	<p>Proposed thinning units in the Mini Mule Planning Area were surveyed for noxious weeds in the spring of 2009. The Planning Area is known to have noxious weeds along many roadsides. Two populations of <i>Rubus armenicus</i> (Blackberry), 10 populations of <i>Senecio jacobaea</i> (Tansy ragwort), 5 populations of Canada thistle (<i>Cirsium arvense</i>), and 1 population of Scotch broom (<i>Cytisus scoparius</i>) were documented within proposed units. (Table A6-1). The scotchbroom site and an additional Canada thistle site were hand pulled.</p> <p>The Medford District RMP states that the objectives for noxious weeds are to “contain and/or reduce noxious weed infestations on BLM-administered land.(p. 92),” and “survey BLM-administered land for noxious weed infestations...(p. 93).” These RMP directions for weed management are intended to be met at a landscape level. In an effort to continue to contain and/or reduce noxious weeds on federal land, the BLM may include some of these weed sites – those that do not have an effective biological control or are particularly aggressive - for treatment scheduled to occur in the spring of 2010.</p> <p>There are three main reasons why potential weed establishment is not expected to result in a detectable effect to overall ecosystem health. First, surveys indicate that a very small percentage - less than 1% of acreage within the Planning Area units - are affected by noxious weeds. Second, these sites located in units proposed for treatment have been reported during predisturbance surveys, and priority species will receive weed treatment under Medford District’s <i>Integrated Weed Management Plan and Environmental Assessment OR-110-98-14</i>. Third, Project Design Features (PDFs) have been established to minimize the rate at which project activities might potentially spread noxious weed seed from outside/adjacent sources.</p> <p>Seeds are spread by the wind, by animal/avian vectors, natural events, and by human activities - in particular through soil attachment to vehicles. BLM’s influence over these causes of the spread of noxious weeds is limited to those caused by human activities. Additional human disturbance and traffic would increase the potential for spreading noxious weed establishment, but regardless of human activity, spread of these weeds would continue through natural forces. Thus, the BLM cannot stop the spread of noxious weeds, it may only reduce the risk or rate of spread. See <i>noxious weed specialist report in Appendix 7</i>.</p>

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Native American Religious Concerns	Not Affected	Native American groups were contacted and no concerns were identified by these groups.
T/E (Threatened or Endangered) Fish Species or Habitat	Not Affected (Southern Oregon/Northern California Coasts coho salmon Evolutionarily Significant Unit (ESU))	Salmon are listed under the Endangered Species Act by evolutionarily significant units (ESU). An ESU is a stock of Pacific salmon that is 1) substantially reproductively isolated from other specific populations units; and 2) represents an important component in the evolutionary legacy of the species. The northern most extent of the federally listed threatened Southern Oregon/Northern California Coasts (SO/NCC) coho salmon is the Rogue River Basin. A small amount of localized sediment may enter streams during log haul and existing road maintenance where roads are hydrologically connected.  <u>SONCC Coho Salmon</u> are within the Rogue River Horseshoe Bend Watershed. Thinning, yarding, road maintenance (including daylighting), hauling, and activity fuel treatments would have no effect on SONCC coho salmon (ESA-Threatened) and coho critical habitat (CCH). The closest coho presence and CCH in Mule Creek is approximately 350 feet (0.06 miles) from the closest thinning unit; and 450 feet (0.08 mile) way from the closest haul road (32-9-15.2C). The 32-9-15.2C road contains four perennial (non-fish) stream crossings that average 616 feet (0.11 mile) from CCH. With dry condition haul, well vegetated ditch lines, properly functioning cross drains, and existing filter strips, sediment would not be of a magnitude that would result in a measurable increase in the overall stream sediment deposition for more than 25 feet downstream within any of the stream channels. Project actions would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and Department of Environmental Quality's (DEQ's) provisions for maintenance of water quality standards.
T/E (Threatened or Endangered) Plant Species or Habitat	Not Present	Of the four federally listed plants on the Medford District ( <i>Fritillaria gentneri</i> , <i>Limnanthes floccosa</i> ssp. <i>grandiflora</i> , <i>Arabis macdonaldiana</i> , and <i>Lomatium cookii</i> ) only <i>Fritillaria gentneri</i> has a range and habitat which extends into the Glendale Resource Area. The Mini Mule Planning Area resides outside the range of <i>F. gentneri</i> , as determined by the US Fish and Wildlife Service. Vascular plant surveys were conducted in the spring of 2009, and no <i>Fritillaria gentneri</i> populations were found. There would be no anticipated effect from the proposed action on any federally listed plant.

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T/E (Threatened or Endangered) Wildlife Species, Habitat and/or Designated Critical Habitat	Affected (spotted owl habitat)	<u>Affected:</u> Alternative 2 would impact suitable habitat for the northern spotted owl (Threatened) and the unit of measure is the acres of dispersal habitat maintained. Refer to Section 3.5 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.
	Affected (1992 NSO critical habitat)	<u>Affected:</u> Alternative 2 would maintain the primary constituent elements of NSO critical habitat within the Planning Area due to canopy retention and existing snag and downwood retention. The unit of measure is the acres of dispersal habitat maintained. Refer to Section 3.5 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.
	Not Affected Disturbance-NSO	<u>Not Affected:</u> Logging activities occurring during spotted owl nesting season are not expected to disturb owls because all proper Project Design Criteria distance buffers and timing restrictions during the nesting and fledging periods would be applied to proposed activities.
	Not Affected (MAMU, including habitat)	<u>Not Affected:</u> The Planning Area occurs within Survey Zone B, requiring surveys for disturbance and projects affecting suitable murrelet habitat. No suitable habitat is affected by the Proposed Action. First year surveys were completed in 2009 with no detections for the species. Second year surveys for adjacent suitable habitat will be completed in August 2010. Should any detections be present from the second year, seasonal restrictions would be applied to occupied sites.

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Water Quality (Surface and Ground)	<p>Not Affected Temperature</p> <p>Not Affected Chemical/Nutrient Contamination</p> <p>Affected: Sediment/ Turbidity (hauling and road maintenance)</p> <p>Not Affected: Sediment/Turbidity (thinning, yarding, haul, and activity fuels treatments)</p>	<p>Temperature: There are no streams within this Planning Area that do not meet ODEQ water quality standards for temperature. BLM lands would continue to be managed to attain compliance with state water quality standards and ACS objectives. Streams in this Planning Area are generally well shaded on public lands by both the mid and upper canopy streamside vegetation. Within this Planning Area, the Ecological Protection Zone (EPZ, described in Section 2.2 of this EA) would maintain stream temperatures by reserving all trees within the primary shade zone, and a majority of the trees within the secondary shade zone (USFS and BLM, 2005) from commercial harvest.</p> <p>Chemical/Nutrient Contamination: No herbicides or pesticides would be used in conjunction with this project. Hydraulic fluid and fuel lines on heavy mechanized equipment would be in proper working condition in order to minimize potential for leakage into streams. Due to Project Design Features such as no re-fueling of any equipment would occur within 150ft of streams or stream crossings it would not be expected for the proposed activities to have any effect on chemical contamination of streams or waterbodies. Fuel treatments could increase nitrogen levels within the stream and riparian zone in the short term. These would be highly localized, low level increases and would not be of a magnitude that would have any adverse affect on macroinvertebrate populations which are the most sensitive indicators of water quality conditions.</p> <p>Sediment/Turbidity: A small amount of localized sediment may enter streams during hauling and road maintenance where roads are hydrologically connected. All thinning, yarding, and activity fuels treatments would not result in measurable inputs of sediment to streams due to project design. <i>See section 3.4: Water Resources and Erosion for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.</i></p>
Wetlands (Executive Order 11990)	Not Affected	The Proposed Actions would not result in the destruction, loss or degradation of any wetland. As such, the Proposed Actions are consistent with Executive Order 11990.
Wild and Scenic Rivers	Not Present	There are no eligible, suitable, or designated Wild and Scenic Rivers within the Mini Mule Planning Area.
Wilderness	Not Present	

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Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Essential Fish Habitat (Magnuson-Stevens Fisheries Conservation and Management Act)	Not Affected (EFH within the Rogue River Basin)	Mule Creek within this Planning Area is designated as EFH (Essential Fish Habitat) under the Magnuson-Stevens Fishery Conservation and Management Act. Thinning, yarding, road maintenance (including daylighting), hauling, and activity fuel treatments would not adversely affect coho and Chinook salmon Essential Fish Habitat. The closest EFH in Mule Creek is approximately 350 feet (0.06) from the closest thinning unit; and 450 feet (0.08 mile) way from the closest haul road (32-9-15.2C). The 32-9-15.2C road contains four perennial (non-fish) stream crossings that average 616 feet (0.11 mile) from EFH. With dry condition haul, well vegetated ditch lines, properly functioning cross drains, and existing filter strips, sediment would not be of a magnitude that would result in a measurable increase in the overall stream sediment deposition for more than 25 feet downstream within any of the stream channels. Project actions would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and DEQ’s provisions for maintenance of water quality standards.
Fire Hazard	Affected	Landing piles on the immediate downhill side of existing roads may present a short term increase in fire hazard because they have the potential to produce flame lengths that exceed the fire behavior threshold to the extent of increased spotting distance. The unit of measure is flame length. <i>Refer to Section 3.2 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.</i>
Fire Risk	Not Affected	Fire risk is the probability of a fire starting, as determined by the presence of ignition sources such as lightning and human activities. New permanent road construction has the potential to increase fire risk because new roads allow for an increase in human presence by providing easier access into previously inaccessible areas. However, there is no new permanent road or temporary route construction proposed in the Mini Mule Project.
Recreation	Not Affected	The Cold Springs Campground and Upper Mule Creek Trail are located in the Mini Mule Project Planning Area, but are located outside of proposed units. The Grave Creek to Marial Byway is a proposed haul route for this project. Recreation activities in the Planning Area included driving for pleasure, hiking, camping, hunting, off-highway vehicle use, horseback riding, and bicycling. While there might be increased logging truck traffic during the operational months, this type of activity is typical for the area because of harvesting on private and other government owned lands.
Rural Interface Areas (RMP, Map 13)	Not Affected	Rural residents abide in the Planning Area would experience short-term noise, dust, and traffic congestion due to logging operations. These types of activities are common because of management practices occurring on private and other public lands.
Special Areas (not including ACEC)	Not Present	

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Special Status Species (not including T/E): Fish Species/Habitat	<p>Not Present Southern Oregon Coast/California Coast fall chinook (sensitive) and Southern Oregon Coast/California Coast spring chinook (assessment)</p> <p>Not Affected Summer and Winter Klamath Mountain Province (KMP) steelhead</p>	<p>Southern Oregon Coast/California Coast fall chinook (sensitive) and Southern Oregon Coast/California Coast spring chinook (assessment) are not located with the project are but are located approximately 5 miles downstream.</p> <p>Not Affected: Summer and Winter Klamath Mountain Province (KMP) steelhead. Thinning, yarding, road maintenance (including daylighting), hauling, and activity fuel treatments proposed within Rogue River Horseshoe Bend Watershed would not affect steelhead found in Mule Creek. Some of the proposed haul route (32-9-15.2) parallels steelhead habitat. The closest road (32-9-15.2C) to steelhead habitat is 450 feet (0.08 mile). With dry condition haul, well vegetated ditch lines, properly functioning cross drains, and existing filter strips, sediment would not be of a magnitude that would result in a measurable increase in the overall stream sediment deposition for more than 25 feet downstream within any of the stream channels. Project actions would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and DEQ’s provisions for maintenance of water quality standards.</p>

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Special Status Species (not including T/E): Plant Species/Habitat	Not Present	<p><b>Bureau Special Status Plants – NOT PRESENT</b></p> <p>On July 26, 2007 a new Special Status Species list went into affect (BLM 2007), coupled with a new Interagency Special Status Species Policy (ISSSP). This new list has two categories, Sensitive and Strategic. The former categories of Bureau Assessment and Bureau Tracking no longer exist. Sensitive species require a pre-project clearance and management to prevent them from trending toward federal listing. There is no pre-project clearance or management required for the Strategic Species at the BLM District level, thus Strategic Species will not be analyzed in this document.</p> <p>Nonvascular surveys, completed in 2009, resulted in no new Sensitive or Strategic plant sites. Vascular plant surveys were conducted in the spring of 2009. Professional botanists surveyed the Planning Area units using intuitive controlled methodology, wherein areas supporting high potential habitat were surveyed more intensively. Surveys revealed a total of 13 sites consisting of one or both of two Bureau Sensitive species, <i>Bensoniella oregana</i> and Hairy sedge (<i>Carex gynodynamis</i>), were located within final Mini Mule Project units.</p> <p>Within timber harvest units, sensitive species would be protected by buffers, which protect the sites from direct and indirect effects. Sensitive plant sites residing in units retaining more than 40% canopy closure would receive a 25-100 ft buffer. Buffers would vary from 25-100 ft depending on unit prescription and proximity to other buffers, such as stream (EPZ) buffers. For example, since both of these species are closely associated with water, each site would more than likely fall within an already established EPZ buffer. If a site occurs on the edge of an EPZ buffer, an additional 25 ft would be added to the EPZ buffer edge – thus encompassing the site – to ensure protection of the site. Given these protection measures, the Proposed Action would not trend these species toward federal listing and should assure persistence.</p> <p><b>Bureau Special Status Fungi – NOT AFFECTED</b></p> <p>The Project Area was not surveyed for fungi, as pre-disturbance surveys for Special Status fungi are not practical, nor required per BLM Information Bulletin No. OR 2004-121, which states “If project surveys for a species were not practical under the Survey and Manage standards and guidelines (most Category B and D species), or a species’ status is undetermined (Category E and F species), then surveys will not be practical or expected to occur under the Special Status/Sensitive Species policies either (USDA/USDI 2004a, p.3).” Current special status fungi were previously in the aforementioned S&amp;M categories which did not consider surveys practical, and are therefore exempt from survey requirements. With the recent Interagency Special Status/Sensitive Species policy (ISSSP), 20 species of fungi were designated.</p>

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Special Status Species (not including T/E): Plant Species/Habitat (continued)	Not Affected	<p>District wide, the Medford BLM has 20 Sensitive (SEN) fungi species; 11 are suspected to occur here, while the remaining 9 have been documented. Of the 9 documented species, only one, <i>Phaeocollybia olivacea</i>, has been found in the Glendale Resource Area, approximately 17.5 air miles away from the closest unit in the Project Area. Dispersal via spore transport and/or mycelial network is improbable, as this site and the Project Area reside within different HUC 5 watersheds (the site is in Middle Cow Watershed, the Mini Mule project area is in Rogue-River Horseshoe Bend Watershed) and the two areas are separated by steep ridges and a several ravines. There are no sites of this species in the Rogue-River Horseshoe Bend watershed, where the Mini Mule Planning Area is located.</p> <p>While it is possible that this project is occurring within potential habitat for some species, there is very little information available describing the <i>exact</i> habitat requirements or population biology of these species (USDA/USDI 2004b, p. 148). The 2004 FEIS to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines addresses this type of incomplete and/or unavailable information (p. 108-109). However, the 2004 Record of Decision (ROD) to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines, offers a broad scale prospective of this current situation in stating, “Any discussion of risk based on rarity and likelihood of disturbance must recognize that, for many species, only a small percentage of potential habitat has been surveyed. Reserves have not been surveyed to the same degree as Matrix and Adaptive Management Area land allocations. The Reserves were not surveyed because there has been little management-induced disturbance there. The vast majority of pre-disturbance surveys have been located in the Matrix and Adaptive Management Area land allocation (19% of the Northwest Forest Plan area), so that is where many of the known sites have been found. This does not mean that a disproportionate amount of their habitat is located in Matrix. If these species are truly closely associated with late-successional or old-growth forests, we can reasonably expect that the large amount of federally managed lands in Late-Successional and Riparian Reserves which provide the most amount of this type of habitat (86% of currently existing late-successional forests is in reserves) would also provide, at a minimum, its proportionate share of the habitat to support populations of these species (USDA/USDI 2004b, p.11).”</p> <p>Based on the above information, the likelihood of a Sensitive fungi species in this Project Area is very low; the likelihood of a sensitive fungi occurring within a single unit(s) encompassed in the Project Area is even lower. The likelihood of contributing toward the need to list is not probable. See Appendix 8 Specials Status Species specialist report.</p>

Soil Productivity	Affected	The unit of measurement for this analysis is based on acre calculations of soil disturbance and compaction per unit. This unit of measurement and scale was selected for this analysis based on productivity losses of concern being associated with the harvest treatments directly. <i>Refer to Section 3.3 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.</i>
Vegetation Resources	Affected	Thinning across diameter classes, while maintaining critical owl habitat characteristics, would increase conifer growth rates for wood volume production in the future while maintaining northern spotted owl habitat. Stand densities would be reduced to increase the availability of light, water, nutrients and growing space for selected retained trees. A thin treatment would promote increased stand and tree vigor as well as development of larger crowns on retained trees. Fewer, but larger trees throughout their diameter classes would make up these stands in the long term. <i>See Appendix 4-Silvicultural Prescription for further discussion.</i>
Greenhouse Gases and Carbon Storage	Affected	<p>Scientific knowledge on the interrelationship between greenhouse gas levels and climate change is rapidly changing, and substantial uncertainties and several key limitations remain. Because forests store carbon, they affect the atmospheric concentrations of carbon dioxide, a greenhouse gas. Forest management can change the amount of carbon stored in a forest.</p> <p>The contributions of carbon storage and carbon emissions from the Proposed Action were calculated to determine the net contributions of greenhouse gases from the project. Carbon calculations in analysis for this EA were based on the assumptions in the 2008 FEIS (USDI/BLM 2008 Appendix C) and subsequent improvements to those assumptions, as set forth in R. Hardt, personal communication, November 6, 2009 (on file in the Medford District BLM Office, and incorporated here by reference). Carbon storage is analyzed by quantifying the change in carbon storage in <i>live trees</i>, storage in forests <i>other than live trees</i> (dead wood and roots, non-tree vegetation, litter and soil organic matter), and storage in <i>harvested wood</i> products. Change in forest ecosystem carbon over time is calculated based on predicted forest growth, using the ORGANON. Growth Model (Hann et al. 2007) with site specific data from stand exams as input into the model. Stand volume in cubic feet per acre per year for the project is used to calculate storage of tonnes of carbon per year. Carbon emissions (carbon dioxide) from this project are calculated from timber harvest activities (including fuel consumption) and post-harvest fuel treatments.</p> <p><i>See Section 3.6: Greenhouse Gases and Carbon Storage for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.</i></p>
Soil Erodibility	Affected	Tractor and cable yarding corridors, hauling, road maintenance and use would result in soil compaction and disturbance that would increase erosion. Offsite erosion and subsequent stream sedimentation is discussed in the Water Quality section of this appendix. <i>See Section 3.5: Water Resources and Erosion for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.</i>

<p>Soil - mass wasting</p>	<p>Not Affected mass wasting</p>	<p>As with all recent projects proposed within the Glendale Resource Area that would have surface disturbing activities, the Mini Mule Planning Area was mapped with GIS layers that show where the geologic contact zones, fault lines, and sensitive soils occur. The Statewide Landscape Information Database for Oregon (SLIDO) mapping was additionally used for this project to provide past known locations of landslides on a watershed scale. Within the Mule Creek HUC 6 sub-watershed there are multiple faultlines and geologic contact zones mapped in the western portion of the sub-watershed outside the Mini Mule Planning Area. There are no mapped faultlines or geologic contact zones within the Planning Area for this project (see Map 2 Faultlines in the Mule Creek Sub-watershed of this EA). The Planning area for this project is in an area of mapped fragile soils. All areas associated with units are TPCC commercial harvest restricted, not withdrawn. Please see Section 3.4.1.4 Fragile Soils and Section 3.4.1.5 (p.43) Skid Trails, Landing, and Yarding Corridors for further information on these areas and protection measures that would be used upon implementation. No areas classified as restricted fragile due to gradient or as fragile withdrawn would be harvested as part of this project.</p> <p>Though the location of fault lines, and geologic contact zones is beneficial to know for the purpose of providing insight into areas on the landscape that may still recovering from a historic large scale event, or areas that may have geologic intrusions with sensitive soils, these mapped features provide little in the way of determining the surface stability of an area for land management purposes. Instead, for land disturbing actions within the Glendale R.A., indicators are identified on the ground, such as large scale or unexplainable areas of pistol butting, jack-strawed, or uprooted trees, slumps, hummocky ground, or areas with excessive seeps and springs (that beyond the expected conditions for the slope and aspect). When these conditions are found appropriate buffers, dependent on the proposed action, are placed accordingly to protect these areas from excessive erosion.</p> <p>For the Mini Mule Project all thinning units were surveyed to identify areas where indicators were present and the extent of the buffers needed to prevent an increase in the risk of mass wasting or excessive erosion during stand thinning and yarding actions. Since some of the steeper draws within this watershed are prone to erosion, some units were modified during this planning and ground truthing process by deferring units, reducing unit acres, altering unit boundaries, deferring Riparian Reserve harvest, or by increasing stream EPZ buffers. Following the on-the-ground examination of each unit, and the design of needed boundary modifications and stream buffers, it was determined that the risk of mass wasting or excessive erosion would not be elevated within any of the proposed Mini Mule Project units during or following implementation of this action.</p>
<p>Visual Resources</p>	<p>Not Affected</p>	<p>The Planning Area is located within VRM (Visual Resource Management) Class IV category lands. This VRM category allows for moderate levels of change to the existing character of the landscape. The Proposed Action is consistent with the visual resource management objectives as stated in the Medford District Resource Management Plan (page 70).</p>

<p>Water Resources (not including water quality)</p>	<p>Not Affected</p>	<p>Water quantity can be affected during timber harvest by soil compaction and increased open space. Under the Proposed Action, a total of 35.5 acres may be compacted from skid trails. This would result in a net increase in sub-watershed compaction for Mule Creek of less than 0.1%. Since this subwatershed is currently well below the 12% watershed compaction known to result in significant changes in runoff timing and peak flows, these increases would not be of a magnitude that would result in any measurable change to the watershed hydrology. Within each unit, localized increases in surface flows at the compaction site could occur that would result in an increase in surface erosion (discussed under erosion). However due to the adjacent unaffected soils that would be left along skid roads on each of these sites, these localized instances of surface erosion would infiltrate back into the unit soils. The Mini Mule Project would not result in the creation of overstorey forest canopy openings that would contribute to open space within this sub-watershed (WPN, 1999). As such, the Proposed Action would not have measurable effects on watershed hydrology, including peak flows, base flows, runoff timing, subsurface flow, or water storage, and would not affect municipal and domestic water use or water rights.</p>
<p>Late-Successional Forest</p>	<p>Proposed action is in compliance with the 15% Standard and Guideline</p>	<p>Federal ownership of late-successional forest is approximately 76% (44,034 acres of 57,649 acres) of federal land within the Rogue River-Horseshoe Bend Creek watershed (WA, p. 54). The Northwest Forest Plan standards and guidelines state that at least 15% of fifth field watersheds should be managed to retain late-successional patches (ROD, C-44). The proposed action is to thin 40 to 80 year old previously entered stands and is in compliance with the 15% Standard and Guideline.</p>
<p>Migratory Birds Species of Concern (U.S. Fish and Wildlife Service 2008) Bald Eagle (b) Peregrine Falcon (b) Rufous Hummingbird Allen's Hummingbird Olive-sided Flycatcher Willow Flycatcher (c) Horned Lark (<i>strigata</i> ssp.) (a) Oregon Vesper Sparrow (<i>affinis</i> ssp.) Purple Finch 8 (a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species</p>	<p>Not Affected, at a state or regional scale*</p>	<p>Both the U.S. Fish and Wildlife Service (2002) and Partners in Flight (Altman 1999) consider the state and regional approach a key to the conservation of migratory songbirds. The Birds of Conservation Concern (USFWS 2008a) identifies species, subspecies, and populations of migratory and nonmigratory birds in need of additional conservation actions that are deemed to be the highest priority for conservation actions. The BCC 2008 encompasses three distinct geographic scales—North American Bird Conservation Initiative (NABCI) Bird Conservation Regions (BCRs), USFWS Regions, and National—and is primarily derived from assessment scores from three major bird conservation plans: the Partners in Flight North American Landbird Conservation Plan, the United States Shorebird Conservation Plan, and the North American Waterbird Conservation Plan. The Northwest Forest Plan as an effort in the same type of conservation planning process, which approaches management at a regional level. The proposed actions are consistent with the Northwest Forest Plan, which is also designed to provide for the conservation of other forest-related species in the range of the Northern Spotted Owl, such as these birds that may occur.</p> <p>Within the Northwest Forest Plan (24,455,300 federal acres), reserved/withdrawn lands total approximately 78% of the federal land base (USDA/USDI 1994, p. 2-62:65). Not all of the reserves are in or will obtain late-successional forest conditions, but the majority is expected to contribute as suitable habitat towards migratory birds utilizing late successional habitat. In addition, Matrix lands (3,975,300 acres) representing about 16% of the federal land base, contain selected portions of the land managed to retain 15-30% in late-successional forest, which provides additional suitable habitat. See Appendix 9 for Migratory Birds Specialist Report.</p>

<p>Special Status Species (not including T/E): Wildlife Species/Habitat</p>	<p>Not Present: Canada lynx, fisher</p>	<p><b>Threatened species - Lynx:</b> Medford BLM was excluded from the lynx known range due to the absence of lynx habitat characteristics (involving elevation and snow depth) and lack of historic sightings.</p> <p><b>Candidate species- Fisher:</b> Fishers have not been found in the Glendale Resource Area for successive years by peer-reviewed survey methods. Approximately 70 remote camera surveys were conducted to protocol (Zielinski and Kucera 1995) from 2002-2005, and 20 camera surveys in 2009 in the Glendale Resource Area, with no fisher detections. Fishers have not been observed by BLM field personnel over many successive years of field work within the Resource Area. It is possible that fisher may disperse through the Project Area, as fishers in the Siskiyou Mountains in Oregon represent the northern extent of indigenous fisher populations of northwestern California (Wisely et al. 2004, Aubry and Lewis 2003). Fishers are secretive small mammals associated with closed canopy conditions in late-successional forests throughout its range in the western United States, often associated with riparian areas (Aubry and Houston 1992, Dark 1997). Jones and Garton (1994) noted that fisher do not use non-forested lands (&lt;40% canopy cover).</p> <p>Causes of historical population declines in the pacific states include loss of habitat from logging, overtrapping, predator control, and urban and agricultural development. High intensity fires from fuels buildup could also have contributed to the loss of habitat. The proposed action does not affect late-successional habitat, and maintains at least 40% canopy cover in treated units. The project retains existing snags, down wood, hardwoods and dominant vigorous trees, accelerating growth and maintaining structural diversity within the units. Fisher are unlikely to be affected by the Proposed Action.</p>
	<p>Not Present: Pond Turtle, foothill-yellow frog</p>	<p><b>Bureau Sensitive: Pond turtles and foothill yellow-legged frogs</b> are not expected to occur in streams or riparian areas adjacent to the proposed units, as the Project Area is above 2,500 ft and lacks lentic water and basking sites for turtles. Therefore these species are not expected to be affected. No large decadent trees or snags, are expected to be affected in proposed units. Potential foothill yellow-legged frog habitat occurs, small to mid-sized streams with shallow, flowing water, riffles containing cobble-sized or larger rocks as substrate occurs, but would be unaffected by the Proposed Action due to the application of EPZs.</p>
	<p>Not Affected: fringed myotis</p>	<p>Some hazardous large snags or trees adjacent to roadway may be felled but would not be of the magnitude to affect habitat abundance or distribution of the fringed myotis bat.</p> <p>Bureau Sensitive not expected to be present in Project Area units: Tricolored blackbird, white-tailed kite, streaked horned lark, American peregrine falcon, bald eagle, Lewis' woodpecker, white-headed woodpecker, purple martin, black salamander, Siskiyou Mountains salamander , Oregon spotted frog, pallid bat, Townsend's big-eared bat, Oregon shoulderband snail, Chase sideband snail, travelling sideband snail, Siskiyou hesperian snail, Evening fieldslug, Franklin's bumblebee, Johnson's hairstreak, mardon skipper, coronis fritillary, Siskiyou short-horned grasshopper.</p>

Elk Management Area (EMA)	Not Affected	<p>The Mini Mule Project Area occurs in a 54,030 acre (42,520 BLM acres) Elk Management Area (EMA), designated by the RMP (RMP Map 7). Elk in the PA are most likely to utilize the main drainages of Mule Creek. No meadows occur within the PA that provides a continual source of high quality forage. Forage quality is the major limiting habitat factor for elk (PRMP EIS 4-61). The proposed second-growth plantation Mini Mule Project units do not qualify as a continual source of high quality forage, such as meadows. Cover would remain high since no activities are proposed in late-successional habitat for this project. There would be no change to the open road density as no road construction is proposed. Forage habitat condition would function within marginal conditions, similarly as in the No Action Alternative. Cover habitat effectiveness would continue to function as highly viable as in the No Action Alternative. Elk population levels are expected to continue to be low within the PA, with populations stable or declining slightly (USDI BLM 1994 PRMP 4-61) after the Proposed Action, which is within the effects anticipated in the Medford District RMP EIS.</p>
Other wildlife	Not Affected: other species: red tree vole, goshawk, great gray owl, Del Norte salamander, pygmy nuthatch	<p><b>Red Tree Vole</b> are not listed as Sensitive or Strategic species for the portion of the range affected by the Planning Area in Final State Director's Special Status Species List (<u>IM-OR-2008-038</u>). The Proposed Action units are young managed stands with little suitability for red tree voles. Diameters are generally 8-16 inches dbh with an occasional 20 inches dbh tree present. All units have had past management activity that has lead to a uniform diameter averaging 12-14 inches dbh. These units were clear-cut in different years ranging from 1961-1969. These units are generally unsuitable as providing habitat for stable populations of red tree voles. Some individuals or nests in treated units may be lost as a result of thinning, the treated stands would continue to function as dispersal habitat between late-successional stands and population persistence in the PA would not be affected. Although red tree voles utilize younger forested stands to a lesser extent, late-successional habitat provide stable and long-term habitat for population persistence.</p> <p><b>Goshawks and great gray owls</b> are not listed as Sensitive or Strategic species in Final State Director's Special Status Species List (<u>IM-OR-2008-038</u>) or USFWS Birds of Conservation Concern for BCR 5 (USFWS 2002). There is no suitable habitat in or adjacent to the proposed units.</p> <p><b>Del Norte</b> salamanders are associated with older, closed-canopy forests with rocky substrates dominated by cobble-sized pieces of rock (Welsh and Lind 1995). Del Norte Salamanders are known to occur within the Project Area; however, no known sites of occupied talus occur within the proposed units.</p> <p><b>Pygmy nuthatches</b> typically use tall pines. No pygmy nuthatches have been documented on the Glendale Resource Area (GLRA). Snag retention guidelines for Matrix management (USDA/USDI NWFP, p. C-41) are expected to meet the needs of this species where it occurs.</p>

Other wildlife (continued)	Not Affected: other species: (continued) California wolverine, pine mart	<p><b>Wolverines</b> are not present in the GLRA. No surveys are planned in the GLRA because the area is not considered to provide habitat.</p> <p><b>Pine marten</b> have been documented in the western sector of the GLRA in high-elevation conifer forest. They are thought to be present in the forested habitats across the lands administered by the Glendale Resource Area. Martens inhabit forested habitats at any elevation and would use openings in forests if there are downed logs to provide cover (Csuti, et al. 1997). They are a forest species capable of tolerating a variety of habitat types if food and cover are adequate. They prefer mature forests that contain large quantities of standing and downed snags and other coarse downed woody material, often near streams. They often use down logs for hunting and nesting. Habitat conditions and possible occurrence would not be affected for these due to maintenance of habitat elements for spotted owl habitat.</p>
Port-Orford-cedar	Not Affected	Project is within natural range of Port-Orford-cedar (POC). A POC Risk Key Analysis was completed. No management specific to POC and POC root disease ( <i>Phytophthora lateralis</i> ) is required. The Proposed Action is consistent with management direction in the Port-Orford-cedar EIS (See POC Risk Key in Appendix 5).

## **APPENDIX 3 – RESPONSE TO PUBLIC SCOPING COMMENTS**

Public scoping included a scoping letter mailed to a standard mailing list of individuals and organizations expressing interest in Glendale Resource Area projects requesting public comment from November 25, 2009 to December 26, 2009. The BLM received approximately three public responses from either letters or emails during this portion of scoping. These comments were form letter comments requested the following: road decommissioning, adequate cumulative effects analysis, address fire hazard created by activity slash, use the findings and recommendations of the watershed analysis, describe yarding in Riparian Reserves, analyze potential habitat fragmentation from daylighting road maintenance, apply variable density management, implement watershed restoration, retain snags, retain nests and, retain canopy to suppress weeds, protect streams, no log hauling during the wet season, analyze the effects of biomass removal, address carbon and climate change, and meet the Aquatic Conservation Strategy objectives.

BLM responses to substantive comments are presented in this Appendix to the EA.

Substantive comments do one or more of the following (BLM Manual, National Environmental Policy Handbook, 1/30/2008):

- question, with reasonable basis, the accuracy of information
- question, with reasonable basis, the adequacy of, methodology for, or assumptions used for the environmental analysis
- present new information relevant to the analysis
- present reasonable alternatives
- cause changes or revisions in one or more alternative

Comments that are not considered substantive include the following:

- comments in favor of or against the proposed action or alternatives without reasoning that meet the criteria listed above (such as “we disagree with Alternative Two and believe the BLM should select Alternative Three).
- comments that only agree or disagree with BLM policy or resource decisions without justification or supporting data that meet the criteria listed above (such as “more grazing should be permitted”).
- comments that don’t pertain to the Project Area or the project (such as “the government should eliminate all dams,” when the project is about a grazing permit).
- comments that take the form of vague, open-ended questions.

If a number of comments are identical or very similar, agencies may group comments and prepare a single answer for each group. Depending on the volume of comments received, responses may be made individually to each substantive comment or similar comments may be combined and a single response made. The Code of Federal Regulations (40

CFR §1503.4) identifies five possible types of responses for use with environmental impact statements.

1. Modify action alternatives.
2. Develop and evaluate alternatives not previously given serious consideration by the agency.
3. Supplement, improve or modify the analysis.
4. Make factual corrections.
5. Explain why the comments do not warrant further agency response, citing the sources, authorities or reasons which support the agency's position and, if appropriate, indicate those circumstances which would trigger agency reappraisal or further response.

### **Klamath-Siskiyou Wildlands Center**

**Comment #1:** Analyze the potential cumulative effects of this project on the timing and magnitude on peak flows due to the high road density in Mule Creek and upper Kelsey Creek.

**BLM Response #1:** The Mini Mule project nor any foreseeable projects propose any permanent road or temporary route construction to increase the road density in Mule Creek or Upper Kelsey Creek. Peak flow concerns are addressed in Appendix 2.

**Comment #2:** Requests the decommissioning of roads after harvest and of duplicative logging roads. Develop an action alternative with road decommissioning in the Mule Creek Watershed to improve aquatic and terrestrial forest health.

**BLM Response #2:** The purpose and need identified for Mini Mule Project is “to offer a timber sale from thinning harvest units”. Since the Mini Mule Project does not entail the construction of roads (permanent or temporary) decommissioning roads under a timber sale would be augmentation of timber receipts. Without specific statutory authority, the bartering of Government property (the value of timber) for services is prohibited because it would result in an unlawful augmentation of an Agency's appropriations. Timber sale contract requirements must enable the harvest of timber and the associated mitigation must be directly related to the harvest of timber related to the individual project. Currently the Glendale Resource Area is conducting a road condition assessment within the Mule Creek area to determine the appropriate management actions, such as standard road maintenance, improvement, and/or closure.

**Comment #3:** Address the fire hazard created by activity slash. Consider prescribed fire to existing and activity fuels in the planning area. Address the site-specific cumulative impacts of the Blossom Fire, fire suppression activities (such as dozer line construction) and post-fire salvage logging on terrestrial and hydrological resources of the planning area.

**BLM Response #3:** See Chapter 3, Section 3.2 (Fire Hazard) for the analysis of activity slash. Prescribed fuels treatments outside of treating activity slash would be augmentation of timber funds (see response to comment #2 above). Future consideration of hazardous fuel reduction could occur outside of the Mini Mule Project. See Section 3.4.2.3 for Cumulative Effects on Water Resources and Erosion from wildfire and prescribed fuels reduction.

**Comment #4:** Incorporate the findings and recommendations of the watershed analysis into the Mini Mule Project environmental analysis.

**BLM Response #4:** Any recommendations in the watershed analysis are considered with the larger landscape analysis done through the Northwest Forest Plan and 1995 Medford District Resource Management Plan. Current site-specific information was collected through satellite imagery, extensive field surveys, and ground-truthing for the Mini Mule Project. The current collection of information for this project is of greater use and accuracy than the findings and recommendations of the 1997 Wild Rogue North Watershed Analysis. However, the Recommendations Section in the Watershed Analysis does note “Plantations resulting from past timber harvest are located throughout the watershed. Management in these stands should focus on maintaining conifer stands, promoting their growth and developing habitat conditions. The specific prescriptions will vary, based on the land allocation in which the plantation occurs....Stands 40-80 years old should be examined as a high priority for commercial thin treatments,” (p.149).

**Comment #5:** Specifically explain how timber would be yarded within Riparian Reserves.

**BLM Response #5:** Outside of the Ecological Protection Zone (EPZ), cable yarding timber would be at least partially suspended, as in the uplands. Though no thinning would occur within the EPZ, logs could be cable yarded over the EPZ but would require full-suspension. Tractor yarding could occur on slopes generally less than 35% within the treatment portion of the Riparian Reserve. For further details see Chapter 2, Section 2.3.2.2 (Timber Yarding) and Appendix 10 (Standard Operating Practices), Streams and Riparian Reserves, and Sedimentation and Soil Compaction from Logging.

**Comment #6:** Limit yarding, when possible, to previously disturbed sites.

**BLM Response #6:** Appendix 10 (Standard Operating Practices), Sedimentation and Soil Compaction from Logging for the Standard Operating Practices (SOP), Best Management Practices (BMPs), and Project Design Features (PDFs) to minimize ground disturbance for yarding.

**Comment #7:** Patch cuts in the RR violate the NWFP and Medford RMP. Focus thinning in RRs on small-diameter understory and for density reduction of young managed stands.

**BLM Response #7:** Patch cuts are not proposed within the Riparian Reserve. Riparian Reserves proposed for thinning are those that are dominated by smaller diameter stands

and lacking large tree structure. The proposed treatment stands in the Mini Mule Project are plantations ranging from 40-80 years old. See Section 2.2.1 (Riparian Thinning) regarding development of species diversity and multiple layers.

**Comment #8:** Believes “daylighting” road maintenance would increase habitat fragmentation, hydrological effects (such as peak flow response) and changes to interior forest temperature already caused by an extensive logging road system.

**BLM Response #8:** See Chapter 3, Section 3.5 regarding the “daylighting” road maintenance on spotted owl habitat. “Daylighting” road maintenance would not affect any other BLM managed wildlife in the Mini Mule Planning Area. See Appendix 2, Critical Element: Water Resources regarding these activities on peak flow response.

**Comment #9:** Requests variable density thinning (provides various recommendations on how to apply it).

**BLM Response #9:** Variable density thinning is a silvicultural treatment tool to meet specific management objectives and is not a one size fits all approach. The commercial thinning silvicultural prescription for Matrix and Riparian Reserves were designed to best meet the objectives of these land use allocations. See Appendix 1 for further public scoping alternative consideration.

## **Oregon Wild**

**Comments #10:** Recommends implementing other aspects of watershed restoration such as pre-commercial thinning, restoring fish passage, reducing impacts from roads, and treating invasive weeds.

**BLM Response #10:** The purpose and need of the Mini Mule Project is to offer an economical timber sale. However, there are other environmental analysis documents on the Medford District to cover the above requested activities. A categorical exclusion for pre-commercial thinning throughout the Glendale Resource Area allows for thinning (trees less than 8 inches dbh) over-stocked young plantations. The Medford District’s Programmatic Aquatic and Riparian Habitat Enhancement Environmental Assessment addresses water restoration activities such as restoring fish passage and reducing impacts from roads that would benefit aquatic species. As stated in the EA (Appendix 7 – Noxious Weeds Specialist Report), priority noxious weed sites in the Mini Mule units will receive treatments under the Medford District *Integrated Weed Management Plan and Environmental Assessment OR-110-98-14*. The Medford District’s Road and Recreation Maintenance Categorical Exclusion (2009) addresses standard road maintenance activities that would reduce impacts of roads such as sedimentation.

**Comment #11 :** Treat the youngest of stands. Retain all the largest trees. Retain some smaller trees in all age-size classes. Retain under-represented conifer and non-conifer trees and shrubs. Strive for variable density. Use skips and small gaps to achieve stand

diversity. States designation by description results in a small amount of stand variability, but is a “significant compromise” to the amount of ecological variability desired.

Retain abundant snags and coarse wood distributed and in clumps to mimic natural disturbance. Retain less more snags where heavier thinning occurs. Use heavy thinning sparingly to retain snag recruitment. Retain snags in riparian areas for LWD.

**BLM Response #11:** The silvicultural prescription is designed to best increase stand and tree vigor, and develop larger crowns and girth of retained trees within these previously managed stands. See BLM Response to comment #9 regarding the variable density management. The purpose and need of harvesting in this project, “is to offer timber for sale from thinning harvest units that are economical and maintain northern spotted owl dispersal habitat”.

See Section 2.3.2.2 (Timber Yarding), regarding the retention of snags in the uplands and within riparian areas. Hardwoods would be retained as a part of this project.

**Comment #12:** For whole-tree yarding or with tops attached, top a portion of trees and leave the greens in stands to retain nutrients on site.

**BLM Response #12:** Leaving all the tops of trees in units would increase the fuel loading in units, and could increase the risk of fire ignition and spread should a fire enter the Project Area. Approximately 80% of fir branches from whole tree yarding would remain in the unit. The needles contain most of the fir nutrients which would be allowed to break down as this material would be lop & scattered in the unit.

**Comment #13:** Avoid impacts to raptor nests and enhance habitat for diverse prey species.

Avoid cutting trees with any sort of nests and trees with defects.

**BLM Response #13:** Appendix 2 analyzes the effects of the Proposed Action on red tree voles (a prey species of the spotted owl), goshawks, great gray owls, marbled murrelets, and northern spotted owls. Also see the effects analysis in Section 3.5 (Northern Spotted Owl). The guidance in the Medford District RMP (p.46) to protect raptor nests is for known sites. There are no known raptor nests in the Project Area, including threatened and endangered, Bureau Sensitive, or Migratory Birds of Concern (see Appendix 9 for further details). For the Mini Mule Project, no thinning or road maintenance would occur within any 70 acre northern spotted owl nest patches. There is no spotted owl nesting habitat in the proposed units. See Section 2.3.2.1 (Forest Management) for Project Design Criteria from the U.S. Fish and Wildlife Service that would be applied to avoid disturbance to spotted owls and marbled murrelets.

The Mini Mule Planning Area contains a wide range of habitat to support prey species. There is no NWFP or Medford RMP management guideline to avoid cutting trees with nests of all species or trees with defects in the Matrix land use allocation. The Mini Mule Project is not a “restoration thinning.” As stated in the EA, one of the objectives is to,

“Produce a sustainable supply of timber and other forest commodities on matrix lands to provide jobs and contribute to community stability,” (RMP, p. 38).

Tree defects typically become evident in older stands (greater than 80 years). Most of the stands in the Project Area exhibit very little substantial defects.

The Mini Mule Project would not affect localized nesting populations to persist and the EA is consistent with the management direction of the Northwest Forest Plan and Medford RMP.

**Comment #14:** Requests the BLM to use canopy cover to suppress weeds.

**BLM Response #14:** See Appendix 7 (Noxious Weeds Specialist Report), regarding the canopy cover retention for this project and its ability to suppress the spread and growth of weeds. Additionally, Project Design Features (PDFs) have been included in the project to decrease the potential spread of weeds associated with the Proposed Action. Project Design Features include washing equipment prior to moving it on-site, operating vehicles/equipment in the dry season, and seeding and/or planting newly created openings (i.e. skid trails and yarding corridors) with native vegetation to reduce the potential establishment of noxious weeds.

In the long term (5-100 years), tree canopies would eventually expand and reduce light levels, which in turn would prevent weeds from growing and expanding within treated areas, because populations decline as the amount of light reaching the plants diminishes. Consequently, in the long term, remaining weed populations would be confined to the roadway and adjoining (private) disturbed land as canopy is re-established in treated areas over time.

**Comment #15:** Avoid soil disturbance and road construction.

**BLM Response #15:** Appendix 10 (Standard Operating Practices) contains Standard Operating Practices (SOP), Best Management Practices (BMPs), and Project Design Features (PDFs) to be applied to the Mini Mule Project to ensure project compliance with the federal Clean Water Act and higher-level National Environmental Policy Act (NEPA) documents, laws and BLM guidelines. Specifically, see “Sedimentation and Soil Compaction from Logging” and “Sedimentation and Soil Compaction from Roads and Landings” for practices to minimize soil disturbance associated with this project.

There is no temporary route or permanent road construction proposed for the Mini Mule Project.

**Comment #16:** Buffer streams from heavy equipment and loss of bank and stream shade trees.

**BLM Response #16:** See Chapter 2, Section 2.2.1 (Riparian Thinning), for application of Ecological Protection Zones (EPZ) to protect flood stage streambank stability; shade

and temperature; surface erosion of streamside slopes; fluvial erosion of the stream channel; soil productivity; habitat for riparian-dependent species; the ability of streams to transmit damage downstream; the role of streams in the distribution of large wood to downstream fish bearing waters; and riparian microclimate. No treatment or heavy equipment would occur within the EPZ. In addition, see Appendix 10 (Standard Operating Practices), “Streams and Riparian Reserves” for Standard Operating Practices (SOP), Best Management Practices (BMPs), and Project Design Features (PDFs) to be applied to the Mini Mule Project.

**Comment #17:** Do not allow log hauling during the wet season.

**BLM Response #17:** See Chapter 2, Section 2.3.2.3 (Road Work) for condition restrictions for log hauling of the Proposed Action. Section 3.4.2.2 for the environmental effects analysis on Water Resources and Erosion from log hauling.

**Comment #18:** Commenter states forest stand modeling with Fire and Fuels Extension to the Forest Vegetation Simulator (FFE-FVS) showed thinning delays recruitment of large wood for up to 60 years in the Umpqua National Forest. (USDA Forest Service 2007. Curran Junetta Thin EA. Cottage Grove Ranger District, Umpqua National Forest. June 2007.

<http://www.fs.fed.us/r6/umpqua/projects/projectdocs/curran-junetta-thin/index.shtml>

**BLM Response #18:** The Proposed Action applies the Northwest Forest Plan and Medford Resource Management Plan, which allocates Matrix land for permanent forest production including commercial thinning. The Curran Junetta Thin EA actually states (p.90), “Under the no action alternative, [advised large snag densities] would not be achieved for another two decades. The action alternatives would delay reaching this level by an additional 10 to 30 years. However, the action alternatives would provide other ecological benefits by allowing trees to grow larger and faster, and to develop other suitable wildlife habitat characteristics.”

**Comment #19:** Describe the effects of biomass removal. How will biomass be brought to landings? Will there be extra passes made by heavy equipment? Will landings be enlarged to accommodate grinders, chip vans, and other equipment? Can local forest roads accommodate chip vans? Will roads be modified to make them passable by chip vans? What are the impacts of this action? What are the direct, indirect, and cumulative impacts on soil, water, wildlife, and weeds?

**BLM Response #19:** There is no biomass removal proposed for the Mini Mule Project.

**Comment #20:** Develop an alternative that addresses carbon and climate by (a) deferring harvest of older forests to store carbon and provide biodiversity and connectivity and (b) thin younger stands to increase forest resilience and diversity and connectivity. Disclose the carbon cost of thinning. Carbon stays out of the atmosphere much longer if it remains in the forest as live and/or dead trees, instead of being converted to wood products and industrial and consumer waste.

**BLM Response #20:** See Section 3.6 Greenhouse Gas and Carbon Storage, for the analysis of carbon loss and storage as a result of proposed thinning under this project. The Mini Mule Project proposes thinning of 40 to 80 year old previously entered stands. No mature or old-growth stands are proposed for harvest in the Mini Mule Project.

**Comment #21:** Thinning is not always consistent with the Aquatic Conservation Strategy (ACS). Thinning captures mortality and delays recruitment of large wood. States agencies often misinterpret the Northwest Forest Plan ROD by confusing accelerated attainment of ACS objectives with ACS compliance. The NWFP ROD actually says that silviculture in riparian reserves is generally prohibited, and allowed only “if needed to attain” ACS objectives, not (as implied by the EA) if needed to “accelerate” ACS objectives. The appropriate evaluation is to ask “will ACS objectives eventually be met without intervention?” If the answer is “yes,” then silviculture is technically not allowed.

The ACS “do not retard” standard, is separate from the “if needed” test, and is a criteria to limit active management, not an excuse to reject the no action alternative. The “do not retard” standard cannot be interpreted to require active management whenever and wherever it would accelerate attainment of ACS objectives.

**BLM Response #21:** See Appendix 6 of the EA for the Aquatic Conservation Strategy Analysis. The EA conforms to the ACS standards and guidelines and the nine objectives as provided on page B-11 of the NWFP. The EA provides the decision maker and reader the restrictions for activities in Riparian Reserves, the minimum distance from streams that any proposed activities would occur, and how the Mini Mule Project is consistent with ACS objectives.

No thinning would occur within 60-187 ft of streams depending on the assigned EPZ distance, as stated on pages 17 of the EA. This page also describes the condition consideration for riparian thinning. No treatment would occur within the EPZ and riparian thinning outside the EPZ would retain 50% canopy closure. See Appendix 2 for the location of managed fish species from proposed activities.

**Comment #22:** Analyze the long-term cumulative effects of perpetuating the shortage of snags and dead wood for several decades by thinning mid-seral stands.

**BLM Response #22:** The Mini Mule Proposed Action states that “All non-hazardous snags would be retained in all harvest units. If it is necessary to fall snags for safety reasons, they would remain on site as down wood. All existing naturally occurring dead and down woody debris, greater than or equal to 16 inches diameter, would remain on site” (EA, p. 23).

The Mini Mule Project is not a “restoration thinning.” As stated in the EA, one of the objectives is to, “Produce a sustainable supply of timber and other forest commodities on matrix lands to provide jobs and contribute to community stability,” (RMP, p. 38).

The Mini Mule EA is consistent with the management direction of the Medford RMP. The Medford RMP provides specific objectives for managing lands under the matrix land allocation. Those objectives include retaining 15 percent late successional forest, and provide a renewable supply of large trees for cavity using birds, etc. Commercial thinning are scheduled after developing stands reach a combination of stem diameter and surplus volume to permit an entry that is economical (RMP, p. 185).

The RMP (pg. 72) only allocated approximately 17 percent of the Medford District's landbase to the matrix land use allocation, from which the majority of the timber harvest is to be derived. The RMP allocated the lands in this project area primarily for timber production and with the general prescription of modified even-aged management that would trend toward a forest composed of stands containing a variety of structures, ages, sizes, and canopy configurations (RMP, p. 187). Matrix lands were not set aside for developing old growth forests.

**Comment #23:** "The final spotted owl recovery plan (FRP) (p 50) describes spotted owl habitat as including "a high incidence of large trees with various deformities (large cavities, broken tops, mistletoe infections, and other evidence of decadence); large snags; large accumulations of fallen trees and other woody debris on the ground; ..." These features, especially the large accumulations of down wood, cannot develop under an aggressive thinning regime.

The FRP (p 119) says "recovery and maintenance of the Spotted Owl populations may well depend on, in part, restoration of habitat lost (to timber harvests, wildfire, [etc] ... Methods include (1) retention of biological legacies, ... (4) management of decadence processes ..." This means the agencies must retain abundant green trees and facilitating natural mortality processes that continuously and episodically recruit dead wood.

The spotted owl recovery plan (Recovery Action 5, FRP page 20) encourages actions such as thinning that have short-term impacts and long-term benefits. The recovery plan does not define "short-term," but the WOPR FEIS (p 4-479) says that short-term impacts last for 10 years, yet thinning will delay recruitment of desired levels of dead wood for much longer than 10 years. Also, these activities must have *demonstrated* long-term benefits. In most cases, long-term benefits of logging are assumed, but not yet demonstrated. See the SAT Report."

**BLM Response #23:** The Mini Mule Project does not propose treatment in any nesting, roosting, and foraging habitat. The Proposed Action would maintain dispersal habitat in previously entered stands (plantations) 40-80 years old through light to moderate thinning. A combination of Forest Operation Inventory data, aerial photo interpretation, GIS spotted owl habitat data layers and field reviews were used to survey the Proposed Action units. One unit and a portion of another unit was deferred from treatment between public scoping and finalizing of the Proposed Action for the EA, due to identification of high quality owl habitat. See Section 3.5 for the EA analysis on the spotted owl and its habitat.

# APPENDIX 4 - SILVICULTURE PRESCRIPTION

## **Introduction**

The Mini Mule Project proposes timber harvest in 17 units within the Mule Creek sub-watershed.

Stands in this Planning Area can be classified as plantation Douglas fir and fall into the following plant associations: Douglas-fir and Tanoak. The Douglas-fir series is the predominant series in this Planning Area. The primary species in the Project Area is Douglas-fir with lesser percentages of Incense Cedar, Western Hemlock, White Fir and Sugar Pine. Hardwood and shrub species include, but are not limited to: Pacific Madrone, Rhododendron, Bracken Fern, Red Alder, tanoak, Salal, Golden Chinquapin, Vine Maple, Oregon Grape, Evergreen Huckleberry, Manzanita, Oregon Ash, and California hazel.

## **Land Use Allocation Objectives:**

The Planning Area is comprised of lands allocated as Northern General Forest Management Area including a Connectivity/Diversity Block, and Riparian Reserves.

**Matrix Lands:** Objectives of Matrix lands include the following:

- Produce a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability.
- Provide early-successional habitat.
- Provide connectivity between Late Successional Reserves.
- Provide habitat for a variety of organisms associated with both late-successional and younger forests.
- Provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees.
- Maintain at least 25 to 30% of each Connectivity/Diversity Block in late-successional forest.

**Riparian Reserves:** Objectives of Riparian Reserves include:

- Aquatic Conservation Strategy objectives (RMP pages 22-23)
- Provide habitat for terrestrial species associated with late-successional forest habitat.
- Provide dispersal habitat for the northern spotted owl.
- Implement strategies to achieve the goals established in the BLM's Riparian Wetland Initiative for the 1990s.

**Specific Unit Objectives:**

**Thinning (uplands and within Riparian Reserves, outside the Ecological Protection Zone): 16-1, 17-1, 17-2, 19-3, 20-2, 20-3, 20-4, 21-2, 21-3, 21-4, 28-3, 29-1, 29-2, 30-1, 30-2, 30-4, and 32-2**

For upland thinning the primary objectives are production of wood volume at the present time and increasing conifer growth rates for wood volume production in the future while maintaining northern spotted owl habitat. Stand densities would be reduced completion by increasing the availability of light, water, nutrients and growing space for selected retained trees. A thinning treatment would promote increased stand and tree vigor as well as development of larger crowns on retained trees. Fewer, but larger trees would make up these stands in the long term. The proposed Mini Mule Project units are previously managed stands 40 to 80 years old.

For riparian thinning, outside the Ecological Protection Zone, the primary objectives are to increase the availability of light, water, nutrients and growing space for retained trees that would lead to the development characteristics of older diverse forests while maintaining northern spotted dispersal habitat. Areas proposed for riparian thinning would maintain an average of 50% canopy closure per stream treatment. Production of wood volume would be a by-product of the treatment rather than a primary objective. Large woody debris, downed logs, and large tree structure are not to desired levels. Retained trees would be better able to develop larger canopies, display better vigor and put on diameter growth faster than if left untreated.

**Effects of Proposed Treatments**

**Vegetation Effects – Short Term (0-10 years)**

<b>Stand Condition</b>	<b>No Treatment</b>	<b>Thinning/Variable Density Management</b>
Vigor	Remain the same to decrease	Remain the same to increase
Growth Rate	Remain the same to decrease	Remain the same to increase
Live crown ratio	Remain the same to decrease	Increase
Conifer species	Remain the same	Increase
Hardwood species	Remain the same to decrease	Increase
Shrubs/brush/forbs	Decrease	Remain the same to increase
Snags	Remain the same	Remain the same
Coarse woody debris	Remain the same	Remain the same

**Vegetation Effects – Long Term (11+ years)**

<b>Stand Condition</b>	<b>No Treatment</b>	<b>Thinning/Variable Density Management</b>
Vigor	Decrease	Increase
Growth Rate	Decrease	Increase
Live crown ratio	Decrease	Increase
Conifer species	Remain the same	Increase
Hardwood species	Remain the same to decrease	Increase
Shrubs/brush/forbs	Decrease	Increase then decrease as canopy closes
Snags	Increase due to mortality, small diameter	Remain the same to decrease
Coarse woody debris	Increase, small diameter	Remain the same to decrease

The processes that shape how these stands appear in the future and their character are dependent on many factors. The above table lists what is thought to be the most likely outcomes of the no action alternative and the Proposed Action. Fire, insect and disease, climate, drought and other management activities will be factors in the long term development of these stands.

**Units: 16-1, 17-1, 17-2, 19-3, 20-2, 20-3, 20-4, 21-2, 21-3, 21-4, 28-3, 29-1, 29-2, 30-1, 30-2, 30-4, and 32-2** T. 32S R. 9W Section 16, 17, 19, 20, 21, 28, 29, 30, 32

**Stand Description:** These units consist of plantation Douglas-fir with a small percentage of Sugar Pine, White Fir, Western Hemlock and Incense Cedar, in some units. Diameters are generally 8 -16 inches dbh with an occasional 20 inch dbh tree present. All units have had past management activity that has lead to a uniform diameter averaging 12-14 inches dbh. These units were clear-cut in different years ranging from 1961-1969, and are growing on productive soils with a site class of 3 and 4. Canopy closure in many of these stands is very high. Many areas are 80% canopy closure or greater. Basal areas within the unit range from 120-200 ft<sup>2</sup>. Live canopy ratios are approximately 30-45%. There are areas within these that contain Ophiostoma Wagerii (Black Stain) and Phellinus Weirii (Laminated) root rot. Minimal mortality has occurred in these units due to these root diseases. Many of these stands are missing large down woody debris, mid-stories, under-stories, and species diversity which are key habitat components, needed for the northern spotted owl. Understory vegetation includes: Rhododendron, Bracken Fern, Tanoak, Salal, Vine Maple, Oregon Grape and Evergreen Huckleberry.

**Analysis:** Units are within the land allocation of Matrix land and Riparian Reserve. Some of these units fall within a Critical Habitat Unit (1992) and are currently categorized as dispersal habitat Units 17-1, 17-2, and a portion of 20-4 are located in a Connectivity Diversity/Block. Within the Connectivity Diversity section 65% of the land-base is in 250+ year old late successional forest, which is well within the management objective set forth in the resource management plan. These stands are fully capable of responding to a release treatment. The treatment proposed would reduce stand

density throughout the smaller diameter classes, promote more vigorous growth in the residual trees and maintain northern spotted owl dispersal habitat. The primary impact from Black Stain root disease occurs when disease centers are found in 15-25 year old plantations. Douglas fir 30 years and older apparently acquire a substantial resistance to the disease (Forest Pest Management Pacific Northwest Region, USFS). The average stand age of these units is 45 years old, which greatly reduces the risk of mortality and spread of this root disease. Laminated root rot was found in one unit, with the infection center located within the ecological protection and riparian reserve area. This infection center has created a natural opening and is not a substantial risk to the surround stand if treated with a buffer of removal. It has been identified that this area is in the Douglas fir plant series and removal of the White fir component from these units would keep these stands from developing into a different plant association in the future.

**Desired Future Conditions/Results:** Short term, the desired future condition would be maintenance of dispersal habitat accompanied by release of retained trees. Maintenance of dispersal habitat would include retaining large down wood and non-hazardous snags, broken/forked topped trees along with saving the majority of minor conifer and hardwood species. The treated stand would have at least 40% canopy cover in the Matrix and 50% canopy cover remaining in the Riparian Reserve. Reduction of competition on the retained trees would result in increased growth rates.

Long term desired future conditions for the unit would be increased growth and vigor. Retained trees of multiple species would have fuller, deeper crowns. Eventually, crown closure would return to near pre-harvest levels. Fewer, but larger vigorous, character trees would make up the unit and the canopy.

**Avoidance Strategies:** During harvesting operations pre-designate skid trail locations to avoid black stain root disease in those units where identified. Limiting damage and compaction in these areas would reduce risk of black stain movement. Timely removal of slash piles would limit the insect vectors associated with long range spread of black stain. Retention of non host conifer species within the infections centers of black stain and laminated root rot area's would also reduce the risk of spread.

**Recommended Treatment:** The recommended treatments for these stands are to thin from below, releasing the dominant, co-dominate and minor species. Retain all minor conifer species with the exception of white fir which is to be removed. Mark to retain 40% canopy closure in the Matrix and 50% canopy closure in the Riparian Reserves. Leave most minor conifer species in and around black stain and laminated root disease infection centers. Thin in Riparian Reserves to allow a diverse multi-layer, multi-species stand to develop. Retain existing decadent woody material such as snags and down wood. Favor retention of trees with 35-45% live crown ratios, and deformities that could be used in the future for owl habitat.

# APPENDIX 5 – PORT ORFORD CEDAR RISK KEY ANALYSIS FOR MINI MULE

Risk Key is from Alternative 2 of the FSEIS for Management of Port Orford Cedar in Southwest Oregon 1/2004

QUESTION		UNIT																
		16-1	17-1	17-2	19-3	20-2	20-3	20-4	21-2	21-3	21-4	28-3	29-1	29-2	30-1	30-2	30-4	32-2
1a.	Are there uninfected POC within, near <sup>1</sup> , or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near <sup>1</sup> , or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7 <sup>th</sup> field watershed <sup>2</sup> as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		<i>If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.</i>																
		<i>If the answer to any of the three questions is yes, continue.</i>																
2.	Will the proposed project introduce appreciable additional risk <sup>3</sup> of infection to these uninfected POC?	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
		<i>If no, then risk is low and no POC management practices are required.</i>																
		<i>If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through</i>																
		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

<i>practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.</i>																		
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- 1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.
- 2 - Uninfested 7th field watersheds are listed on Table A12-2 [of FSEIS] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.
- 3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Risk Key is from Alternative 2 of the FSEIS for Management of Port Orford Cedar in Southwest Oregon 1/2004

QUESTION		Roads / Road Systems (operations and use including roadside brushing, renovation, drainage improvement, log hauling, and decommissioning.)																			
		County Road 27	33-7-2	30-6-32	32-8-1	32-8-1.1	31-9-35	32-8-9.2	32-8-31	32-9-14.2	32-9-14.1	32-9-32	32-9-32.2	32-9-15.2	32-9-20.3	32-9-21	32-9-16	32-9-30	32-9-18	32-9-21.1	32-9-33
1a.	Are there uninfected POC within, near <sup>1</sup> , or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near <sup>1</sup> , or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7 <sup>th</sup> field watershed <sup>2</sup> as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		<i>If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.</i>																			
		<i>If the answer to any of the three questions is yes, continue.</i>																			
2.	Will the proposed project introduce appreciable additional risk <sup>3</sup> of infection to these uninfected POC?	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		<i>If no, then risk is low and no POC management practices are required.</i>																			
		<i>If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the</i>																			
		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

<p><i>project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.</i></p>																																								
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- 1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.
- 2 - Uninfested 7th field watersheds are listed on Table A12-2 [of FSEIS] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.
- 3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

**Conclusion: No measures or mitigation for Port-Orford-cedar are required.**

## APPENDIX 6 - AQUATIC CONSERVATION STRATEGY CONSISTENCY ANALYSIS

“The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy would protect salmon and steelhead habitat on federal lands managed by the Forest Service and Bureau of Land Management within the range of the Pacific Ocean anadromy” (Medford District RMP pg. 22).

The four components of the ACS are Riparian Reserves, key watersheds, watershed analysis, and watershed restoration. The ACS was designed to meet the nine objectives discussed below.

This ACS consistency analysis evaluates Mini Mule Project EA on BLM land.

### **Analysis of the Four Components of the ACS:**

**1. Riparian Reserves:** The proposed project is consistent with the actions and directions within Riparian Reserves as described in the Medford District RMP. The Proposed Action would result in 101 acres of thinning to promote forest health and the development of large woody debris (LWD) within Riparian Reserves outside the Ecological Protection Zone (EPZ). Thinning would be designed to expedite the development of late successional, multi-story habitat conditions and restore the species composition and structural diversity of the plant communities, needed to achieve ACS and Riparian Reserve objectives (Medford RMP, pg 22, pg 26 respectively). Riparian Reserves within the proposed units are currently dominated by Douglas fir and some hardwoods. Most riparian stands are lacking large wood debris, downed logs, and large tree structure. Thinning of dense Riparian Reserves would reduce competition on the retained trees for light, nutrients, water and growing space, allowing trees would develop larger canopies, display better vigor and put on diameter growth faster than if left untreated.

The project is also consistent with the Best Management Practices (BMP) within Appendix D of the 1995 Medford RMP.

**2. Key Watershed:** The Planning Area is not located in a Key watershed.

**3. Watershed Analysis:** The Glendale Resource Area completed the Wild Rogue North Watershed Analysis in 1999. The proposed activity is consistent with the Watershed Analysis.

The Watershed Analysis found that management directions in the Northwest Forest Plan and the 1995 RMP including the Aquatic Conservation Strategy, Best Management Practices, and Riparian Reserve management would be adequate at protecting, maintaining and improving aquatic and riparian ecosystems. The Wild Rogue North

Watershed Analysis recommended reducing road densities which are not needed for future management.

The Wild Rogue North Creek Watershed Analysis discussed restricting road construction or considering alternatives to constructing new roads in sensitive soil areas. Temporary route or permanent road construction is not proposed for the Mini Mule Project. Many of the roads within the Mini Mule Project Planning Area are not public roads and are under reciprocal right-of-way agreements with private landowners because of the checkerboard ownership pattern. The BLM does not have the option to close many of these roads due to the reciprocal right-of-way agreements.

**4. Watershed Restoration:** Though the Mini Mule Project is not a watershed restoration project, it would aid in the improvement of watershed health through the following proposed activities: thinning and activity fuels reduction in Riparian Reserves.

#### **Analysis of the Mini Mule Project EA Proposed Action's consistency with the Aquatic Conservation Strategy objectives:**

The ACS gives direction to maintain and restore ecosystem health at watershed and landscape scales. For the purposes of this analysis the watershed scale will be discussed in terms of site or project scale and will be at the HUC 6 and 7 watersheds. The landscape scale will be at the HUC 5 watershed level.

Appropriate consideration of potential cumulative effects is a critical element in determining a project's consistency with the ACS. The minimal effects at the HUC 7 scale would not reach a magnitude detectable at the HUC 6 or HUC 5 scales. Because there would be no detectable cumulative effects caused by the Proposed Action, cumulative effects will not be discussed in the individual ACS objectives.

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

The watershed and landscape-scale features which protect species, populations, and communities dependent on aquatic systems would be maintained and in some cases enhanced in the short term and long term. The distribution, diversity, and complexity of watershed and landscape-scale features needed for the protection of aquatic systems would be maintained. Proposed activities such as riparian thinning would restore watershed features in the short and long term.

#### **Riparian Reserves**

One key component of watershed and landscape scale features needed for the protection of aquatic systems is Riparian Reserves. Riparian Reserves would be maintained at the site and watershed levels in the short and long term. Riparian vegetation treatments (thinning) would enhance riparian characteristics. Riparian thinning would result in a

reduction in stand densities in young dense stands and would allow for the development of late successional riparian characteristics. Some of these characteristics include multi-level canopy cover which helps to maintain cool water temperatures. Late successional characteristics in riparian areas also include downed coarse woody debris and LWD which increases channel complexity. Late successional characteristics in riparian areas also include diverse species composition which provides a variety of chemical and biological inputs to streams. Riparian thinning would also reduce the spread of disease and the risk of a high intensity or severity fire within Riparian Reserves. Such a fire could result in tree mortality and a reduction in shade, which could negatively affect fish habitat by causing an increase in water temperature, a reduction in future recruitment of LWD, an increase in soil erosion and sediment entering streams.

### Roads

Sedimentation would result from the blading of roads and pulling of ditchlines during maintenance of haul routes. There would also be a small amount of stream sedimentation from the use of this road at stream crossing locations. A small amount of sediment may also enter streams during log haul and existing road maintenance where roads are hydrologically connected. All sediment producing actions would result in measurable increases in sediment for no more than 25 feet downstream of the impact point, and would all be within the State of Oregon water quality standard of no more than a 10% increase in turbidity above and below the action.

This project would not increase the number of permanent roads within this sub-watershed, since permanent road building is not part of the proposed project. No foreseeable permanent road construction is planned on federally managed lands within this sub-watershed.

### Peak Flows

The Proposed Action would not affect the timing, magnitude, duration, and spatial distribution of peak, high and low flows. The Mini Mule Project would not result in the creation of overstory forest canopy openings that would contribute to open space within this sub-watershed (WPN, 1999). There is no road construction proposed for this project, and canopy closure retentions would be 50% in Riparian Reserves (outside the EPZ) and 40% in the uplands. Research has shown canopy closures above 30% would not result in changes in runoff timing and peak flows that would result in any measurable changes to (WPN 1999).

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

The spatial and temporal connectivity within and between watersheds would be maintained in the short and long term at the site and landscape scales. Chemically and

physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species would be maintained.

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

The physical integrity of aquatic systems, including shorelines, banks, and bottom configurations would not be affected at the site or landscape scale in the short or long term. The proposed activities would not manipulate or affect shore lines, banks or bottom configurations.

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

Water quality necessary to support healthy riparian, aquatic and wetland ecosystems would be maintained. Water quality would remain within the range that maintains biological, physical, and chemical integrity streams.

Slight increases in turbidity would occur in the short term in localized areas as a result of road maintenance and haul. Best Management Practices (BMPs) were designed to minimize the amount and duration of sediment entering stream channels. Such increases in turbidity would not measurably alter the biological, physical, or chemical integrity of streams. Aquatic and riparian dependent species' survival, growth, reproduction, and migration would be maintained.

Road maintenance on BLM land (26 miles), thinning, and hauling would have no effect on SONCC salmon (ESA-Threatened) or coho critical habitat (CCH). The closest coho presence and CCH in Mule Creek is approximately 0.6 mile (3,168 feet) from the proposed project. Sediment would not be transported to CCH because of the dry condition haul, ridgeline location, EPZs, the proximity of the road to fish habitat and the design features to reduce the transmission of fine sediment. Sediment resulting from the haul and road maintenance would not be of a magnitude that would result in a visible increase in stream turbidity, or a measurable increase in the overall stream sediment deposition for more than 25 feet downstream within any of the stream channels.

*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.*

The sediment regime under which aquatic ecosystems evolved would be maintained at the site and landscape scales in the short and long terms. Some of the proposed activities such as road maintenance would reduce sediment input in the short and long term. Streams within the Planning Area evolved with sediment input. Sediment input can

result from natural disturbances such as landslides, slumps, wildfires, bank erosion, and channel scour.

#### Road Related Activities

Road maintenance and haul could deliver sediment to streams but would not result in a measurable increase in the overall stream sediment deposition for more than 25 feet downstream within any of the stream channels. Because of PDFs the amount of sediment entering streams from road related activities would be minimal. Changes in embeddedness, interstitial spaces, and pool depth would not be measurable.

Roads proposed for dry condition haul would result in negligible amounts of sediment entering streams because the roads are either bituminous surface treatment (BST) or crushed aggregate (rocked) or are hydrologically disconnected due to ridgetop location of timbersale units. The roads proposed for dry condition haul could result in sediment entering stream channels, however; negligible changes to stream channels from sediment input would be expected. Changes in embeddedness, interstitial spaces, and pool depth would not be measurable.

Road maintenance (including daylighting) would result in a minimal amount of sediment reaching stream channels. Increased sediment levels from road maintenance would not be detectable above background levels following the first few substantial rain events, therefore sediment input would be short term. Negligible changes to stream channels from sediment input would be expected. Changes in embeddedness, interstitial spaces, and pool depth would not be measurable.

#### Harvest Activities

All other soil disturbing activities are located outside the EPZ, and would be implemented using BMPs that minimize the quantity and transport of soil erosion. Since the EPZ is designed to filter out sediment produced during upslope activities that are implemented using BMPs, these activities would not result any sediment entering streams.

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

The Mini Mule Project would not affect the timing, magnitude, duration, and spatial distribution of peak, high and low flows. The Mini Mule Project would not result in the creation of overstory forest canopy openings that would contribute to open space within this sub-watershed (WPN, 1999). There is no road construction proposed for this project, and canopy closure retentions would be 50% in Riparian Reserves (outside the EPZ) and 40% in the uplands. Research has shown canopy closures above 30% would not result in changes in runoff timing and peak flows that would result in any measurable changes to (WPN 1999).

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

The timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands would not be affected by any of the proposed activities. There are no wetlands, as defined on page 117 of the RMP, within the Planning Area.

*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.*

The species composition and structural diversity of plant communities in riparian areas would be maintained at the site and landscape scales in the short and long term. There are no wetlands, as defined on page 117 of the 1995 RMP, within the Planning Area. Vegetation treatments proposed in the Proposed Action were designed to enhance riparian conditions in the short and long term. Plant communities in riparian areas would be maintained and enhanced through silvicultural prescriptions and no treatment buffers to provide for 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.

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

Habitat for riparian-dependent plant, invertebrate and vertebrate species would be maintained at the site and landscape scales. Vegetation treatments proposed were designed to enhance riparian conditions in the short and long term. There would not be a reduction of habitat needed to support riparian dependant species in the short term or long term.

**CONCLUSION:**

Based on this analysis at both the site and landscape scale of the proposed activities in the Mini Mule Project, it was determined that the actions are consistent with the nine objectives and the four components of the ACS. This determination was based on the small spatial and temporal disturbances associated with the proposed activities.

# APPENDIX 7 - NOXIOUS WEEDS

## Specialist Report Memo

To: Katrina Symons, Field Manager, Glendale Resource Area  
 From: Rachel Showalter, Botanist, Glendale Resource Area  
 Re: Noxious Weed Rationale Report for the Mini Mule Planning Area  
 Date: February 23, 2010

### Mini Mule Project Area – Noxious Weeds – PRESENT, NOT AFFECTED

Units with the Mini Mule Planning Area were surveyed for noxious weeds in the spring of 2009. The Planning Area is known to have noxious weeds along many roadsides. Two populations of *Rubus armenicus* (Blackberry), 10 populations of *Senecio jacobaea* (Tansy ragwort), 5 populations of Canada thistle (*Cirsium arvense*), and 1 population of Scotch broom (*Cytisus scoparius*) were documented within proposed units. (Table A6-1). The scotchbroom site and an additional Canada thistle site were hand pulled.

Based on these population sizes, per noxious weed reports provided by professional botany contractors, the Glendale botanist estimated that less than 1% of the harvest unit / road construction / road decommission acreage harbor noxious weeds. The maximum square footage occupied by all noxious weed species is approximately 72,651 sq. ft (1.67 acres).

**Table A6-1. 2009 Plant Surveys Revealing Noxious Weed Species in the Mini Mule Project Area Units**

Location in Township (T), Range (R), Section (S)	Species	Coverage in Sq. Feet	Oregon Department of Agriculture Designation	Plant Description / Habitat Requirements
T32S-R9W-30 T32S-R9W-20	Himalayan Blackberry	20 100	B*	Himalayan blackberry is a robust, clambering or sprawling, evergreen shrub which grows up to 9.8 feet (3 m) in height (Munz, 1974). Himalayan blackberry typically grows in open weedy sites, such as along field margins, railroad right-of-ways, roadsides, and riparian areas (Crane, 1940; Hitchcock et. al, 1973; Laymon, 1984; Roberts et al, 1980).
T32S-R9W-17 T32S-R9W-19 T32S-R9W-20 T32S-R9W-28 T32S-R9W-32 T32S-R10W-25 T32S-R10W-35	Tansy ragwort	200 150 65,690 90 330 10 320	B*	Tansy ragwort, a biennial herb, requires sunlight and a disturbed site to establish. It is often found on roadsides, contributing to the spread of new infestations. Tansy ragwort will establish in disturbed sites including roadsides, pastures, and forested areas recently harvested for timber

Location in Township (T), Range (R), Section (S)	Species	Coverage in Sq. Feet	Oregon Department of Agriculture Designation	Plant Description / Habitat Requirements
T32S-R10W-36 T32S-R9W-33 T32S-R9W-29		520 483 1,500		(Sweeney et al. 1992). The cinnabar moth ( <i>Tyria jacobaeae</i> ) is the biological agent effectively used to control tansy ragwort in Oregon, California, and Washington (Rees et. al, 1996).
T32S-R9W-17 T32S-R9W-28 T32S-R9W-30 T32S-R9W-32 T32S-R10W-36	Canada thistle	30 33 2,515 240 420	B*	Generally, Canada thistle establishes and develops best on open, moist, disturbed areas, including ditch banks, overgrazed pastures, meadows, tilled fields or open waste places, fence rows, roadsides, and campgrounds; and after logging, road building, fire and landslides in natural areas (Romme et al, 1995). Canada thistle is an early seral species, susceptible to shading, and grows best when no competing vegetation is present (Donald, 1994). Canada thistle growth may be discouraged in disturbed natural areas if suitable native species are seeded densely enough to provide sufficient competition (Haber, 1997).
T34S-R7W-1	Scotch broom	pulled		Scotch broom is a long-lived, brushy, early seral colonizer which does not grow well in forested areas, but invades rapidly following logging, land clearing, and burning (Mobley, 1954). Scotch broom is generally intolerant of shade and will not grow in heavily shaded places (DiTomaso, 1998; Peterson and Prasad, 1998), and is typically shaded out once native species are established (Bossard, 2000; Williams, 1983) or forest canopy closes (Sawyer et. al, 2000).
Total Sq. feet		72,651 sq ft = 1.67 ac		

\* “B” designation; a weed of economic importance which is regionally abundant but which may have limited distribution in some counties. Where implementation of a fully integrated statewide management plan is not feasible, biological control shall be the main control approach (ODA, 2005).

Over the last 150 years activities such as motor vehicle traffic, recreational use, rural and urban development, timber harvest, road construction, and natural process have introduced and transported noxious weeds into the Rogue Valley. Noxious weeds are spread by the wind and by seed via attachment to vehicles and vectors such as humans,

animals, and birds, and are able to grow on suitable habitat (generally considered as any newly disturbed ground and/or an influx of light due to canopy removal). Since the 1970s, a recognition that weeds were causing environmental damage resulted in the passage of State noxious weed laws, the Carson-Foley Act of 1968 – Plant Protection Act of 2000, and Presidential executive orders like Invasive Species E.O. 13112, which directs federal agencies to combat the noxious weeds on federal lands. Additional direction is provided by the Medford District RMP, which states the district is to “contain and/or reduce noxious weed infestations on BLM-administered land...(p. 92),” and “...survey BLM-administered land for noxious weed infestations...(p. 93).” These RMP directions for weed management are intended to be met at a landscape level; whether the direction is achieved is not intended to be measured at the site specific level nor with the implementation of each project. Thousands of acres of weed treatments have occurred on federal (and non-federal) lands over the last decade across the Medford District with the RMP-driven objective of containing or reducing – not eradicating - noxious weed populations (Budesza, 2006). In an effort to continue to contain and/or reduce noxious weeds on federal land, the BLM proposed to treat known weed populations within the Glendale Resource Area. Roads within the Mini Mule Planning Area are scheduled for treatment in 2010.

### **Environmental Consequences of the Mini Mule Project Implementation**

#### Alternative 1 (No Action) – Direct and Indirect Effects

Under the No Action Alternative, noxious weeds within the Planning Area would continue to spread into suitable habitat at an unknown rate. The rate at which noxious weeds spread is impossible to quantify, as it depends on a myriad of factors including, but not limited to, logging on private lands, motor vehicle traffic, recreational use, rural and urban development, and natural processes (Northwest Area Noxious Weed Control Program EIS, p. 59). The following table (1-2) illustrates how each of these activities affects noxious weed dispersal.

**Table A6-2. Factors Affecting the Determination of the Rate of Noxious Weed Spread**

<b>Activity</b>	<b>Role in Potential Noxious Weed Seed Dispersal</b>
Private Land	Private lands host a perpetual source for noxious weed seed, which can be dispersed when seeds attach to tires, feet, fur, feathers or feces, or when natural processes such as wind and/or flooding events transport the seed from its source to another geographical vicinity.
Logging on Private Lands	Logging activity presents a key dispersal opportunity for noxious weed seeds per 1) attachment to tires/tracks of mechanized logging equipment, tires of log trucks, and various other logging-related substrates which subsequently transport the seed from its source to another geographic vicinity, 2) creation of openings for potential noxious weeds colonization and 3) a lack of PDFs – such as equipment/vehicle washing, etc. - which attempt to reduce the activity’s spread of noxious weed seeds.

Activity	Role in Potential Noxious Weed Seed Dispersal
Motor Vehicle Traffic (including Log Trucks)	Roads on public land include public use, which results in a plethora of seed-dispersing activities occurring on a daily basis. Private landowners use public roads to haul logs, undertake recreational pursuits, and/or access their properties. This transportation often occurs along BLM-administered roads, which are situated within a checkerboarded ownership arrangement. How or when seed detachment occurs is a random event could take place within feet or miles from the work site/seed source, presenting a high likelihood of detachment on public lands.
Recreational Use	The public often recreates on BLM-managed public lands, and can spread seed from their residences to public land in a variety of ways such as attachment to vehicle tires, hikers' sox, shoes, or other clothing, the fur of domesticated animals, etc.
Rural and Urban Development	Rural development occurring within the checkerboard land arrangement often requires public landowners to acquire a Right-of-Way (ROW) from the BLM to legally access their parcel(s). These ROWs, or use of BLM-administered roads is often granted (Groves, 2006). Please refer to 'Motor Vehicle Traffic' and 'Private Land,' for clarification of how this affects the spread of noxious weeds from private to public lands.
Natural Processes	Wind, seasonal flooding, and migration patterns of birds/animals are a few natural processes that potentially spread noxious weeds, especially from private land to public land. Wind carries seeds, and deposits them at random intervals. High water caused by flooding reaches vegetation (often harboring a noxious weed component) growing on the banks of rivers/creeks/streams, and deposits seeds downstream.

The abovementioned activities would contribute to noxious weed spread, which could degrade some elements of the environment. To predict the rate of this degradation would be highly speculative, as the extent of weed expansion is dependent on so many factors that it is considered impossible to quantify. The degree of degradation would depend on the noxious weed species, as some, such as scotch broom and meadow knapweed, are more intrusive than others. The more aggressive species mentioned in Table A8-2 - specifically scotch broom and meadow knapweed - are slated for treatment under Medford District's *Integrated Weed Management Plan and Environmental Assessment OR-110-98-14* under a separate project. However, the success of implementing the weed management plan would be temporary, as logging on non-federal lands, recreational use, rural and urban development, natural processes and vehicle traffic will continue to spread noxious weed populations into the Planning Area.

Indirect effects of noxious weed spread include the potential degradation of wildlife habitat (Rice et. al. 1997, Harris and Cranston 1979), a decline in natural diversity (Forcella and Harvey 1983; Tyser and Key 1988; Williams 1997), and decline in water quality (Lacey et al. 1989); however, a very small amount of Mini Mule unit acreage (less than 1% of unit acreage under Alt. 2) is covered by noxious weeds, making it difficult to quantify any potential decline in ecosystem health related to existing noxious weed populations, or to quantify the potential decline in ecosystem health related to any additional noxious weed populations potentially established by the activities described in Table A6-2.

Alternative 2 (Proposed Action) – Direct and Indirect Effects

In the short term (approximately 1-5 years), proposed activities within the Planning Area would result in the reasonable probability of spreading noxious weeds. However, the rate at which this potential spread would occur is unknown due to the indistinguishable causal effect of other activities and factors listed in table A6-2 on the spread of noxious weeds. Openings, caused by harvesting activities (286 acres) would provide suitable habitat for noxious weeds to colonize. In addition, during project implementation, increased vehicle traffic could increase, or at least perpetuate, weed infestations along road systems because of seed dispersal.

Openings and disturbance provide the greatest opportunity for the establishment of noxious weeds. In an effort to address the potential for project activities to increase the rate of spread of noxious weeds, Project Design Features (PDFs) have been included in the project to decrease the potential spread of weeds associated with the Proposed Action. Project Design Features include washing equipment prior to moving it on-site, operating vehicles/equipment in the dry season, and seeding and/or planting newly created openings (e.,g. skid trails and yarding corridors) with native vegetation to reduce the potential establishment of noxious weeds. These PDFs are widely accepted and utilized as Best Management Practices (BMPs) in noxious weed control strategies across the nation (Thompson, 2006). Table A6-3 delineates the project design features and their expected implementation results.

**Table A6-3: Project Design Features and Expected Implementation Results**

<b>Project Design Feature (PDF)</b>	<b>Result of Implementing PDF</b>
Washing vehicles / equipment	Removes dirt that may contain viable noxious weed seeds, thereby reducing the potential for noxious weed spread
Operating vehicles/equipment during the dry season	Reduces the potential for viable noxious weed seed to be transported and dispersed via mud caked on the undercarriages/tires/tracks of logging equipment.
Seeding and/or planting newly created openings with native seed vegetation.	Introduces native vegetation to the site prior to noxious weed seed recruitment, allowing native plants an advantageous jump-start in reestablishment, which reduces the potential for noxious weed infestation.

Implementing the PDFs that reduce the potential spread of noxious weeds associated with the Proposed Action, and using native species for seeding/planting newly disturbed openings (e.,g. skid trails and yarding corridors) is expected to result in a similar potential of noxious weed expansion as associated with the No Action Alternative.

In the long term (5-100 years), tree canopies would eventually expand and reduce light levels, which in turn would prevent weeds from growing and expanding within treated areas, because populations decline as the amount of light reaching the plants diminishes.

Consequently, in the long term, remaining weed populations would be confined to the roadway and adjoining (private) disturbed land as canopy is re-established in treated areas over time.

The effect of implementing Alternative 2 could possibly result in the establishment of new noxious weed populations. Although the *immediate* potential for weed spread would be less with the No-Action Alternative than for the Proposed Action, the potential for the spread of existing noxious weeds and the introduction of new species is considered similar for both alternatives, because of the inclusion of PDFs in Alternative 2, and the fact that under the “No Action” Alternative, populations would continue to establish and spread due to seed transport by vehicular traffic, wildlife, and other natural dispersal methods listed in Table A6-2. Indirect effects associated with noxious weed population enlargement are similar to those mentioned in the No Action Alternative, and are known to include, generally, declines in the palatability or abundance of wildlife and livestock forage (Rice et al., 1997), declines in native plant diversity (Forcella and Harvey, 1983; Tyser and Key, 1988; Williams, 1997), reductions in the aesthetic value of the landscape, encroachment upon rare plant populations and their habitats, potential reductions in soil stability and subsequent increases in erosion (Lacey et. al, 1989), and an overall decline of ecosystem health. However, considering implementation of Alternative 2, there are three main reasons why potential weed establishment that might be caused by the Proposed Action is not expected to result in a detectable effect to overall ecosystem health. First, surveys indicate that a very small percentage - less than 1% of acreage within the Project Area units - are affected by noxious weeds. Second, these sites located in units proposed for treatment have been reported during pre-disturbance surveys, and the high priority weed species – or those that do not have a biological control or have proven especially difficult to control – will receive treatment in 2010 under Medford District’s *Integrated Weed Management Plan and Environmental Assessment OR-110-98-14*, which means that the acreage in the Planning Area affected by noxious weeds would be even closer to 0% until ongoing activities listed in Table A6-2 would potentially re-introduce weeds into the Planning Area. Third, as aforementioned, Project Design Features (PDFs) have been established to minimize the rate at which project activities might potentially spread noxious weed seed from outside/adjacent sources.

#### Alternative 2 (Proposed Action)

In order to address the cumulative effects of the Proposed Action on the spread of noxious weed encroachment, the condition of non-federal lands must be considered. However, there is no available or existing data regarding noxious weed occurrence on local non-federal lands. Therefore, for purposes of this analysis, BLM assumes that 1) there is a perpetual source of noxious/invasive weeds on non-federal lands that can spread to federal lands, especially when the land ownership is checkerboard, as within the Planning Area, and 2) conversely that noxious weeds are not established on these lands, and therefore there is a need to reduce the risk of spread of noxious weeds from the federal lands to the adjoining non-federal lands. Seeds are spread by the wind, by animal/avian vectors, natural events, and by human activities - in particular through soil

attachment to vehicles. BLM's influence over these causes of the spread of noxious weeds is limited to those caused by human activities. Additional human disturbance and traffic would increase the potential for spreading noxious weed establishment, but regardless of human activity, spread of these weeds would continue through natural forces. Thus, the BLM cannot stop the spread of noxious weeds, it may only reduce the risk or rate of spread.

Given the unpredictable vectors for weed spread, such as the vehicle usage by private parties, wildlife behavior, and wind currents, it is not possible to quantify with any degree of confidence the rate of weed spread in the future, or even the degree by which that potential would be increased by the Proposed Action.

Foreseeable activities within the Planning Area are expected to be similar to past and current activities: motor vehicle traffic, recreational use, rural and urban development, timber harvest, road construction, and firewood collection. These types of activities could result in new disturbed sites available for colonization by existing noxious weed populations, and they do offer the possibility of introduction of new noxious weed species to the Planning Area under any alternative, including the No-Action Alternative. As stated above, there is no available or existing data concerning the rate of weed spread occurring on either federal or non-federal lands as a consequence of these types of activities. Also, as discussed above, there is no information on what, if any, increase in the rate of weed spread the Proposed Action would cause, and hence, it is not possible to quantify with any degree of confidence what the incremental effect of the Proposed Action on the spread of noxious weeds would be when added to the existing rate of weed spread caused by past, present, and future actions.

PDFs exist to reduce the potential that the Proposed Action would contribute to the spread of weed seed and establishment of new populations. PDFs are not intended or expected to completely eliminate any possibility that the Proposed Action would contribute to the spread of weed seed and establishment of new populations; however, PDFs ensure that any incremental contribution of the Proposed Action to the spread of weeds, when added to the rate of weed spread caused by past, present, and future actions, would be so small as to be incapable of quantification or distinction from background levels.

As described above, PDFs for this project include washing vehicles/equipment, operating in the dry season, and seeding/planting newly created openings with native vegetation. BLM, and other federal and nonfederal organizations involved in combating noxious weed spread, routinely utilize these PDFs in noxious weed control strategies. These PDFs are widely accepted as Best Management Practices (BMPs), as they are inexpensive to implement, easily attainable, and accomplish the objective of reducing the potential of spreading noxious weeds as a result of project-oriented activities.

Data collection would not reduce the inherent speculation in predicting incremental effects of the Proposed Action on the spread of weeds because of (1) the unpredictable

natural factors that largely determine whether weeds would spread after project activities, (2) the unlikelihood that future data collection would be able to detect or measure any difference between background rates of weed spread and the rate of weed spread as affected by the Proposed Action and correspondingly reduced by PDFs, and (3) the included PDFs that would reduce, if not eliminate, any project effects on the rate of weed spread that would make the already undetectable effects of the Proposed Action even more undetectable. Finally, further data collection on the rate of spread would not alter the PDF techniques already being applied to reduce that rate of spread. It cannot be over emphasized that under the “No Action” Alternative, noxious weeds are likely to spread over time regardless of whether or not the Mini Mule project occurs, and that rate would not be altered to any detectable degree by the Proposed Action.

# APPENDIX 8 - SPECIAL STATUS SPECIES

## Specialist Report Memo

To: Katrina Symons, Field Manager, Glendale Resource Area  
From: Rachel Showalter, Botanist, Glendale Resource Area  
Re: Special Status Plants Rationale Report for the Mini Mule Planning Area  
Date: February 23, 2010

### **T/E Plants – NOT PRESENT, NOT AFFECTED**

Of the four federally listed plants on the Medford District (*Fritillaria gentneri*, *Limnanthes floccosa* ssp. *grandiflora*, *Arabis macdonaldiana*, and *Lomatium cookii*), only *Fritillaria gentneri* has a range which extends into the Glendale Resource Area. Final units within the Mini Mule Project Area are not within the range of *F. gentneri*, as determined by the 2004 US Fish and Wildlife Service Biological Opinion. Vascular plant surveys were conducted in the spring of 2009, and no *Fritillaria gentneri* populations were found. There would be no anticipated effect from the Proposed Action on any federally listed plant.

### **Bureau Special Status Plants – PRESENT, NOT AFFECTED**

On July 26, 2007 a new Special Status Species list went into affect (IM No. OR-2007-072), coupled with a new Interagency Special Status Species Policy (ISSSP). This new list has two categories, (ISSSP) Sensitive and Strategic. The former categories of Bureau Assessment and Bureau Tracking no longer exist. Sensitive species require a pre-project clearance and management to prevent them from trending toward federal listing. There is no pre-project clearance or management required for the Strategic Species at the BLM District level, thus Strategic Species will not be analyzed in this document.

Nonvascular surveys, completed in 2009, resulted in no new Sensitive or Strategic plant sites. Vascular plant surveys were conducted in the spring of 2009. Professional botanists surveyed the Planning Area units using intuitive controlled methodology, wherein areas supporting high potential habitat were surveyed more intensively. Surveys revealed a total of 13 sites consisting of one or both of two Bureau Sensitive species, Bensonia (*Bensoniella oregana*) and Hairy sedge (*Carex gynodynama*), were located.

Within timber harvest units, sensitive species would be protected by buffers, which protect the sites from direct and indirect effects. Sensitive plant sites residing in units retaining more than 40% canopy closure would receive a 25-100 ft buffer. Buffers would vary from 25-100 ft depending on unit prescription and proximity to other buffers, such as stream (EPZ) buffers. For example, since both of these species are

closely associated with water, each site would more than likely fall within an already established EPZ buffer. If a site occurs on the edge of an EPZ buffer, an additional 25 ft would be added to the EPZ buffer edge – thus encompassing the site – to ensure protection of the site. Given these protection measures, the Proposed Action would not trend these species toward federal listing and should assure persistence.

### **Bureau Special Status Fungi – NOT AFFECTED**

The Project Area was not surveyed for fungi, as pre-disturbance surveys for Special Status fungi are not practical, nor required per BLM – Information Bulletin No. OR 2004-121, which states “If project surveys for a species were not practical under the Survey and Manage standards and guidelines (most Category B and D species), or a species’ status is undetermined (Category E and F species), then surveys will not be practical or expected to occur under the Special Status/Sensitive Species policies either (USDA/USDI 2004a, p.3).” Current special status fungi were previously in the aforementioned S&M categories which did not consider surveys practical, and are therefore exempt from survey requirements. With the recent reinstatement the new Interagency Special Status Species policy (ISSSP), 20 species of fungi were designated as Sensitive, 9 of which have been documented on Medford District. As mentioned above, none of these species require surveys.

District wide, the Medford BLM has 20 Sensitive (SEN) fungi species; 11 are suspected to occur here, while the remaining 9 have been documented. Of the 9 documented species, only one, *Phaeocollybia olivacea*, has been found in the Glendale Resource Area, approximately 17.5 air miles away from the closest unit in the Project Area. Dispersal via spore transport and/or mycelial network is improbable, as this site and the Project Area reside within different HUC 5 watersheds (the site is in Middle Cow Watershed, the Mini Mule project area is in Rogue-River Horseshoe Bend Watershed) and the two areas are separated by steep ridges and a several ravines. There are no sites of this species in the Rogue-River Horseshoe Bend watershed, where the Mini Mule Planning Area is located.

While it is possible that this project is occurring within potential habitat for some species, there is very little information available describing the *exact* habitat requirements or population biology of these species (USDA/USDI 2004c, p.148). The 2004 FEIS to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines addresses this type of incomplete and/or unavailable information (p. 108-109). However, the 2004 *Record of Decision (ROD) to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines*, offers a broad scale prospective of this current situation in stating, “Any discussion of risk based on rarity and likelihood of disturbance must recognize that, for many species, only a small percentage of potential habitat has been surveyed. Reserves have not been surveyed to the same degree as Matrix and Adaptive Management Area land allocations. The Reserves were not surveyed because there has been little management-induced disturbance there. The vast majority of pre-disturbance surveys have been located in the Matrix and Adaptive Management Area

land allocation (19 percent of the northwest Forest Plan area), so that is where many of the known sites have been found. This does not mean that a disproportionate amount of their habitat is located in Matrix. If these species are truly closely associated with late-successional or old-growth forests, we can reasonably expect that the large amount of federally managed lands in Late-Successional and Riparian Reserves which provide the most amount of this type of habitat (86 percent of currently existing late-successional forests is in reserves) would also provide, at a minimum, its proportionate share of the habitat to support populations of these species (2004 ROD to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines, p.11).”

Based on the above information, the likelihood of a Sensitive fungi species in this Project Area is very low; the likelihood of a sensitive fungi occurring within a single unit(s) encompassed in the Project Area is even lower. The likelihood of contributing toward the need to list is not probable.

### **Alternative 1 – No Action**

#### **Direct and Indirect Effects**

##### **Sensitive Vascular Plants**

There would be no direct effects to ISSSP vascular plants under Alternative 1 because no physical disturbance would occur that could impact them even if they were present. No timber harvest would occur in mid-seral stands on BLM-managed lands. In the absence of a wildfire event, they would continue to provide habitat for mid-seral and possibly late-successional associated Special Status vascular plants.

##### **Sensitive Nonvascular Plants**

No direct or indirect effects would occur to Special Status nonvascular plants because A) there were no ISSSP or T&E species located, and B) no activities would occur that could impact them.

##### **Sensitive Fungi**

There would be no direct or indirect effects to Special Status fungi under Alternative 1 because 1) no physical disturbance would occur that could impact them if they were present, and 2) special status fungi species are most commonly associated with late-successional - as opposed to mid-seral - habitat.

#### **Cumulative Effects**

Information is not available about rare plant populations in the Mini Mule Planning Area prior to BLM botanical surveys, which began during the last 30 years. However, past activities, described in the affected environment, likely affected Special Status plants and populations by damaging or destroying individuals or reducing or degrading suitable habitat.

Although specific logging plans for private industrial forest lands are not available, it is assumed that commercial harvest would occur in the future on relatively short rotations, and that privately-owned forests would remain in early to mid-seral stages. Sensitive species do not receive protection on privately-owned lands, but would continue to be protected and conserved on federal lands, according to BLM policy (IM OR-91-57).

Alternative 1 would not contribute additional cumulative effects to ISSSP vascular / nonvascular plants, or fungi. The amount of mid-seral forest on BLM-managed lands would remain unchanged.

## **Alternative 2**

### **Direct and Indirect Effects**

#### **Sensitive Vascular Plants**

In Alternative 2, timber harvest activities would not affect ISSSP vascular species, since the two sensitive species present within units would be protected by a 25-100 foot buffer, as aforementioned.

#### **Sensitive Nonvascular Plants**

No Sensitive nonvascular plants were found inside final Mini Mule units.

#### **Sensitive Fungi**

No fungi surveys have been conducted in the Mini Mule Project Area, therefore, it is unknown if Sensitive fungi are present in the treatment units. Potential habitat for many of the 20 Sensitive species does not exist in the Project Area because although a predominant Douglas-fir component is present (generally considered an indicator species, but recorded sites commonly have white fir as well), the stand is less than 80 years old, which is considered mid-seral versus late-successional. Because of their rarity across the Northwest Forest Plan area, it is unlikely that populations are present in the treatment units. However, if present, they could be directly or indirectly adversely impacted by the proposed actions in Alternative 2.

Harvest can have varying degrees of adverse impacts on fungi, depending on the level of tree removal and ground disturbance. Removing, disturbing, or compacting the top layer of organic material and mineral soil could negatively impact fungi. The main and most extensive part of the fungus consists of a below-ground mycelia network that resides in the top few inches of mineral soil. Mycelia networks are often connected to multiple trees through their root systems. In one study, fungal mycelia networks ranged in size from 1.5 - 27 square meters (Dahlberg and Stenlid 1995). Disruption of mycelia networks could occur during timber harvest, construction or ripping of roads or landings, removal of host trees that sustain the ectomycorrhizae, or burning post-harvest slash piles. The effect of these activities on fungi is a loss of species diversity and abundance (Amaranthus et al.

1996). Alternative 2 presents a potential risk of impacting Sensitive fungi, if present, because it proposes temporary roads and the harvesting of trees.

Fungi could also be directly impacted from radiant heat during burning of post-harvest slash piles. Effects of pile burning include damage or death of mineral soil fungi including the mycelia and spores; loss of litter, organic matter and large wood, resulting in reduced moisture retention capability, loss of nutrient sources, and changes in fungal species diversity and abundance. Implementation of Alternative 2 creates the greatest threat of damage to fungi from burn piles because the trees would be harvested. However, commercial thinning activities do not produce as much slash as Regeneration Harvesting, and the area impacted by burn piles would be a small percentage of acreage compared to the total amount of acres in the planning area.

### **Cumulative Effects**

Information is not available for rare plant populations in the Mini Mule Planning Area prior to BLM botanical surveys, which began during the last 30 years. However, it is assumed that past activities, described in the affected environment, likely affected Sensitive plants and populations by damaging or destroying individuals or reducing or degrading suitable habitat.

Although information is not available for logging plans on private industrial forest lands, it is assumed commercial harvest would occur in the future and privately-owned forests would be in early to mid-seral stages. Sensitive species do not receive protection on privately-owned lands, but would continue to be protected and conserved on federal lands, according to BLM policies and federal regulations.

Sensitive plants would not be directly impacted by the activities proposed in Alternative 2 because sensitive plants located during surveys would receive buffers to mitigate potential harm caused by logging/slash pile burning activity. Project design features would reduce the risk of introducing or spreading noxious weeds during project implementation, which could potentially impact Sensitive vascular plant habitat. No Sensitive Status vascular or nonvascular plants would trend toward listing as a result of implementing the activities proposed in Alternative 2.

The potential cumulative effect of the proposed project on Sensitive fungi would be the risk of impacting rare populations on 286 acres during timber harvest treatments. However, the proposed harvest would occur on matrix lands, which are designated for timber production and harvest. In addition, this project occurs on mid-seral ground, whereas most sensitive fungi are associated with late-successional forests.

Because of their rarity across the Pacific Northwest Forest Plan Area, coupled with the association of rare fungi with late-successional forests, it is unlikely Sensitive fungi are present in the Mini Mule timber harvest units. The risk is low that they would be

impacted. The assumption is made that protecting known sites (current and future found) of these Sensitive fungi, in addition to conducting large-scale inventories throughout the Pacific Northwest, would be adequate in ensuring that this project and future projects would not contribute to the need to list them (USDI 2004, 5-2).

# APPENDIX 9 - MIGRATORY BIRDS

## Specialist Report

To: Katrina Symons, Field Manager, Glendale Resource Area  
From: Marlin Pose, Wildlife Biologist, Glendale Resource Area  
Re: 'Not Affected' rationale regarding migratory birds  
Date: 12/15/09

### **Analysis of Proposed Action Effects on Birds of Conservation Concern for the Mini Mule Planning Environmental Analysis**

#### **Compliance with the Executive Order To Protect Migratory Birds**

Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds," (Federal Register 2001) highlights the need for federal agencies including the USDI Bureau of Land Management (BLM) to conserve migratory birds (those species listed in 50 C.F.R. 17.11) (U.S. Fish and Wildlife Service 2002) protected by the migratory bird conventions (the Migratory Bird Treaty Act [16 U.S.C. 703 – 711], the Bald and Golden Eagle Protection Acts [16 U.S.C. 668 – 668d], the Fish and Wildlife Coordination Act [16 U.S.C. 661 – 666c], and the Endangered Species Act of 1973 [16 U.S.C. 1531 – 1544]. This responsibility includes the need to ensure that environmental analysis of federal actions evaluate the effects of those actions on migratory birds, "with emphasis on species of concern" (Federal Register 2001, p.3855).

"To the extent permitted by law and ...in harmony with agency missions" (p.3854, Ibid.) such as the O&C Act of 1937, the Medford District Resource Management Plan (USDI 1995) and the Northwest Forest Plan (USDA/USDI 1994a); the proposed actions are consistent with "avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources," (p. 3854, Federal Register 2001) as directed in the Executive Order mentioned above.

#### **Birds of Conservation Concern.**

Table 1 below summarizes the potential effects of the proposed actions described in the Mini Mule Planning Environmental Analysis on the Birds of Conservation Concern known to occur on Medford District BLM managed lands.

<b>Table A8-1: Birds of Conservation Concern for Medford District BLM</b>		
<b>species</b>	<b>habitat</b>	<b>presence in Mini Mule Project Area and effects</b>
peregrine falcon	cliffs	Habitat not present in the Project Area
olive-sided flycatcher	Green coniferous forests with snags. Habitat is relatively broken-canopied coniferous forest from sea level to Cascades up to 9,000 ft elev., containing large trees and snags (Zeiner et al 1990). Geographic distribution over W side of CA,OR,WA, intermountain West and most of Canada (Natl. Geographic 1989). Mature and old-growth coniferous stands or fragments of these with uneven, mixed-age canopies that contain occasional snags, from which it forages (Csuti et al 2001, Kemper 2002, Altman 1999)	Present in Project Area, but very limited in proposed units which are dominated by younger trees and few large snags or large trees which are retained. Suitable medium and large conifer habitat would persist in Congressionally (Wilderness and National Parks) and Administratively (lands unsuitable for timber harvest) Withdrawn Lands, which total over 2.25 million acres (FEMAT 1993, Table IV-3) plus 100-acre owl cores (over 100,000 ac.[USDA/USDI 1994]); marbled murrelet LSRs; Riparian Reserves (630,000 ac [Ibid.]); and some forested lands in the following land allocations W of the Cascade crest: Mapped LSRs, many state parks; military installations, and national and state wildlife refuges. Individual home range is approximately 20 ac. (Johnston 1971 <i>In</i> Zanier 1980). Therefore, the proposed actions would have no measurable effect on population trends at a state or regional scale.
rufous hummingbird	Nests in shrubs and trees near foraging habitat including young second growth, mature and old growth conifer forests. Forages on nectar-producing flowers, which occur in early successional areas. (Healy et. al. 2006, Kemper 2002)	Present in the Project Area. Foraging habitat not present within timber harvest units, as units are forested and not in early successional stages. Some small openings occur. Residential areas, or recent harvested area on private or BLM, natural or man-made openings may provide flowering plants. Nesting habitat may be present in some edges of units. Some nesting habitat near edges within units would be removed. But since nesting habitat suitability depends on the proximity of trees and shrubs to foraging habitat, it is likely that the proposed action would not result in creation or removal of woody vegetation for foraging or nesting habitat. However, since habitat for this species is very widespread (in suburban and forested areas of NW CA, the NW 2/3 of OR and ID, all of WA and over half of BC), population trends at state or regional levels would not be affected by proposed actions.
Allens's hummingbird	breeds only along a narrow strip of coastal California and southern Oregon, in moist coastal areas, scrub, chaparral, and forests (Mitchell 2000, Kemper 2002)	Not expected to occur inland in the Project Area.

species	habitat	presence in Mini Mule Project Area and effects
Oregon Vesper Sparrow ( <i>affinis</i> ssp.)	Open habitats, favoring areas with a high percentage of bare ground and short, sparse herbs or grasses. Similar habitat to the horned lark. It selects open habitats with scattered trees or shrubs for singing perches and escape cover. (Beauchesne 2002)	Habitat not affected by proposed action units, not expected to occur in Project Area.
bald eagle	Mature and old-growth forested areas adjacent to large bodies of water with some habitat edge, relatively close (usually <2 km)	Potential habitat not expected to be affected by the Proposed Action.
Horned Lark ( <i>strigata</i> ssp.) ESA candidate	Occurs in short-grass habitats and areas with bare ground. (Kemper 2002, USFWS 2008a)	No known sitings near the Project Area, and not expected to occur.
willow flycatcher (non-listed subspecies or population)	Shrubby, often wet habitats, river corridors; Occurs in moderate density in early-growth clearcuts in western Oregon. In California, high foliage-volume willow cover areas, moist brushy thickets, open second-growth, and riparian woodland, especially with willow.  (Kemper 2002, Sedgwick 2000, Craig and Williams 1998)	May occur within Project Area. Proposed action not expected to reduce potential riparian or early successional conifer habitat.
purple finch	Breeds primarily in moist or cool coniferous forests. Also frequently found breeding in mixed coniferous-deciduous forest, edges of bogs, and riparian corridors. Also breeds in deciduous forests, orchards, ornamental plantations, pastures and lawns with scattered conifers and shrubs, hedgerows, and developed areas. Purple finch prefers open wooded habitats. (Wootton 1996)	May occur in Project Area and in or near proposed units. Typically nests on conifer branches. Some nests may be lost if proposed action occurs during nesting season. Suitable conifer habitat would persist in Congressionally (Wilderness and National Parks) and Administratively (lands unsuitable for timber harvest) Withdrawn Lands, which total over 2.25 million acres (FEMAT 1993, Table IV-3) plus 100-acre owl cores (over 100,000 ac.[USDA/USDI 1994]); marbled murrelet LSRs; Riparian Reserves (630,000 ac [Ibid.]); and some forested lands in the following land allocations west of the Cascade crest: Mapped LSRs, many state parks; military installations, and national and state wildlife refuges. Therefore, the proposed actions would have no measurable effect on population trends at a state or regional scale.

### Regional Strategies

Both the USDI Fish and Wildlife Service (2008) and Partners in Flight (Altman 1999) consider the state and regional approach a key to the conservation of migratory songbirds. In 1999, strategies for the conservation of the olive-sided flycatcher and the rufous hummingbird and other species were proposed in the form of a regional conservation

plan for coniferous forests in Oregon and Washington. This strategy, which “represents the collective efforts of multiple agencies and organizations within ...Partners in Flight,” recognized the Northwest Forest Plan as an effort in the same type of conservation planning process, which approaches management at a regional level. The proposed actions are consistent with the Northwest Forest Plan, which is also designed to provide for the conservation of other forest-related species in the range of the Northern Spotted Owl, such as these songbirds.

Within the Northwest Forest Plan (24,455,300 federal acres), reserved/ withdrawn lands total approximately 78% of the federal land base (USDA/USDI 1994, p. 2-62:65). Not all of the reserves are in or will obtain late-successional forest conditions, but the majority is expected to contribute as suitable habitat towards migratory birds utilizing late successional habitat. In addition, Matrix lands (3,975,300 acres) representing about 16% of the federal land base, contain selected portions of the land managed to retain 15-30% in late-successional forest, which provides additional suitable habitat.

<b>Allocation</b>	<b>Acres</b>	<b>Percent</b>
Congressionally Withdrawn	7,321,000	30
Late Successional Reserves	7,431,000	30
Riparian Reserves	2,628,000	11
Administratively Withdrawn	1,477,000	6
<b>TOTAL</b>	<b>18,857,000</b>	<b>77</b>
Matrix land	3,975,300	16

**Compliance with the Migratory Bird Treaty Act.**

This act implements various treaties and conventions between the U.S. and other countries that share migratory flyways. With this proposed action, and as prohibited in the Act, there would be no deliberate take (IM OR-2009-018), possession, import, export, transport, sale, purchase, barter or offering of these activities, or possessing migratory birds, including nests and eggs.

**Summary**

The implementation of the proposed actions is not expected to affect the trend in populations of migratory birds, as established at a state or regional scale. Also, the proposed actions are consistent with planning documents designed to conserve songbirds at those scales.

# APPENDIX 10 - STANDARD OPERATING PRACTICES

## Standard Operating Practices

As described in Chapter 2 (Section 2.1) Standard Operating Practices are those standard provisions applied to all timber sales. Standard Operating Practices (SOP), Best Management Practices (BMPs), and Project Design Features (PDFs) were identified and are included here to ensure project compliance with the federal Clean Water Act and higher-level National Environmental Policy Act (NEPA) documents, laws and BLM guidelines. BMPs are specifically required by the Federal Clean Water Act to reduce nonpoint source pollution. The BMPs are methods, measures, or practices selected from Appendix D of the 1995 ROD/ RMP to ensure that water quality would be maintained. Project design features (PDFs) are specific measures included in the site specific design of the Proposal to eliminate or minimize adverse impacts on the human environment. These PDFs were developed by the Mini Mule Project interdisciplinary team with guidance of the 1995 ROD/RMP and resource protection measures specific to the Planning Area.

## Soil Productivity, Residual Trees and Coarse Woody Debris

- Piles would be burned in the fall to spring season after one or more inches of precipitation have occurred. Patrol and mop-up of burning piles would occur when needed to prevent treated areas from reburning or becoming an escaped fire.
- Slash piles would not be allowed on roadways, turnouts, shoulders, or on the cut bank.
- Lateral yarding would be required on all units to protect residual leave trees and existing conifer regeneration. Yarding carriages would be required to maintain a fixed position during lateral yarding to reduce damage to the residual stand.

## Air Quality / Smoke Management

- All prescribed burning would be managed in a manner consistent with the requirements of the Oregon Smoke Management Plan administered by the Oregon Department of Forestry and the regulations established by the Air Quality Division of the Oregon Department of Environmental Quality.
- Local residents would be advised of burning on the Glendale Resource Area prior to seasonal burning through news releases.

## **Cultural Sites**

- Surveys in Planning Area were conducted. There are no known cultural resource sites located within proposed units. If cultural resources are found during project implementation, the project would be redesigned to protect the cultural resource values present, or evaluation and mitigation procedures would be implemented based on recommendations from the Resource Area archaeologist with concurrence from the Field Manager and State Historic Preservation Office.

## **Noxious Weeds**

- To prevent the potential spread of noxious weeds into the Medford District BLM, the operator would be required to clean all logging, construction, chipping, grinding, shredding, rock crushing, and transportation equipment prior to entry on BLM lands.
- Cleaning shall be defined as removal of dirt, grease, plant parts, and material that may carry noxious weed seeds into BLM lands. Cleaning prior to entry onto BLM lands may be accomplished by using a pressure hose.
- Only equipment inspected by the BLM would be allowed to operate within the Analysis Area. All subsequent move-ins of equipment as described above shall be treated the same as the initial move-in.
- Prior to initial move-in of any equipment, and all subsequent move-ins, the operator shall make the equipment available for BLM inspection at an agreed upon location off Federal lands.
- Equipment would be visually inspected by the Authorized Officer to verify that the equipment has been reasonably cleaned.

## **Streams and Riparian Reserves**

- Cleaning culvert inlets in stream channels should occur between the low period of flow (generally June 15 to September 15) in accordance with Oregon Department of Fish and Wildlife (ODFW) in-stream work period guidelines (RMP, p. 161)
- Slumps, intermittent seeps, and other unstable areas would be buffered (no treatment) by leaving one row of overstory trees or a 25 foot diameter (whichever is greatest), from the outer edge of instability, around these areas for soil stabilization (RMP, p. 154).

- Unless unsafe, trees within Riparian Reserve boundaries (one or two site potential trees) would be directionally felled away from the stream, and upslope trees would not be felled into Riparian Reserves.
- Trees in no-harvest portions of Riparian Reserves that are accidentally knocked over during falling and yarding would be retained on site for fish /wildlife habitat, and would not be treated with activity fuels.
- Contractors must prepare a Spill Prevention, Control, and Countermeasure Plan for all hazardous substances (e.g. oil, gas, and diesel) to be used in the contract area, as directed by the Authorized Officer. Such plan shall include identification of Purchaser's representatives responsible for supervising initial containment action for releases and subsequent cleanup. Such plans must comply with the State of Oregon DEQ OAR 340-142, Oil and Hazardous Materials Emergency Response Requirements.
- Refueling of chainsaws and heavy equipment would be done no closer than 150 feet of any stream or wet area.

### **Sedimentation and Soil Compaction from Logging**

- Prior to October 15 of the same operating season, winterize and rehabilitate landings, corridors, skid trails, and other areas of exposed soils by properly installing and/or using water bars, berms, sediment basins, gravel pads, hay bales, small dense woody debris, seeding and/or mulching, to reduce sediment runoff as directed by the Authorized Officer.
- Tractors would not exceed nine feet in width and would be equipped with an integral arch to minimize soils disturbance and compaction. Skid trails including turning points would be 12 feet width on average.
- Cable yarding would suspend one end of the log clear of the ground during inhaul on the yarding corridor.
- To minimize soil disturbance the use of blades while tractor yarding would not be permitted to keep soil organics on site. Equipment would walk over as much ground litter as possible to reduce compaction.
- Existing skid trails would be used whenever practical and new skid trails would be placed at least 100 feet apart, where topography allows, to reduce the amount of compaction within tractor yarded units. New skid trails, would be located outside the Riparian Reserve whenever possible and would be pre-designated and approved by the Authorized Officer.

- The number of yarding corridors would be minimized to reduce soil compaction and displacement from cable yarding. Corridors would be located approximately 150 feet apart at the tail end.

### **Sedimentation and Soil Compaction from Roads and Landings**

- Landings would be located in approved sites and designed with adequate drainage.
- Ditchline blading would occur to restore proper drainage and road surface blading would be occur to maintain the running surface or restore proper drainage.

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## GLOSSARY

**Air Quality** - Refers to standards for various classes of land as designated by the Clean Air Act, P.L. 88-206, Jan. 1978.

**Authorized Officer** – BLM employee delegated the authority to oversee timber sale contract administration.

**Best Management Practices (BMP)** - Practices determined by the resource professional to be the most effective and practicable means of preventing or reducing the amount of water pollution generated by non-point sources; used to meet water quality goals (See Appendix D in RMP (USDI BLM 1995)).

**Biological Assessment (BA)** - Document prepared by or under the direction of BLM concerning listed and proposed species and designated and proposed critical habitat that may be present in a project area(s) and contains the BLM's determination of potential effects of the action on such species and habitat. Biological assessments are required for formal consultations and conferences on "major construction projects." They are recommended for all formal consultations and formal conferences and many informal consultations where a written evaluation of the effects of an action on listed or proposed species and on designated or proposed critical habitat is needed.

**Cable yarding** - Removes logs by use of wire cable(s) and tower for full or partial suspension log removal from harvest units.

**Canopy** - The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand in the overstory.

**Climate Change** – global climate is becoming warmer, and there is strong evidence that this warming is resulting, at least in part, from human-caused production of greenhouse gases, including carbon dioxide. Climate interacts with vegetation and ecosystems; climate affects plant growth and ecosystem productivity; and ecosystem dynamics affect climate through the storage and release of greenhouse gases, including carbon dioxide.

**Coarse Woody Debris** - Portion of trees that have fallen or been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter.

**Compaction** - Refers to soil becoming consolidated by the effects of surface pressure often from heavy machinery or vehicle and pedestrian traffic.

**Critical Habitat Unit** - Under the Endangered Species Act, (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require

special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species when it is determined that such areas are essential for the conservation of the species. For further information see ([Federal Register \(57\):1796-1838](#)) for the 1992 CHU designation and [Federal Register \(73\): 47326-47522](#) for the 2008 CHU designation.

**Connectivity/ Diversity Block** – Manage to provide ecotypic richness and diversity and to provide for habitat connectivity for old growth dependent and associated species within the northern GFMA, maintain a minimum of 25% of each block in late-successional condition, in both long-and short-term. Suitable commercial forestland within blocks would be managed to assure a moderately high level of sustained timber production. Regeneration harvest would be permitted in stands 150 years and older and prescriptions would retain 12-25 trees per acre. The priority prescription in stands less than 150 years would be commercial thinning. There is one Connectivity /Diversity Blocks are present in T33S-R9W-Section17 in the Planning Area.

**Cultural Resources** - The physical remains of human activity (artifacts, ruins, burial mounds, petroglyphs, etc.) having scientific, prehistoric or social values.

**Cumulative Effect** - 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 regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can also result from individually minor, but collectively significant actions taking place over a period of time.

**Diameter at Breast Height (dbh)** - The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.

**Dispersal Habitat** - forested habitat greater than 40 years old, with canopy closure at least 40%, with average diameters greater than 11 inches and that has flying space for owls in the understory. It provides temporary shelter for owls moving through the area between suitable habitat and may offer some opportunities for owls to find prey, but does not provide all of the requirements to support an owl throughout its life. This habitat type has adequate cover to facilitate movement between blocks of suitable NRF habitat.

**Drainage** - In this document the term refers to the entire area that contributes water to a drainage system or stream at the seventh-field watershed scale (HUC 7).

**Effects (or Impacts)** - Environmental consequences as a result of a proposed action. Effects provide the scientific and analytical basis for comparison of alternatives. Effects might be either direct (caused by the action and occur at the same time and place) or indirect (occurring later in time or at a different location, but are reasonably foreseeable or cumulative results of the action).

Effects and impacts as used in this EA are synonymous. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic quality, historic, cultural, economic, social, or healthy effects, whether direct, indirect, or cumulative. Effects might also include those resulting from actions that might have both beneficial and detrimental effects, even if on the balance it appears that the effects would be beneficial.

**Endangered Species** - Any species defined through the Endangered Species Act of 1973 as amended, as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

**Environmental Assessment (EA)** - A statement of the environmental effects of a proposed action and alternatives to it. It is required for major federal actions under Section 102 of NEPA and is released to the public and other agencies for comment and review. It is a formal document that must follow the requirements of NEPA, CEQ guidelines, and directives of the agency responsible for the project proposal.

**Erosion** - Detachment or movement of soil or rock fragments by water, wind, ice, or gravity. Accelerated erosion is more rapid than normal, natural, or geologic erosion, primarily resulting from the activities of people, animals, or natural catastrophes.

**Evolutionary Significant Unit** - The National Marine Fisheries Service (NMFS, NOAA Fisheries) definition is as follows: a population must satisfy two criteria to be considered an ESU: (1) it must be substantially reproductively isolated from other conspecific population units; and (2) it must represent an important component in the evolutionary legacy of a species. 69 Fed. Reg. at 31355

**Fragile Groundwater** - Sites have high water tables where water is at or near the soil surface for sufficient periods of time that vegetation survival and growth are affected (as defined by the 1995 Medford District Resource Management Plan).

**Fragile Slope Gradient** - Sites consist of steep to extremely steep slopes that have a high potential for surface ravel. Gradients commonly range from 60 to greater than 100 percent (as defined by the 1995 Medford District Resource Management Plan).

**Fire Hazard** - The ability of a fire to spread once ignition has occurred. Hazard is rated using a numerical point system for each of the following factors: slope, aspect, position on slope, adjacent fuel model, ladder fuels, and estimated fuel loading. A point summary is then calculated and a rating of high, moderate or low is assigned.

**Fire Risk** - The probability of ignition. A rating of high, moderate or low is assigned based on the concentration and/or frequency of human presence and on historic lightning occurrence.

**Flame length** - Distance measured from the tip of the flame to the middle of the flaming zone at the base of the fire. It is measured on a slant when the flames are tilted due to effects of wind and slope (NWCG, 1994).

**Floodplain** - The lowland and relatively flat area adjoining inland and coastal waters, including, at a minimum, areas that are subject to a 1% or greater chance of flooding in any given year.

**Forage** - All browse and non-woody plants that are available to livestock or game animals and used for grazing or harvested for feeding.

**Forest canopy** - Stratum containing the crowns of the tallest vegetation present in the stand, usually above 20 feet in height (NWCG, 1994).

**Forb** - Any herb other than grass.

**Fuels** - Combustible wildland vegetative materials present in the forest which potentially contribute to a significant fire hazard.

**Fuel Load** - Measure of the amount of fuel in a given area, generally expressed in tons per acre (NWCG, 1994).

**Fuels Management** - Manipulation or reduction of fuels to meet Forest protection and management objectives while preserving and enhancing environmental quality.

**Handpile burning** - Prescribed fire used to remove man-made or natural collections of concentrated woody debris. Generally the fire is hotter than in broadcast burning or underburning.

**Impacts** - A spatial or temporal change in the environment caused by human activity. See effects.

**Indirect Attack** - Method of fire suppression in which the fireline is located a considerable distance away from the fire's active edge. Generally employed in the case of fast moving or high intensity fire. The fuel between the control line and the fire's edge is usually backfired, but occasionally the main fire is allowed to burn up to the fireline, depending on conditions (NWCG, 2005).

**Indirect effects** - Secondary effects which occur in locations other than the initial action or significantly later in time.

**Intermittent Stream** - Any nonpermanent flowing drainage feature having a definable channel and evidence of scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

**Lop & Scatter** - scattering of tree limbs and small diameter logs to facilitate its decomposition.

**Matrix** - Designated under the 1995 Medford District Resource Management Plan, Matrix lands were identified as areas where timber harvesting would occur and comprise approximately 20% of the total 24 million acres of federal lands identified in the Northwest Forest Plan. There are additional management restrictions, such as for riparian reserves that overlap Matrix lands and retaining at least 15% of the watershed in late successional forest patches. The desired condition in Matrix lands on the Medford Bureau of Land Management is a patchwork of different aged forests created by thinning younger forest stands to assure high levels of volume production and regeneration harvesting older forest stands on an approximate 100 year rotation length.

**National Environmental Policy Act of 1969 (NEPA)** - This law requires the preparation of environmental impact statements for every major Federal Action which causes a significant effect on the quality of the human environment.

**Nesting, Roosting, & Foraging Habitat (NRF)** – Habitat used by owls for nesting, roosting and foraging and is frequently referred to as “suitable habitat”. NRF also functions as dispersal habitat. Suitable habitat in SW Oregon is typified by mixed-conifer habitats, recurrent fire history, patchy habitat components, and has a higher incidence of wood rats, which is a high quality spotted owl prey species. Suitable habitat in southwest Oregon varies greatly. It may consist of somewhat smaller trees and tree species are more diverse within each stand than owl habitat in the northern west-side Oregon BLM districts and national forests. Generally this habitat is at least 80-years of age (depending on stand type and structural condition), includes a moderate to high canopy, is multi-storied and has sufficient snags and down wood to provide for nesting, roosting and foraging owls, and for prey species habitat. The best quality suitable habitat has large old trees (greater than 30 inches in diameter) with cavities, a high incidence of larger trees with various deformities, including mistletoe, large snags, large accumulations of fallen trees and wood on the ground; and flying space (Thomas et al. 1990).

**No-Action Alternative** - The No-Action alternative is required by regulations implementing the National Environmental Policy Act (NEPA) (40 CFR 1502.14). The No-Action alternative provides a baseline for estimating the effects of other alternatives. When a proposed activity is being evaluated, the No-Action alternative discusses conditions under which current management direction would continue unchanged.

**Non-attainment** - Failure of a geographical area to attain or maintain compliance with ambient air quality standards.

**Noxious Weeds** - Rapidly spreading plants that can cause a variety of major ecological or economic impacts to both agriculture and wildland.

**Peak Flow** - The highest amount of stream or river flow occurring in a year or from a single storm event.

**Perennial Streams** - Streams that flow continuously throughout the year.

**Prescribed Burning** - The intentional application of fire to wildland fuels in either their natural or altered state. Burning is conducted under such conditions as to allow the fire to be confined to a predetermined area and to produce an intensity of heat and rate of spread required to meet planned objectives (e.g., silvicultural, wildlife management, reduction of fuel hazard, etc.).

**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. (See USDI, BLM 1995).

**Riparian Reserves** - Designated under the 1995 Medford District Resource Management Plan, this land use allocation consists of the stream, the area of the active stream channel, the width of the 100-year floodplain, and the outer edges of the riparian vegetation. Riparian widths vary from one site-potential tree length (187 ft) for seasonal or intermittent streams or up to two site-potential tree lengths (at least 374 ft) for fish bearing streams.

**Road Maintenance** - Activities on an existing road to keep a road at its original design standard. Typical maintenance would include, but is not limited to: 1/ blading and shaping; 2/ cleaning of ditches, catch basins and culverts; 3/ brush cutting and vegetation removal from roadway; 4/ pot hole repair; 5/ surface replacement; 6/ culvert replacement; 7/ slide removal; and 8/ daylighting.

**Roadway** – The engineered footprint of a road including the useable road width, cutbank, and downhill fillslope.

**Sediment** - Any material carried in suspension by water, which would ultimately settle to the bottom. Sediment has two main sources: from the water channel itself and from disturbed upland sites.

**Slash** - The residue on the ground following felling and other silvicultural operations and/or accumulating there as a result of a storm, fire girdling, or poisoning of trees.

**Snag** - A standing dead tree usually without merchantable value for timber products, but having characteristics of benefit to cavity nesting wildlife species.

**Soil Compaction** - An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure.

**Soil Productivity** - Capacity or suitability of a soil for establishment and growth of a specified crop or plant species, primarily through nutrient availability.

**Sub-watershed** - In this document the term refers to the entire area that contributes water to a drainage system or stream at the sixth-field watershed scale (HUC 6). There are two sixth field watersheds within the Mini Mule Planning Area which are Mule Creek and Missouri Creek.

**Surface Erosion** - The detachment and transport of soil particles by wind, water, or gravity. Surface erosion can occur as the loss of soil in a uniform layer (sheet erosion), in many rills or dry rattle.

**Threatened Species** - Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and which has been designated in the Federal Register as such. In addition, some states have declared certain species in their jurisdiction as threatened or endangered.

**Understory** - Vegetation (trees or shrubs) growing under the canopy formed by taller trees.

**Underburning** - The use of prescribed fire, most often below an overstory canopy to remove excess forest fuels. Generally conducted in the spring months and a cooler fire than broadcast burning.

**Water Quality** - The chemical, physical and biological characteristics of water.

**Watershed** - Entire area that contributes water to a drainage system or stream. The term refers to the fifth-field scale (HUC 5) in this document. The Mini Mule Project Planning Area is contained within a portion of the Rogue River-Horseshoe Bend fifth field watershed.

**Water Yield** - The total volume of surface runoff, measured as stream discharge that leaves a sub-watershed area. Increased water yield is primarily a result of reduced evapotranspiration and interception within the watershed, and can persist for one to two decades following harvest activity depending on the rate of vegetative recovery. As forests regenerate, water yields generally decrease to pre-treatment levels within two to three decades.

**Yarding** - The act or process of moving logs to a landing.

# Map 2. Geologic Contact Zones and Faultlines within Mule Creek HUC 6 sub-watershed

R 10 W

R 9 W

Mule Creek Geology

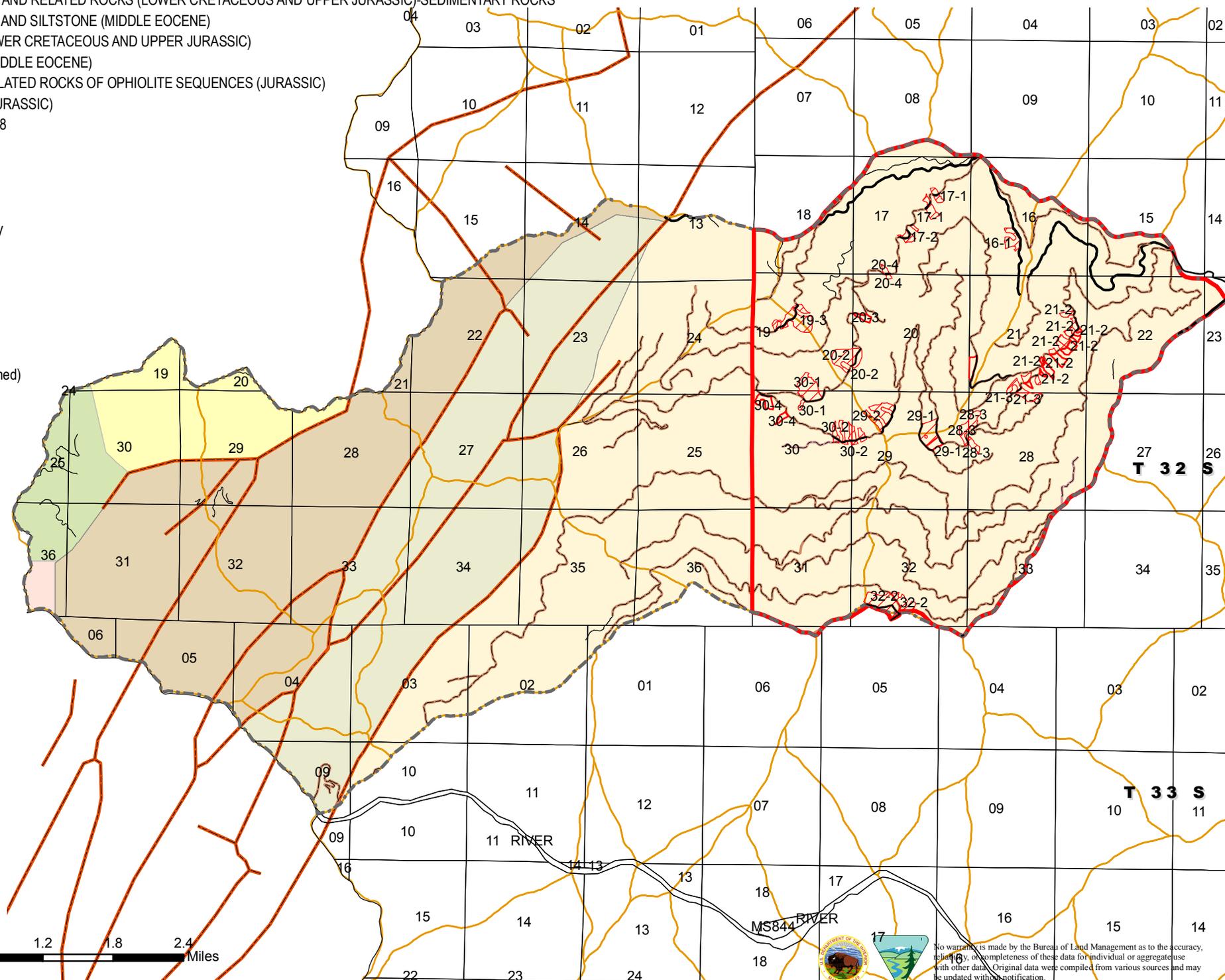
- DOTHAN FORMATION AND RELATED ROCKS (LOWER CRETACEOUS AND UPPER JURASSIC)-SEDIMENTARY ROCKS
- MARINE SANDSTONE AND SILTSTONE (MIDDLE EOCENE)
- MYRTLE GROUP (LOWER CRETACEOUS AND UPPER JURASSIC)
- TYEE FORMATION (MIDDLE EOCENE)
- ULTRAMAFIC AND RELATED ROCKS OF OPHIOLITE SEQUENCES (JURASSIC)
- VOLCANIC ROCKS (JURASSIC)
- Glendale Faultlines 2008

Mini Mule Units

- method
- cable
  - tractor
  - Planning Area Boundary
- MiniMule\_HUC6\_Roads

Surface Type

- Aggregate
- Bituminous
- Grid Rolled
- Hard Surface
- Natural (Graded & Drained)
- Natural Unimproved
- Not Known
- Pit Run
- Mule Creek HUC 6
- HUC 7 drainages



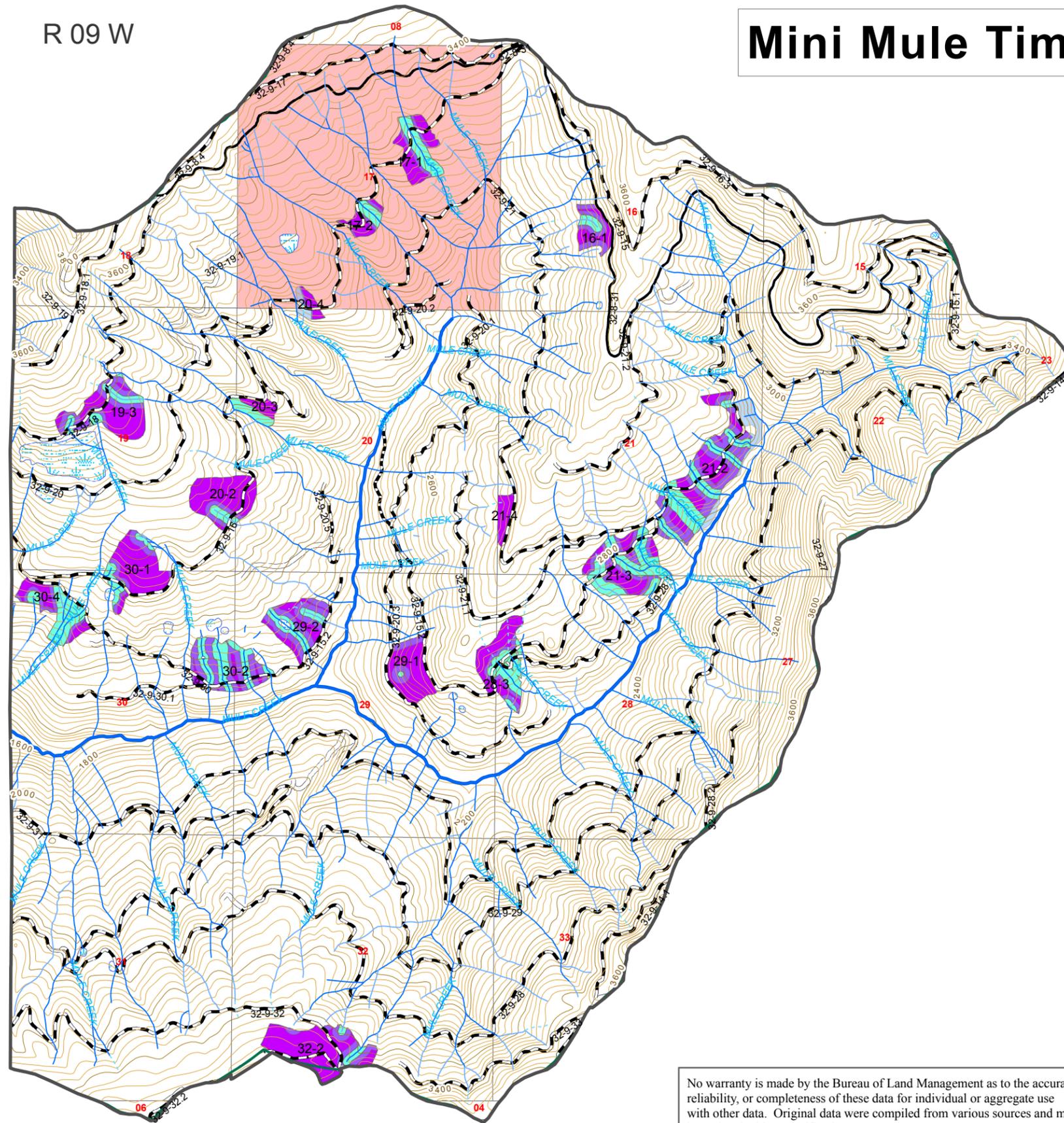
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

R 09 W

# Mini Mule Timber Sale EA Map



T  
32  
S



- Planning Area Boundary
- Mini Mule Units
- Watershed Boundary
- Streams**
  - Perennial
  - Intermittent
  - Ephemeral
  - Fish Presence
  - Intermediate 40-ft contour
  - Index 200-ft contour
  - Wet Areas
  - Ecological Protection Zone
  - Riparian Reserve
- Roads**
  - Rocked
  - Paved
  - Natural surface
  - Connectivity/Diversity Block
  - Matrix

Note: The Mini Mule Project is located entirely within an Elk Management area

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