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Coast Dorena Project
Environmental Assessment and Preliminary Finding of No Significant Impact

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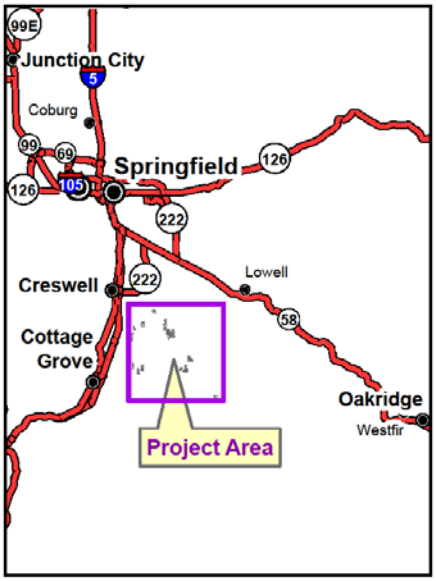
1.0 Introduction

The Upper Willamette (UW) Field Office, Eugene District, Bureau of Land Management (BLM) is proposing commercial thinning harvests and density management projects within the Coast Fork Willamette River and Row River Fifth Field Watersheds. The units are within Matrix and Riparian Reserve land use allocations (LUAs) under the 1995 Eugene District Resource Management Plan/Final Environmental Impact Statement (RMP/FEIS) and Record of Decision (ROD) (see p. 4-Conformance for 2016 Northwestern and Coastal Oregon ROD/RMP transition language). Harvests are proposed in both General Forest Management Area (GFMA) and Diversity/Connectivity blocks within the Matrix LUA.

Table 1: Project Summary

Sale Name	Location	Harvest Type	Stand Ages	Total Acres[1] (Harvest & Reserve)	Harvest Acres
Lucky Meyer	T20S R02W Sec 13, 19 & 23	Thinning	57-72	370	240
What's Bruin	T19S R02W Sec 31 & 33, T20S R02W Sec 3	Thinning	52-67	420	295

Figure 1: Vicinity Map



The project area is located approximately 2 to 9 miles northeast of Cottage Grove, Oregon in Lane County (Figure 1). Approximately 259 acres of the project area are located within the Dorena Lake-Row River sub-basin of the Row River 5th Field Watershed. Approximately 414 acres of the project area are located within the Bear Creek-Coast Fork Willamette River sub-basin of the Lower Coast Fork Willamette River 5th Field Watershed. The remaining 117 acres are located within the Hill Creek-Coast Fork Willamette River sub-basin of the Lower Coast Fork Willamette River 5th Field Watershed. The Row River 5th Field Watershed encompasses over 179,000 acres and the Lower Coast Fork Willamette

[1] Acres and mileages throughout document are approximate and provided for comparison purposes only.

River 5th Field Watershed encompasses over 89,000 acres.

1.1 Purpose and Need

Need for Action

The Oregon and California Railroads (O&C) Act requires the lands in the project area to be managed for permanent forest production and the timber to be sold, cut, and removed in accordance with the principles of sustained-yield. The project was designed to meet the BLM's obligation to implement the Eugene District Record of Decision and Resource Management Plan (ROD/RMP, USDI 1995; hereafter the 1995 RMP) and to address the primary objectives of the land use allocation. The 1995 RMP establishes an allowable sale quantity (ASQ) to manage timber production at sustainable levels. Since the institution of the 1995 RMP, changes to environmental regulations and increased controversy has resulted in timber management focusing almost exclusively on thinning in recent years to achieve ASQ.

The 1995 RMP provides management direction for forest habitat and for forest products (FEIS, p. 1-4). The 1995 RMP addresses these dual needs through designations of land use allocations in conformance with applicable laws including the O&C Act, the Clean Water Act, and the Endangered Species Act, as well as applicable rules, regulations, and policies. The statutory requirements of the O&C Act (43 U.S.C. §1181a et seq.), which governs BLM-administered O&C lands in western Oregon, include, but are not limited to, managing the O&C lands for permanent forest production by selling, cutting, and removing timber in conformance with the principles of sustained-yield; determining the annual productive capacity of the lands managed under the O&C Act; and offering that determined capacity annually under normal market conditions. The statute states that the purpose of sustained-yield management of these lands is to provide a permanent source of timber, contribute to the economic stability of local communities and industries, as well as benefit watersheds, regulate stream flows, and provide recreational use.

Forest management by the BLM must be implemented in full compliance with a number of subsequent laws that direct how the BLM accomplishes that statutory direction. For further discussion of legal authorities which direct the proposed action and alternatives, see EA section 1.2, Conformance with Land Use Plan, Statutes, Regulations, and Other Plans.

The Federal Land Policy and Management Act of 1976 (FLPMA, 43 U.S.C. §1701 et seq.) requires that public lands be managed for multiple uses and establishes a planning process. FLPMA does not require that every parcel be managed for every value and timber is included in these uses. FLPMA further specifically provides that if there is any conflict between its provisions and the O&C Act related to management of timber resources, the O&C Act prevails (43 U.S.C. §1701).

The 1995 RMP responds to both the need for a healthy forest ecosystem and the need for a sustainable supply of timber. "The Oregon and California Lands Act requires the Secretary of the

Interior to manage Oregon and California lands for permanent forest production; however, such management must also be in accord with sustained-yield principles. Further, that Act requires that management of Oregon and California lands protect watersheds" (RMP: Record of Decision, Introduction and pp. 1-2). The BLM has identified specific forest stands that can be managed at this time to provide a portion of the Eugene District's sustainable supply of timber resources within the context of providing for a healthy forest ecosystem.

The 1995 RMP establishes that ASQ is to be derived entirely from the Matrix LUA. BLM resource specialists on the Interdisciplinary Team (IDT), who developed this project, alternatives, and assessment examined these stands in the field and analyzed data from stand exams using growth and yield tables (FVS). Using professional judgment and data from modeling, the IDT analyzed expected stand growth rates, timber products yield, species composition, and elements of stand structure to compare stand development with and without treatment. Stands determined to meet criteria for treatment to meet 1995 RMP objectives for the Matrix and Riparian Reserve LUAs are analyzed in this EA.

Uplands (Matrix)

Stand exams were conducted within the Coast Dorena project area in fall of 2013. These showed that stands are dense, overstocked, and uniform in structure, which has resulted in reduced tree growth and stand vigor in some Matrix LUA stands. Thinning is needed to promote increased tree growth, canopy growth, stand vigor, and species diversity. Thinning these stands would contribute to long-term timber production and the current established ASQ for the Eugene District along with more desirable wildlife habitat. In addition the over-dense stands with closed canopies result in reduced light penetration for understory growth or the growth of minor tree species. Current stand conditions interfere with the development of large, well-developed crowns desirable for many wildlife species including northern spotted owls. Overall, the current stand conditions proposed for thinning in the project area provide less desirable habitat for wildlife in both the short and long-term than more complex stands.

Riparian Reserves

Riparian Reserves in the project area are predominantly densely-stocked, even-aged stands that show very little of the stand diversity or complexity goals identified by the Aquatic Conservation Strategy (ACS) Objectives. The *Consistency Analysis of the Coast Dorena Project Alternatives with the Aquatic Conservation Strategy* report is available at the Eugene District by request. These younger managed stands are in the stem exclusion stage and are competing for sunlight, water, and nutrients, causing reduced tree growth and vigor as well as limiting understory vegetation. Increased tree growth and vigor, canopy growth, and species diversity are needed for both wildlife habitat and to manage the stand for ACS Objective characteristics.

Purpose of Actions

The 1995 RMP specifies management objectives and direction to be accomplished in managing lands in the project area. These purposes may be given different weight, depending on the objectives for the particular LUA. For example, timber production is given greater emphasis in

Matrix LUA stands and forest habitat purposes are emphasized in the Riparian Reserve LUA. A reasonable action alternative must respond to the needs described above, and meet the objectives outlined below to be considered and analyzed in detail for this project. The following are the purposes for the actions proposed herein, in conformance with the 1995 RMP:

Uplands (Matrix)

- produce a sustainable supply of timber
- maintenance of valuable structural components, such as down logs and snags
- produce, over time, forests that have desired species composition, structural characteristics, and distribution of seral or age classes.

Specifically, for thinning in General Forest Management Areas (GFMA):

- increase the proportion of merchantable volume
- promote development of desired understory vegetation
- maintain good diameter growth rates

Specifically, for density management in Diversity/Connectivity Blocks:

- accelerate growth of trees to provide large-diameter snags and down logs
- promote development of understory vegetation and multiple canopy layers
- produce larger, more valuable timber
- harvest mortality of small trees as the stand develops
- maintain good crown ratios and stable, windfirm trees
- manage species composition

Riparian Reserves

The purpose of treatment in Riparian Reserves is to provide accelerated development of the following, as per the ACS Objectives:

- Structural complexity representative of those that would result from natural disturbance patterns
- Vegetation diversity.
- Understory development.
- Increased growth rates of residual live green trees.
- Provide for the conservation of and habitat for Special Status Species as well as other aquatic and terrestrial species.

- Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.

1.2 Conformance

The BLM signed a Record of Decision approving the Northwestern and Coastal Oregon Resource Management Plan (2016 ROD/RMP) on August 5, 2016.

Revision of an RMP necessarily involves a transition from the application of the old RMP to the application of the new RMP. The planning and analysis of future projects such as timber sales requires several years of preparation before the BLM can design a site-specific project and reach a decision. Allowing for a transition from the 1995 RMP to the new RMP avoids disrupting the management of BLM-administered lands and allows the BLM to utilize work already begun on the planning and analysis of projects.

The 2016 ROD/RMP (pp. 9-12) allows the BLM to implement projects consistent with the management direction of either the 1995 RMP or the approved RMP, at the discretion of the decision maker, if—

- The BLM had not signed a project-specific decision prior to the effective date of the ROD;
- The BLM began preparation of NEPA documentation prior to the effective date of the ROD; and
- The BLM signs a project-specific decision on the project within two years of the effective date of the ROD.

The Eugene District began preparation of NEPA documentation prior to the effective date of the 2016 ROD/RMP, as the District initiated planning and NEPA documentation for this project in November 2015 with a project initiation letter to the interdisciplinary team. This project was designed to conform to and be consistent with the Eugene District's 1995 Record of Decision and Resource Management Plan (1995 RMP).

This project meets the criteria described in the 2016 ROD/RMP that allows the BLM to implement projects that conform and are consistent with the 1995 RMP, with the exception of five categories of prohibited carry-over actions (2016 ROD, pgs. 9-13). The Coast Dorena project does not include and has been modified to exclude any actions that are excepted and therefore precluded from the 2-year transition period under the 2016 ROD/RMP.

1. Regeneration harvest (construction of roads or landings does not constitute regeneration harvest) within the Late-Successional Reserve allocated by this ROD that is inconsistent with the management direction for the Late-Successional Reserve contained within the approved RMP.

   The proposed project does not include regeneration harvest.

2. Issuance of right-of-way grants within the Late-Successional Reserve allocated by this ROD that are inconsistent with the management direction for the Late-Successional Reserve contained within the approved RMP.

   The project is not located within Late Successional Reserve LUA and is not an issuance of a ROW grant.

3. Commercial thinning within the inner zone of the Riparian Reserve allocated by this ROD that is inconsistent with the management direction for the Riparian Reserve contained within the approved RMP.

   Riparian Reserve no cut buffer widths have been modified from the original proposal to be consistent with this exception criteria and the approved RMP (pgs. 1117-1121).

4. Projects within the District-Designated Reserve – Lands Managed for their Wilderness Characteristics allocated by this ROD that are inconsistent with the management direction for the District-Designated Reserve – Lands Managed for their Wilderness Characteristics contained within the approved RMP.

   The proposed project is not located within the above land use allocations.

5. Timber harvest that would cause the incidental take of northern spotted owl territorial pairs or resident singles and does not have a signed Biological Opinion and Incidental Take Statement that predates the effective date of the Biological Opinion for the approved RMP.

   As outlined in the EA (Section 3.1.3.2, p. 42) and the Biological Assessment (p. 84-88), the proposed project would not cause the incidental take of northern spotted owl.

The BLM designed the project to conform to these statutes and authorities:

- Oregon and California Act (O&C Act), 1937 (43 U.S.C. §1181a et seq.) – The O&C Act governs BLM-administered O&C lands in western Oregon. It requires the BLM to manage O&C lands for permanent forest production, in accord with sustained-yield

principles, to protect watersheds, regulate stream flow, provide for recreational facilities, and contribute to the economic stability of local communities and industries.

- Federal Land Policy and Management Act (FLPMA), 1976 – Defines the BLM's organization and provides the basic policy guidance for the BLM's management of public lands.
- National Environmental Policy Act (NEPA), 1969 – Requires the preparation of EAs or Environmental Impact Statements (EISs) on federal actions. These documents describe the environmental effects of these actions and determine whether the actions have a significant effect on the human environment.
- Endangered Species Act (ESA), 1973 – Directs Federal agencies to ensure their actions do not jeopardize threatened and endangered species.
- Clean Air Act (CAA), 1990 – Provides the principal framework for national, state, and local efforts to protect air quality.
- Clean Water Act (CWA), 1987 – Establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water.
- Healthy Forests Initiative (HFI), 2002 - Focuses on reducing the risk of catastrophic fire by thinning dense undergrowth and brush in priority locations that are identified on a collaborative basis with selected Federal, state, tribal, and local officials and communities. The initiative also provides for more timely responses to disease and insect infestations.
- Migratory Bird Treaty Act, 1918 - Protects migratory birds (16 U.S.C. 703).
- Executive Orders 11644 (1972) and 11989 (1997) - Direct the BLM to control off-road vehicle use so as to protect public lands.

Additional details pertaining to statutes, authorities and management direction are presented in the discussions of specific resources throughout the remainder of this EA.

1.2.1 **Survey and Manage**

The project is consistent with the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, as incorporated into the 1995 RMP.

This project utilizes the December 2003 species list. This list incorporates species changes and removals made as a result of the 2001, 2002, and 2003 Annual Species Reviews (ASR) with the exception of the red tree vole. For the red tree vole, the Ninth Circuit Court of Appeals in KSWC et al. v. Boody et al., 468 F3d 549 (9th Cir. 2006) vacated the category change and removal of the red tree vole in the mesic zone, and returned the red tree vole to its status as

existed in the 2001 ROD Standards and Guidelines, which makes the species Category C throughout its range.

Previously, in 2006, the District Court for the Western District of Washington (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 (the "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:
> A. Thinning projects in stands younger than 80 years old;
> B. 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;
> C. 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 of large wood, channel and floodplain reconstruction, or removal of channel diversions; and
> D. The portions of projects 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."

Areas under 80 years of age that are being considered for thinning under all action alternatives meet Exemption A of the Pechman Exemptions.

1.3 Scoping and Public Involvement

On February 2, 2016, a public scoping letter was mailed to landowners near the project area as well as emailed to individuals and organizations who had previously requested to be informed of District activities. A letter was also sent to five tribes: Confederated Tribes of Siletz, Confederated Tribes of Grand Ronde, Confederated Tribes of Coos, Lower Umpqua and Siuslaw, Confederated Tribes of Warm Springs, and Cow Creek Band of Umpqua Tribe. It was also posted on the Eugene District's Planning Website the same day.

Four public scoping response letters were received: two from organizations (American Forest Resource Council and Oregon Wild) and two from private landowners. Comments included support for the project, requests for additional treatments, reduced treatments in riparian areas, reduced or no road building, and concerns about the safety of haul routes. Some of these are specifically addressed in section 1.6 below. Numerous articles were submitted for BLM review

during the scoping process. The BLM reviewed these documents, and considered the information in developing the final Proposed Action and alternatives.

The BLM IDT conducted internal scoping from January to March, 2016.

Both internal and external scoping comments were considered in development of the issues and Alternatives.

1.4 Acres Removed from the Project

During the development of the project, approximately 175 acres were dropped for a variety of site-specific reasons such as the presence of northern spotted owls (including nest patches and habitat with the characteristics described in Recovery Actions 10 and 32 of the Northern Spotted Owl Recovery Plan; see Issue 1), lack of need for treatment in select Riparian Reserves, excessive road costs, and logging systems infeasibility.

1.5 Issues

In the context of an environmental analysis, an issue is a point of disagreement, debate, or dispute with a proposed action based on some anticipated environmental effect. An issue:

- has a cause and effect relationship with the proposed action or alternatives;
- is within the scope of the analysis;
- has not been decided by law, regulation, or previous decision; and
- is amenable to scientific analysis rather than conjecture.

The IDT considered the following issues as it developed and refined the project alternatives, identified project design features (PDF), and analyzed the environmental effects. Issues presented in detail in this analysis are:

- What are the effects of timber harvest and associated activities on northern spotted owl (NSO) habitat quantity and quality, and the suitability of affected home ranges? Section 3.1.1.
- What are the effects of timber harvest on stand structure in the Riparian Reserves? Section 3.2.1
- How would timber harvest and road construction activities affect constituent elements (canopy cover, snags and down wood, large trees, stand structure, and prey availability)? Section 3.2.7.

1.6 Issues Not Presented in Detail

1.6.1 What are the effects on Special Status Species other than northern spotted owls?

For Special Status Species other than northern spotted owl, Survey and Manage Species, relevant migratory birds, and RMP wildlife, all of the Coast Dorena Project alternatives would meet the requirements of the Endangered Species Act, the Survey and Manage Program, BLM Sensitive Species policy, and/or BLM migratory bird policy, as applicable. Detailed effects analysis for these species is outlined in the wildlife specialist report which is available upon request. Appendix C provides a summary of that report and list rationale for why these species were not considered in detailed analysis in the EA.

1.6.2 What are the effects on the spread of invasive weeds?

This issue was not analyzed in detail because previous experience with similar commercial thinning projects has demonstrated that there is no potentially significant impact to the spread or persistence of noxious weeds from this type of project, with the contractual implementation of project design features. Roads are the primary vector for noxious weeds. PDF 19 requiring all equipment to be free of soil and plant debris prior to arrival on BLM lands would minimize the risk of introduction of new weed species to the project area. Additionally, PDF 20 requires all equipment to be free of soil and plant debris before entering T20S R2W Section 13, even from other BLM land, as this unit is essentially weed-free. Use of BLM-provided seed and weed-free mulch, where activities such as culvert replacement and road decommissioning result in exposure of bare soil, would minimize the risk of weeds establishing.

1.6.3 What are the effects of proposed timber harvest and associated activities on carbon emissions and storage?

Carbon analyses have been completed for similar projects and showed no significant impact on carbon emissions and storage. The carbon analyses are incorporated here by reference (2011 Thinnings Project EA DOI-BLM-OR-E060-2010-001-EA, pp. 25-26; Hills Camp EA DOI-BLM-OR-E060-2010-003-EA, pp. 6-8). This proposed action would result in a similar magnitude of short-term carbon emissions and long-term carbon storage as analyzed in those projects, because the forest stand conditions and treatments for this proposed action are approximately similar in terms of carbon implications. The 2011 Thinnings Project analyzed removal of 13,095 board feet per acre across a 1,400 acre project area. Hills Camp EA analyzed removal of 10,894 board feet per acre across a 1,040 acre project area. The Coast Dorena EA is analyzing removal of 17,364 board feet per acre across a 790 acre project area.

Because of the similarity between previous analyses and the stands and treatments analyzed in the Coast Dorena EA, it is expected that effects would be similar in scope, intensity, and character, supporting these conclusions regarding Carbon Storage and Carbon Emissions:

Carbon Storage

- The No Action Alternative stores more carbon in 30 years than all action alternatives in 30 years.
- After a timber harvest, some of the carbon would be stored in the harvested wood and some carbon would remain in the existing live trees standing.

Carbon Emissions

- The proposed treatments would result in carbon being released because of harvested wood, slash treatment, biomass recovery, and fuel consumption for timber operations.

1.6.4 What are the effects on fish-bearing streams and hydrological function?

There are negligible differences in the amount of sediment per alternative (road renovation/stream culvert replacements) that would occur and the amount of new material added to the local stream networks is insignificant compared to background levels.

Under the No Action Alternative, some roads or road segments within the project area would continue to contribute sediment until they are properly repaired, maintained, or removed. Lack of maintenance on area roads (cleaning ditch lines, culvert replacements and maintenance, rocking, grading, etc.) would continue to produce sediment off poorly drained roads.

Under the Action Alternatives, the installation, renovation, and maintenance of stream crossing culverts would be the primary contributor of sediment and would occur as brief, short-term pulses during construction activity. Adding cross drains and improving the functionality of existing cross drain culverts would improve road drainage and limit the amount of sediment entering streams over the long term. New cross drains would improve road drainage and disconnect ditchlines from area streams, alleviating sediment sources. Ditchlines that flow to streams currently allow sediment from the road to be transported directly to the streams. Placing new cross drains would allow the ditchlines to transport water and material washed off the road system onto forested areas away from streams. New culverts for small streams and seeps would be added to prevent ditchlines from re-routing streams.

Increased road use from timber hauling and related activities would result in minor short-term increases in sedimentation. This project allows for year-round timber haul, with the greatest potential for sedimentation occurring during winter haul. However, proposed haul routes are predominately gravel surfaced roads leading to paved roads which would have lower potential for sedimentation than native surface roads. Roads would be renovated (add rock if needed, blading, etc.) before winter haul would be authorized (PDF 32). Therefore, the potential for increases in sedimentation in fish-bearing streams is expected to be insignificant and likely undetectable compared to existing background levels.

Across all action alternatives, road related activities would have some short term increases in sediment delivery to area streams due to disturbance of the road bed, ditch lines and stream

crossings; however, long term sediment inputs should be reduced due to improved road drainage from the addition of aggregate, crowning of roads, and ditch lines being disconnected to streams (new cross drains).

1.6.5 **What are the effects on fish passage?**

Action alternatives would not create any new fish barriers. All stream culvert replacements would occur on non-fish bearing streams and would not improve or remove aquatic barriers. However, in alternatives 2 and 3, two culverts would be removed from section 19 on Road Nos. 20-2-19.1 and -19.3 at the end of harvest operations, which would improve fish passage and hydrologic connectivity on streams 9 and 17.

Alternative 4 would have the same project-wide effects as Alternatives 2 and 3 concerning connectivity with the exception that the two culverts on Road Nos. 20-2-19.1 and -19.3 would not be removed. These culverts would continue to prevent aquatic organism passage on streams 9 and 17, and the native surface roads would continue to fragment the Riparian Reserves. However, the roads built and renovated in Alternative 4 would be outside riparian areas and would not produce the short-term sediment delivery and loss of hydrologic function from renovation within a Riparian Reserve.

Each action alternative was shown to have trade-offs. Using the Road Nos. 20-2-19.1 and -19.3 has the benefits of removing the culverts and improving fish passage post-harvest, but the costs would include sediment delivery and continued reduction in hydrologic function due to harvest operations.

1.6.6 **What are the effects of harvest operations on hunter and recreational access?**

This issue was not presented in detail because hunter and recreational access to most of the BLM sections proposed for harvest is limited by gates installed by the BLM or private landowners for other management reasons. The exception to this is T20S R2W Sec 23 containing part of the Lucky Harms timber sale; here, Lane County Road #2455 (Rat Creek Road) connects with 5.4 miles of BLM roads designated with legal public access. Temporary public access to lands restricted by gates for hunting and other dispersed recreation activities may be granted by the private landowner at their discretion. The BLM's administrative rights in such instances do not allow the agency to determine public availability of such roads. Where locked BLM gates are installed on roads with legal public access designation, the BLM generally allows limited public entry between mid-October through December 31 coincident with general fall deer rifle season.

The prevalence of gates closed to limit access to private land within the O&C checkerboard for all or most of the year limits recreational activity within the proposed timber sale areas. Gravel road bicycling, hunting, walking, and dispersed camping are some of the recreational activities occurring within, or adjacent to, the proposed harvest areas. Similarly, occasional photography, mushroom picking, driving-for-pleasure, and scenic viewing are pursuits associated with the

greater project area. These recreational activities are casual in nature, as no organized, commercial, or competitive recreation events have been administered by the BLM to date for those areas.

1.6.7 What are the economic impacts of the proposed action?

This issue was not presented in detail because the proposed harvest amount, approximately 9 MMBF (million board feet), is the same for each alternative. Small differences in logging costs and road costs translate to approximately 2% difference in net value between Alternatives. As noted in Table 4, Alternative 2 would yield a net value of $2,913,000, Alternative 3 would yield $2,923,000, while Alternative 4 would yield a net value of $2,855,000. All alternatives are economically viable, and the difference is so small that this would not lead to a more informed decision.

1.6.8 What effects would the proposed action have on fuel loading, fuel structure , and fire behavior? How would any prescribed burning effect air quality?

Fire behavior describes how a wildland fire burns based on environmental characteristics such as surface fuels, vegetation, canopy base height, density or closure, slope, aspect, weather, and elevation. The identification of fuel models helps to describe the fuels available to a fire based on the amount, distribution, and continuity of the vegetation and wood. Fuels combined with weather and slope can be used to predict potential surface fire behavior characteristics such as rate of spread, flame lengths, and fire line intensity. Historically, fire was a normal occurrence and has played a key role as a natural disturbance process throughout southwestern Oregon. However, fire suppression and forest management activities have altered the historic vegetative patterns within the Project Area on both public and private lands. Thinning treatments are intended to create multi-aged and multi-layered stands. Stands would be left in a condition more resilient to environmental stressors such as fire, drought, and insects. Isolated unthinned areas could exhibit isolated and group torching of trees during a wildland fire, however, the reduced canopy bulk density of the stand and openings would limit large scale crown fire potential. Because of the structural diversity these stands would still represent timber understory and timber litter fuel types but with reduced surface fuel loading. Stands would exhibit a decrease in overall potential fire behavior and an increase in suppression capability. Treated stands would experience a decrease in fire hazard and risk for 5 to 15 years or until vegetation density returned to existing levels. Timber management activities generally increase the surface fuels within a stand. However, whole tree harvesting with disposal of the tops at the landings is the most effective method of preventing surface fuel increases within the residual stand (Agee and Skinner 2005). At the landings, slash would be piled, chipped, sold for firewood, or prescribed burned. Slash remaining within the stands would be lopped and scattered or hand piled and burned. Lopping and scattering the activity slash would reduce the vertical height and horizontal continuity of the fuel bed. However, it would temporarily increase the surface fuel loads. This would put the stand into a slash fuel model resulting in higher predicted flame lengths, fire

duration, and intensity. In 10 to 15 years after lopping and scattering, the effect of the slash on fire behavior would be overcome by the effects of decomposition and new vegetation growth (McIver and Ottmar 2006). Hand piling and burning would decrease fuel loading of material one to six inches in diameter by 85% to 95%. Fuels greater than 6 inches in diameter would be left on the surface and would contribute to the coarse woody debris load. This treatment would move stands from a slash fuel type into a timber fuel type, which would result in a reduced rate of fire spread and average flame length.

Immediately following forest management activities and prior to slash disposal, fire behavior potential could increase from the current condition due to increased surface fuels. Following slash disposal treatments, a reduction in potential fire behavior would occur due to the reduction in surface The BLM fuels management specialist would conduct a fuels assessment within each unit following timber harvest activity. This assessment would determine the fuel hazard and fire risk based on surface fuel loading, aspect, slope, access, and location of each unit. The fuels management specialist would mitigate remaining slash concentrations within the stands by a lop and scatter or handpile and burn treatment. At the landings, slash would be piled, chipped, sold for firewood, or prescribed burned. Post-treatment surface fuel loading would be reduced because the majority of the slash would be removed from the unit. Timber management activities could have potential short term adverse effects on fuel loading, fuel structure, and fire behavior. However, planned fuels reduction mitigation measures would minimize the short term effects and the resultant long term effects would be negligible.

For all prescribed burning activities, the Eugene District BLM is required to be in compliance with the Oregon Smoke Management Plan (OAR 629-048-0010). The Oregon Smoke Management Plan designates SSRA (Smoke Sensitive Receptor Areas), which are areas designated for the highest level of protection under the smoke management plan, as described and listed in OAR 629- 048-0140. The objective of the Smoke Management Plan is to prevent smoke from prescribed burns from entering the SSRA. Eugene District BLM is also required to be in compliance with the Oregon Visibility Protection Plan (OAR 340-200-0040, Section 5.2) which mandates that prescribed burning does not affect the visibility of Class I areas. The Project is not within a Class I area. Prior to conducting prescribed burning activities, the BLM must register prescribed burn locations with Oregon Department of Forestry. The specific location, size of the burn, fuel loadings, ignition source, time, and duration of ignition are reported prior to ignition. Smoke management advisories or restrictions are generated on a daily basis by the State Meteorologist. This information is used to determine the appropriate time to conduct the planned prescribed burn. Most prescribed burning on the Eugene District is accomplished by hand-pile burning. Hand-pile burning generally occurs throughout the winter months during storm events when unstable atmospheric conditions are present in order to maximize mixing and lessen smoke impacts to localized areas. All piles would be covered with four millimeter thick polyethylene plastic sheeting to facilitate rapid ignition and consumption of fuels to minimize residual smoke.

This issue was considered but eliminated from further analysis because there would be negligible direct or indirect effects on air quality within the Project Area and the SSRA. Effects on air quality from activity slash burning would be short-term and localized. All units are not burned at the same time or in the same year. A large portion of particulate matter emissions produced during prescribed burning is lifted by convection into the atmosphere where it dissipates by horizontal and downward dispersion. At distances greater than five miles, the air concentrations for these emissions are expected to be small. Under these conditions and by following the prescribed fire management guidelines in the Oregon Smoke Management Plan, there would be negligible direct or indirect effects on air quality within the Project Area and the SSRA. Prescribed burning would comply with the guidelines established by the Oregon Smoke Management Plan and the Visibility Protection Plan (OAR 340-200-0040, Section 5.2). As a result, prescribed burning emissions are not expected to adversely affect annual PM10 attainment within the SSRA. In addition, the BLM does not expect prescribed burning to affect visibility within smoke sensitive Class I areas due to the distance from the Project Area and implementation of smoke management guidelines. Therefore, this issue was not analyzed further.

1.6.9 How would the proposed timber management, road activities, and water source restoration affect the Visual Resource Management Class III and IV landscape?

The Visual Resource Management (VRM) classifications within the project area are VRM Class III and IV. The VRM III visual quality objective is to partially retain the existing character of the landscapes. The visual quality objective for VRM IV areas is to allow major modification of the existing character of landscapes. Lands within the Row River SRMA are classified as VRM III; all other lands within the project area are classified as VRM IV. The landscape within and around the project area is characterized by a patchwork of harvested timberlands, an extensive road network, rural residential developments, and open pasture.

The proposed actions would not be visible from major public transportation routes. Bureau of Land Management lands are, for the most part, unidentifiable from other lands when viewing the landscape from any vantage point because of the contiguous coniferous forests in the Oregon coastal mountains. The proposed project would comply with VRM Class III and IV management guidelines. Visual changes within the project area would result from implementing timber thinning operations. Visible changes within the project areas would include: reduction of the number and density of conifers and alders, road construction and/or renovation, physical damage to shrubs and forbs from logging and yarding operations, and a short term change in vegetation color from green to green mixed with reddish brown as the cut tree tops, limbs and branches dry. Fuel treatment of logging debris, if burned, may result in short-term decline in visual quality. Fuel treatments would comply with state smoke management regulations thus reducing the affect to visual quality to a few days. Evidence of harvest activities, excluding new road construction would be minimized within approximately five years as the understory vegetation and conifer crowns develop and increase in size and density. However, the overall project area would

remain a coniferous forest at the completion of the project. All visual changes to the landscape would be localized within the project area.

2.0 Alternatives

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." Within this EA, the BLM analyzed four alternatives. The BLM did not identify any unresolved conflicts concerning use of resources that warranted the development of an additional alternative. Alternatives considered but not analyzed in detail are discussed in section 1.7 of this EA.

2.1 Planning and Implementation Process

Planning Process

In planning the Coast Dorena timber sales, the BLM used an interdisciplinary team (IDT) process. An IDT composed of experienced professional resource specialists developed criteria using direction in the RMP for selecting stands to be treated, types of silvicultural treatments, boundary locations, logging systems, fuel treatments, and road system design and use. The IDT also developed a set of project design features (PDFs) to guide implementation of the project. The IDT developed and analyzed the proposed action (including project design features).

Upon completion of this EA, the BLM would make the EA available for a 30 day public comment period. The BLM will consider and evaluate comments received in response to public review of this EA and make any necessary changes to the analysis or the proposed action. Changes to the project design and responses to comments would be incorporated in the project-specific Decision Record (DR).

Implementation Process

The BLM proposes to implement the proposed action through timber sales offered during the 2017 fiscal year. The BLM would implement the actions analyzed in this EA during project layout (physical delineation of treatment boundaries and road locations) and timber sale contract provisions.

The BLM would write and administer the timber sale contract and would require the timber sale operator to accomplish the requirements of the contract in a manner that is consistent with the actions and PDFs and BMPs analyzed in this EA. In all timber sale contracts, the BLM enforces compliance through standard contract administration procedures where performance is monitored by authorized BLM personnel. The Authorized Officer enforces compliance with the contract and would suspend operations if the operator fails to perform the required preventive and restorative practices. The BLM timber sale contract requires bonding in an amount sufficient for BLM to complete restoration work of the damages caused if the operator fails to perform the

contract requirements. Logging Systems: The BLM designed a basic logging systems plan to comply with the RMP, be technically and economically feasible, environmentally sound, use equipment and logging systems known to be commonly available in the area, and comply with BLM timber sale contract provisions and administration. There are many combinations of specific equipment and operating methods which could be used and the final plan implemented may be different than the plan analyzed in this EA.

2.2 No Action

The No Action Alternative is the only alternative which does not conform to the purpose and need for action. This alternative provides a baseline for comparison of the environmental effects- i.e., the existing conditions in the project area and the continuing trends in those conditions if the BLM does not implement any of the proposed actions. Consideration of this alternative also answers the question: "What would it mean for the objectives to not be achieved?" Under this alternative, no harvest of these stands would occur at this time. This would not, however, constitute a decision to reallocate the lands to non-commodity uses. No road construction would occur as part of this project. Road renovations and improvements to improve drainage and reduce sedimentation would not be undertaken at this time. Only normal administrative activities and other uses (e.g., road use, programmed road maintenance, recreation, or harvest of special forest products) would continue on BLM-managed lands within the project area. On private lands adjacent to the project area, forest management and related activities are assumed to continue to occur.

2.3 Alternative 2: Preferred Alternative

Alternatives 2 and 3 propose the same logging systems and haul routes. Alternative 2 proposes more rocked roads than Alternative 3, as many of the spur roads in Alternative 3 would be native rather than rock surfaced.

See Chapter 7: Maps for harvest systems, roadwork, and haul routes associated with Alternatives 2 and 3.

Table 2: Proposed Harvest Summary for Alternatives 2 and 3

	Total Acres	Lucky Meyer	What's Bruin
Upland (Matrix) Acres Harvested Thinning	**401**	170	231
Riparian Reserve Acres Harvested Thinning	**134**	70	64
Cable or Cable-Preferred Logging	**421**	184	237
Ground-based or Ground-based Preferred Logging	**114**	56	58

2.3.1 **Thinning Treatments in Uplands (Matrix)**

The commercial thinning prescription would reduce stand density by thinning from below (removing smaller, supressed, less-vigorously growing trees) to a Curtis Relative Density[2] between 27 and 35 (or 130-170 sq.ft of Basal Area), variable across each unit. To the extent possible, all hardwoods and Pacific yew would be retained, except where necessary to accommodate safety and logging systems. Minor coniferous species would generally be selected for retention to ensure their continued presence in the stand. However, when minor conifer species are encountered in small scale pockets of atypical proportion relative to what was sampled in the stand exam, minor species would be cut to meet the target reserve basal area. If western hemlock trees are infested with mistletoe, they would not be favored for retention. The thinning would generally retain the largest and most vigorous trees, which would decrease tree-to-tree competition. Trees selected for harvest would generally be the suppressed, intermediate, and co-dominant conifer trees. In What's Bruin (T20S R02W Sec 03), Western hemlock would not be preferentially reserved. Post-harvest canopy cover in all units would be above 50%.

2.3.2 **Thinning Treatments in Riparian Reserves**

The commercial thinning prescription would be the same as the uplands (Matrix). Areas of no harvest adjacent to streams and wetlands would be 75 feet on intermittent streams and 120 feet on perennial and fish-bearing streams.

2.3.3 **Road Construction, Renovation, and Maintenance**

Under Alternative 2, 0.2 mile of temporary native surfaced roads, 0.8 mile of optional permanent rock or temporary native surfaced roads, and 1.8 miles of permanent rocked roads would be constructed. Spurs 13A and 19B in Lucky Meyer, and a portion of Spur 33B in What's Bruin would be improved to rocked roads (0.9 mi. total). Renovations would occur on 20.8 miles of existing roads. Between 13 and 49 culverts[3] would be installed or replaced. See Appendix C for road tables.

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[2]Relative Density is a means of describing the relative degree of inter-tree competition in stands of differing average tree size and stand density of conifers over 8'' DBH (Curtis, A Simple Index of Stand Density for Douglas-fir, 1982). Relative Density is calculated by dividing the Basal Area by the square root of the Quadratic Mean Diameter. Basal Area is the cross sectional area of a single stem, including the bark measured at breast height (4.5 ft.) above the ground. Basal Area is described in square feet and of all conifers e 8" DBH.

[3] At a minimum, all (13) culverts with a high or very high need for replacement or installation, as determined by hydrology and engineering staff, would be replaced.

2.3.4 **Fuels Management**

Prior to project initiation, a fuels assessment for each sale unit would be completed by the Fuels Specialist, in consultation with Logging Systems Specialists. The fuels assessment would determine an anticipated post-harvest fuel hazard and fire risk and would help determine post-harvest fuels treatment for each unit. The fuels assessment would be based on factors such as current fuel model, silvicultural prescription, logging systems, surface fuel loading, aspect, slope, access, and location of each unit.

On all harvest units, landing piles would be covered and burned in the first wet season practicable (late-autumn or early-winter) following completion of harvest. Depending on anticipated fuel hazard and risk, logging debris (slash) located near landings, along roads, or property lines may be piled. When additional piling along roads is required, activity fuels less than 6 inches in diameter and within 50 feet of the road would be piled, covered, and burned at the same time as the landing piles. See PDFs 54 through 56.

2.4 Alternative 3

Harvest acres and haul routes for Alternative 3 are the same as Alternative 2. Refer to Table 2 for harvest acres and Chapter 7: Maps for haul routes.

2.4.1 **Thinning Treatments in Uplands (Matrix)**

Commercial thinning prescription would be the same as described in Alternative 2.

2.4.2 **Thinning Treatments in Riparian Reserves**

Commercial thinning prescription would be the same as described in Alternative 2. However, within treated Riparian Reserves in T19S R2W Sec. 31, T19S R2W Sec. 33, T20S R2W Sec. 13, and T20S R2W Sec. 23, within 5 years post-harvest an average of 5 TPA would be turned into snags or CWD. The ratio of snags to CWD would be determined following a post-harvest assessment based on unit-specific conditions.

2.4.3 **Road Construction, Renovation, and Maintenance**

Under Alternative 3, 1.3 miles of temporary native surface roads, 0.5 miles of optional permanent rock or temporary native surface roads, and 1 mile of permanent rock surfaced roads would be constructed. Spurs 13A and 19B in Lucky Meyer, and a portion of Spur 33B in What's Bruin would be improved to rocked roads (0.9 mi. total). Renovations would occur on 20.8 miles of existing roads. Between 13 and 49 culverts would be installed or replaced. See Appendix B for road tables.

2.4.4 **Fuels Management**

Fuels treatment would be the same as described in Alternative 2.

2.5 Alternative 4

Alternative 4 differs from Alternatives 2 and 3 in road access and resulting logging systems. Portions of the unit north of stream 03 in section 19 would be harvested via cable yarding and would be accessed using Castle Rock mainline (see section 2.5.3 for road information and Table 4 for logging systems and acres for Alternative 4).

See Chapter 7: Maps for harvest systems, roadwork, and haul routes associated with Alternative 4.

Table 3: Proposed Harvest Summary for Alternative 4

	Total Acres	Lucky Meyer	What's Bruin
Upland (Matrix) Acres Harvested Thinning	**401**	170	231
Riparian Reserve Acres Harvested Thinning	**134**	70	64
Cable or Cable-Preferred Logging	**438**	201	237
Ground-based or Ground-based Preferred Logging	**97**	39	58

2.5.1 Thinning Treatments in Uplands (Matrix)

Commercial thinning prescription would be the same as described in Alternative 2.

2.5.2 Thinning Treatments in Riparian Reserves

Commercial thinning prescription would be the same as described in Alternative 2.

2.5.3 Road Construction, Renovation, and Maintenance

Under Alternative 4, 0.8 mile of optional permanent or temporary native surface roads and 1.8 miles of permanent rocked roads would be constructed. No temporary native surface roads would be constructed. Spur 13A in Lucky Meyer and a portion of Spur 33B in What's Bruin would be improved to rocked roads (0.6 mi. total). Renovations would occur on 23.4 miles of existing roads. Access to the east unit of T20S R02W Section 19 would be via Castle Rock Mainline and other industry-owned, private roads. Because of the increase in road construction, approximately 17 acres (for which ground-based yarding was preferred under the previous action alternatives) would be made available for cable yarding. Road Nos. 20-2-19.1 and 20-2-19.3 would not be renovated and no extensions would be built onto these roads. Between 12 and 42 culverts would be installed or replaced. See Appendix B for road tables.

2.5.4 Fuels Management

Fuels treatment would be the same as described in Alternative 2.

2.6 Comparison of Action Alternatives

Table 4: Comparison of Action Alternatives

	Alternative 2	Alternative 3	Alternative 4
Total Acres Dorena Lake-Row River, Hill Creek & Bear Creek-Coast Fork Willamette 6th Field Watersheds	78,600		
Total Acres (includes harvested, treated and untreated riparian areas)	790		
Upland (Matrix) Acres Harvested Thinning	401		
Riparian Reserve Acres Harvested Thinning	134		
Thinning in GFMA Blocks	475		
Thinning Acres in Connectivity Blocks	60		
Cable or Cable-Preferred Logging Acres	421	421	438
Ground-based or Ground-based Preferred Logging Acres	114	114	97
Upland Prescription	130-170sq. ft. of Basal Area remaining		
Riparian Treatment	Same prescription as Uplands	Same prescription as Uplands. 5 TPA would be utilized for creation of CWD & Snags within 5 years post-harvest	Same prescription as Uplands
Projected Number of Corridors over Perennial and Intermittent Streams	7		

	Alternative 2	Alternative 3	Alternative 4
Seasonal Restrictions for Wildlife Protection	None		
Roads	• 20.8 miles Renovation • 0.9 miles Improvement • 1.8 miles Construction (Permanent) • 0.2 miles Construction (Temporary) • 0.8 miles Optional Native/Rock Construction • 13-49 Culverts Replaced • 6-29 Stream Culverts Replaced/Installed	• 20.8 miles Renovation • 0.9 miles Improvement • 1.0 mile Construction (Permanent) • 1.3 miles Construction (Temporary) • 0.5 miles Optional Native/Rock Construction • 13-49 Culverts Replaced • 6-29 Stream Culverts Replaced/Installed	• 23.4 miles Renovation • 0.6 miles Improvement • 1.8 miles Construction (Permanent) • 0 miles Construction (Temporary) • 0.8 miles Optional Native/Rock Construction • 12-42 Culverts Replaced • 5-26 Stream Culverts Replaced/Installed
Total Estimated Volume (mbf)	9,000		
Total Approximate Gross Value	$4,689,000	$4,689,000	$4,728,000
Total Approximate Net Value	$2,913,000	$2,923,000	$2,855,000

2.7 Alternatives Considered but Eliminated from Detailed Analysis

2.7.1 Do not construct any new roads

Internal and external comments received during scoping suggested that the BLM should consider an alternative to include no new road construction. A minimal roads alternative (Alternative 3) is being considered, and would include 1 mile of new permanent roads.

Guiding principles for new road construction include the following:

- Provide access to current and future forest management projects and maintain transportations systems for the management of BLM lands to produce timber and special forest products and other commodities. (Transportation Management Plan, p. 5)
- Select logging systems based on the suitability and economic efficiency of each system for the successful implementation of the silvicultural prescription, for protection of soil and water quality, and for meeting other land use objectives (RMP, p. 85).

To harvest units most efficiently, some level of road construction would need to occur. Without construction of new roads, many harvest units would either be left untreated or helicopter-only operations would be prescribed. The helicopter-only harvest method limits which purchasers are able to bid, and depending on the timber prices at the time of sale, may result in no-bid sales, and foregone forest treatments.

Log landing locations would be placed to promote adequate deflection (suspension of logs) during yarding to protect soil and water quality. In most places within the project area, primary road access to the units already exists. Proposed new road construction would be located principally within unit boundaries allowing landings to be moved off of through-roads and/or placed in areas that provide adequate reach and deflection to minimize yarding impacts.

Stand exam data indicates that approximately 535 forested acres are in need of treatment in the project area. Without new road construction, approximately 45% of the acres would not be treated or would need to be helicopter yarded. Using representative appraisal criteria, helicopter yarding would be three to four times more expensive than traditional cable yarding or ground-based harvest methods. Along with the small unit size, small log diameters, and market fluctuations, this could make harvest economically inefficient, resulting in no-bid sales and therefore not implementable.

2.7.2 **Do not treat in Riparian Reserves**

Riparian Reserves in the project area are predominantly densely-stocked, even-aged stands that show very little of the stand diversity or complexity goals identified by the ACS Objectives. These managed stands are in the stem exclusion stage and are competing for sunlight, water, and nutrients, causing reduced tree growth and vigor as well as limiting understory vegetation. Increased tree growth and vigor, canopy growth, and species diversity are needed to meet ACS Objectives.

2.7.3 **Treat to within 35 feet of streams in Riparian Reserves and create additional gap openings in Riparian Reserves**

External comments received during scoping expressed a desire for the BLM to thin Riparian Reserves to within 35 feet of the stream, create gaps to promote early seral habitat, use treatments to diversify all areas of the reserve, and write prescriptions to provide for the full range of objectives that the ACS mandates.

Within the Coast Dorena project, no-treat buffers would range from 75 feet for intermittent streams and 120 feet for fish-bearing and perennial streams, with the Riparian Reserve extending to the distance of one site-potential-tree-height from the stream, or 200 feet. These distances provide for objectives set forth in the 1995 RMP, including the ACS.

The RMP states (p. 18) "for instance, Late Successional and Riparian Reserves, and many Special Management Areas (e.g., Areas of Critical Environmental Concern) will be managed to enhance and/or maintain late-successional forest conditions" and "management emphasis in the Late-Successional Reserves and Riparian Reserves will be for those species whose preferred habitat is late seral stages, mature, and old growth forests. This allocation will retain mature and old growth habitat in these stands until younger forests develop the structural and functional components needed by species such as the spotted owl and marbled murrelet" (p. 59).

Although gaps and openings can be a component of Late-Successional habitat, this is scale dependent. At the larger physical scale, such as the project or landscape scale, gap openings are not deficient. On a temporal scale, these stands are fairly young (50-75 years old) and gaps and openings would be expected to develop on their own. It would not be practicable to implement gaps (normally ¼ acre or greater in size) within the narrow "rind" between the no-cut reserve and the uplands, and gaps that extend into uplands would not be compatible with the objectives of the LUA. Creation of gaps would require additional retention elsewhere to maintain overall canopy cover. There are also concerns in most of the units about proximity of riparian reserves (where the gaps would occur) to openings created by adjacent clear-cuts on private land and road systems.

2.7.4 **Do not haul on Meyer Road**

External comments received during scoping indicated some safety concerns from the use of Meyer Road for timber haul. Lane County (the road owner) was contacted by the BLM to explore the options available on that road system. According to Lane County (E. Chastain, personal communication):

Meyer Road #2412 is a County Road, with a pavement width of approximately 20' wide from Mile Post (MP) 0.0 at Sears Road to approximately MP 1.4 with a centerline marking for two-way traffic in narrow lanes. From MP 1.4 to its end at a gate near MP 2.3, the width varies 14-17' without a centerline markings, it is essentially a single lane road. The County right-of-way width is narrow, approximately 40' and our Road Maintenance Division indicates there are currently no plans to acquire additional right of way or widen the roadway. The traffic volume is approximately 210 vehicles per day near Sears Road. This road is considered a low-volume road in accordance with Part 5, Chapter 5A.01 of the U.S. Department of Transportation, Federal Highway Administration's "*Manual on Uniform Traffic Control Devices for Streets and Highways*" (MUTCD) and as such may have a limited number of traffic control devices. However, many of the curves on this road are marked with horizontal alignment warning signs and advisory speeds. Because this road is a low-volume road it doesn't meet ODOT speed zoning requirements and therefore, there are no posted speed limits; however, Oregon's Basic Speed Rules is [sic] applicable.

The speed limit issues under consideration for Meyer Road are covered under Oregon Statutes (ORS) 811.100 and 810.180. The concerned party will also be notified of Lane County's process for the public to present testimony on needed road improvements.

Meyer Road is the only viable access to the western portion of section 19. Building new roads from the west or south would require crossing non-industrial, privately owned land held outside of right-of-way agreements, would be economically infeasible (renovation is approximately one-quarter the cost of standard construction and one-sixth the cost of full bench construction), and would add unnecessary road miles to the landscape.

2.7.5 **Regeneration Harvest**

The IDT considered an alternative with regeneration harvest as the primary treatment in the Matrix (GFMA). Considering the age and structure of the forest stands, the IDT determined that the stands considered for treatment are more appropriate for thinning. The stands have not yet reach culmination of mean annual increment, indicating that more volume would be accrued with later harvest. Additionally, regeneration harvest in the Matrix would limit BLM's ability to treat the adjacent Riparian Reserves. The BLM included these stands in the proposed action specifically for the need for treatment to meet RMP objectives.

2.8 Project Design Features

Project Design Features (PDFs) are operating procedures developed by the interdisciplinary team used to avoid or reduce adverse environmental impacts and ensure conformance with regulations, laws, and polices including Best Management Practices from the Eugene District RMP, BLM handbooks and manuals, and Instruction Memorandums. Site-specific waiver of PDFs during implementation would be infrequent and require review by specialists for the affected resource(s) to determine that single or aggregated extent of the site-specific waiver would not produce effects outside of those analyzed. Review results would be reported to the Authorized Officer to implement through contracts. Unless otherwise noted, all PDFs apply to all action alternatives.

<u>All Areas and Activities</u>

1. Cultural Resources surveys have been completed for all units. No cultural resource issues were identified during surveying. If any cultural and/or paleontological resource (historic or prehistoric site or object) is discovered during project activities, all operations in the immediate area of such discovery shall be suspended until an evaluation of the discovery can be made by a professional archaeologist to determine appropriate actions to prevent the loss of significant cultural or scientific values.
2. Retain all Wildlife Trees marked with a painted "W", and where possible place landings, skid trails, guyline trees, cable corridors, etc. to avoid these habitat features. If Wildlife Trees are cut they would be left on site as coarse woody debris, and such CWD may be cut into sections and/or moved to facilitate operations or safety.
3. Project implementation would be conducted in conformance with the applicable biological opinion or letter of concurrence concerning federally listed wildlife species.
4. The Field Office wildlife biologist and/or botanist would be notified if any special status animal, botanical, or fungal species are found within or adjacent to project areas. Site management of any federal T&E or bureau special status, including survey and manage species, found as a result of additional inventories or incidental findings would be

accomplished in accordance with BLM Manual 6840 (12/12/2008, IM- 2009-039) or the applicable agency directive for Survey and Manage Species (IMOR-2014-037).

5. Except in T20S R02W Sec 3, retain all hardwoods, yew, and vigorous cedar and hemlock to the extent possible, except where necessary to accommodate safety and logging systems and meet basal area/trees per acre targets. In T20S R02W Sec 03 (What's Bruin), retain all hardwoods and yew to the extent possible, except where necessary to accommodate safety and logging systems and basal area/trees per acre targets. Western Hemlock would not be preferentially reserved in this section.
6. Consistent with Instruction Memorandum OR-99-036 (E-4 Special Provisions), apply seasonal restrictions, or suspension of harvest and road activities within 1/4 mile (or as determined by resource specialist) of: known nesting great blue herons, peregrine falcons, bald eagles, spotted owls, great grey owls, accipiter hawks, and other owls, hawks, or raptors if they are located at any time during project activities. If required, apply mitigations for Survey and Manage species detected in or near the project.
7. Seasonal restrictions to operations at BLM quarries would be applied when quarry use would disrupt ESA or BLM special status wildlife species.
8. All Decay Class (1-5) snags, CWD decay class 3-5, and existing rootwads would be retained undamaged when possible and/or would not be cut, except in road construction rights of way, landings, yarding corridors, and those posing a safety hazard. Where possible, cable corridors would be placed to avoid these habitat features. If such snags are felled, they would be left on site for CWD; CWD may be cut into sections and moved to facilitate operations or safety and could be counted towards any post-treatment CWD requirement. Attempt to maintain segments at least 20 foot long for any cut and moved CWD.
9. Landings would be located a minimum of 125' from streams. This would not apply to roads 20-2-19.1, 20-2-19.3, and 20-2-23.2
10. Cable corridors and skid trails would be placed on the landscape to minimize the amount of residual trees (especially larger retention trees) cut to implement logging systems and log yarding, and would be limited to 12 feet in width.
11. Except during winching (ground-based) or skyline lateral yarding, skidding and yarding systems shall require at least one end suspension of all logs above the ground during in-haul.
12. If streams must be crossed, keep corridors as perpendicular to stream as possible (45-90 degrees). Fully suspend logs above the ground when yarding over water, stream banks, riparian vegetation, and sensitive soils. Restrict corridors to the minimum number feasible.
13. All trees cut for yarding corridors in the Riparian Reserve no-harvest buffer, shall be left on site as CWD to meet ACS objectives.

14. Harvest activities during sap flow season would be minimized and monitored to ensure residual stand damage is not occurring. Additional protections to trees (i.e. plastic barreling) during sap flow would be required if damage to tree cambium is occurring.
15. Fuel and other petroleum products must be stored and refueling must occur at least 150 feet from any stream or forested wetland.
16. A Spill Containment Kit (SCK) must be kept on-site during any operation within the project area; prior to starting work each day, all machinery would be checked for leaks and necessary repairs would be made.
17. Removal, notification, transport, and disposal of any diesel, hydraulic fluid, or other petroleum product released into soil and/or water would be accomplished in accordance with all applicable laws and regulations.
18. Operators shall be responsible for the clean-up, removal, and proper disposal of contaminated materials from the site.
19. All logging, tilling, and road construction equipment must be washed and be free of soil and plant debris prior to arrival on BLM lands.
20. Prior to entering T20S R2W Section 13, wash all vehicles (road building, harvest) prior to their arrival from other projects, including all BLM lands.
21. Where operationally feasible, falling techniques would be utilized for the protection of retention trees and other reserve areas. Falling techniques include falling to lead with yarding corridors, skid trails, and areas where residual tree damage would be minimized.
22. Limit log lengths to 40' in length where excessive damage is occurring to residual trees, snags and coarse woody debris, and soil disturbance is occurring as determined by the AO.
23. Manage access to sale areas during active logging, road building, hauling, and fuel treatments to ensure public and operator safety, as required by Oregon Occupational Safety and Health Administration.

<u>Roads</u>

Road Decommissioning and Closure

24. Compacted surface of native surface spur roads, landings, and other compacted areas such as turnouts, truck turnarounds, and log decking areas shall be subsoiled (broken up, loosened, decompacted) with an excavator or other effective equipment:
    a. All decompaction equipment shall be inspected and approved by AO before tillage begins.
    b. Subsoiling shall be completed to a minimum depth of 18" below the ground surface and span the entire width of compacted surface.

c. At least 80% of compacted soil profile shall be shattered, except within a five foot radius of the boles of residual trees where major roots can be cut or mangled or in areas where equipment is prohibited from operations (i.e., on slopes in excess of 35% or crossing streams).

d. Drainage features (lead-offs, water bars, daylight, etc.) may be required as necessary to effectively remove surface water accumulation.

e. To restore soil productivity and prevent soil erosion, pull slash debris generated during road or trail construction as available back onto decompacted surface. Use of slash that would otherwise be piled may also be used. Slash debris should cover at minimum 70% of bare surfaces not to exceed an average depth of 12". Equipment should be capable of grabbing large woody debris (rootwads/logs) and fine woody debris (slash) for distribution of debris across decommissioned surfaces.

f. If insufficient material is available to cover and protect exposed soil (>70% cover), seeding would be required.

25. Road prism would be rendered erosion resistant by combination of techniques that may include construction of water bars, drain dips, fill, pull back, and seeding and mulching at cross drain removal and waste disposal sites. Seeding and mulching to be completed simultaneous with equipment work. Waterbar spacing to follow guidelines set forth in RMP.

26. Employ all of the following design features for all stream crossing removals/rehabilitation at time of stormproofing/closure. Remove all fill material down to original channel bottom. Excavate channel to bank full width and natural gradient. Shape newly excavated channel sideslopes to facilitate erosion control (approximately 1:1 slope). Seeding and mulching with BLM-supplied materials to be accomplished promptly after machine operations. Work would occur during the ODFW in-stream work period. Position waste to avoid direct sediment delivery to stream channel.

    The in-stream work windows are:

    - Coast Fork Willamette (confluence with Middle fork Willamette to Cottage Grove Dam) by specific arrangement with ODFW (generally July 1 to August 3)
    - Row River (below Dorena Dam) June 1 to October 31
    - Row River (above Dorena Dam) May 15 to November 30

Road Construction and Culvert Replacements

27. All culverts scheduled for removal and/or replacement shall be removed and disposed of in a lawful manner off of BLM land in conformance with BMPs.

28. Design roads to the minimum width needed for the intended use. Right-of-way stumps shall be grubbed out only within the road prism (road surface, ditch line, and cut/fill areas) and not

within other portions of the posted right-of-way unless necessary to facilitate intended function of the road (i.e. turnarounds, curve widening).

29. All landings would be shaped to direct surface water away from water features and directed onto well- vegetated forest floor

30. To protect fish species during critical life cycle functions, apply the ODFW in-stream guidelines for all stream culvert installation and removal.

    The in-stream work windows are:

    - Coast Fork Willamette (confluence with Middle fork Willamette to Cottage Grove Dam) by specific arrangement with ODFW (generally July 1 to August 3)
    - Row River (below Dorena Dam) June 1 to October 31
    - Row River (above Dorena Dam) May 15 to November 30

31. Require the following for stream culvert installation and/or replacements:

    a. Stream flow would be routed around the construction activity as much as possible (i.e., temporary flow diversion structure).

    b. Sediment containment structure placed across the channel below the work section (i.e., weed free mulch, booms) as needed.

    c. Work site would be pumped free of standing water as applicable.

    d. If present, fish and other aquatic species would be removed from the project area and block nets placed above and below the worksite by Area fisheries biologist.

    e. Install new culverts at the natural stream grade.

    f. Promptly after installation, disturbed ground would be stabilized with BLM-provided seed and mulch.

    g. Countersink culverts in fish bearing streams at least 6-8 inches below the streambed to minimize scouring.

32. Non-functional cross drains would be rendered functional and cross drains to be added would be installed prior to log haul beginning. Roads would be renovated (add rock, blading, etc.) before winter haul would be allowed.

33. Construction of roads, landings etc. would not occur when soils are saturated in order to minimize soil degradation, erosion, and sedimentation.

34. Design all roads to be constructed to move water rapidly (quickly and frequently) off the road surface and minimize water concentration.

35. To minimize excavation, maintain hydrologic function, and reduce water concentration in ditch lines, outslope temporary and permanent low volume/ short term use roads to provide surface drainage on road gradients up to 8% where appropriate.

36. At time of installation, provide energy dissipaters (i.e. splash pads/armoring) below cross drain outlets where water is discharged onto bare soil from construction activities.

37. Revegetate select (> 6 feet height for > 200 square feet) cut and fill slopes by seeding and/or mulching with BLM-provided seed and mulch. Apply erosion control promptly after construction.

38. To reduce the potential for sediment delivery and down cutting of ditchlines, erosion control would be applied to select (>8% grade, within 200' of stream crossing or first cross drain whichever is closer) non-vegetated ditch segments immediately adjacent to new cross drains and new stream crossing culverts. Techniques could include: coir logs, jaw run check dams, and/or armor.

Road Maintenance

39. Implement the following combination of methods year round to maintain drainage and minimize sedimentation from roads into stream channels:

    a. Keep ditch line, cross drains, and leadoff ditches clean and free to flow, while minimizing disturbance to existing ditch line vegetation.

    b. Sediment traps, rock armor, or other devices may be installed in ditch lines lacking vegetation and having the potential to deliver sediment to streams.

    c. Prior to and during haul operation, rock surfacing and road condition would be assessed for road damage, drainage, and erosion throughout the project and haul route to determine if haul may continue or if any damage has occurred that would require corrective actions (e.g., grading, crowning, adding rock, re-establish functional ditchlines) before haul may resume.

    d. If erosion and road degradation occurs during or after freeze and thaw or rainy periods, log haul operations may be discontinued.

40. Gravel, fill, and borrow material would need to be weed free and/or approved by BLM botanist. Gravel from pits known to be weedy should not be used.

41. Prior to use, areas used for borrow, fill, and waste piles need to be reviewed for special status plants by BLM Botanist.

<u>Ground-based Units</u>

42. Logs would be skidded only to approved landings, with landing size up to 60' X 80' (except as necessary for safety and approved by the AO) adjacent to log haul truck roads.

43. To prevent soil degradation, ground-based equipment operations would be suspended during and after periods of significant or prolonged rain as determined by the Authorized Officer in consultation with watershed specialists.

44. To minimize soil compaction and increase in bulk density, limit ground disturbing activities and ground-based skidding and yarding to the annual dry season (typically July 1 to Oct. 1) when soils provide the most resistance to compaction. Soil moisture determinations would be made prior to start of all ground based operations.

45. Skid trail locations would be approved by the BLM prior to use. Skid trail design shall keep a skid trail pattern to keep within 10% of the ground-based unit by restricting operations to 12' wide trails spaced at least 150 feet apart. Skidding/yarding equipment (does not include mechanized harvest equipment such as feller-bunchers) would remain on designated skid trails at all times.

46. Skid trails would be located a minimum of 75' from stream and wetland no cut boundaries to the extent possible, except where necessary to accommodate logging systems. Maximize winching distance within Riparian Reserves. Use existing skid trails where appropriate (as determined by AO).

47. Mechanized harvest equipment (excluding feller-bunchers) would only be approved for travel off of designated skid trails when all of the following are met:

    a. A unit has been analyzed for ground-based systems.

    b. On slopes less than 35%.

    c. Restrict operations to conditions when soils are dry and provide the most resistance to compaction, typically July 1 to Oct. 1. Soil moisture determinations would be made prior to entry of tracked ground-based machines.

    d. Operate from a prepared slash mat that the machine creates of sufficient depth to prevent severe compaction.

    e. Limit equipment movement to one pass over the same ground.

48. Design ground-based units with skid trail pattern on up to 35% favorable skidding to downhill ground-based landings, and a skid trail pattern with up to 20% adverse skidding to uphill ground-based landings.

49. All severely compacted skid trails would be decompacted promptly after specific unit has been harvested. Equipment will laterally shatter the compacted layer (typically less than 18" in depth) and scatter slash and/or forest duff on decompacted surface. Actions will occur when soils are dry and provide the most resistance to compaction (typically July 1 through October 1).

<u>Cable Units</u>

50. Corridors for independent cable settings would be spaced 150 feet apart on average.

51. Minimize sidehill yarding by limiting lateral yarding to 75 feet.

52. Yard only to approved landings, with landing size average being 60' X 40' except as necessary for safety.

53. After use, hand water-bar or lop and scatter slash on cable corridors that are prone to accelerated erosion.

Fuels Management

54. Prescribed burning would only be permitted with an approved burn plan and smoke management plan. The prescription for prescribed burning would be based on treatment objectives with the timing parameters developed in the burn plan to meet the objectives. Prescribed fire may also be used to remove cut and piled vegetation (pile burning).

55. Where appropriate, landings would be burned in the first wet season (late-autumn or early-winter) following completion of harvest.

56. When piles are identified by the Authorized Officer as the specified fuels treatment the following requirements would apply:

    a. Piling of fuels intended for burning would be prohibited closer than 75 feet from any stream channel.

    b. Piles would be located as far as possible from large snags, green trees, and other reserved trees to minimize damage.

    c. Woody debris greater than six inches in diameter would be retained on site and not piled. Piles would not be constructed on top of stumps or existing coarse woody debris (CWD).

    d. In skyline yarding areas, machine and landing piles would only be constructed within 25 feet of designated roads and landings.

    e. Equipment used in the construction of machine piles at landings would remain on the roads or landings during the construction.

    f. Piles would be covered with 4 mm thick, black, polyethylene plastic, or equivalent. The plastic shall adequately cover the pile to ensure ignition, and would be placed and anchored to help facilitate the consumption of fuels during the high moisture fall/winter burning periods.

    g. Utilization of small-diameter slash for firewood or energy production from biomass would be incorporated where appropriate. Post-harvest treatment monitoring would be implemented with results used to reevaluate the fuels strategy and adapt future treatments.

3.0 Affected Environment and Environmental Consequences

This section summarizes the physical, biological, and social environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the previous chapter. The interdisciplinary reports are incorporated by reference in this EA. Reports in their entirety are available at the Eugene District Office upon request.

Brief History of Project Area

The history of the Coast Fork Willamette and Row River watersheds provide the foundation for understanding the conditions that exist in the Project Area today. Natural processes and human activities influence and shape the vegetation and landscape found within the Project Area. They may cause slow and subtle changes only visible through the passage of time, or sudden, devastating changes that occur in an instant.

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

By the mid-1940s, much of the mature timber on timber company lands had been harvested and the demand for timber from Federal lands increased. The high demand for lumber during World War II also served to increase timber harvest on Federal lands. Roads were built or extended to provide access to timber stands, improve fire protection capabilities, and provide access for recreation and administration. Passage of the O&C Act in 1937 provided direction for Federal lands managed by the BLM in this area. The O&C Act is intended to contribute to the local economy by providing for Federal timberlands to be managed for permanent timber production on a sustained yield basis. One of the purposes of the O&C Act was to increase timber harvest on these lands to their timber-producing capacity. Timber harvest revenues were to provide a consistent level of income to the counties that contain O&C lands.

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

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

The cumulative effects analysis considers past, present, and reasonably foreseeable future actions that would affect the issue of concern within the geographic scopes and the timeframes of the analysis by Issue.

In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. Current conditions, or the affected environments, reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. The Affected Environment sections for each Issue summarize past actions to describe the present conditions. As such, this discussion of cumulative effects utilizes present conditions to identify the aggregate impact of past actions, and specific past actions are only identified where their aggregate impact is still applying direct impacts to the project environment relevant to each Issue.

Public scoping for this project did not identify any public interest or need for detailed information on individual past actions. The Council on Environmental Quality (CEQ) issued an interpretive memorandum on June 24, 2005, regarding analysis of past actions, which states, "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".

Ongoing management and other present actions are considered where the management and actions have relevance under each Issue. Not all ongoing management, public uses, or projects-in-progress have relevance to each Issue; some ongoing actions (i.e., collection of special forest products, dispersed pedestrian recreation) do not contribute to incremental impacts under any Issue, but are listed to recognize the occurrence of the use or action presently. Where current actions have relevance and influence on an Issue, the actions and uses are discussed in the analysis. For the Coast Dorena Project, aerial photograph analysis and GIS databases were utilized in helping to determine past actions on both federal and private lands.

Reasonably foreseeable future actions are those for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends.

In some circumstances, past actions may need to be described in greater detail when they bear some relation to the proposed action. For example, past actions that are similar to the proposed action might have some bearing on what effects might be anticipated from the proposed action or alternatives. Known past projects of particular importance to analysis conducted for the Coast Dorena EA have been listed below (Table 5), along with all known present and reasonably foreseeable future actions, and have been considered as appropriate in conducting cumulative affects analysis for the project.

Reasonably foreseeable future actions are those for which there are existing decisions, funding, formal proposals, or which are highly probable based on known opportunities or trends. In addition to the actions listed below, BLM land management in the Eugene District would continue to occur for timber production, habitat management, or riparian management.

The tables cover an area of the largest cumulative effects analysis area identified (Coast Fork Willamette and Row River 5th Field Watersheds), excepting carbon and greenhouse gasses. Not

all actions are considered by each issue or resource, as each issue identified the appropriate boundary for temporal and spatial activities, and relevant actions to include in their consideration of cumulative impacts.

The list of the activities in the following tables does not in and of itself amount to a disclosure of cumulative effects. The information in the tables is supported with relevant cumulative effects discussions by Issue.

Table 5: NEPA Projects or Private Projects Within the Considered Cumulative Effects Analysis Area (Coast Fork Willamette and Row River 5th Field Watersheds).

Project Name	Project Description	Location/Acreage	Decision Date
Eagles Bluff Timber Sale	Commercial thinning and associated road work	T21S R02W Sec 9 & 15; 390 acres	September 2013
Gosage Incline Timber Sale	Commercial thinning, regeneration harvest, and associated road work	T20S R01W Sec 7 & 17, T20S R02W Sec 13; 193 acres	May 2016
Row River MITA	Commercial thinning and regeneration harvest with associated road work	T. 21 S., R. 1 W. Section 31; T. 21 S., R. 2 W., Sections 25, 27, 35; T. 22 S., R. 1 W. Sections 5, 9, 15, 17, 21, 28, 35; T. 22 S., R. 2 W., Sections 1, 2, 11; T. 23 S., R. 1 W., Section 2; 613 acres of regeneration harvest and 895 acres thinning	Expected October 2017
King Mosby EA	Commercial thinning and regeneration harvest with associated road work	T. 20 S., R. 1 W. Section 31; T. 20 S., R. 2 W., Sections 15, 21, 25,27,29, 31, 35; T. 21 S., R. 1 W., Sections 5, 7; T. 21 S., R. 2 W., Sections 1, 5, 6; T. 21 S., R. 3 W., Section 3; 1260 acres of regeneration harvest and 265 acres of thinning	Expected January 2019
Quartz Integrated Project	Commercial thinning timber sale(s), fuels reduction, road maintenance, road closures, early seral habitat creation, noxious weed treatments	Planning area includes the Row River 5th field watershed; approx. 1400 acres of thinning proposed	Expected fall 2016
** Italicized projects are past projects*			

Table 6: Ongoing BLM Management within the Considered Cumulative Effects Analysis Area.

Ongoing BLM Management
Routine road maintenance
Routine trail maintenance
Routine manual/mechanical weed/invasive plant management
Hazard tree management
Unilateral permits (rights-of-ways, easements)
Fire suppression (if wildfires occur)
Row River National Recreation Trail and Covered Bridges State Scenic Bikeway maintenance

Table 7: Ongoing Public Uses within the Considered Cumulative Effects Analysis Area.

Ongoing Public Uses
Special Forest Products collection
Hunting
Dispersed recreation

Table 8: Predominant non-BLM Landowners and Primary Uses within the Considered Cumulative Effects Analysis Area.

Landowner	Primary Use	Notes
Weyerhaeuser Company	Industrial timber management (includes construction and maintenance of roads)	Timber management on private industrial timber lands historically has occurred on 40-60 year rotations.
Lost Creek Timber	Industrial timber management (includes construction and maintenance of roads)	Timber management on private industrial timber lands historically has occurred on 40-60 year rotations.
Giustina Resources Limited Partnership	Industrial timber management (includes construction and maintenance of roads)	Timber management on private industrial timber lands historically has occurred on 40-60 year rotations.
Giustina Land & Timber Company	Industrial timber management (includes construction and maintenance of roads)	Timber management on private industrial timber lands historically has occurred on 40-60 year rotations.
US Forest Service	Managed in accordance with Forest Plans for a variety of purposes including recreation, commercial timber, habitat, and special status species	
Private homeowners	Residential/Agricultural	Residences and agricultural use including grazing, hay, and crop production.

3.1 WILDLIFE

The following issue will be addressed in the environmental effects section below:

3.1.1 Issue 1: What are the effects of timber harvest and associated activities on northern spotted owl (NSO) habitat quantity and quality, and the suitability of affected home ranges?

Effects to spotted owls from the proposed Alternatives could occur through effects to their habitat as well as noise disruption. Habitat effects are measured by tracking any change in acres of available habitat types due to project activities because this may affect habitat suitability for spotted owls. Totaling the acres of project habitat effects within each spotted owl Provincial Home Range (PHR), and comparing post-project habitat amounts to the percentage thresholds established by the U.S. Fish and Wildlife Service (while considering recent survey data), would determine the overall effect to each PHR. Noise disruption is evaluated by determining the distance (feet, yards, or miles depending on the type of noise) from noise-generating project activities to habitat that spotted owls could be precluded from using by that noise. If activities would occur within the threshold distance, then effects to spotted owls would occur. The temporal bound for analysis is 40 years and the spatial bounds are the site and 5th-field watershed scale.

3.1.2 Affected Environment

General Stand Conditions

The proposed units are mid-seral stands; overstory trees are generally densely stocked and have crown ratios of 40% or less. The stands are dominated by Douglas-fir, with varying amounts of western redcedar and western hemlock; Pacific yew and grand fir are present but uncommon. Hardwoods are represented by bigleaf maple, red alder, and scattered chinkapin and madrone. These stands are in stem exclusion stage, with understories of varying densities that are dominated by typical shrubs like hazel, oceanspray, and vine maple. Advanced regeneration of conifer species is not prevalent in these stands. Large remnant “W” trees (trees reserved for wildlife habitat characteristics) are present in T19S R02W Sec.33, and T20S R02W Secs.13, 19, and 23, and would be left on-site (if felled) because of the outstanding habitat features they provide.

Northern Spotted Owls

The northern spotted owl (*Strix occidentalis caurina*; spotted owl) is a long-lived owl species that ranges from northern California to British Columbia. Spotted owls prey on a variety of small mammals and typically nest and forage in older forest stands (USFWS 2011).

Species Status and Recovery Guidance

The species was listed as ‘Threatened’ by the Fish and Wildlife Service in 1990 because of its decreasing numbers, with habitat loss from timber harvest considered the greatest risk at that

time. Since 1990, removal of habitat has slowed, but spotted owl populations have continued to decline and it is now believed that competition from barred owls (*S. varia*) is an equally pressing concern (U.S. Fish and Wildlife Service, 2011). The USFWS has initiated experimental removal of barred owls to explore the possibility of controlling barred owl numbers and reducing competition with spotted owls (U.S. Fish and Wildlife Service, 2013), and revised their Recovery Plan (U.S. Fish and Wildlife Service, 2011) to provide additional direction for habitat management to Federal land managers such as the BLM.

The spotted owl Recovery Plan identified Recovery Actions intended to help conserve the species and of these, Recovery Actions 10 and 32 (RA10 and RA32) apply to the Coast Dorena Project. RA10 calls for the conservation of spotted owl sites and high-value habitat in the quantity and spatial configuration necessary for the species' recovery. The Willamette Province Level 1 Team used the interim guidance for RA10 implementation found in the Recovery Plan to develop a site prioritization method. This method was used for Section 7 consultation for the Coast Dorena Project to ensure consistency with RA10. RA32 calls for reserving high-quality spotted owl habitat to serve as a refuge from negative interactions with barred owls. The Eugene District developed a method for identifying RA32 habitat based on office and field evaluation (Eugene BLM, 2012). All stands within the Coast Dorena project area identified as RA32 habitat were dropped from consideration early in the planning process (Data on file).

Northern Spotted Owl Critical Habitat

Critical Habitat for a species is defined by the US Fish and Wildlife Service as the areas containing the physical or biological features (Primary Constituent Elements or PCEs) essential to the conservation of the species. PCEs of Critical Habitat for the spotted owl generally correspond with those described above for suitable, foraging, and dispersal habitat. Critical Habitat for the spotted owl was revised in 2012, and was delineated to meet the most current assessment of the species' conservation needs as described in the 2011 Recovery Plan (U.S. Fish and Wildlife Service, 2011). Similar to Threatened and Endangered species, effects to Critical Habitat are regulated under the Endangered Species Act. The Coast Dorena project area does not occur within northern spotted owl Critical Habitat, with the closest Critical Habitat located approximately 3 miles from the project area. As there is no Critical Habitat within or adjacent to the project area, effects to Critical Habitat are not considered further in this EA.

Northern Spotted Owl Area of Concern

The Coast Dorena project area is within the South Willamette-North Umpqua Area of Concern (AOC), a corridor of federal land in the Eugene and Roseburg BLM districts that facilitates movement of spotted owls between the Coast Range and Cascade Mountains. The AOC was informally identified by the Interagency Scientific Committee in 1990 (Thomas, Forsman, Lint, Meslow, Noon, & and Verner, 1990) because of concerns that habitat losses within it could disrupt genetic exchange within the spotted owl population. Beginning in 1997 the BLM Eugene District, in association with the interagency Level 1 Team for the Willamette Province, formally delineated and has evaluated its portion of the AOC in Section 7 consultation with the USFWS to

determine if proposed management actions would affect habitat conditions and owl movement through the corridor.

The AOC has continued to be considered during larger-scale planning efforts such as the 2008 and 2012 revisions to spotted owl Critical Habitat (US Fish and Wildlife Service, 2008) (US Fish and Wildlife Service, 2012), and the 2008 and 2015 Western Oregon BLM Resource Management Plan revisions (Bureau of Land Management, 2008), (Bureau of Land Management, 2016).

Northern Spotted Owl Habitat

Suitable habitat for spotted owls provides for all the species' life history requirements, and is also called Nesting/Roosting/Foraging (NRF) habitat. In the Upper Willamette Field Office, this habitat is generally described as conifer forest greater than 80 years old with mature or late-seral characteristics such large-diameter trees with nesting structure (broken tops, cavities, or platforms), multiple canopy layers, large down logs and snags, and a somewhat open understory. Stands that show most of these characteristics except nesting structure, and that provide roosting and hunting opportunities, are called foraging habitat. Stands without nesting, roosting, and foraging components but with sufficient canopy cover and sub-canopy space for spotted owl movement are referred to as dispersal habitat. These stands are used to facilitate owl movement at both the site and landscape scale, and may also provide foraging opportunities if the habitat supports prey species. Dispersal habitat is generally found in stands 40 to 80 years old. Forested areas that currently provide no function for spotted owls due to small, dense trees are called unsuitable habitat, and areas that will never provide for spotted owl life history needs (e.g. rock outcrops or water bodies) are called non-habitat. The stands proposed for management in the Coast Dorena project area (Table 9) are all dispersal habitat

Table 9: Acres of Affected Spotted Owl Habitat in Coast Dorena Project Area by Alternative

Sale Name	Spotted Owl Sites Intersecting Project Area	Project Area Spotted Owl Habitat Type	Alt. 2 Acres	Alt. 3 Acres	Alt. 4 Acres
Lucky Meyer Section 19	None	Dispersal	113	113	113
Lucky Meyer Sections 13/23	75NEWITS	Dispersal	127	127	127
What's Bruin	Cougar Mountain	Dispersal	295	295	295
Total			**535**	**535**	**535**

Northern Spotted Owl Sites

Spotted owl sites could be affected by the Coast Dorena Project. Spotted owl sites include areas where spotted owls are or have been known to occupy, or areas where spotted owl occupation was predicted by the Willamette Level 1 Team during ESA consultation. Information on the location and status of spotted owl sites in the Coast Dorena project area is available from surveys conducted beginning in the 1990s (Data on file). All spotted owl sites in the project area are thought to have been identified, but staffing constraints have prevented surveying every site during every year. The effects of habitat modification to spotted owl sites in the Coast Dorena project area are assessed by assigning generalized Nest Patches, Core Areas, and Provincial Home Ranges (PHRs) with radii of 300 meters, 0.5 miles, and 1.2 miles respectively (US Fish and Wildlife Service, 2015). The quality, amount, and spatial distribution of habitat within the three areas described above are analyzed in combination with survey data to determine the pre-harvest habitat conditions and analyze treatment effects to site occupation and reproductive capability.

The PHRs of one known site (Cougar Mountain) and one potential site (75NEWITS) overlap the Coast Dorena project area (Table 10). No spotted owl Core Areas or nest patches overlap the project area. Existing habitat conditions for these sites are detailed in Table 10. These overlapping sites currently have low amounts of suitable habitat due to previous harvest on BLM lands and ongoing harvest on adjacent private lands. Neither of these PHRs meet USFWS thresholds for site viability (40% suitable habitat in PHR and 50% in Core Areas) (US Fish and Wildlife Service, 2015)(Table 10).

Table 10: Current Habitat[A] Availability in Spotted Owl Sites that Intersect the Coast Dorena Project Area

Site Name	Scale	Habitat Type						Acres of Proposed Thinning, All Alternatives
		Dispersal (40-79 yrs)		Suitable (80+ yrs)		All Habitat		
		Acres	Percent	Acres	Percent	Acres	Percent	
75NEWITS	Nest Patch	0	0%	0	0%	0	0%	0
	Core Area	120	24%	0	0%	120	24%	0
	PHR	779	27%	126	4%	905	31%	55
Cougar Mountain	Nest Patch	14	20%	23	33%	37	53%	0
	Core Area	197	39%	31	6%	228	46%	0
	PHR	831	29%	142	5%	973	34%	97

A. Only habitat on federal lands is reported. Private lands are assumed to not contribute towards spotted owl conservation.

Snags and CWD

Snags and coarse woody debris are important components of NSO habitat. Refer to Issue #3, section 3.2.7 for discussion of snags and CWD in the project area.

3.1.3 **Environmental Effects**

3.1.3.1 **Alternative 1: No Action**

No direct effects to spotted owls or their habitat would occur under this Alternative. Stands would not be modified through timber harvest and no potential for noise disturbance from timber harvest or associated actions would occur. In the near-term, the project area would continue to provide for spotted owl use at current levels.

Indirect effects would occur through habitat continuing to develop along current trajectories. Dispersal habitat in the project area would continue to develop these suitable habitat components as growing space is created through suppression mortality and small-scale disturbances like windthrow or disease. These disturbance processes would occur more slowly compared to the Action Alternatives. Therefore, untreated dispersal habitat would still develop into suitable habitat at approximately age 80, but would be of lesser quality than that which would develop after thinning.

Cumulative Effects

Cumulative effects are the consideration of incremental impacts of the proposed actions when considered with other present and reasonably foreseeable future actions. As described above, the No Action alternative would contribute to the slower development of dispersal habitat which would be of lesser quality than that developed under the action alternatives. Since no project actions are proposed under this Alternative, there are no actions upon which to consider any incremental impacts.

3.1.3.2 **Alternative 2: Preferred Alternative**

General Spotted Owl Habitat

Alternative 2 would thin approximately 535 acres of dispersal habitat (Table 9).

Thinning would result in direct impacts to dispersal habitat from vertical and horizontal cover reduction in thinned areas through overstory tree removal. Thinning would also damage existing shrub and herb layers, and may damage or destroy some existing coarse woody debris and snags. Because no snags or CWD would be created after thinning, this Alternative would also contribute to the continued lack of these habitat features in the project area. Post-thinning canopy closure and horizontal cover would continue to allow spotted owls to effectively use the treated area for dispersal. Canopy closure after treatment would be 40% or greater, meeting or exceeding the threshold for dispersal habitat function (Thomas, Forsman, Lint, Meslow, Noon, & and Verner, 1990), (U.S. Fish and Wildlife Service, 2011). Despite meeting or exceeding

canopy closure levels, spotted owls would be unlikely to utilize these thinned stands in the project area to a lesser extent than unthinned stands for approximately 15-20 years while other elements of habitat quality (e.g., shrub/understory, prey base) recover, because thinning has been shown to have negative short-term consequences for spotted owls (Forsman, Meslow, & Wight, 1984), (Meiman et al., 2003) and their prey (Maser, Mate, Franklin, & Dyrness, 1981), (Waters, McKelvey, Zabel, & Oliver, 1994), (Luoma, Trappe, Claridge, Jacobs, & Cazares, 2003), (Wilson T. , 2010), (Wilson & Forsman, 2013). The thinning would leave untreated riparian buffers that would provide a narrow network of denser canopy cover (approximately 234 acres or 30% of the project area) that could also facilitate spotted owl movement through the treated areas.

Thinning would accelerate the development of some habitat features used by both spotted owls and their prey, like large (e 30• DBH) trees and snags, deep crowns with large branches, multiple canopy layers, and herbaceous and shrub vegetation (Bailey & Tappeiner, 1998), (Harrington, Roberts, & Brodie, 2005), (Kuehne & Puettman, 2008), (Ares, Berryman, & Puettmann, 2009), (Davis & Puettmann, 2009). Implementation of Project Design Feature 8 would protect existing late-successional features in the thinned area (e.g. large snags/CWD, large hardwoods, remnant conifer trees, and conifer species diversity). Therefore, the proposed thinnings would result in direct short-term (approximately 15-20 years) reduction in spotted owl habitat quality and indirect long-term improvement in spotted owl habitat quality.

Spotted Owl Sites

Habitat alteration from thinning would affect spotted owl sites; while spotted owls can survive or remain productive in areas with varying levels of suitable habitat, at some threshold home ranges cease to be viable. Based on previous research, 50 percent suitable habitat within a Core Area (Swindle, 1997), (Irwin, Rock, & Miller, 2000), (Irwin, Rock, & Rock, 2005) and 40 percent suitable habitat within a PHR (Thomas, Forsman, Lint, Meslow, Noon, & and Verner, 1990), (Courtney, et al., 2004) is considered a conservative viability threshold for a reproductive spotted owl pair and these thresholds are used by the USFWS in Section 7 consultation. Additionally, any commercial forest management within approximately 300 meters (Nest Patch) of a spotted owl nest is likely to cause negative effects (Swindle, 1997), (Perkins, 2000). Both of the affected home ranges are below this standard; however spotted owl reproduction has recently occurred at the Cougar Mountain site and enough dispersal habitat is present in the 75NEWITS site that it could support non-reproductive resident owls or owl dispersal across the landscape. The amount of proposed thinning at each site is shown in Table 10 and the effects calls made in consultation with the USFWS for the sites and the rationales are detailed below:

75NEWITS: There is a low probability of occupation or reproduction at this site due to high private ownership and extensive recent harvest. Alternative 2 would be “Not Likely to Adversely Affect” the site because of these habitat conditions, when considered with the low amount of proposed thinning.

Cougar Mountain: Alternative 2 would be “Likely to Adversely Affect” the site because both the Core Area and PHR are below habitat threshold values and thinning would cause a further temporary reduction in habitat quality at a site with recent spotted owl occupation. “Take” would not occur because thinning would affect a relatively low amount of the available habitat and because the orientation of the proposed thinning would not preclude spotted owl movement through the Core Area or PHR.

No direct effects to spotted owls from noise disruption would be expected because no project activities would occur within the disruption distances of spotted owl nest sites or other high-use areas. Additionally, use of BLM quarries would be seasonally restricted if their use would disrupt spotted owls during the breeding season (PDF #7).

Spotted Owl Area of Concern

Analysis conducted during ESA consultation (USFWS 2015, Appendix I) concluded that the thinning proposed under Alternative 2 would not preclude spotted owl movement across the Area of Concern due to the limited effects from thinning and the total amount of available habitat in the area.

Cumulative Effects (Alt. 2)

Two scales are appropriate for analyzing the cumulative effects to spotted owls: general habitat effects at the watershed scale and site effects at the affected PHR scale. Project effects would last approximately 40 years, which is the duration that thinning effects will be apparent in the units.

Spotted Owl Sites

No reasonably foreseeable future BLM timber management would occur in the Cougar Mountain PHR. The BLM plans to analyze regeneration harvest of approximately 405 acres in the 75NEWITS site (Table 10). Neither of these PHRs would be affected by any reasonably foreseeable USFS project.

Private lands comprise approximately 40% of the affected PHRs and currently offer little northern spotted owl habitat of any type. It is reasonably foreseeable that private lands will be managed for industrial timber production on 40 to 60 year rotations. As a result, these private lands would not be expected to contribute meaningful amounts of habitat in the affected home ranges and the cumulative effect of private land management would be a continued lack of spotted owl habitat.

The cumulative effects of the Action Alternatives on spotted owl sites, when considered with private timber harvest and reasonably foreseeable future Federal actions, would be an ongoing lack of spotted owl habitat on private land, a decrease in the amount of suitable habitat available in regeneration harvest areas for approximately 80 years, and a short-term (15-20 years) decrease and long-term (20-40 years) increase in habitat quality in proposed thinning areas on BLM land.

Table 11: Acres/Percent of non-BLM Ownership, Proposed Harvest, and Reasonably Foreseeable Actions in Affected Spotted Owl Home Ranges

Site	Scale	Private Ownership		USFS Ownership		Acres of Proposed Thinning: Alts 2, 3, 4	Acres of Reasonably Foreseeable Federal Actions	
		Acres	Percent	Acres	Percent	Thin	Thin	Regeneration Harvest
75NEWITS	Patch	70	100%	0	0%	0	0	0
	Core	378	75%	0	0%	0	0	79
	PHR	1,781	62%	0	0%	55	5	327
Cougar Mountain	Patch	33	47%	0	0%	0	0	0
	Core	248	49%	0	0%	0	0	0
	PHR	1,745	60%	0	0%	97	0	0

General Spotted Owl Habitat

The Coast Dorena project area occurs in two fifth-field watersheds: Lower Coast Fork Willamette and Row River.

Lower Coast Fork Willamette Watershed

Within the Lower Coast Fork Willamette watershed, no reasonably foreseeable future Federal actions that would affect spotted owl habitat would occur. Table 12 details the land ownership and age distribution, when known, in the watershed.

Private industrial forest lands comprise approximately 18% of the watershed and currently offer little northern spotted owl habitat of any type. It is reasonably foreseeable that industrial private forest lands will be managed for industrial timber production on 40 to 60 year rotations and would not be expected to contribute meaningful amounts of habitat in the watershed. Small-owner private forest lands are similarly not expected to provide spotted owl habitat because they are generally small parcels in the lower reaches of the watershed that are subject to diverse uses and high levels of ongoing noise disruption. Therefore, the cumulative effect of private forest land management in the watershed would be a continued lack of spotted owl habitat.

The cumulative effects of the Action Alternatives on spotted owl habitat in the watershed, when considered with private land management and reasonably foreseeable future Federal actions, would be an ongoing lack of spotted owl habitat on private land and a short-term (15-20 year) decrease and long-term (20-40 years) increase in habitat quality in proposed thinning areas on BLM land.

Modeling of landscape-scale habitat development and simulated spotted owl dispersal completed for the Western Oregon BLM Resource Management Plan revision (Bureau of Land Management, 2016) showed that the project area does contribute to east-west connectivity between the Coast Range and Western Cascades in the spotted owl Area of Concern. A finer-

scale analysis of habitat availability in the Area of Concern, which includes the Coast Dorena project area, was included in the most recent USFWS Biological Opinion for actions "Likely to Adversely Affect" the spotted owl in the Willamette Province. It concluded that approximately 946 acres of dispersal and/or suitable habitat could be removed in the Lower Coast Fork watershed while maintaining east-west dispersal function in the AOC (US Fish and Wildlife Service, 2015). Because there is no reasonably foreseeable habitat removal by the BLM in this watershed, the AOC would be expected to continue functioning for East-West spotted owl dispersal.

Table 12: Ownership, Proposed Harvest, and Reasonably Foreseeable Federal Actions in the Lower Coast Fork Willamette River 5th-Field Watershed.

Owner	Age Class	Existing		Reasonably Foreseeable Future Actions				Proposed Thinning: Alternatives 2, 3, and 4	
				Thinning		Regeneration Harvest		Thinning	
		Acres	Percent of Watershed	Acres	Percent of Existing	Acres	Percent of Existing	Acres	Percent of Existing
Federal[1]	Non-Forest	43	0.05%	0	0.00%	0	0%	0	0%
	0-39	1,646	1.8%	0	0.00%	0	0%	0	0%
	40-79	2,616	2.9%	0	0.00%	0	0%	379	14%
	80+	1,034	1.2%	0	0.00%	0	0%	0	0%
Industrial Private	Forest	16,294	18.3%	Unk	Unk	Unk	Unk	NA	NA
Other Uses[2]		67,522	75.7%	Unk	Unk	Unk	Unk	NA	NA
Total		89,154	100%						

1: Includes BLM, US Forest Service, and Army Corps of Engineers
2: Includes urban areas, agriculture, and rural residential.
Unk=Unknown, NA= Not applicable

Row River Watershed

Within the Row River watershed, approximately 4,744 acres of reasonable foreseeable future Federal actions that would affect spotted owl habitat may occur. The BLM plans to analyze thinning approximately 1,160 acres and regeneration harvest of approximately 1,220 acres of spotted owl dispersal habitat; and regeneration harvest of approximately 650 acres of spotted owl suitable habitat. The US Forest Service has analyzed thinning of approximately 412 acres of spotted owl dispersal habitat and 1,310 acres of spotted owl suitable habitat, with effects similar to those described for thinning above. Table 10 details the land ownership and age distribution, when known, in the watershed.

Private industrial forest lands comprise approximately 17% of the watershed and currently offer little northern spotted owl habitat of any type. It is reasonably foreseeable that industrial private forest lands will be managed for industrial timber production on 40 to 60 year rotations and would not be expected to ever contribute meaningful amounts of habitat in the watershed. Small-owner private forest lands are similarly not expected to provide spotted owl habitat because they are generally small parcels in the lower reaches of the watershed that are subject to diverse uses and high levels of ongoing noise disruption. Therefore, the cumulative effect of private forest land management in the watershed would be a continued lack of spotted owl habitat.

The cumulative effects of the Action Alternatives on spotted owl habitat in the watershed, when considered with private land management and reasonably foreseeable future Federal actions, would be an ongoing lack of spotted owl habitat on private land, a decrease in the amount of suitable habitat available in proposed regeneration harvest areas for approximately 80 years, and a short-term (15-20 years) decrease and long-term (20-40 years) increase in habitat quality in proposed thinning areas on BLM and USFS land.

Modeling of landscape-scale habitat development and simulated spotted owl dispersal completed for the Western Oregon BLM Resource Management Plan revision (Bureau of Land Management, 2016) showed that the project area does contribute to east-west connectivity between the Coast Range and Western Cascades in the spotted owl Area of Concern. When the reasonably foreseeable BLM regeneration harvest units were included in this modeling the area continued to provide east-west spotted owl movement.

A finer-scale analysis of habitat availability in the Area of Concern, which includes the Coast Dorena project area, was included in the most recent USFWS Biological Opinion for actions "Likely to Adversely Affect" the spotted owl in the Willamette Province. It concluded that approximately 1,125 acres of dispersal and/or suitable could be removed in the Row River watershed while maintaining east-west dispersal function in the AOC (US Fish and Wildlife Service, 2015). The maximum of 1,880 acres of reasonably foreseeable habitat removal would exceed this guideline and would require further analysis during future project planning. However, because the Coast Dorena project proposes thinning only, and would not preclude movement across the AOC, this project is not expected to contribute to a reduction in the east-west dispersal function in the AOC in the Row Rover watershed beyond what may occur with the reasonably foreseeable federal actions.

Table 13: Ownership, Proposed Harvest, and Reasonably Foreseeable Federal Actions in the Row River 5th-Field Watershed.

Owner	Age Class	Existing		Reasonably Foreseeable Future Actions				Proposed Thinning: Alternatives 2, 3, and 4	
				Thinning		Regeneration		Thinning	
		Acres	Percent of Watershed	Acres	Percent of Existing	Acres	Percent of Existing	Acres	Percent of Existing
Federal[1]	Non-Forest	1,325	0.7%	0	0.0%	0	0.0%	0	0%
	0-39	26,286	14.7%	0	0.0%	0	0.0%	0	0%
	40-79	26,156	14.6%	1,572	6.0%	1,223	4.7%	153	0.6%
	80+	54,979	30.7%	1,309	2.4%	650	1.2%	0	0%
Industry Private	Forest	31,057	17.3%	Unk	Unk	Unk	Unk	NA	NA
Other Uses[2]		39,333	22.0%	Unk	Unk	Unk	Unk	NA	NA
Total		179,136	100%	Unk	Unk	Unk	Unk	Unk	Unk

1: Includes BLM, US Forest Service, and Army Corps of Engineers
2: Includes urban areas, agriculture, and rural residential.
Unk=Unknown, NA= Not applicable

3.1.3.3 Alternative 3

Effects to spotted owls would be similar to those described for Alternative 2, with the following exceptions:

General Spotted Owl Habitat

5 trees per acre of snags and CWD would be created in some treated Riparian Reserves, which would improve habitat conditions for spotted owl prey species and improve short- and long-term habitat quality compared to Alternative 2.

Cumulative Effects

Cumulative effects for Alternative 3 would be the same as in Alternative 2.

3.1.3.4 Alternative 4

Direct and indirect effects to spotted owls in Alternative 4 would be the same as Alternative 2.

Cumulative Effects

Cumulative effects for Alternative 4 would be the same as Alternatives 2 and 3.

3.2 FOREST STRUCTURE

Two issues will be addressed in the environmental effects section below:

- Issue 2: What are the effects of timber harvest on stand structure in the Riparian Reserves?
- Issue 3: What are the effects to quantity, quality, and recruitment of snags and coarse woody debris?

3.2.1 **Issue 2: What are the effects of timber harvest on stand structure in the Riparian Reserves?**

The spatial bounds for analysis of direct and indirect effects for this Issue are the project area's Riparian Reserves plus one Site Potential Tree Height (400 feet) as this is the maximum distance light and microclimate effects from other actions such as timber harvest would reasonably travel. While total acres of Riparian Reserves treated may vary by alternative, the actions and inactions present relevancy to the discussion of the impacts to stand structure and riparian function. As such, the spatial bounds for analysis do not vary by alternative, but the total acres on which actions would or would not occur are discussed specific to each alternative with anticipated effects. Identifying the Riparian Reserves within the project area as the spatial bounds for this Issue is appropriate for the effects analysis because this is the landscape on which actions are considered.

The temporal bounds for analysis of effects for this Issue is 40 years. This timeframe encompases impacts that could occur in both short-term and long-term, which could have differing effects to the same resource or location. Where these differences exist, they are discussed with the specifics of the short or long-term timeframes being discussed. This timeframe is appropriate because 40 years post-harvest the development of the understory and overall Riparian stand complexity declines. At 40 years post-harvest, overstory tree growth and crown expansion declines, limiting sunlight reaching the forest floor and restricting photosynthesis.

3.2.2 **Affected Environment**

The 1995 RMP (p. 24) provides direction on management of Riparian Reserves to: Apply Silvicultural practices to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives. This IDT has identified that at the watershed scale, these stands lack structure and diversity in the understory. Franklin & Spies (1991) describe the composition and structure of old growth forests as having large trees in the overstory, smaller trees of varying sizes and species in the lower and middle story, large standing and fallen dead trees, and patchy shrub and herb communities. A highly diverse understory is another characteristic of the old-growth stands. Understories in old-growth stands tend to be much patchier than in younger forest stands. This variability is partially a response to varied overstory conditions.

In order to create this complex structure, it is very important to understand how these old growth forests developed. Tappeiner et al. (1997) and Poage & Tappeiner (2002) suggest that many old growth Douglas-fir forests in western Oregon developed over long time periods with low densities of dominant trees. This developmental pathway produced forests with multi-aged, multi-storied canopies with low overstory tree densities. This developmental trajectory is very different from the current trajectory of the high-density stands proposed for thinning. Active management can be used to guide stands toward an old-growth trajectory and enhance structural diversity. Tappeiner et al. (1997) and Poage (2000) support the idea that development of late successional attributes in young stands can be accelerated with various thinning practices and found that when the objective of forest management is to grow stands with old growth characteristics, it appears that density management (e.g. one or more thinnings to low densities) will be required.

Forested stands adjacent to streams and wetlands serve to provide habitat for terrestrial species including invertebrates, amphibians, birds, and small mammals. Currently, the Riparian Reserve stands in the project area provide low quality, mid-successional wildlife habitat due to the stand conditions described below. The stands proposed for commercial thinning treatment in the Riparian Reserves are second growth, even-aged, largely closed canopy; 50-75 year old stands (Table 14). Some stands do not have a complete stand history and were most likely naturally regenerated post-harvest. Stands are composed mostly of Douglas-fir (>80%), with smaller components of western hemlock, western redcedar, and incense-cedar. Mistletoe is present in the hemlock trees. Hardwoods such as golden chinquapin, madrone, big leaf maple, and red alder exist in varying amounts on the landscape primarily in the Riparian Reserves and generally comprise less than 20% of the total species composition. The dominant understory vegetation consists of salal, hazel, vine maple, Oregon-grape, and sword fern.

Within the Coast Dorena project area, stands are dense, overstocked, and uniform in structure, which has resulted in reduced tree growth and stand vigor. Stand ages range from 50-75 year old. The treatment history in these stands has consisted of commercial harvests, precommercial thinnings, and fertilizations. Table 14 below provides the current stand metrics of the six sections and Figure 2 visually depicts the typical stand conditions.

Table 14: Current Stand Conditions (Riparian and Uplands) for the Coast Dorena Project.

Sale Name	Township - Range - Section	Location in the Section	Age in 2017	Treatment history	BA	TPA	QMD	RD	CC
What's Bruin	19S-2W-33		57	1984 Pre-Commercial Thinning (PCT)	225	140	17	55	72
	20S-2W-3	west	67	1976 PCT	290	190	16	73	82
	20S-2W-3	south	52	1985 PCT	274	241	14	73	79
	20S-2W-3	east	67	1988 Fertilization ; 1991 PCT ; 1976 PCT	226	140	17	55	80
	19S-2W-31	east unit	67	1974 Herbicide spray	217	123	18	51	72
Lucky Meyer	20S-2W-23	west unit	67	not available	190	95	19	44	70
	20S-2W-23	east unit	72	not available	207	118	17	50	71
	20S-2W-13		67	1976 and 1982 PCT	291	179	17	71	73
	19S-2W-19	west	57	planted 1983, PCT 1992	201	138	16	50	78
	19S-2W-19	south	57	PCT 1983 & 1990	301	216	16	75	79
	20S-3W-19	east	67	PCT 1976	289	160	18	68	78

All values in Table 14 are on a per acre basis. Table 14 uses five stand metrics to describe Riparian Stand complexity, which are Basal Area (BA), Trees per acre (TPA), Quadratic Mean Diameter (QMD), Relative Density (RD), and Canopy Cover (CC). Basal Area is the cross sectional area of a single stem, including the bark, measured at breast height (4.5 ft.) above the ground (Helms, 1998). Basal Area is described in square feet and of all conifers e 8" DBH. Trees per acre describes the conifers per acre of all conifer trees e 8" DBH. Quadratic Mean Diameter is a measure of the average diameter of all conifers e 8" DBH in the stand. It was used as a measure in this analysis because tree size is an important attribute of stand complexity. Relative Density is a means of describing the relative degree of inter-tree competition in stands of differing average tree size and stand density of conifers over 8'' DBH (Curtis 1982). Relative Density is calculated by dividing the Basal Area by the square root of the Quadratic Mean Diameter. Relative Density helps define the forest condition in different zones of ecological condition. At Relative Densities above 55, some trees become suppressed and die because of

competition (Hayes, Chan, Emmingham, Tappeiner, Kellogg, & Bailey, 1997). Relative Density and Trees per acre can provide insight into the degree of suppression mortality and amount of dead wood that is created, which is a facet of stand complexity. Canopy Cover is a measure of the cover created by the overstory tree canopies. It is measured in percentage for all species ≥8'' DBH. With increased canopy cover, less sunlight is available for vegetation development in the understory and forest floor.

Figure 2: Photo of Forested Stand in T20S R02W Section 13

CWD and snags are important habitat features for many riparian dependent terrestrial wildlife species. CWD provides refugia, foraging sites, and travel corridors, particularly for species with low mobility and small home ranges like invertebrates, small mammals, and amphibians (reviewed in Spies, Pollock, Reeves, & Beechie, 2013). Additionally, CWD provides important basic ecological functions like moisture retention, microclimate buffering, and providing substrates for plants and fungi (Harmon & Franklin, 1989), (Harvey, Larson, & Jurgensen, M.F., 1976), (Jonsson, Kruys, & Ranious, 2005), (Kluber, Olson, & Puettmann, 2009). These characteristics vary with the size and Decay Class of snag and CWD pieces. Larger snags and CWD that are moderately decayed can provide more ecological functions for a longer period and are valuable in previously harvested stands, due to their rarity and the time required for their development (Bunnell & Houde, 2010). However, smaller diameter snags and CWD are also valuable habitat components, for example by serving as substrates for fungi and invertebrates and contributing to food webs for species like woodpeckers and flying squirrels (Spies, Pollock, Reeves, & Beechie, 2013). Amounts of CWD and snags in Riparian Reserves are generally low (Table 9) compared to typical unmanaged stands of similar ages, which average 8.8 snags per acre greater than 18" DBH in Decay Class 1 and 2 and 383 linear feet per acre of CWD greater than 19" diameter in Decay Class 1 or 2 ; these figures were taken from the Middle McKenzie Landscape Design (Eugene District Bureau of Land Management, 2002), which reviewed and reported snag and CWD levels for stands of different ages in similar forest types in western Oregon. Due to previous harvest, site preparation, previous thinning, and low subsequent tree mortality the CWD present is generally either large-diameter/high decay class residue from the initial harvest or small diameter/low decay class from suppression mortality. Small-diameter snags occur in the project area primarily due to suppression mortality, and large-diameter snags

are uncommon. Two proposed units, Lucky Meyer Section 19 East and Lucky Meyer Section 13, have higher large CWD levels due to previous harvest practices.

3.2.3 **Environmental Effects**

3.2.3.1 Alternative 1: No Action

In the short term, shrub density and cover would be expected to remain stable (Chan, Larson, Hebner, Emmingham, Johnston, & Mikowski, 2006). Shading would continue to suppress or eliminate any light-dependent understory plants, thereby reducing available food for herbivores. Overstocked stands would continue to grow, but at slower rates as trees compete with each other for growing space. Canopy Cover and Relative Density would increase and the crowns of individual trees would continue to recede (Chan, Larson, Hebner, Emmingham, Johnston, & Mikowski, 2006), resulting in increased suppression mortality and decreasing diameter growth as trees compete for water, nutrients, and sunlight (Oliver & Larson, 1996). Due to the lack of sunlight reaching the forest floor, there would be little to no complex understory development and species diversity. Hardwoods would decline within the stands through suppression mortality. Natural pruning of shaded branches would lower the live crown ratios of the overstory trees and foliage would become concentrated high on the boles (Franklin J. S., 2002). As the canopy cover increases, sunlight would be more restricted from the forest floor and thus understory growth and species diversity would decline.

Self-thinning or density dependent mortality would continue to occur at the lower end of the diameter distribution. Over time, natural canopy gaps and pulses of CWD would be created. Within these naturally created canopy gaps, shrubs and tolerant tree species (e.g., hemlock) would gradually increase as understory light increases due to receding overstory tree crowns and tree mortality (Oliver & Larson, 1996). This process would be slow and it is unlikely that understory tree development would be sufficient to cause a shift from single-storied to a two-storied or layered structure within 50 years (Oliver & Larson, 1996).

Table 15 and Figure 3 below are a tabular and visual representation of the stand conditions of T19S R02W Section 33. Both table and figure show the current conditions of the stand as well as stand conditions projected in 40 years. In Figure 3, the left hand image represents the current stand condition and the right hand image projects what the stand would look like in 40 years under the No Action Alternative. Currently, the stand has entered the zone of imminent suppression and mortality due to the overstocking in the stand (current Relative Density of 55) (Table 15). Modeling projects that in 40 years, the following stand conditions would occur:

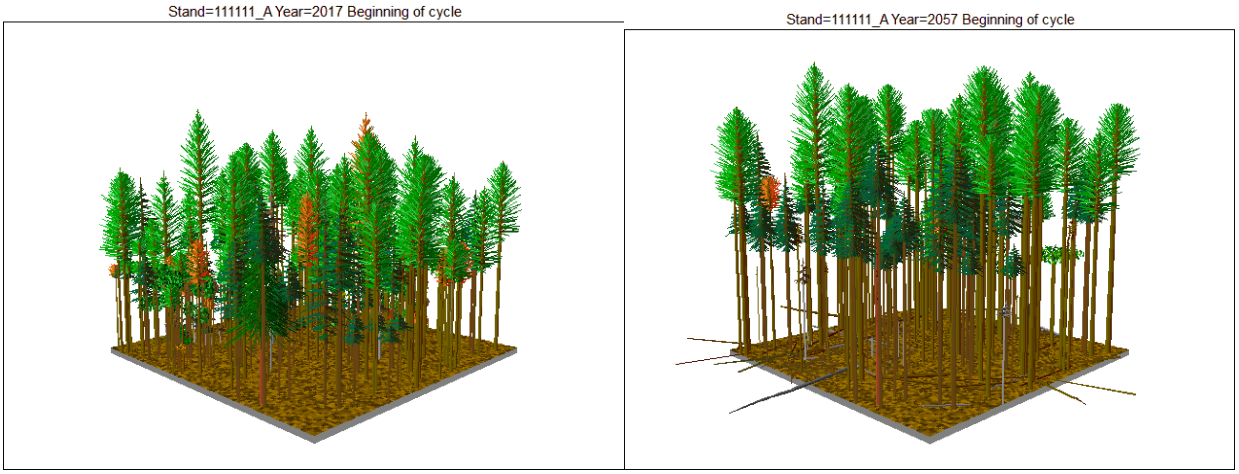
- The Relative Density would persist above 75. This relative density indicates overly dense stand conditions, contributing to reduced or suppressed growth and subsequent tree mortality (Hayes, Chan, Emmingham, Tappeiner, Kellogg, & Bailey, 1997). When stands are left at this high of a Relative Density, they generally do not develop a diverse understory (Bailey J. D., 1996).

- TPA would decrease from 140 to 103 due to natural suppression mortality.
- The QMD would increase from 17 to 25 due to tree growth and suppression mortality of less vigorous trees.
- The continued high canopy cover would characterize a dense stand condition which prevents sunlight from reaching the forest floor, restricting the development of understory vegetation species and structural diversity.

Table 15: Current Stand Conditions and 40-Year Projection in T19S R02 W Section 33 under No Action Alternative

TRS	Current Condition						40 year projection				
	BA	TPA	QMD	RD	CC		BA	TPA	QMD	RD	CC
19S-2W-33	225	140	17	55	72		377	103	25	75	73

Figure 3: Current Stand Conditions Compared to Stand Conditions in 40 years under No Action Alternative



Alternative 1 would result in the longest time requirement (40 years) for the development of high-quality habitat for terrestrial riparian-dependent wildlife. However, in the short term this Alternative would continue to provide the following benefits compared to the Action Alternatives:

- Riparian areas would not experience the temporary reduction in canopy cover from thinning, which, under the action alternatives, would decrease habitat suitability for terrestrial riparian-dependent wildlife for approximately 15-20 years.
- Existing snags and CWD would not be disrupted, and levels would remain at current conditions and trajectories. Therefore Alternative 1 would provide the highest levels of these habitat features. However, Alternative 1 would not meet the silvicultural objective to reduce stand densities to natural carrying capacities and create favorable growing conditions to improve individual tree health (vigor) for desirable species.

The No Action Alternative would not meet the stated need to maintain and promote vigorously growing conifer forests, reduce tree mortality, and provide timber resources, in accord with sustained yield principles, on BLM-Administered lands.

Cumulative Effects

No actions would occur from the proposed Coast Dorena project under the No Action Alternative. Cumulative effects are the consideration of incremental impacts of the proposed action when considered with other present and reasonably foreseeable future actions. As described above, the No Action alternative would contribute to the slower development of dispersal habitat which would be of lesser quality than that developed under the action alternatives. Since no project action is proposed under this alternative, there are no actions upon which to consider the incremental impacts, and thus, the BLM does not address cumulative impacts for the No Action Alternative.

3.2.3.2 Alternative 2: Preferred Alternative

Stand Structure

Thinning prescriptions were designed considering historic stand conditions and stand development processes local to the area, promoting the development of both species and structural diversity. Management toward these conditions would have effects to herbaceous vegetation and shrubs, stand structure and vigor, snags and CWD, and would have localized effects to specific locations resulting from a need to accommodate logging systems.

Thinning would initially cause short-term reductions in the understory shrubs and herbaceous plants due to harvesting disturbance including road construction, landing construction, corridors, skid trails, and accumulation of residual slash or limbs. Herbaceous plant diversity would be expected to increase in the first few years following thinning activities to levels exceeding pre-treatment conditions until canopy recloses (Chan, Larson, Hebner, Emmingham, Johnston, & Mikowski, 2006); (Bailey et al, 1998). Bailey & Tappeiner (1998) found that species richness for herbaceous species and total species richness across trees, shrubs, and herbaceous vegetation was greater in thinned stands than in unthinned and old-growth stands. The Young Stand Thinning and Diversity Study. Establishment Report, Study Plan, and Key Findings (2013) states that while shrub layers showed initial declines, they recovered strongly 5-7 years post-harvest and by 10 years post-harvest, shrub layers were higher in all thinning treatments relative to un-thinned controls.

Chan, Larson, Hebner, Emmingham, Johnston, & Mikowski (2006) found that understory conifer and hardwood tree and shrub vigor and survival diminish as the overstory canopy closes. As the crowns grow, light declines and understory species are unable to compete.

Thinning would maintain and increase live crown ratios (Oliver & Larson, 1996) and (Chan, Larson, Hebner, Emmingham, Johnston, & Mikowski, 2006). The live crown ratio is the ratio of

crown length to total tree height. Chan, Larson, Hebner, Emmingham, Johnston, & Mikowski (2006) found that the live crown ratios of un-thinned trees decreased indicating crown recession whereas trees in both moderately and heavily thinned stands maintained their existing live crown ratios. Chan, Larson, Hebner, Emmingham, Johnston, & Mikowski (2006) observed that thinning increased overstory stem growth and crown expansion.

Table 16 and Figure 4 below are a tabular and visual representation of the stand conditions of T19S R02W Section 33. Both table and figure show the current conditions of the stand as well as stand conditions projected in 40 years under Alternative 2. Figure 4, on the left hand image, represents the current stand condition, while the right hand image projects what the stand would look like in 40 years under Alternative 2. Modeling projects 40 years post-harvest, the following conditions would occur:

- The Relative Density would be approximately 57, indicating that the canopy has been opened to a sufficient amount to allow sunlight to reach the forest floor.
- In Alternative 2, after harvest, the canopies would return to a closed canopy condition and Relative Densities would then reach the point of suppression mortality.
- The TPA would decrease from 140 to 62 because the intermediate suppressed trees would be removed in the thinning. Little to no suppression mortality would occur under Alternative 2.
- The QMDs in Alternative 2 would increase from 17 to 29, higher than Alternative 1, which would improve the development of late successional forest characteristics including larger diameter trees. More open stand conditions allow the stand to develop more epicormic branching and more diverse branch structure, which is a facet of stand complexity.

Project Design Feature 8 would retain most existing Decay Class 3-5 CWD and Decay class 3-5 snags in proposed units, but harvest operations could damage some down logs (particularly those in advanced decay classes), and some snags could be felled for safety reasons or be inadvertently knocked over. Therefore, the proposed thinning may result in an immediate reduction of snags and CWD in the project area. Warmer, drier microclimates due to overstory removal would also modify CWD and snag function and quality until stand canopy conditions recover in 10-15 years.

In addition to damaging or removing some existing CWD and snags, thinning would also remove trees that would soon suffer suppression mortality and become snags or down wood, and existing material would disappear from the stands as decay continues. As a result, less CWD and fewer snags would be recruited into the stands when compared to Alternative 1, and their development would be delayed until mortality of residual trees resumes in approximately 30 years, although sporadic mortality from wind, disease, or insects would occur. Therefore, thinning under Alternative 2 would delay the recruitment of snags and CWD in thinned portions of the Riparian Reserves and would exacerbate the lack of these habitat features for terrestrial riparian dependent

wildlife. Additionally, all reserved trees that occur in logging corridors would be felled and removed to facilitate harvest operations. Reserved trees typically include the largest in the stand and represent the earliest potential new CWD inputs of such size. Removing cut trees within the proposed cable yarding corridors would forego the opportunity to immediately improve CWD conditions in the Riparian Reserves. Retention of unthinned riparian buffers and deferred areas in and around the proposed units would moderate these effects to snags and CWD at the project scale.

The Riparian Reserves proposed for thinning would realize habitat improvements for terrestrial riparian dependent wildlife species through the stand development dynamics described above due to their relatively young ages, lack of existing late-successional features, and overstory homogeneity. As described above, thinning would accelerate the development of late-successional characteristics used by these species like fissured/sloughing bark, deep crowns, large branches, multiple canopy layers, and cavities. Additionally, thinning would ensure that hardwood and minor conifer species would be retained and persist in the units.

Table 16: Current Stand Conditions and 40-Year Treatment Projection in T19S R02W Section 33 under Alternative 2

	Current Condition						40 year projection				
TRS	BA	TPA	QMD	RD	CC		BA	TPA	QMD	RD	CC
19S-2W-33	225	140	17	55	72		305	62	29	57	61

Figure 4: Current Stand Conditions Compared to Treated Stand Condition in 40 years under Alternative 2

Cumulative Effects

Approximately 24 acres of adjacent private industrial timberlands could affect the Riparian Reserves in the project area if they are clear-cut at 40 to 60 years, as has been the typical rotation in this area. The effect of the adjacent clear-cuts, should they occur, on Riparian Reserve stand complexity would include increased light penetration to the forest floor thus improving understory growth and development. Other effects could include blow-down in the Riparian Reserves causing within-stand gaps. There is also the potential for trees within the Riparian Reserves to be used as guy backs/anchors from other harvest operations. Sufficient damage from such activities could kill the trees, converting them into snags. Historically, there have been non-discretionary rights-of-ways issued for new road construction by private timber industry across BLM lands. Minimal if any requests are anticipated within the project area as it is already a heavily roaded watershed. The actions proposed under the Coast Dorena Project, when combined with other relevant ongoing and reasonably foreseeable actions on BLM administered lands within the project area would further improve tree vigor, reduce the impacts of disease, and improve fire resiliency.

3.2.3.3 Alternative 3

Stand conditions in Alternative 3 would be the same as in Alternative 2 except for the following conditions:

Stand Structure

In Alternative 3, approximately 5 TPA would be used in Riparian Reserves for post-project CWD and snag creation. This snag and CWD creation would help to establish amounts of these features that are more typical of similar age unmanaged conifer stands in western Oregon. Snag and CWD creation would occur as a single pulse of tree mortality within 5 years of harvest as compared to natural processes (Alternative 1) that would generate gradual and more prolonged inputs of snags and CWD. However, created snags and CWD would be larger than those in Alternative 1, as they would be created from co-dominant and dominant trees rather than from suppression mortality. Over the next few decades, these created snags and CWD would begin to decay and provide benefits to the greatest diversity of riparian dependent wildlife species. Therefore, Alternative 3 would provide higher quality habitat for terrestrial riparian dependent wildlife than Alternatives 2 while also retaining the long-term habitat improvements from thinning.

Cumulative Effects

Cumulative effects for Alternative 3 would be the same as Alternative 2.

3.2.3.4 Alternative 4

Direct and indirect effects for Alternative 4 would be the same as Alternative 2.

Cumulative Effects

Cumulative effects for Alternative 4 would be the same as Alternatives 2 and 3.

3.2.4 Issue 3: What are the effects of timber harvest and associated activities to quantity, quality, and recruitment of snags and coarse woody debris?

Effects to snags and CWD could occur through degradation of existing material and effects to future recruitment. Indicators are the number of snags per acre and the linear feet of CWD per acre. The temporal bounds for analysis are 40 years and the spatial bounds are the project area.

3.2.5 Affected Environment

<u>Snags and Coarse Woody Debris</u>

Snags

Snags are a key structural habitat component for NSO. Many wildlife species depend on snags for key life cycle needs such as nesting, roosting, perching, foraging, shelter, and hibernation. Of the nearly 100 northwest forest species that use snags, over half are dependent on cavities for at least a part of their life cycle (Eugene District Bureau of Land Management, 2002) (Appendix F, p. A-36). Wildlife life cycle needs are related to a variety of factors including: surrounding forest conditions like canopy cover, thermal exposure, and slope position; tree species; diameter; height; Decay Class; and attributes such as bark thickness, cavities, fissures, hollowness and perching locations. In the project area, snags are likely being used by both primary and secondary cavity nesters/users. Primary cavity excavators include species such as woodpeckers, nuthatches, and chickadees. Secondary cavity nesting users include birds such as wood ducks, swallows, and owls, and small mammals such as bats, squirrels and woodrats. Larger hollow snags are key habitat for bat and swallow colonies and larger mammals such as raccoons, skunks, and bears.

Coarse Woody Debris

Coarse woody debris is a fundamental habitat component in forest communities. Many wildlife species depend on them to provide for key life cycle needs such as breeding, foraging, refugia, thermal protection, and protective cover. They are important travel corridors for species with low mobility and small home ranges like small mammals, amphibians, and invertebrates. Large, well-decayed logs are used by many mammals such as foxes and bears for denning and hibernation. Coarse woody debris also provides a substrate for vascular plants, lichens, bryophytes, fungi, and microbes while contributing to basic ecological functions such as moisture retention, nutrient cycling, microclimate buffering, and lessening of soil erosion. High quality and amounts of coarse woody debris are also key habitat components for spotted owl foraging and nesting at the stand scale.

The relationship between coarse woody debris diameter and Decay Class, and their quality and longevity as wildlife habitat is similar to that for snags: large diameter coarse woody debris can

provide more ecological functions for a longer period and is valuable in previously harvested stands due to its rarity and the time required for its development. However, smaller diameter snags and CWD are also valuable habitat components, for example, by serving as substrates for fungi and invertebrates and contributing to food webs for species like woodpeckers and flying squirrels (Spies, Pollock, Reeves, & Beechie, 2013).

Proposed Units

Snag and coarse woody debris data were collected during stand exams within approximate unit boundaries (Table 17). Due to previous harvest, site preparation, previous thinning, and low subsequent tree mortality the proposed units are generally deficient in snags and in Decay Class 1 and 2 coarse woody debris compared to typical unmanaged stands of similar ages, which average 8.8 snags per acre greater than 18" DBH in Decay Class 1 and 2 and 383 linear feet per acre of CWD greater than 19" diameter in Decay Class 1 or 2. These figures represent the best available data, and were taken from the Middle McKenzie Landscape Design (Eugene District Bureau of Land Management, 2002), which reviewed and reported snag and CWD levels for stands of different ages in similar forest types, approximately 30 miles from the Coast Dorena project area, in western Oregon.

The utility and life span of snags and CWD are affected by several attributes that can be examined with stand exam data: diameter, height (snags), length (coarse woody debris) and Decay Class. This EA organizes discussion of snags and coarse woody debris into four categories:

- Small diameter with low decay (4-19 inch in Decay Class 1-2)
- Large diameter with moderate decay (20+ inch in Decay Class 3-4)
- Large diameter with low decay (20+ inch in Decay Class 1-2)
- Total snags or CWD (diameters 4+ inch in any Decay Class)

These categories are useful for analyzing current wildlife habitat, the effects of thinning, and the benefits of snag and coarse woody debris creation. The "Total" category provides insight into stand history but is only briefly discussed because it is dominated by smaller or more advanced decay snags and coarse woody debris, and is too general to be useful for effects analysis.

Table 17: Existing Snags and CWD Levels, Coast Dorena Project

Decay Class	CWD (linear ft./ac)		Snags/acre	
	4"-19"	20+"	4"-19"	20+"
Lucky Meyer 19 West				
DC1	0.0	0.0	0.0	0.0
DC2	186.6	0.0	0.0	0.0
DC3	435.4	62.2	0.0	0.0
DC4	62.2	62.2	0.0	0.0
DC5	124.4	62.2	0.0	0.0
Total	808.6	186.6	0.0	0.0
Lucky Meyer 19 South				
DC1	0.0	0.0	0.0	0.0
DC2	0.0	0.0	0.0	0.0
DC3	68.4	0.0	0.0	0.0
DC4	0.0	0.0	0.0	0.0
DC5	0.0	0.0	0.0	0.0
Total	68.4	0.0	0.0	0.0
Lucky Meyer 19 East				
DC1	0.0	0.0	4.1	0.0
DC2	402.4	40.2	0.0	0.0
DC3	603.7	362.1	0.0	0.0
DC4	80.4	281.6	0.0	0.0
DC5	80.4	160.8	0.0	0.0
Total	1,166.9	844.7	4.1	0.0
Lucky Meyer 23 West				
DC1	85.5	0.0	0.0	0.0
DC2	85.5	0.0	0.0	0.0
DC3	641.3	0.0	0.0	0.0
DC4	683.8	299.2	0.0	1.5
DC5	0.0	256.6	0.0	0.0
Total	1,496.1	555.8	0.0	1.5
Lucky Meyer 23 East				
DC1	0.0	0.0	0.0	0.0
DC2	263.2	0.0	0.0	0.0
DC3	668.5	210.5	0.0	0.0
DC4	254	236.9	0.0	0.0
DC5	26.3	7.3	0.0	0.0
Total	1,212	454.7	0.0	0.1

Decay Class	CWD (linear ft./ac)		Snags/acre	
	4"-19"	20+"	4"-19"	20+"
Lucky Meyer 13				
DC1	92.2	0.0	4.7	0.2
DC2	74.0	18.5	2.9	0.0
DC3	258.5	92.5	0.6	0.0
DC4	314.4	813.9	0.0	0.2
DC5	240.4	351.4	0.0	0.0
Total	979.5	1,276.3	8.2	0.4
What's Bruin 03				
DC1	122.1	8.4	0.7	0.0
DC2	550.4	8.4	2.2	0.2
DC3	290.1	16.9	0.0	0.0
DC4	598.6	186.3	0.0	0.0
DC5	79.4	69.7	0.0	0.0
Total	1,641	290	3.0	0.2
What's Bruin 31				
DC1	42.8	0.0	0.0	0.0
DC2	0.0	0.0	0.0	0.0
DC3	299.4	42.8	0.0	1.3
DC4	342.2	384.9	0.0	0.0
DC5	128.4	128.3	0.0	0.0
Total	812.8	556	0.0	1.3
What's Bruin 33				
DC1	57	24.4	2.2	0.0
DC2	97.7	0.0	0.0	0.0
DC3	668	73.2	0.0	0.0
DC4	252.4	293.2	0.0	0.4
DC5	97.7	122.2	0.0	0.0
Total	1,172.8	513	2.2	0.4

Snags

All snags: Stand exam data show a range of 0.1 to 8.2 snags per acre in the proposed units. Most snags are small 8-15 inch diameter in Decay Classes 1 and 2. Most of these were recruited since the previous timber harvest that regenerated the units, with large remnants from the previous stands found in only a few units. Overall, proposed units are deficient in most diameter and decay classes compared to similar unmanaged stands. The current and future habitat values of snags based on diameter and Decay Class are discussed below.

Small, low Decay Class 1 & 2 snags generally ranges from 0 to 4.1 per acre among harvest units, with Lucky Meyer section 13 as an outlier with 7.6 such snags per acre. These snags are a result of recent recruitment due to suppression mortality of understory trees and are generally the least important current or future wildlife habitat because of their smaller size and shorter life span. Additionally, these small snags are generally more common in and near the project area compared to larger snags because they are routinely recruited in younger mid-seral stands. Due to their relatively low importance, these features are not discussed further in this EA.

Large moderate Decay Class 3 & 4 snags occur from 0 to 1.5 per acre in the proposed units. These types of snags are generally uncommon in and near the project area and are often a limiting habitat feature for wildlife species that use them for critical life history functions like nesting. When present, they have survived and persisted since the previous regeneration harvest and are the most important current snag habitat for many species due to their long life span, greater amount of useable habitat (especially when hollow), and their ability to provide functions that are never found in smaller snags. In addition to use by mammals and cavity nesting birds, these types of snags are also used by the greatest number of vascular plants, fungi, bryophyte, and lichen species. This is due in large part to their ability to retain and regulate available water, especially in summer months.

Large, low Decay Class 1 & 2 snags are found in only two of the proposed units: Lucky Meyer section 13 and What's Bruin section 03. When present, they were most likely created through the infrequent mortality of dominant trees. These snags represent important current and future wildlife habitat should they remain standing after harvest. These types of snags are lacking in the proposed units; similar unmanaged mid-seral stands in western Oregon typically contain 8.1 to 12.2 such snags per acre (MMLD, Tables F-2 and F-3).

Coarse Woody Debris

All coarse woody debris: Stand exam data show a range of 68 to 2,256 linear feet per acre of coarse woody debris in all sizes and Decay Classes among the proposed units. Generally, coarse woody debris occurs in either smaller diameters or in larger diameter Decay Class 3 to 5 material. Small diameter coarse woody debris was recruited through mortality of suppressed trees after the units were regenerated by timber harvest. Larger coarse woody debris is either logging residue created by the previous harvest, or is remnant material from the previous stand. This distribution of coarse woody debris types and its spatial distribution is typical of managed

mid-seral stands on the Eugene District. The current and future habitat values of coarse woody debris are discussed below based on diameter and decay class.

Small, low Decay Class 1 & 2 coarse woody debris ranges from 0 to 673 linear feet per acre in the proposed units. These types of coarse woody debris are the least important current or future habitat for wildlife. While still part of the wildlife habitat spectrum and important for other ecosystem processes, smaller coarse woody debris is used by the fewest wildlife species for the fewest life history needs, while also having the shortest lifespan before decaying completely**.** Due to their relative low importance, these features are not discussed further in this report.

Large, moderate Decay Class 3 & 4 coarse woody debris is an important current habitat for wildlife due to their size, longer life span and larger diameters which provide for the greatest amount and variety of wildlife life history needs compared to smaller coarse woody debris. Most of these features were left over from the last major disturbance or recruited early in the life of the current stand from remnant trees. Stand exam data show a range of 0 to 906 linear feet per acre in the proposed units. The amounts present in Lucky Meyer section 19 East and section 13 are greater than seen in typical managed stands due to the logging practices used during previous harvest. As with snags, these types of coarse woody debris are typically used by the greatest number of vascular plants, fungi, bryophyte, and lichen species due in large part to their ability to retain and regulate available water, especially in summer months.

Large, low Decay Class 1 & 2 coarse woody debris ranges from 0 to 40 linear feet per acre in the proposed units. When present, they were most likely created through the infrequent mortality of dominant trees and are important current habitat for wildlife, which will improve in the future as decay progresses. Because this type of coarse woody debris is key wildlife habitat, and can be created from live trees, these types of coarse woody debris are the focus of active management that would create these features after harvest. These types of coarse woody debris are lacking in the proposed units; similar unmanaged mid-seral stands in western Oregon typically contain 312-400 linear feet per acre (MMLD, Tables F-6 and F-7).

3.2.6 **Environmental Effects**

3.2.6.1 Alternative 1: No Action

Existing snags and coarse woody debris would not be physically degraded or removed, nor would their quality or function change due to alteration of surrounding microclimate. Barring catastrophic disturbance like large-scale wildfire, disease, or windthrow, natural successional process would continue as the proposed units develop from mid-seral into mature stands.

Small diameter, low Decay Class 1 & 2 snags and coarse woody debris would continue to be recruited into the proposed units through mortality of currently suppressed trees. The amount recruited would be higher than would occur under the Action Alternatives, in which these smaller suppressed trees would be removed by thinning.

The low amounts of **large diameter, low Decay Class 1 & 2** snags and coarse woody debris present would continue to decay, and would be replaced by new material when competition among the current dominant and codominant trees reaches the point of suppression mortality. Alternative 1 would recruit such material sooner than Alternatives 2 and 4, in which tree competition would be reduced. Alternative 3 calls for creation of large diameter, low decay class snags and coarse woody debris as mitigation in Riparian Reserves.

Large, moderate Decay Class 3 & 4 snags and coarse woody debris would continue to decay and disappear from the proposed units, but would be replaced in time as lower decay class material continued to age. Therefore, Alternative 1 would provide the best continuity for large snags and coarse woody debris among the Alternatives. However, very large material (40+ inches) would take longer to develop under Alternative 1 because the units would not be thinned and tree growth would be slower.

Existing large-diameter snags and coarse woody debris would continue to decay and disappear from the stand. These features would not be replaced until natural processes created the necessary growing space for the development of large-diameter trees.

Cumulative Effects

Cumulative effects are the consideration of incremental impacts of the proposed actions when considered with other present and reasonably foreseeable future actions. Since no project actions are proposed under this Alternative, there are no actions upon which to consider any incremental impacts.

3.2.6.2 Alternative 2: Preferred Alternative

Project Design Features would physically retain most existing snags and coarse woody debris in proposed units. However, harvest operations would damage some down logs (particularly those in advanced decay classes), and some snags could be felled for safety reasons or inadvertently knocked over. Harvest operations could also inadvertently initiate snag development by breaking trees or introducing pathogens through operational damage of live trees. However, operators are required by contract to limit such damage so the amount of such snag creation would be low.

Microclimate conditions surrounding snags and coarse woody debris in treated areas would change due to a reduction in canopy cover and surrounding vegetation, leading to generally drier and warmer conditions. This effect to snags and coarse woody debris would be alleviated after vegetative growth and canopy cover return to pre-harvest conditions in approximately 10-15 years.

The thinning proposed under Alternative 2 would mimic the effects of suppression mortality and stimulate growth in the residual trees. However, thinning selects and removes most future tree mortality instead of these features remaining in a stand as snags and coarse woody debris. Spies et al. (2013), demonstrated that conventional thinning results in notably lower amounts of large

tree mortality for decades after treatment, compared to no thinning. Such effects can still be present in modelling 100 years after treatment, which indirectly affects the amount of naturally recruited large snags and coarse woody debris in thinned stands. As a result, the thinning proposed under Alternative 2 would likely delay and reduce natural snag and coarse woody debris recruitment until residual tree growth slows and suppression mortality resumes. This delay could last for several decades or more. Effects to specific snag and coarse woody debris types are discussed below:

The low amounts of **large diameter, low Decay Class 1 & 2** snags and coarse woody debris present would continue to decay, and would be not be replaced by new material for several decades because competition among trees will be reduced by thinning. Alternative 2 would recruit such material more slowly than Alternative 1, but would recruit very large (40+ inch) snags and coarse woody debris more quickly than Alternative 1 because thinning would increase tree growth.

Large, moderate Decay Class 3 & 4 snags and coarse woody debris would continue to decay and disappear from the proposed units and would not be replaced by lower decay class material, which would be removed from the unit or continue as vigorously growing trees. Therefore, Alternative 2 would provide poor continuity for large snags and coarse woody debris. Retention of unthinned riparian buffers and deferred areas in and around the proposed units would moderate this effect at the project scale. However, the overall effect of Alternative 2 would be to prolong the level of these habitat features in the proposed units.

Cumulative Effects

Snag and coarse woody debris data are not available for areas other than the proposed units. The BLM is the only party that would directly affect snag and coarse woody debris within harvest areas and there are no other reasonably foreseeable actions that would occur within the proposed units that would affect snags or coarse woody debris. Adjacent private lands are already clear cut harvested, or likely would be within the next 40 years. Adjacent clear-cuts could indirectly contribute to creation of snags or coarse woody debris in the proposed units due to increased chance of windthrow or use of BLM trees as anchors for logging systems, but such contributions would be minimal and restricted to the periphery of the proposed units.

3.2.6.3 Alternative 3

The direct and indirect effects of Alternative 3 would be the same as Alternative 2, except in the treated Riparian Reserves of Lucky Harms sections 13, 19-East and 23, and What's Bruin sections 31 and 33. In these areas, 5 trees per acre would be used to create snags and/or coarse woody debris within 5 years of the proposed thinning. This would help to mitigate the delay and reduction of snag and coarse woody debris recruitment that thinning would cause and ensure that a range of sizes and Decay Classes would be available over time. Ecological functions and wildlife habitat values would therefore be similar to those found in unmanaged stands under this Alternative.

Cumulative Effects

Cumulative effects would be the same as Alternative 2.

3.2.6.4 Alternative 4

Direct and indirect effects for Alternative 4 would be the same as Alternative 2.

Cumulative Effects

Cumulative effects for Alternative 4 would be the same as Alternative 2.

4.0 Consultation

Northern Spotted Owl

The BLM assessed the effects of the project in two batched consultation documents; Lucky Meyer in the Willamette Planning Province FY2016 Biological Assessment of NLAA Projects with the Potential to Modify the Habitat or Critical Habitat of Northern Spotted Owls, and What's Bruin in Willamette Planning Province FY2016/17 Biological Assessment of LAA Projects with the Potential to Modify the Habitat and/or Disrupt Northern Spotted Owls. The Lucky Meyer portion of the project is *Not Likely to Adversely Affect* spotted owls and the What's Bruin portion of the project was found to *Likely to Adversely Affect* spotted owls. None of the project would affect spotted owl Critical Habitat. These ESA effects determinations are described in Issue 1. The US Fish and Wildlife Service issued a Letter of Concurrence for Lucky Meyer (US Fish and Wildlife Service 2015a) and Biological Opinion for What's Bruin (US Fish and Wildlife Service 2015b) that verified these effects calls.

Upper Willamette River Spring Chinook Salmon

Upper Willamette River Spring Chinook salmon have Critical Habitat downstream approximately 1.5 miles from the closest timber sale unit. Most timber sale units are much further upstream (~3 miles). Short-term increases in sediment and stream turbidity would be caused by replacing and/or placing culverts on streams and wet weather haul on forest roads. These small pulses of sediment would occur across all action alternatives, at the site scale. However, further downstream, inputs of sediment would be immeasurable and would have no effect on Chinook salmon or their critical habitat. Due to lack of proximity of proposed harvest areas, and haul routes being disconnected from Critical Habitat, this project would have *No Effect* on Upper Willamette River Spring Chinook salmon or their Critical Habitat.

5.0 List of Preparers

Name	Title	Contributions
Elizabeth (Liz) Aleman	Outdoor Recreation Planner	Recreation, Visual Resources Management
Matt Buss	Planning & Environmental Specialist	NEPA
Christina (Chrissy) Cate	Forester	Logging Systems, Silviculture
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Andrew Hamilton	Hydrologist	Hydrology, ACS lead
Christopher Langdon	Wildlife Biologist	Wildlife, ACS
Steven Liebhardt	Fisheries Biologist	Fisheries, ACS
Cheryl (Cheshire) Mayrsohn	Botanist	Botany
Mike Millay	Engineer	Roads, Engineering
Jennifer Puttere	Soils Scientist	Soils, ACS
Eric Risdal	Fuels Specialist	Fuels
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Cary Swain	Forester	Lead Logging Systems, Forestry
Rob Titcomb	Silviculturist	Lead Silviculture, Climate Change, ACS
Heather Ulrich	Archaeologist	Archaeology
Janet Zentner	Forester	Timber Planner

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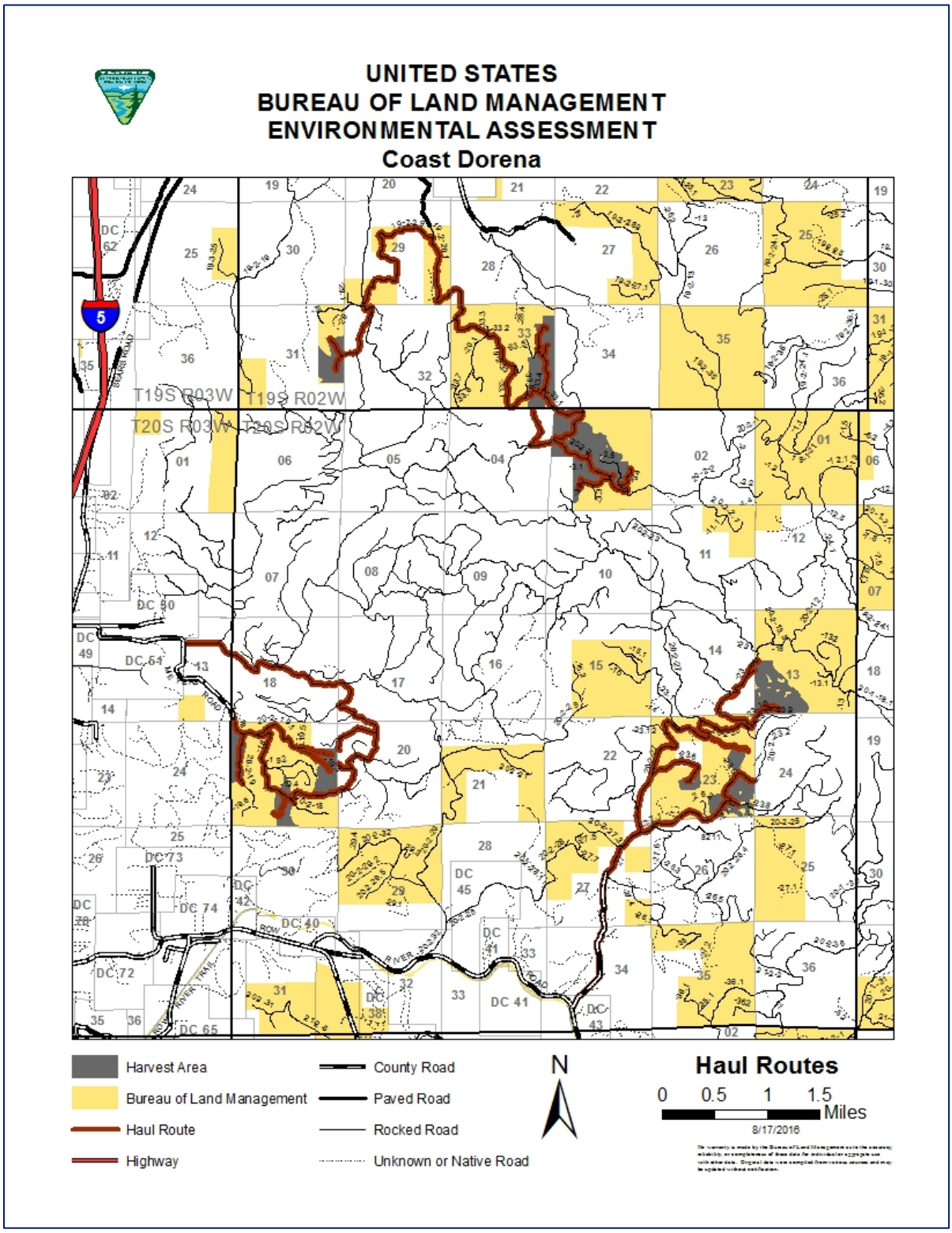
7.0 Maps


UNITED STATES
BUREAU OF LAND MANAGEMENT
ENVIRONMENTAL ASSESSMENT
Coast Dorena
T19S R03W
T19S R02W
T20S R03W
T20S R02W
Harvest Area
Bureau of Land Management
Haul Route
Highway
County Road
Paved Road
Rocked Road
Unknown or Native Road
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Haul Routes
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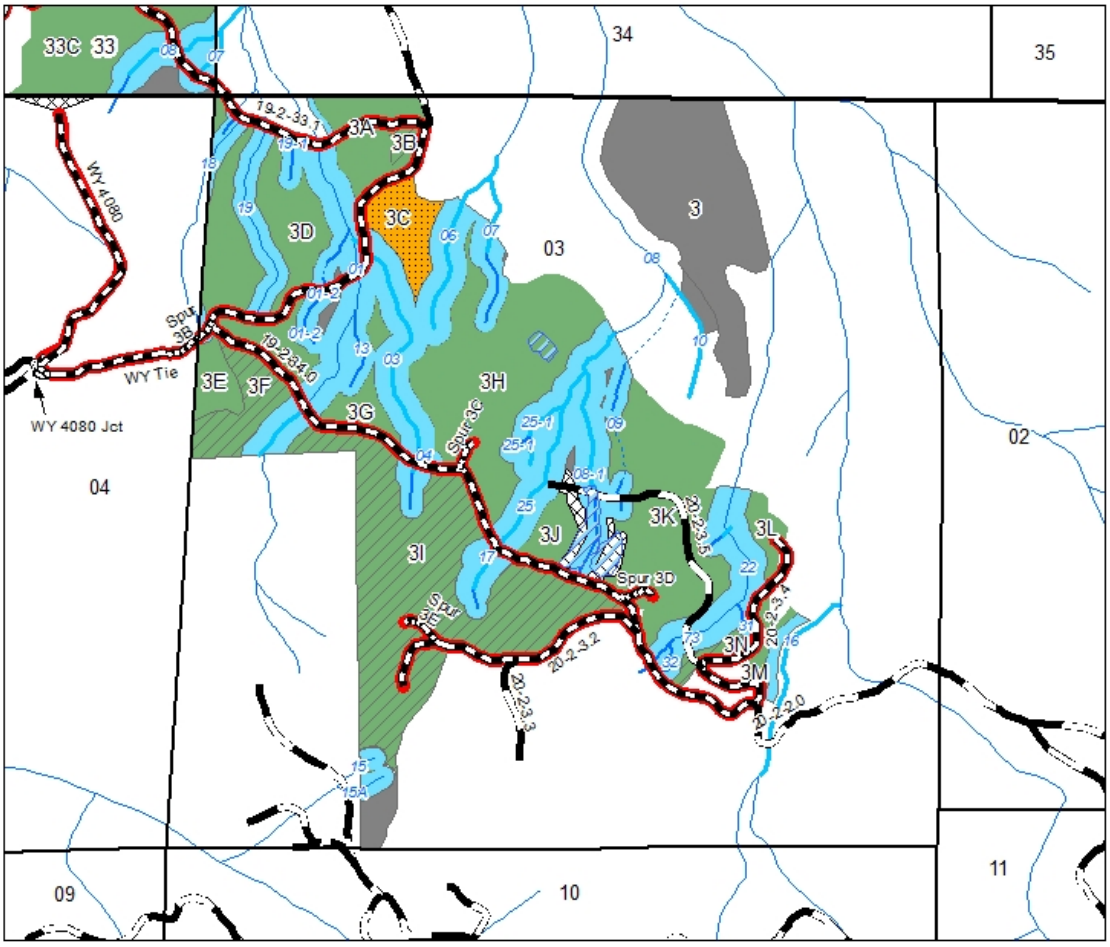
Miles
8/17/2016

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ASSESSMENT
Coast Dorena, T. 20 S., R. 02 W., SEC. 03



Alternatives 2 and 4

Cable
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No Cut Hydro Buffer
Optional Preferred Cable
Optional Preferred Ground Base
Special Yarding Area
Ephemeral
Intermittent
Perennial
Unknown
Wetland
Construction, Rock
Existing Road
Renovation
Haul Route

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8/17/2016

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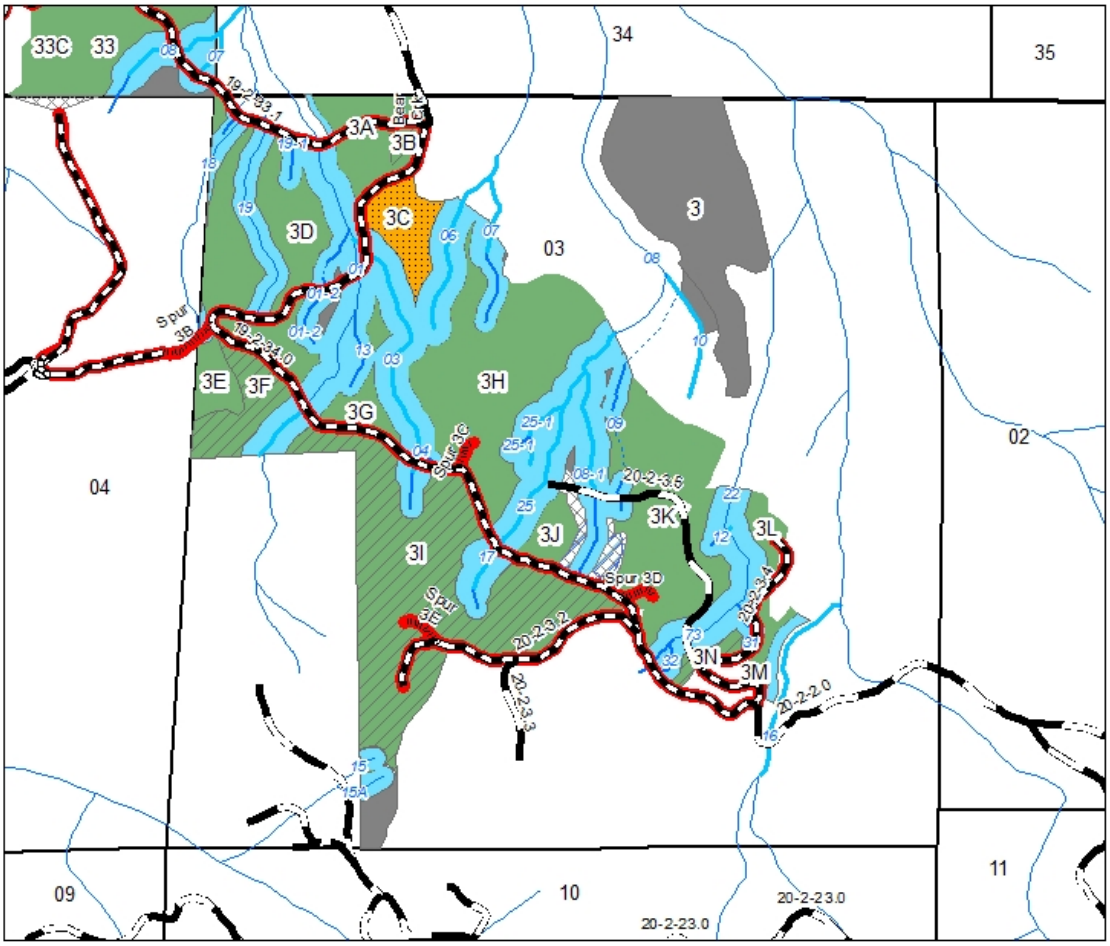
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ASSESSMENT
Coast Dorena, T. 20 S., R. 02 W., SEC. 03



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Construction, Rock
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Renovation
Haul Route

Alternative 3

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8/24/2016

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ASSESSMENT
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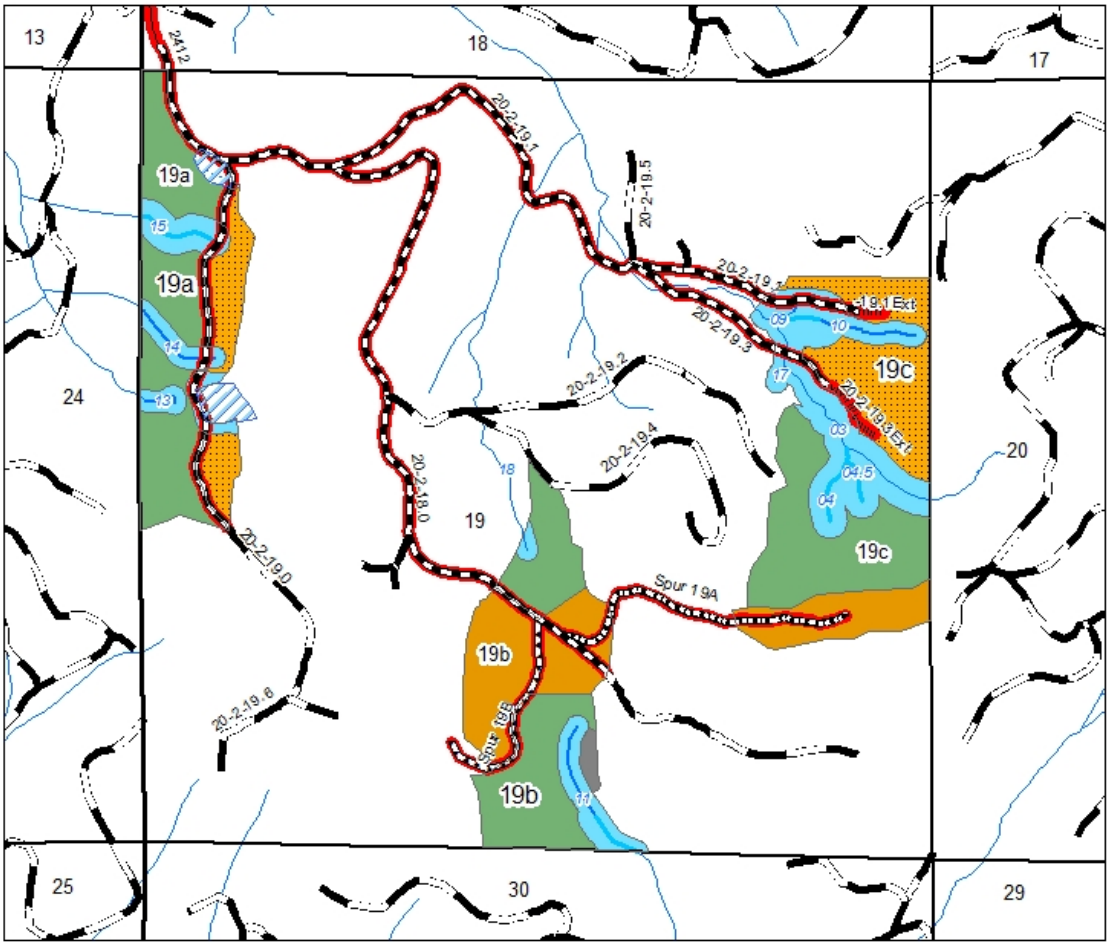

Alternatives 2 and 3

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Optional Preferred Ground Base
Ephemeral
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Perennial
Unknown
Wetland
Road
Construction, Native
Construction, Rock
Existing
Improvement
Renovation
Haul Route

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8/17/2016

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UNITED STATES
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BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ASSESSMENT
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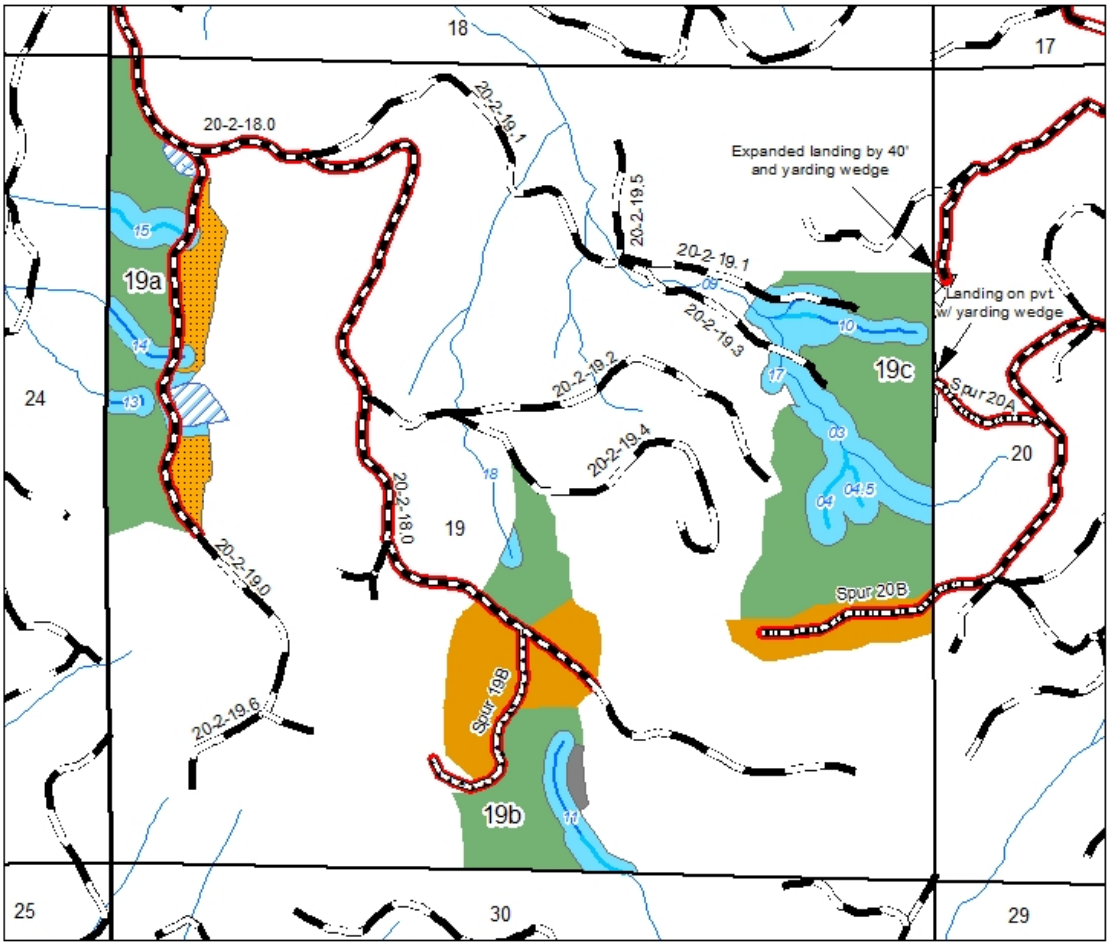

Alternative 4

Cable
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No Cut Hydro Buffer
Optional Preferred Ground Base
Special Yarding Area
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Intermittent
Perennial
Unknown
Wetland
Construction, Rock
Existing Road, Rock
Improvement
Renovation
Haul Route

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0 500 1,000 1,500 Feet
8/17/2016

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ASSESSMENT
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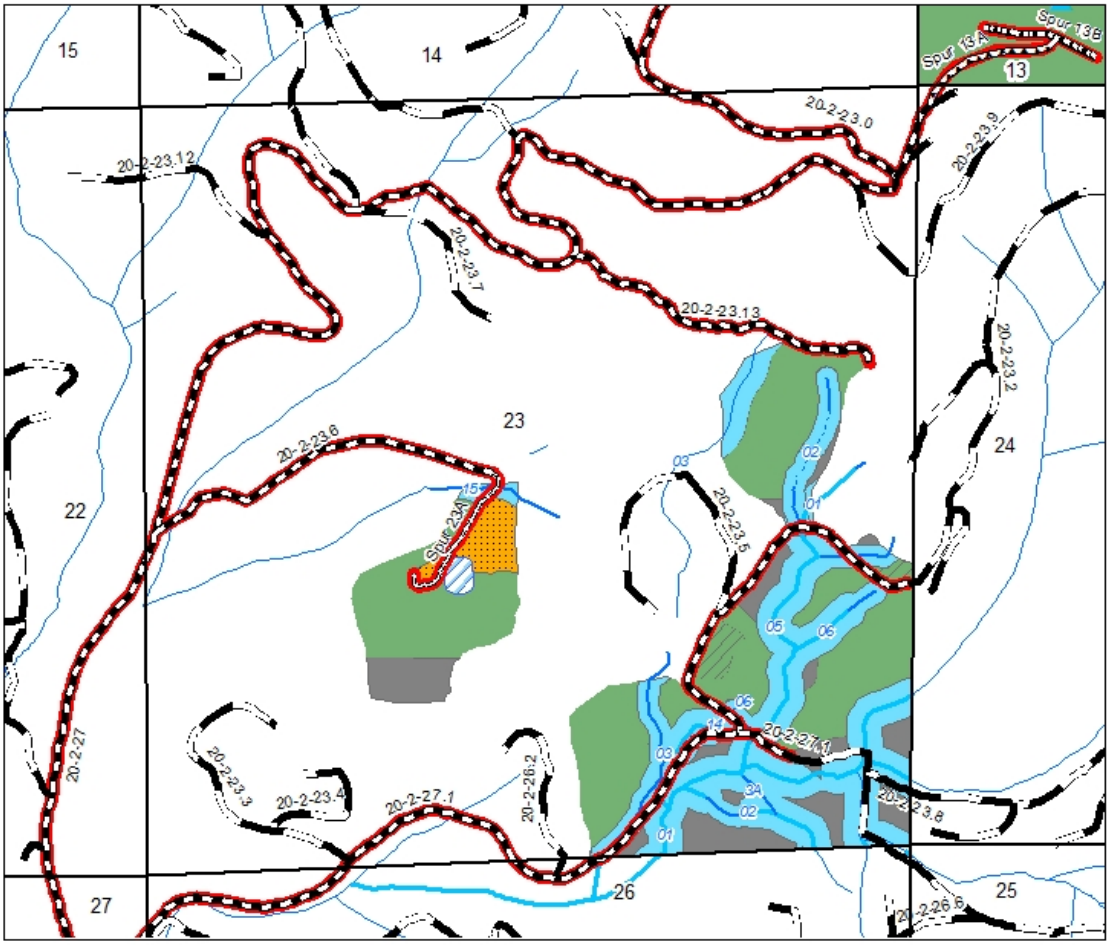

Cable
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Perennial
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Wetland
Construction, Optional Rock
Construction, Rock
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Improvement
Renovation
Haul Route

Alternatives 2 and 4

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0 500 1,000 1,500 Feet

8/17/2016

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ASSESSMENT
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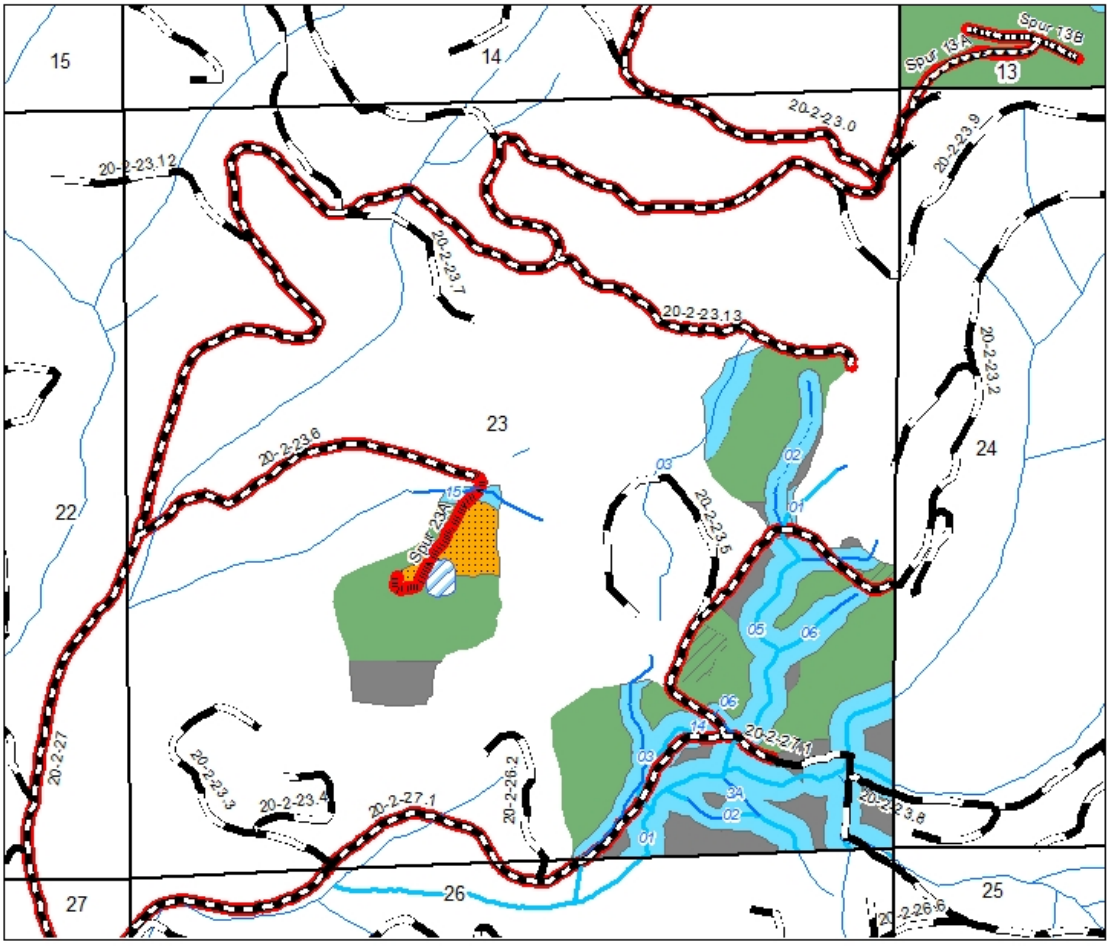

Alternative 3

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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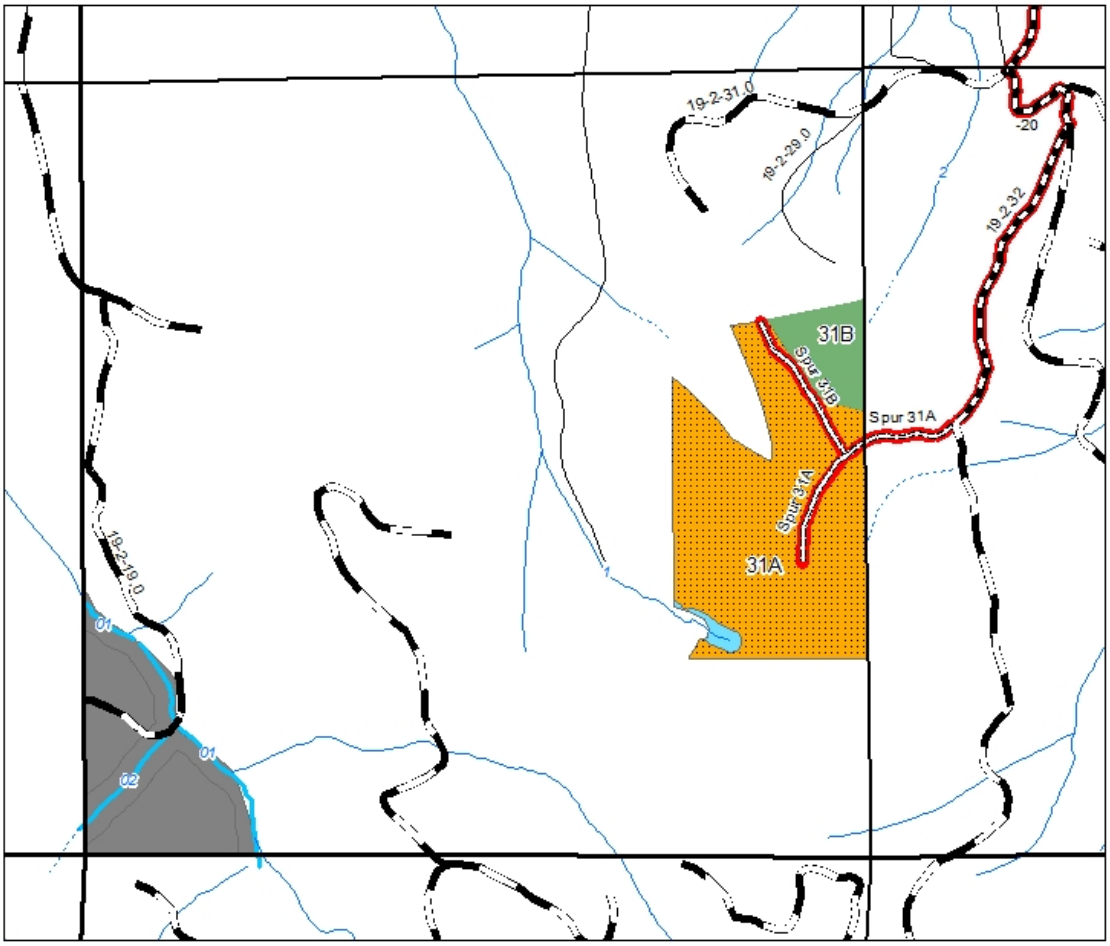

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UNITED STATES
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BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ASSESSMENT
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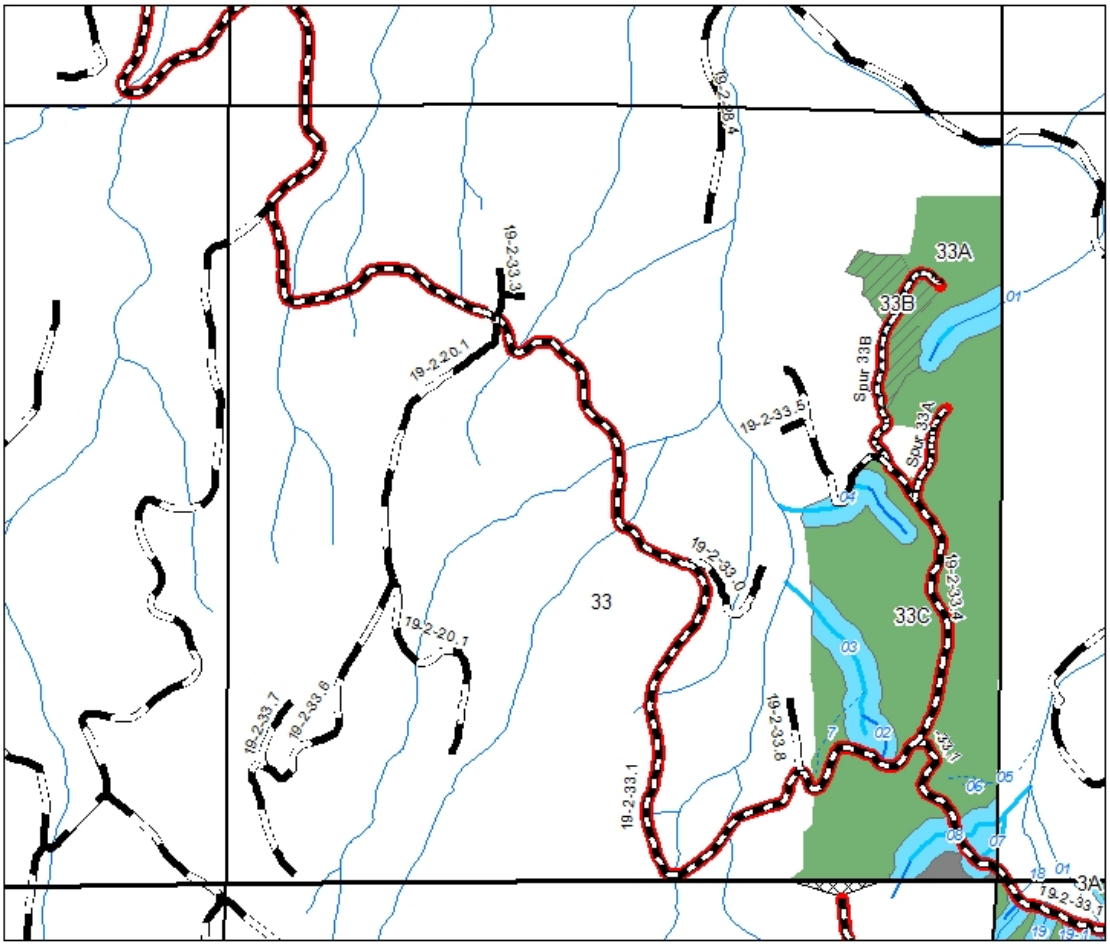

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Alternatives 2 and 4

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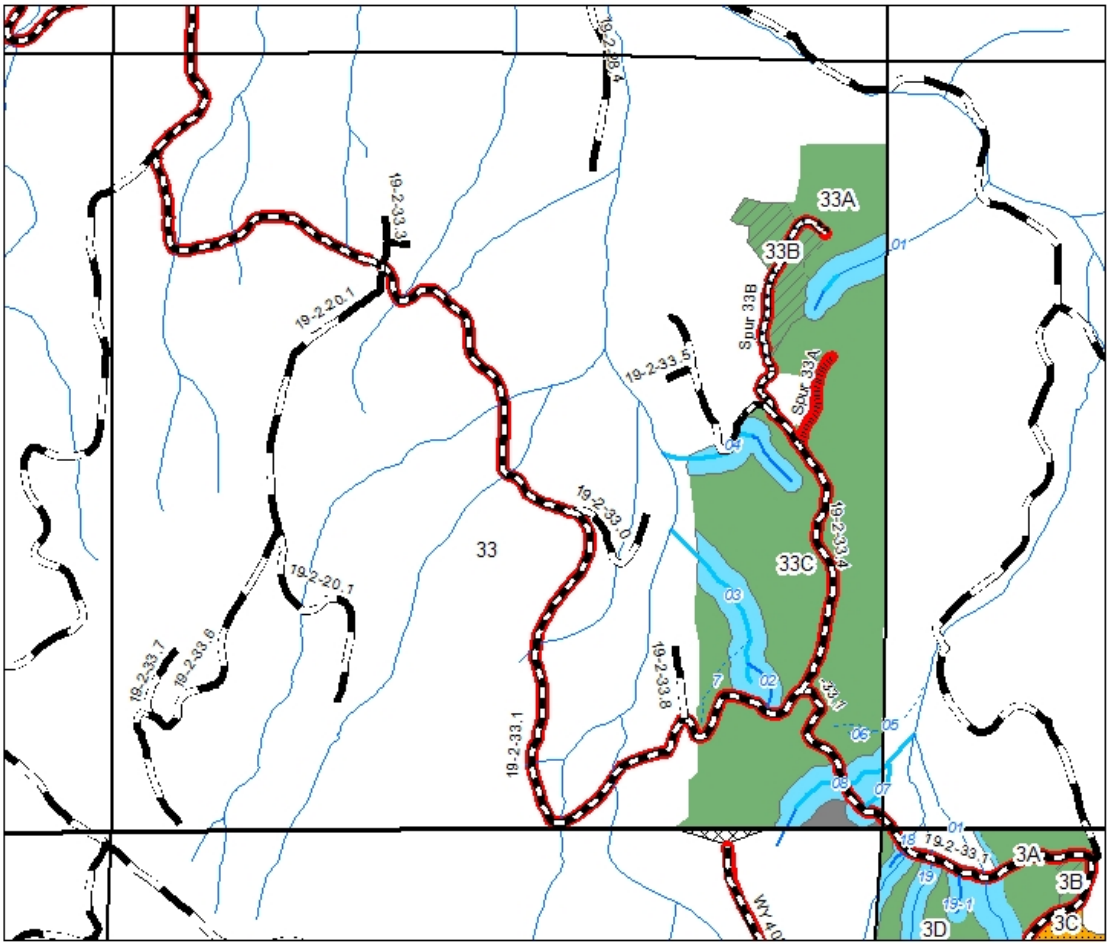
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ASSESSMENT
Coast Dorena, T. 19 S., R. 02 W., SEC. 33



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8.0 Appendices

Appendix A: Glossary

Glossary

Unless otherwise indicated, definitions are from the 1995 Eugene RMP.

Basal Area - The area of the cross section of a tree stem near its base, generally at breast height, 4.5 feet above the ground and inclusive of bark.

Baseline - The starting point for Analysis of Environmental Consequences; may be the conditions at a point in time (e.g., when inventory data is collected) or may be the average of a set of data collected over a specified period of years

Biological Corridor - A habitat band linking areas reserved from substantial disturbance.

Broadcast Burn - Allowing a prescribed fire to burn over a designated area within well-defined boundaries for reduction of fuel hazard or as a silvicultural treatment, or both.

Bureau Sensitive Species - Plant or animal species eligible for Federal Listed, Federal Candidate, State Listed, or State Candidate (plant) status, or on List 1 in the Oregon Natural Heritage Data Base, or approved for this category by the State Director.

Canopy Cover – Proportion of the forest floor covered by the vertical projection of tree crowns. (BLM 2009)

Clear-Cut Harvest - A timber harvest method in which all trees are removed in a single entry from a designated area, with the exception of wildlife trees or snags, to create an even-aged stand.

Commercial Thinning - The removal of merchantable trees from an even-aged stand to encourage growth of the remaining trees.

Core Area - That area of habitat essential in the breeding, nesting, and rearing of young, up to the point of dispersal of the young.

Cover - Vegetation used by wildlife for protection from predators, or to mitigate weather conditions, or to reproduce. May also refer to the protection of the soil and the shading provided to herbs and forbs by vegetation.

Critical Habitat - 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.

Culmination of Mean Annual Increment (CMAI) - The peak of average yearly growth in volume of a forest stand (total volume divided by age of stand).

Cumulative Effect - The impact that results from identified actions when they are added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions. Cumulative effects can 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.

Endangered Species - Any species defined through the Endangered Species Act 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 systematic analysis of site-specific BLM activities used to determine whether such activities have a significant effect on the quality of the human environment; and whether a formal Environmental Impact Statement is required; and to aid an agency's compliance with NEPA when no EIS is necessary.

Environmental Impact - The positive or negative effect of any action upon a given area or resource.

Environmental Impact Statement (EIS) - A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of a major Federal action.

Even-Aged Management - A silvicultural system that creates forest stands, which are primarily of a single age or limited range of ages.

Forest Canopy - The cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Forest Health - The ability of forest ecosystems to remain productive, resilient, and stable over time and to withstand the effects of periodic natural or human-caused stresses such as drought, insect attack, disease, climatic changes, flood, resource management practices and resource demands.

Forest Succession - The orderly process of change in a forest as one plant community or stand condition is replaced by another, evolving towards the climax type of vegetation.

Green Tree Retention - A stand management practice in which live trees as well as snags and large down wood, are left as biological legacies within harvest units to provide habitat components over the next management cycle.

High Level -A regeneration harvest designed to retain the highest level of live trees possible while still providing enough disturbance to allow regeneration and growth of the naturally occurring mixture of tree species. Such harvest should allow for the regeneration of intolerant and tolerant species. Harvest design would also retain cover and structural features necessary to provide foraging and dispersal habitat for mature and old growth dependent species.

Low Level - A regeneration harvest designed to retain only enough green trees and other structural components (snag, coarse woody debris, etc.) to result in the development of stands, which meet old growth definitions within 100-120 years after harvest entry, considering overstory mortality.

Habitat Fragmentation - The breaking up of habitat into discrete islands through modification or conversion of habitat by management activities.

Home Range - The area that an animal traverses in the scope of normal activities; not to be confused with territory, which is the area an animal defends.

Landing - Any place on or adjacent to the logging site where logs are assembled for further transport.

Land Use Allocations - Allocations that define allowable uses/activities, restricted uses/activities, and prohibited uses/activities. They may be expressed in terms of area such as acres or miles, etc. Each allocation is associated with a specific management objective.

Log Decomposition Class - Any of 5 stages of deterioration of logs in the forest; stages range from essentially sound (class 1) to almost total decomposition (class 5).

Mitigating Measures - Modifications of actions that (a) avoid impacts by not taking a certain action or parts of an action; (b) minimize impacts by limiting the degree or magnitude of the action and its implementation; (c) rectify impacts by repairing, rehabilitating or restoring the affected environment; (d) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (e) compensate for impacts by replacing or providing substitute resources or environments.

Old Growth - This stage constitutes the potential plant community capable of existing on a site given the frequency of natural disturbance events. For forest communities, this stage exists from approximately age 200 until when stand replacement occurs and secondary succession begins again. Depending on fire frequency and intensity, old growth forests may have different structures, species composition, and age distributions. In forests with longer periods between natural disturbances, the forest structure will be more even-aged at late mature or early old growth stages.

Prescribed Fire - A fire burning under specified conditions that will accomplish certain planned objectives.

Quadratic Mean Diameter(QMD) - the measure of the average diameter of all conifers e 8" DBH in the stand.

Reforestation - The natural or artificial restocking of an area with forest trees; most commonly used in reference to artificial stocking.

Regeneration Harvest - Timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished. [A cutting procedure by

which a new age class is created. The major methods are clear-cutting, seed-tree, and shelterwood. (Dictionary of Forestry).]

Relative Density - The means of describing the relative degree of inter-tree competition in stands of differing average tree size and stand density of conifers over 8'' DBH (Curtis 1982). Relative Density is calculated by dividing the Basal Area by the square root of the Quadratic Mean Diameter. Relative Density helps define the forest condition in different zones of ecological condition.

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.

Rotation - The planned number of years between establishment of a forest stand and its regeneration harvest.

Seed Tree Regeneration Method - The cutting of all trees except for a small number of widely dispersed trees retained for seed production and to produce a new age class in fully exposed microenvironment. (SAF, 2014).

Seral Stages -The series of relatively transitory plant communities that develop during ecological succession from bare ground to the climax stage. There are five stages:

> **Early-Seral Stage** - The period from disturbance to crown closure of conifer stands usually occurring from 0-15 years. Grass, herbs, or brush are plentiful.
>
> **Mid-Seral Stage** - The period in the life of a forest stand from crown closure to ages 15-40. Due to stand density, brush, grass, or herbs rapidly decrease in the stand. Hiding cover may be present.
>
> **Late-Seral Stage** - The period in the life of a forest stand from first merchantability to culmination of mean annual increment. This is under a regime including commercial thinning, or to 100 years of age, depending on wildlife habitat needs. During this period, stand diversity is minimal, except that conifer mortality rates will be fairly rapid. Hiding and thermal cover may be present. Forage is minimal.
>
> **Mature-Seral Stage** - The period in the life of a forest stand from Culmination of Mean Annual Increment to an old growth stage or to 200 years. This is a time of gradually increasing stand diversity. Hiding cover, thermal cover, and some forage may be present.
>
> **Old Growth** - This stage constitutes the potential plant community capable of existing on a site given the frequency of natural disturbance events. For forest communities, this stage exists from approximately age 200 until when stand replacement occurs and secondary succession begins again. Depending on fire frequency and intensity, old growth forests may have different structures, species composition, and age distributions. In forests with longer periods between natural disturbances, the forest structure will be more even-aged at late mature or early old growth stages.

Shelterwood Regeneration Method - Some or all of the shelter trees are retained after regeneration has become established to attain goals other than regeneration (SAF, 2014)

Site Class – A classification of site quality, usually expressed in terms of ranges of dominant tree height at a given age or potential mean annual increment at culmination. (Dictionary of Forestry)

Site Potential Tree height - A site- potential tree height is the average maximum height of the tallest dominant trees (watershed analysis)

Site Preparation - Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment that is favorable for survival of suitable trees during the first growing season. This environment can be created by altering ground cover, soil, or microsite conditions, using biological, mechanical, or manual clearing, prescribed burns, herbicides, or a combination of methods.

Skid Trail - A pathway created by dragging logs to a landing (gathering point).

Slash - The branches, bark, tops, cull logs, and broken or uprooted trees left on the ground after logging.

Snag - Any standing dead, partially-dead, or defective (cull) tree at least 10 inches in diameter at breast height (DBH) and at least 6 feet tall. A hard snag is composed primarily of sound wood, generally merchantable. A soft snag is composed primarily of wood in advanced stages of decay and deterioration, generally not merchantable.

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 Displacement - The removal and horizontal movement of soil from one place to another by mechanical forces such as a blade.

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

Stand (Tree Stand) - An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition so that it is distinguishable from the forest in adjoining areas.

Stand Density - An expression of the number and size of trees on a forest site. May be expressed in terms of numbers of trees per acre, basal area, stand density index, or relative density index.

Stem exclusion - As the trees grow, their crowns and roots expand. As resources become limited, there is strong competition among trees, and self-thinning occurs.

Trees per acre - The conifers per acre of all conifer trees e 8" DBH.

Stocked/Stocking - Related to the number and spacing of trees in a forest stand.

Sustained Yield - The yield that a forest can produce continuously at a given intensity of management.

Wildlife Tree - A live tree retained to become future snag habitat.

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

8.1 Appendix B: Road Construction, Improvement, and Renovation

Appendix B Table 1 - Alternative 2

Road and Segment/ Spur Name	Proposed Work	Length Miles	Temp or Perm*	Proposed Surface Type	Culvert Replace/New		Post-Harvest Decomm Plan	Comments	Access Type (Public or Administrative -Only)
					X-Drain	Stream			
What's Bruin									
19-2-20	Renovation	0.2	Perm	Rock	0-1		None	0-6 inches rock	Administrative - Only
19-2-20.1	Renovation	1.8	Perm	Rock	4-8	0-2	None	0-6 inches rock	Public
19-2-29	Renovation	1.7	Perm	Rock	0-2	1-5	None	0-6 inches rock	Public
19-2-32	Renovation	0.5	Perm	Rock	0-2		None	0-6 inches rock	Administrative-Only
19-2-33	Renovation	0.5	Perm	Rock	0-1	0-2	None	0-6 inches rock	Public
19-2-33.1	Renovation	1.5	Perm	Rock	0-2	0-2	None	0-6 inches rock	Public until it enters into Sec. 34, then the road becomes Administrative-Only
19-2-33.4	Renovation	0.5	Perm	Rock	1-3	0-1	None	0-6 inches rock	Public
19-2-34	Renovation	1	Perm	Rock	0-1	0-1	None	0-6 inches rock	Administrative-Only
20-2-2	Renovation	0.5	Perm	Rock	0-1	1-2	None	0-6 inches rock	Administrative-Only
20-2-3.2	Renovation	0.4	Perm	Rock	0-1		None	0-6 inches rock	Administrative-Only
20-2-3.4	Renovation	0.3	Perm	Rock	0-3		None	0-6 inches rock	Administrative-Only
Spur 3B	Construction	0.1	Perm	Rock	0-1	0-1	None	0-14 inches rock	Administrative-Only
Spur 3C	Construction	0.1	Perm	Rock	0-1		None	0-14 inches rock	Administrative-Only
Spur 3D	Construction	0.1	Perm	Rock	0-1		None	0-14 inches rock	Administrative-Only
Spur 3E	Construction	0.1	Perm	Rock	0-2		None	Optional Locate	Administrative-Only
Spur 31A	Construction	0.3	Temp or Perm	Optional	0-3		None or Block & Till	Decomm work depends on surfacing	Administrative-Only
Spur 31B	Construction	0.2	Temp or Perm	Optional	0-2		None or Block & Till	Decomm work depends on surfacing	Administrative-Only
Spur 33A	Construction	0.2	Perm	Rock	0-2		None	0-14 inches rock	Public
Spur 33B	Construction	0.1	Perm	Rock	0-1		None	0-14 inches rock	Public
Spur 33B	Improvement	0.3	Perm	Rock	1-4		None	0-14 inches rock	Public
WY 4080	Renovation	0.5	Perm	Rock			None	0-6 inches rock	Administrative-Only
WY tie rd.	Renovation	0.2	Perm	Rock			None	0-6 inches rock	Administrative-Only
WY 4080 Jct.	Construction	0.1	Perm	Rock			None	0-14 inches	Administrative-

								rock	Only
Lucky Meyer									
20-2-18	Renovation	1.4	Perm	Rock	1-3	0-1	None	0-6 inches rock	Public
20-2-19	Renovation	0.8	Perm	Rock	1-4	0-1	None	0-6 inches rock	Public
20-2-19.1	Renovation	0.7	Perm	Rock	0-2	1-3	None	0-6 inches rock	Public
20-2-19.1	Renovation	0.3	Perm	Native	1-3	0-1	Block & Waterbar	Pull culverts during decom	Public
20-2-19.1 Ext	Construction	0.1	Temp	Native	0-1		Waterbar	Pull culverts during decom	Public
20-2-19.3	Renovation	0.4	Perm	Native	1-4		Block & Waterbar	Pull culverts during decom	Public
20-2-19.3 Ext.	Construction	0.1	Temp	Native	0-1		Waterbar	Pull culverts during decom	Public
20-2-23	Renovation	1.8	Perm	Rock	1-3	1-2	None	0-6 inches rock	Public until it enters into Sec. 14, then the road becomes Administrative-Only
20-2-23.10	Renovation	0.1	Perm	Rock			None	0-6 inches rock	Administrative-Only
20-2-23.13	Renovation	0.5	Perm	Rock	1-2	0-1	Block & Waterbar	0-6 inches rock	Public
20-2-23.2	Renovation	0.6	Perm	Rock	1-2		None	0-6 inches rock	Public until it enters into Sec. 24
20-2-23.6	Renovation	0.5	Perm	Rock	0-1		None	0-6 inches rock	Public
20-2-27	Renovation	0.4	Perm	Paved			None		Public
20-2-27	Renovation	2.2	Perm	Rock	1-3	1-2	None	0-8 inches rock	Public
20-2-27.1	Renovation	1.2	Perm	Rock	1-2	1-2	None	0-6 inches rock	Administrative-Only
Spur 13A	Improvement	0.3	Perm	Rock	0-2		Block & Waterbar	0-14 inches rock	Administrative-Only
Spur 13A	Construction	0.1	Perm	Rock	0-1		Waterbar	0-14 inches rock	Administrative-Only
Spur 13B	Construction	0.1	Perm	Rock	0-1		None	0-14 inches rock	Administrative-Only
Spur 13C	Renovation	0.1	Perm	Rock			None	0-6 inches rock	Administrative-Only
Spur 13C	Construction	0.1	Perm	Rock			None	0-14 inches rock	Administrative-Only
Spur 13D	Renovation	0.2	Perm	Rock			None	0-6 inches rock	Administrative-Only
Spur 13D	Construction	0.1	Perm	Rock			None	0-14 inches rock	Administrative-Only
Spur 19A	Construction	0.6	Perm	Rock	1-5		None	0-14 inches rock	Public
Spur 19B	Improvement	0.3	Perm	Rock	0-2		None	0-14 inches rock	Public
Spur 23A	Construction	0.3	Temp or Perm	Optional	0-1		None or Block & Waterbar	Decomm work depends on surfacing	Administrative-Only

Appendix B Table 2 - Alternative 3

Road and Segment/ Spur Name	Proposed Work	Length Miles	Temp or Perm*	Proposed Surface Type	Culvert Replace/New		Post-Harvest Decomm Plan	Comments	Access Type Public or Administrative-Only)
					X-Drain	Stream			
What's Bruin									
19-2-20	Renovation	0.2	Perm	Rock	0-1		None	0-6 inches rock	Administrative-Only
19-2-20.1	Renovation	1.8	Perm	Rock	4-8	0-2	None	0-6 inches rock	Public
19-2-29	Renovation	1.7	Perm	Rock	0-2	1-5	None	0-6 inches rock	Public
19-2-32	Renovation	0.5	Perm	Rock	0-2		None	0-6 inches rock	Administrative-Only
19-2-33	Renovation	0.5	Perm	Rock	0-1	0-2	None	0-6 inches rock	Public
19-2-33.1	Renovation	1.5	Perm	Rock	0-2	0-2	None	0-6 inches rock	Public until it enters into Sec. 34, then the road becomes Administrative-Only
19-2-33.4	Renovation	0.5	Perm	Rock	1-3	0-1	None	0-6 inches rock	Public
19-2-34	Renovation	1.0	Perm	Rock	0-1	0-1	None	0-6 inches rock	Administrative-Only
20-2-2	Renovation	0.5	Perm	Rock	0-1	1-2	None	0-6 inches rock	Administrative-Only
20-2-3.2	Renovation	0.4	Perm	Rock	0-1		None	0-6 inches rock	Administrative-Only
20-2-3.4	Renovation	0.3	Perm	Rock	0-3		None	0-6 inches rock	Administrative-Only
Spur 3B	Construction	0.1	Temp	Native	0-1	0-1	Block & Till	Pull culverts during decom	Administrative-Only
Spur 3C	Construction	0.1	Temp	Native	0-1		Block & Till	Pull culverts during decom	Administrative-Only
Spur 3D	Construction	0.1	Temp	Native	0-1		Block & Till	Pull culverts during decom	Administrative-Only
Spur 3E	Construction	0.1	Temp	Native	0-2		Block & Till	Optional locate, pull culverts during decom	Administrative-Only
Spur 31A	Construction	0.3	Temp or Perm	Optional	0-3		None or Block & Till	Decomm work depends on surfacing	Administrative-Only
Spur 31B	Construction	0.2	Temp or Perm	Optional	0-2		None or Block & Till	Decomm work depends on surfacing	Administrative-Only
Spur 33A	Construction	0.2	Temp	Native	0-2		None or Block & Till	Decomm work depends on surfacing	Public
Spur 33B	Construction	0.1	Perm	Rock	0-1		None	0-14 inches rock	Public

Spur 33B	Improvement	0.3	Perm	Rock	1-4		None	0-14 inches rock	Public
WY 4080	Renovation	0.5	Perm	Rock			None	0-6 inches rock	Administrative-Only
WY tie rd.	Renovation	0.2	Perm	Rock			None	0-6 inches rock	Administrative-Only
WY 4080 Jct.	Construction	0.1	Perm	Rock			None	0-14 inches rock	Administrative-Only
Lucky Meyer									
20-2-18	Renovation	1.4	Perm	Rock	1-3	0-1	None	0-6 inches rock	Public
20-2-19	Renovation	0.8	Perm	Rock	1-4	0-1	None	0-6 inches rock	Public
20-2-19.1	Renovation	0.7	Perm	Rock	0-2	1-3	None	0-6 inches rock	Public
20-2-19.1	Renovation	0.3	Perm	Native	1-3	0-1	Block & Till	Pull culverts during decom	Public
20-2-19.1 Ext	Construction	0.1	Temp	Native	0-1		Till	Pull culverts during decom	Public
20-2-19.3	Renovation	0.4	Perm	Native	1-4		Block & Till	Pull culverts during decom	Public
20-2-19.3 Ext.	Construction	0.1	Temp	Native	0-1		Till	Pull culverts during decom	Public
20-2-23	Renovation	1.8	Perm	Rock	1-3	1-2	None	0-6 inches rock	Public until it enters into Sec. 14, then the road becomes Administrative-Only
20-2-23.10	Renovation	0.1	Perm	Rock			None	0-6 inches rock	Administrative-Only
20-2-23.13	Renovation	0.5	Perm	Rock	1-2	0-1	Block & Waterbar	0-6 inches rock	Public
20-2-23.2	Renovation	0.6	Perm	Rock	1-2		None	0-6 inches rock	Public until it enters into Sec. 24
20-2-23.6	Renovation	0.5	Perm	Rock	0-1		None	0-6 inches rock	Public
20-2-27	Renovation	0.4	Perm	Paved			None		Public
20-2-27	Renovation	2.2	Perm	Rock	1-3	1-2	None	0-8 inches rock	Public
20-2-27.1	Renovation	1.2	Perm	Rock	1-2	1-2	None	0-6 inches rock	Administrative-Only
Spur 13A	Improvement	0.3	Perm	Rock	0-2		Block & Waterbar	0-14 inches rock	Administrative-Only
Spur 13A	Construction	0.1	Perm	Rock	0-1		Waterbar	0-14 inches rock	Administrative-Only
Spur 13B	Construction	0.1	Perm	Rock	0-1		None	0-14 inches rock	Administrative-Only
Spur 13C	Renovation	0.1	Perm	Rock			None	0-6 inches rock	Administrative-Only
Spur 13C	Construction	0.1	Temp	Native			Block & Till		Administrative-Only
Spur 13D	Renovation	0.2	Perm	Rock			None	0-6 inches rock	Administrative-Only

Spur 13D	Construction	0.1	Temp	Native			Block & Till		Administrative-Only
Spur 19A	Construction	0.6	Perm	Rock	1-5		None	0-14 inches rock	Public
Spur 19B	Improvement	0.3	Perm	Rock	0-2		None	0-14 inches rock	Public
Spur 23A	Construction	0.3	Temp	Native	0-1		Block & Till	Pull culverts during decom	Administrative-Only

Appendix B Table 3 - Alternative 4

Road and Segment/ Spur Name	Proposed Work	Length Miles	Temp or Perm*	Proposed Surface Type	Culvert Replace/New		Post-Harvest Decomm Plan	Comments	Access Type (Public or Administrative-Only)
					X-Drain	Stream			
What's Bruin									
19-2-20	Renovation	0.2	Perm	Rock	0-1		None	0-6 inches rock	Administrative-Only
19-2-20.1	Renovation	1.8	Perm	Rock	4-8	0-2	None	0-6 inches rock	Public
19-2-29	Renovation	1.7	Perm	Rock	0-2	1-5	None	0-6 inches rock	Public
19-2-32	Renovation	0.5	Perm	Rock	0-2		None	0-6 inches rock	Administrative-Only
19-2-33	Renovation	0.5	Perm	Rock	0-1	0-2	None	0-6 inches rock	Public
19-2-33.1	Renovation	1.5	Perm	Rock	0-2	0-2	None	0-6 inches rock	Public until it enters into Sec. 34, then the road becomes Administrative-Only
19-2-33.4	Renovation	0.5	Perm	Rock	1-3	0-1	None	0-6 inches rock	Public
19-2-34	Renovation	1.0	Perm	Rock	0-1	0-1	None	0-6 inches rock	Administrative-Only
20-2-2	Renovation	0.5	Perm	Rock	0-1	1-2	None	0-6 inches rock	Administrative-Only
20-2-3.2	Renovation	0.4	Perm	Rock	0-1		None	0-6 inches rock	Administrative-Only
20-2-3.4	Renovation	0.3	Perm	Rock	0-3		None	0-6 inches rock	Administrative-Only
Spur 3B	Construction	0.1	Perm	Rock	0-1	0-1	None	0-14 inches rock	Administrative-Only
Spur 3C	Construction	0.1	Perm	Rock	0-1		None	0-14 inches rock	Administrative-Only
Spur 3D	Construction	0.1	Perm	Rock	0-1		None	0-14 inches rock	Administrative-Only
Spur 3E	Construction	0.1	Perm	Rock	0-2		None	Optional Locate	Administrative-Only
Spur 31A	Construction	0.3	Temp or Perm	Optional	0-3		None or Block & Till	Decomm work depends on surfacing	Administrative-Only
Spur 31B	Construction	0.2	Temp or Perm	Optional	0-2		None or Block & Till	Decomm work depends on surfacing	Administrative-Only
Spur 33A	Construction	0.2	Perm	Rock	0-2		None	0-14 inches rock	Public
Spur 33B	Construction	0.1	Perm	Rock	0-1		None	0-14 inches rock	Public
Spur 33B	Improvement	0.3	Perm	Rock	1-4		None	0-14 inches rock	Public
WY 4080	Renovation	0.5	Perm	Rock			None	0-6 inches rock	Administrative-Only
WY tie rd.	Renovation	0.2	Perm	Rock			None	0-6 inches rock	Administrative-Only
WY 4080 Jct.	Construction	0.1	Perm	Rock			None	0-14 inches rock	Administrative-Only

Lucky Meyer									
20-2-17 (WY 1200)	Renovation	0.9	Perm	Rock			None	0-6 inches rock	Administrative-Only
20-2-18	Renovation	1.4	Perm	Rock	1-3	0-1	None	0-6 inches rock	Public
20-2-18.1 (WY 1000)	Renovation	0.8	Perm	Rock			None	0-6 inches rock	Administrative-Only
20-2-19	Renovation	0.8	Perm	Rock	1-4	0-1	None	0-6 inches rock	Public
20-2-20 (WY 1250)	Renovation	0.6	Perm	Rock			None	0-6 inches rock	Administrative-Only
20-2-20.1 (WY 1270)	Renovation	0.5	Perm	Rock			None	0-6 inches rock	Administrative-Only
Castle Rock M/L (20-3-13)	Renovation	1.2	Perm	Rock			None	0-6 inches rock	Administrative-Only
20-2-23	Renovation	1.8	Perm	Rock	1-3	1-2	None	0-6 inches rock	Public until it enters into Sec. 14, then the road becomes Administrative-Only
20-2-23.10	Renovation	0.1	Perm	Rock			None	0-6 inches rock	Administrative-Only
20-2-23.13	Renovation	0.5	Perm	Rock	1-2	0-1	Block & Waterbar	0-6 inches rock	Public
20-2-23.2	Renovation	0.6	Perm	Rock	1-2		None	0-6 inches rock	Public until it enters into Sec. 24
20-2-23.6	Renovation	0.5	Perm	Rock	0-1		None	0-6 inches rock	Public
20-2-27	Renovation	0.4	Perm	Paved			None		Public
20-2-27	Renovation	2.2	Perm	Rock	1-3	1-2	None	0-8 inches rock	Public
20-2-27.1	Renovation	1.2	Perm	Rock	1-2	1-2	None	0-6 inches rock	Administrative-Only
Spur 13A	Improvement	0.3	Perm	Rock	0-2		Block & Waterbar	0-14 inches rock	Administrative-Only
Spur 13A	Construction	0.1	Perm	Rock	0-1		Waterbar	0-14 inches rock	Administrative-Only
Spur 13B	Construction	0.1	Perm	Rock	0-1		None	0-14 inches rock	Administrative-Only
Spur 13C	Renovation	0.1	Perm	Rock			None	0-6 inches rock	Administrative-Only
Spur 13C	Construction	0.1	Perm	Rock			None	0-14 inches rock	Administrative-Only
Spur 13D	Renovation	0.2	Perm	Rock			None	0-6 inches rock	Administrative-Only
Spur 13D	Construction	0.1	Perm	Rock			None	0-14 inches rock	Administrative-Only
Spur 19B	Improvement	0.3	Perm	Rock	0-2		None	0-14 inches rock	Public
Spur 20A	Construction	0.3	Perm	Rock	1-2	0-1	None	0-14 inches rock	Administrative-Only
Spur 20B	Construction	0.3	Perm	Rock	1-3		None	0-14 inches rock	Administrative-Only
Spur 23A	Construction	0.3	Temp or Perm	Optional	0-1		None or Block & Waterbar	Decomm work depends on surfacing	Administrative-Only

8.2 Appendix C: Special Status Species

Wildlife Special Status Species other than northern spotted owl and red tree vole, Survey and Manage wildlife species, and relevant migratory birds that are known or suspected to occur on the Eugene District BLM.

Special Status Species are defined by BLM Manual section 6840, Survey and Manage species are identified in the 2001 Survey and Manage Record of Decision, and relevant migratory birds are identified as described in BLM Instruction Memorandum OR-2008-050.

Common Name	Scientific Name	Status[1]	Occurrence on District[2]	Potential Presence in Project Area and Potential Effects
FENDER'S BLUE BUTTERFLY	PLEBEJUS ICARIOIDES FENDERI	FE	D	Associated strongly with Kincaid's Lupine in meadow and prairie habitat, which is not present. No potential for effects.
MARBLED MURRELET	BRACHYRAMPHUS MARMORATUS	FT, BCC	D	Within 50 miles of coast, project area is out of range. No potential for effects.
STREAKED HORNED LARK	EREMOPHILA ALPESTRIS STRIGATA	FT, BCC	S	Uses areas with low grassy vegetation: prairies, dunes, beaches, pastures, which are not present. No potential for effects.
TAYLOR'S CHECKERSPOT	EUPHYDRYAS EDITHA TAYLORI	FE	S	Used grassland, prairie habitats, which are not present. No potential for effects.
OREGON RED TREE VOLE: North Oregon Coast DPS	ARBORIMUS LONGICAUDUS	FC, SM-C, SEN	D	Project area is not in this Distinct Population Segment. No potential for effects.
PACIFIC FISHER: West Coast DPS	PEKANIA PENNANTIA	FPT	D	Uses large contiguous blocks of mature forest with structural complexity, which is not present. No potential for effects.
CRATER LAKE TIGHTCOIL	PRISTILOMA ARCTICUM CRATERIS	SEN, SM-B	S	Uses perennially wet habitats above 2000 feet, which would be protected by riparian buffers. No potential for effects.
HADDOCK'S RHYACOPHILAN CADDISFLY	RHYACOPHILA HADDOCKI	SEN	S	Uses small, cool mountain streams and adjacent riparian areas, which would be protected by riparian buffers. No potential for effects.
WESTERN BUMBLEBEE	BOMBUS OCCIDENTALIS	SEN	S	Uses diverse habitats that provide nectar, pollen, and suitable colony sites. Unlikely to occur in the project areas, but habitat availability could be increased by regeneration harvest.
COASTAL GREENISH BLUE BUTTERFLY	PLEBEJUS SAEPIOLUS LITTORALIS	SEN	S	Project area is outside the extremely restricted coastal range. No potential for effects.
JOHNSON'S HAIRSTREAK	CALLOPHRYS JOHNSONI	SEN	D	Uses mistletoe on western hemlock in late-successional forest, which is not present. No potential for effects.
MARDON SKIPPER	POLITES MARDON	SEN	S	Uses grassland or prairie, which is not present. No potential for effects.
FOOTHILL YELLOW-LEGGED FROG	RANA BOYLII	SEN	D	Uses large, low-gradient streams with bedrock or gravel substrate, which are not present. No potential for effects.
WESTERN POND TURTLE	ACTINEMYS MARMORATA	SEN	D	Uses ponds, lakes, and larger streams with emergent vegetation and basking sites and nearby nesting habitat, which are not present. No potential for effects.

Common Name	Scientific Name	Status[1]	Occurrence on District[2]	Potential Presence in Project Area and Potential Effects
PAINTED TURTLE	CHRYSEMYS PICTA	SEN	S	Uses slow water; rivers, marshes, large ponds with abundant vegetation and basking sites, which are not present. No potential for effects.
ALEUTIAN CANADA GOOSE	BRANTA HUTCHINSII LEUCOPAREIA	SEN	S	Uses pasture, harvested agricultural fields, and marshes, which are not present. No potential for effects.
AMERICAN PEREGRINE FALCON	FALCO PEREGRINUS ANATUM	SEN	D	Uses cliffs and other sheer vertical structure, which are not present. No potential for effects.
BALD EAGLE	HALIAEETUS LEUCOCEPHALUS	SEN, BCC	D	Uses large nest trees and snags near large water bodies, which are not present.
BLACK SWIFT	CYPSELOIDES NIGER	SEN	S	Nests under large waterfalls, which are not present. No potential for effects.
DUSKY CANADA GOOSE	BRANTA CANADENSIS OCCIDENTALIS	SEN, GBBDC	D	Uses Willamette Valley agricultural fields and wetlands, which are not present. No potential for effects.
CALIFORNIA BROWN PELICAN	PELECANUS OCCIDENTALIS CALIFORNICUS	SEN	S	Uses coastal and estuarine habitats, which are not present. No potential for effects.
GRASSHOPPER SPARROW	AMMODRAMUS SAVANNARUM	SEN	D	Uses grassland and prairie, which are not present. No potential for effects.
HARLEQUIN DUCK	HISTRIONICUS HISTRIONICUS	SEN, GBBDC	D	Uses high-flow, fast-flowing streams with boulders and logs and adjacent riparian habitat, which are not present.
LEWIS' WOODPECKER	MELANERPES LEWIS	SEN	D	Uses open woodlands with ground cover and snags, which are not present. No potential for effects.
OREGON VESPER SPARROW	POOECETES GRAMINEUS AFFINIS	SEN, BCC	D	Uses dry, open habitat with moderate herb and shrub cover, which is not present. No potential for effects.
PURPLE MARTIN	PROGNE SUBIS	SEN	D	Uses snags and trees with suitable nest cavities, typically in open areas. Species is widespread and any effects would be insignificant at the population scale, and therefore would not contribute to the need to list it under the ESA.
WHITE-TAILED KITE	ELANUS LEUCURUS	SEN	D	Uses low-elevation grassland, farmland or savannah and nearby riparian areas, which are not present. No potential for effects.
FRINGED MYOTIS	MYOTIS THYSANODES	SEN	D	Known hibernacula and roosts include caves, mines, buildings and large snags; forages in variety of habitats. Species is widespread and any effects would be insignificant at the population scale, and therefore would not contribute to the need to list it under the ESA.
PALLID BAT	ANTROZOUS PALLIDUS	SEN	S	Uses arid or semi-arid habitat with rock, brush, or forest edge; roosts in caves, mines, bridges, buildings, and hollow trees or snags. These habitats are not present and there would be no potential for effects.
TOWNSEND'S BIG-EARED BAT	CORYNORHINUS TOWNSENDII	SEN	D	Roosts in mines, caves, and occasionally buildings, which are not present. No potential for effects.
GREAT GRAY OWL	STRIX NEBULOSA	SM-C	D	Uses mature or late-successional forest adjacent to large natural meadows or openings, which is not present. No potential for effects.

Common Name	Scientific Name	Status[1]	Occurrence on District[2]	Potential Presence in Project Area and Potential Effects
OREGON MEGOMPHIX	MEGOMPHIX HEMPHILLI	SM-F_5	D	Uses moist sites in conifer forest; especially leaf litter, ferns, stumps, coarse woody debris. No known sites occur in the project area. Species is widespread on the Eugene District and any effects would be insignificant at the population scale.
NORTHERN GOSHAWK	ACCIPTER GENTILIS	BCC	D	Uses mature and late-successional forest. No known sites in the project area. Species is widespread and any effects would be insignificant at the population scale.
OLIVE-SIDED FLYCATCHER	CONTOPUS COOPERI	BCC	D	Uses edge habitats, tall snags and trees important. Project would preserve or create habitat. Species is widespread and any effects would be insignificant at the population scale.
PURPLE FINCH	CARPODACUS PURPUREUS	BCC	D	Uses moist conifer forest. Thinning would improve habitat. Species is widespread and any effects would be insignificant at the population scale.
RUFOUS HUMMINGBIRD	SELASPHORUS RUFUS	BCC	D	Uses shrubby, early-successional habitat; nectar-producing plants important for food. Project would preserve or create habitat. Species is widespread and any effects would be insignificant at the population scale.
WILLOW FLYCATCHER	EMPIDONAX TRAILLI	BCC	D	Uses brushy or forested habitat in riparian areas, which would be protected or improved. Species is widespread and any effects would be insignificant at the population scale.
BAND-TAILED PIGEON	COLUMBA FASCIATA	GBBDC	D	Nests in mature forest, feeds in a variety of habitats. Thinning would improve habitat. Species is widespread and any effects would be insignificant at the population scale.
MOURNING DOVE	ZENAIDA MACROURA	GBBDC	D	Uses forest and shrub habitats. Thinning would improve habitat. Species is widespread and any effects would be insignificant at the population scale.
WOOD DUCK	AIX SPONSA	GBBDC	D	Uses nest cavities near water and riparian areas, which would be protected or improved. Species is widespread and any effects would be insignificant at the population scale.

1: FE = Federal Endangered, FT = Federal Threatened, FC = Federal Candidate, FPT = Federal Proposed Threatened, SEN = BLM Sensitive, SM = Survey and Manage, BCC = Bird of Conservation Concern, GBBDC = Game Bird Below Desired Condition
2: D = Detected on District, S = Suspected on District

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
EUGENE DISTRICT OFFICE

PRELIMINARY FINDING OF NO SIGNIFICANT IMPACT

DOI-BLM-OR-E060-2016-0004-EA
Coast Dorena Environmental Assessment

INTRODUCTION

The Bureau of Land Management (BLM) conducted an environmental analysis for a proposal to conducting thinning harvest in the Coast Dorena Environmental Assessment (EA). The proposal is to perform thinning harvest on approximately 535 acres of early and mid-seral forest in the Matrix (General Forest Management Area) and Riparian Reserves land use allocations (LUAs).

The project area is located approximately 2 to 9 miles northeast of Cottage Grove, Oregon, in Lane County on forested land managed by the Upper Willamette Field Office of the Eugene District BLM. The project area lies within the Row River and Lower Coast Fork Willamette River fifth-field watersheds in Township 19 South, Range 02 West, Sections 31 and 33, and Township 20 South, Range 02 West, Sections 3, 13, 19, and 23, Willamette Meridian.

The BLM is providing a 30 day public review period for the EA and preliminary Finding of No Significant Impact (FONSI) from September 2, 2016 to October 3, 2016. The BLM will review comments received during this period; substantive comments may be used to refine the proposed action or may be responded to in project-specific Decision Records.

FINDING OF NO SIGNIFICANT IMPACT

The Bureau of Land Management (BLM) has prepared an Environmental Assessment (EA), (DOI-BLM-OR-E060-2016-0004-EA), for the Coast Dorena project, which analyzed the effects of the proposed action and alternatives. On the basis of the information contained in the EA, and all other information available to me, it is my determination that the implementation of any of the action alternatives would not have a significant effect on the quality of the human environment, considering the context and intensity of impacts (40 CFR 1508.27). Therefore, an environmental impact statement is not necessary and will not be prepared.

This finding is based on my consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), both with regard to the context and to the intensity of the impacts as described in the EA. I have determined that the effects of the proposed activities would be in conformance with the 1995 Record of Decision/Resource Management Plan for the Eugene District.

CONTEXT

BLM adopted its Eugene District Resource Management Plan in 1995, incorporating the 1994 Northwest Forest Plan (NWFP) and its EIS. BLM has thus prepared two EISs that consider the significant and potentially significant effects of conducting timber harvest in the Eugene District

within stands of the age classes found in this project. Even though the incremental harvest within the Coast Dorena EA falls within the RMP EIS's effects analysis, the BLM analyzed the specific effects of the proposed action to determine if the Coast Dorena EA is in and of itself significant under NEPA. The BLM has determined the effects are not significant, for the reasons detailed below in the evaluation of the NEPA intensity factors.

This project is a site-specific action that by itself does not have international, national, region-wide, or statewide importance. The actions described in the action alternative would be limited in scope and geographic application (40 CFR 1508.27(a)). The location of the action is described in the EA (p. 1) and displayed on maps (EA, pp. 71-80). The physical and biological effects are limited. The affected environment sections of Chapter 3 in the EA describe the locations and current conditions of the various resources. The resource effects sections in Chapter 3 reveal that most of the direct and indirect environmental effects are confined to the project area with some effects extending slightly outside the project area. The direct and indirect effects of the action alternatives along with cumulative effects (incremental effects of the proposed action in light of past, present, and reasonably foreseeable future actions) for each resource are described in Chapter 3 of the Coast Dorena EA (p. 33-66). These analyses were reviewed in consideration of the Council on Environmental Quality (CEQ) guidance on cumulative effects analysis, and results were disclosed in the EA.

The actions would occur in the Matrix and Riparian Reserve Land Use Allocations (LUA) as designated by the 1995 Eugene District Resource Management Plan (RMP). The RMP anticipated that forest management activities would occur in these LUAs as follows:

<u>Matrix</u>:

- produce a sustainable supply of timber (RMP, p. 34, 84)
- maintenance of valuable structural components, such as down logs and snags (RMP, p. 34)
- produce, over time, forests that have desired species composition, structural characteristics, and distribution of seral or age classes. (RMP, p. 85)

Specifically, for density management in Diversity/Connectivity Blocks:

- accelerate growth of trees to provide large-diameter snags and down logs (RMP, p. 203)
- promote development of understory vegetation and multiple canopy layers (RMP, p. 203)
- produce larger, more valuable logs (RMP, p. 203)
- harvest mortality of small trees as the stand develops (RMP, p. 203)
- maintain good crown ratios and stable, windfirm trees (RMP, p. 203)
- manage species composition (RMP, p. 203)

<u>Riparian Reserve</u>:

- to meet the objectives of the Aquatic Conservation Strategy (RMP, p. 18)
- Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives. (RMP, p. 24)

The action alternatives are in compliance with the RMP, as amended.

INTENSITY

I have considered the potential intensity of the impacts that would result from the action alternatives relative to each of the ten areas suggested for consideration by the CEQ, as detailed below (40 C.F.R. § 1508.27(b)):

1. **Impacts that may be both beneficial and adverse.**

   I considered both beneficial and adverse impacts associated with the action alternatives as presented in the Coast Dorena EA. These impacts are within a range of effects identified in the Eugene District Final Proposed Resource Management Plan/Final Environmental Impact Statement (FEIS; 1994) for timber resources (Chapter IV, p. 4-106 to 4-119) and other resources as they relate to timber management (Soils, p. 4-15 to 4-20; Water, p. 4-21 to 4-25; Fish, p. 4-66 to 4-67; Wildlife, p. 4-51 to 4-65; Recreation, p. 4-103 to 4-105; Cultural Resources, p. 4-97; and Climate Change, p. 4-9) and the NWFP EIS to which this EA is tiered.

   The EA for the Coast Dorena project identified impacts, both beneficial and adverse, for three issues presented in detail. The potential for adverse impacts from the action alternatives are similar to other projects previous to this one and are not unique to this project. These impacts are minimized and/or avoided using the Project Design Features (PDFs) found in the EA (p. 25-33). In BLM'S experience implementing previous projects, we have found similar activities using these or similar design criteria to be effective in avoiding or minimizing adverse effects. The analysis indicates that the disclosed adverse impacts are within the range of effects analyzed in the Eugene District RMP/FEIS.

   Northern Spotted Owls (EA, p. 38)

   Both suitable and dispersal habitat would be affected through thinning. Thinning would maintain habitat function while causing indirect beneficial effects through long-term habitat improvement.

   Riparian Reserves (EA, p. 49)

   There would be no significant effect on attainment of Aquatic Conservation Strategy Objectives under the Action Alternative. Mid- to long-term beneficial impacts would include acceleration of development of late-successional characteristics including deep crowns, large branches, multiple canopy layers, and cavities. Short-term adverse impacts would include reduction in canopy cover as well as in shrub and herbaceous plants from harvest activities.

2. **The degree to which the proposed action affects public health and safety.**

   No aspect of the action alternatives would have an effect on public health and safety.

   Smoke management from pile burning would comply with the Clean Air Act and State of Oregon Air Quality Standards by adhering to the Oregon Smoke Management Plan. Adherence to the Oregon Smoke Management Plan would greatly limit smoke dispersal. Due to the combination of burning only on days with stable atmospheric conditions and limited smoke dispersal, there would be no significant impacts on air quality

associated with burning, and hence no significant impacts on public health or safety from burning.

The proposed action would have no impact on geologic conditions or increase risk of catastrophic landslides. No drinking water sources are present in the project area and, therefore, would not be affected by the proposed action.

No herbicides would be used in conjunction with this project. Thus there would be no public health or safety issue presented by the use of herbicides associated with this project.

3. **Unique characteristics of the geographic area such as proximity of historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.**

   There would be no significant effects on unique characteristics of the area such as historic or cultural resources, park lands, prime farmlands, wild and scenic rivers, or ecologically critical areas (including areas of Critical Environmental Concern) as there are no such areas in the project vicinity.

4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.**

   The effects of actions planned under the proposed action are similar to many other forest management projects implemented within the scope of the 1995 Eugene RMP. No unique or appreciable scientific controversy has been identified regarding the effects of the proposed action.

5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.**

   The action alternative would not impose highly uncertain impacts or involve unique or unknown risks. The analysis has not shown that there would be any unique or unknown risks to the human environment not previously considered and analyzed in 1994 FEIS, to which this decision is tiered. Timber harvest is a common practice on lands managed by the BLM in western Oregon, and the activities and associated design criteria incorporated with this decision are well-established land management practices. The risks are well known and understood. Based on this, and previous similar actions, the probable effects of this decision on the human environment, as described in the EA, do not involve effects that are highly uncertain or involve unique or unknown risks.

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.**

   This project neither establishes a precedent nor represents a decision in principle about future actions. The timber management program on BLM managed lands in western Oregon is well established and this project would not establish a new precedent of management for this program. The action alternatives are consistent with actions appropriate for the Matrix and Riparian Reserve land use allocations as designated by the RMP. This project will not bind any future BLM actions and will not shape or determine BLM forestry methods or strategies beyond this project.

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

   The Interdisciplinary Team evaluated the project in context of past, present, and reasonably foreseeable actions and determined that there is not a potential for significant cumulative effects beyond those analyzed in the Eugene District RMP / FEIS and the NWFP FEIS. There are no individual or cumulatively significant impacts identified by the analysis conducted for the Coast Dorena EA. Cumulative effects analysis for the project area, by Issue, were presented in Chapter 3 of the EA. Effects from the action alternatives were largely localized with minimal impacts outside the project area.

8. **The degree to which the action may adversely affect districts, sites, highways, structures, or 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 historic resources.**

   There are no features within the planning area that are listed or eligible for listing in the National Register of Historic Places or are significant scientific, cultural, or historic resources.

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.**

   Terrestrial Species

   Northern Spotted Owl

   The proposed timber harvest was originally consulted on in the *Biological Assessment for LAA Projects with the Potential to Modify the Habitat of Northern Spotted Owls; Willamette Planning Province-FY 2009-2010* (September 2008) under the activity name "Stennetts Fawn" timber sale. This name was later modified to "Little Stennetts Fawn".

   A biological opinion was received on February 3, 2009 [FWS Reference Number 1-7-09-F-0008].

   The proposed action would conform to all management standards in these documents and would otherwise remain consistent with the original consultation, including the same or lesser effects determinations within the same or lesser footprint. The U.S. Fish and Wildlife Service confirmed in August 2015 that the original consultation would remain valid.

   The proposed action ***may affect, but is not likely to adversely affect*** critical habitat; ***may affect, but is not likely to adversely affect*** the spotted owl due to disturbance; and ***may affect, but is not likely to adversely affect*** spotted owls or their territories due to habitat modification. All actions would be consistent with Recovery Actions 10 and 32 in the spotted owl recovery plan.

   The Coast Dorena project would not appreciably diminish the effectiveness of the conservation efforts established under the Revised Recovery Plan for the Spotted Owl, the Northwest Forest Plan, or the Critical Habitat Rule. Reasonably foreseeable future actions

on adjacent private lands in the project area, watershed, and Willamette Planning province would not result in cumulative effects that would change these effects determinations.

There are no other Threatened or Endangered wildlife or botany species within the project area, and there is no causal mechanism for the project to affect any Threatened or Endangered terrestrial species outside of the project area.

Aquatic Species

There are no Threatened or Endangered fish species or their critical habitat within the project area and no causal mechanism for the project to affect any Threatened or Endangered fish species outside of the project area.

Implementation of the proposed actions would not change the likelihood of and need for listing of any Special Status Species under the ESA as identified in BLM Manual 6840 and BLM OR/WA 6840 policy.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The action alternatives do not threaten to violate any Federal, State, or local laws imposed for the protection of the environment including, but not limited to, the Clean Water Act, Clean Air Act, and Endangered Species Act. The action alternatives comply with the 1995 Eugene RMP, which provides direction for the protection of the environment on public lands. Project design criteria listed in the EA would assure compliance with these laws. The EA also meets National Environmental Policy Act disclosure requirements.

Pursuant to Executive Order 13212, the BLM must consider the effects of this decision on the President's National Energy Policy. As there would be no impact to the exploration, development, or transportation of undeveloped energy sources from the proposed action, a Statement of Adverse Energy Impacts is not required.

Signature of the Responsible Official:

unsigned

William O'Sullivan
Upper Willamette Field Manager
Eugene District Office

Date: